

# **Lesson 1: Introduction to Geospatial Analytics**

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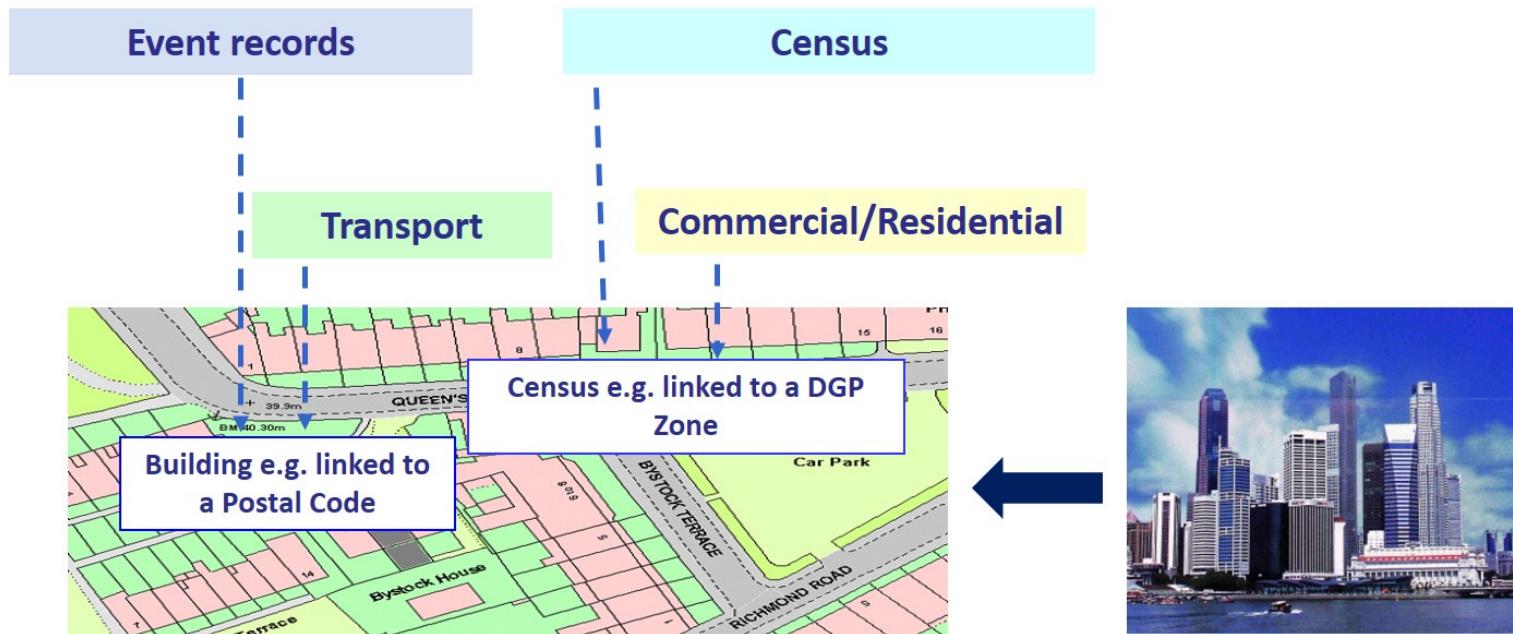
**2020/04/25 (updated: 2021-08-03)**

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- Demystifying Geospatial Analytics
- Motivation of Geospatial Analytics
- The Role of Geospatial Analytics
- Geospatial Analytics and Social Consciousness

# Demystifying Geospatial Analytics

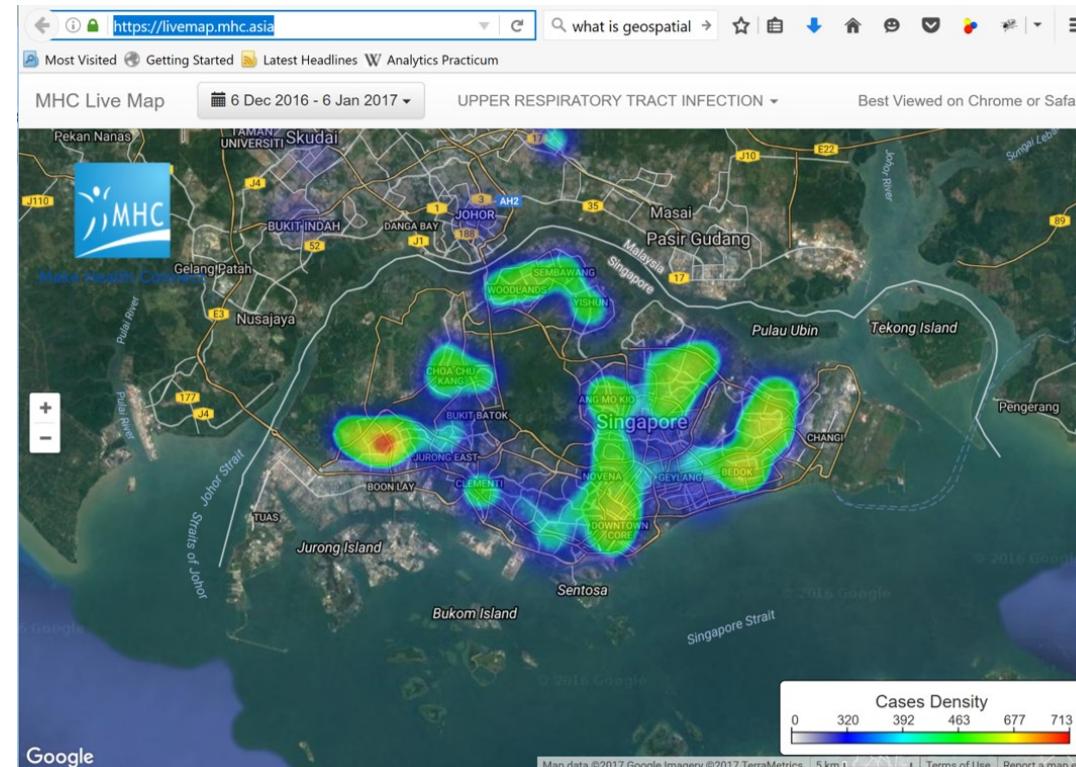
- A **Geographical Information System (GIS)** is a toolkit for creating, managing, analysing, visualising, and sharing data of any kind according to where it's located.



Geospatial analytics is more than a GIS

# Demystifying Geospatial Analytics

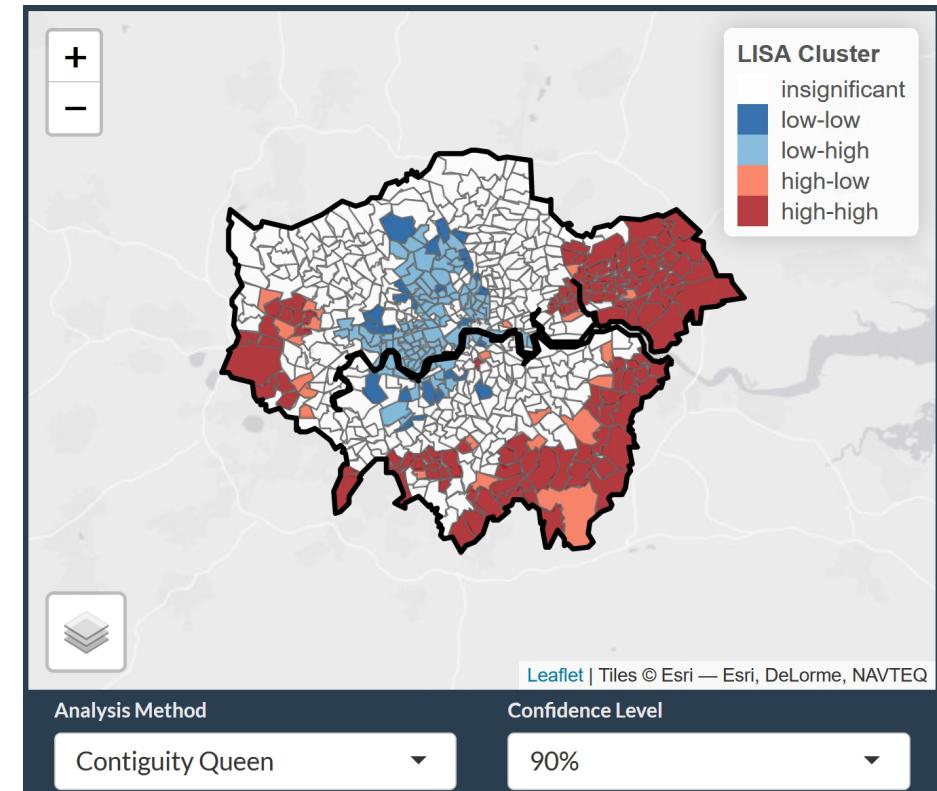
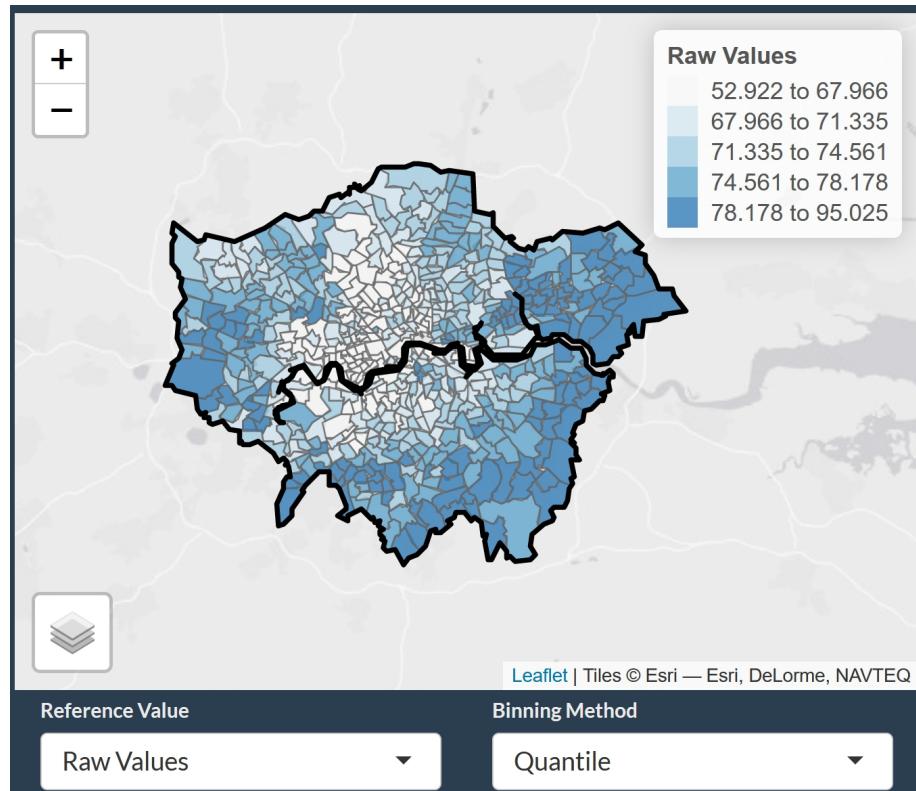
- Geospatial analytics is more than data visualisation



Source: <https://livemap.mhc.asia/> and the real geospatial analytics [https://wiki.smu.edu.sg/1213t2is415g1/IS415\\_2012-13\\_Term2\\_Assign2\\_Derek.Lee](https://wiki.smu.edu.sg/1213t2is415g1/IS415_2012-13_Term2_Assign2_Derek.Lee)

# Demystifying Geospatial Analytics

- Geospatial analytics is more than just mapping



Source: <https://isss608.shinyapps.io/shiny/>

# Motivation of Geospatial Analytics

- About 80% of all data maintained by organisations around the world has a location component.

(Source: BusinessWeek Research Services, 2006)

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD			
1	Country	Exchange	Name	ForEx	Symbol	ISIN	GEDOL	ChenBe	Moegle	MoypU	Industry	Supercar	1 Day Chg	1Wkch C	2Wkch C	1 Month	2 Month	3 Month	1 Day Chg	1 Day Chg	1Wkch C	1Wkch C	2 Wkch C	1 Month	1 Month	2 Month	2 Month	3 Month			
2	AT	VIE	EuroGrp	EUR	EDCT.VI	AT000001334931	12.25	35-03	3E+03	Financial Banks		22.65	-25	19.95	14.62	-16	15.3	-0.064	-0.068	-0.052	0.0016	0.2415	0.2657	0.4453	0.7121	0.3256	0.3754	0.05			
3	AT	VIE	Raffaello	EUR	RBIB.VI	AT0000010047	21.21	15-03	3E+03	Financial Banks		22.65	-25	19.95	14.62	-16	15.3	-0.064	-0.068	-0.052	0.0016	0.4508	0.5017	0.3256	0.3754	0.05					
4	AT	VIE	youngstar	EUR	VOES.VI	AT000001434340	3.93	15-03	3E+03	Financial Banks		10.11	30.47	11.19	12.4	15.22	15.05	-0.026	-0.028	-0.053	-0.074	-0.12	-0.101	-0.206	-0.173	-0.353	-0.38				
5	AT	VIE	WiseEuro	EUR	WBES.VI	AT000001669332	5.93	5E-03	3E+03	Financial Banks		6.15	5.6	5.5	6.37	10.06	11.3	-0.036	-0.038	0.0509	0.0622	0.0762	0.1019	-0.097	-0.08	-0.41	-0.38	-0.5			
6	AT	VIE	latorex	EUR	ICEL.VI	AT0000010076	23.2	3E-08	3E+03	Industrial	Coatings		21.22	21.48	21.49	22.3	25.68	21.84	0.0533	0.0508	0.0581	0.0591	0.0786	0.1029	0.054	-0.097	-0.064	0.062			
7	AT	VIE	Auditor	EUR	ANDV.VI	AT000001817004	23.3	3E-08	3E+03	Industrial	Industries		21.47	21.51	19.79	24	23.3	19.15	0.0787	0.0784	0.0767	0.0592	0.0702	0.1957	-0.067	0.0494	-0.006	0.0286	0.27		
8	AT	VIE	Vigorex	EUR	VBEX.VI	AT000001006303	1.59	15-03	3E+03	Industrial	Plastics		20.47	20.7	20.7	20.4	20.4	20.4	-0.026	-0.028	0.0507	0.0508	0.0508	0.0508	0.0508	0.0508	0.0508	0.0508	0.0508		
9	AT	VIE	CAVAC	EUR	OMVY.VI	AT000001455149	25.2	4E-09	3E+03	Oil & Gas	Oil & Gas		24.29	23.84	21.23	23.72	22.39	10.12	0.0517	0.0502	0.057	0.0439	0.197	0.2106	0.2544	0.2557	0.3641	0.344			
10	AT	VIE	Teknolo	EUR	TELAM.VI	AT000001455309	11.4	4E-09	3E+03	Telecoms	Telecoms		10.66	10.43	10.43	9.35	11	10.3	0.0837	0.0374	0.0667	0.0534	0.102	0.157	0.0364	0.0737	0.309				
11	AT	VIE	Yurberd	EUR	VEBEV.VI	AT0000014661607	28.53	2E-09	3E+03	Utilities	Utilities		23.36	23.32	23.52	25	23.97	23.56	-0.053	-0.053	-0.044	-0.0649	0.102	0.1436	0.1903	-0.046	-0.072	-0.5			
12	AT	VIE	Atmos	EUR	ATRIVY.VI	AT000001751864	2.27	5E-09	3E+03	Financial	Real Estate		2.02	2.02	2.15	1.47	2.10	2.59	-0.022	-0.024	0.1238	0.0396	0.0558	0.1289	0.3442	0.6843	0.0413	0.1501	-0		
13	AU	ASX	Bridge	AUD	BENAX.AU	AU000001509126	8.3	2E-03	3E+03	Financial	Banks		7.92	7.4	6.3	6.84	10	11	0.0241	0.0348	0.1058	0.0395	0.3	0.473	0.374	0.3737	-0.181	-0.035			
14	AU	ASX	Success	AUD	SURAX.AU	AU000001550204	6	8E-03	3E+03	Financial	Banks		5.14	6.17	5.4	5.2	7.5	8.3	-0.023	-0.022	0.0448	0.0497	0.1111	0.1501	0.358	0.5785	-0.2	0.237	-0.2		
15	AU	ASX	Neurotex	AUD	NEUAX.AU	AU000001007542	20.1	4E-09	3E+03	Financial	Banks		21.09	19.79	19.35	20.1	20.1	20.1	-0.044	-0.045	0.057	0.0596	0.1002	0.1473	0.2522	0.601	0.3501	-0.05			
16	AU	ASX	Alpha	AUD	ALPHAX.AU	AU0000010075424	8.44	15-03	3E+03	Financial	Banks		7.71	7.71	7.71	7.4	7.4	7.4	-0.044	-0.045	0.057	0.0594	0.1002	0.1473	0.2522	0.601	0.3501	-0.05			
17	AU	ASX	Armatix	AUD	ANZAX.AU	AU000001665556	15.75	3E+00	3E+03	Financial	Banks		13.05	15.75	15.69	13.05	13.27	15.25	-0.049	-0.049	0.0448	0.0512	0.102	0.157	0.2457	0.3715	0.0321	0.3501	-0.05		
18	AU	ASX	Victrix	AUD	WEBCO.AU	AU000001507146	13.03	2E-09	3E+03	Financial	Banks		13.04	10.95	10.73	16.65	15.54	16.63	-0.003	-0.002	0.0171	0.0171	0.0171	0.0171	0.0171	0.0171	0.0171	0.0171	0.0171	0.0171	
19	AU	ASX	Connex	AUD	CBAAX.AU	AU000001520105	34.47	3E-01	4E+10	Financial	Banks		35	35.08	31	25.3	25.8	28.3	-0.008	-0.007	-0.01	-0.01	-0.01	0.0211	0.0259	0.2417	0.0554	0.3070	0.2391	0.4815	0.22
20	AU	ASX	Bluesco	AUD	BSLAX.AU	AU000001553202	2.37	2E-09	3E+03	Basic Mfg	Basic Industries		2.74	2.55	2.25	2.3	3.32	3.47	-0.078	-0.078	0.0028	0.0023	0.0422	0.2516	0.103	0.2238	-0.212	-0.171	-0.2		
21	AU	ASX	CSR Ltd	AUD	CSRX.AU	AU000001523864	1.26	2E-09	3E+03	Basic Mfg	Basic Industries		1.27	1.15	1.17	1.02	1.425	1.75	-0.053	-0.053	0.048	0.0422	0.0295	0.3614	0.1765	0.3890	-0.162	-0.1			
22	AU	ASX	Illico	AUD	UXIAX.AU	AU000001553202	1.26	2E-09	3E+03	Basic Mfg	Basic Industries		1.27	1.15	1.17	1.02	1.425	1.75	-0.053	-0.053	0.048	0.0422	0.0295	0.3614	0.1765	0.3890	-0.162	-0.1			
23	AU	ASX	Orion	AUD	OTRAX.AU	AU000001553202	3.03	15-03	3E+03	Basic Mfg	Basic Industries		4.1	4.2	4.2	4.25	4.44	4.44	-0.017	-0.017	-0.054	-0.05	-0.05	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
24	AU	ASX	Almanac I	AUD	ANCAAX.AU	AU000001554549	2.02	2E-09	3E+03	Basic Mfg	Basic Industries		2.02	2.05	2.05	1.8	2.43	2.39	-0.055	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
25	AU	ASX	Norwest	AUD	NCM4AX.AU	AU000001563701	22.22	3E-09	3E+03	Basic Mfg	Basic Industries		22.22	22.22	22.22	22.22	22.22	22.22	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
26	AU	ASX	BHP Billiton	AUD	BHPAX.AU	AU000001344639	31	3E-09	3E+03	Basic Mfg	Basic Industries		31	31	31	31	31	31	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
27	AU	ASX	Litar	AUD	LQLAX.PG	PG000001553556	1.26	2E-09	3E+03	Financial	Financial Services		1.26	1.15	1.14	1.09	1.09	1.09	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
28	AU	ASX	Fortescue	AUD	FMGAX.AU	AU000001505251	31	3E-09	3E+03	Financial	Financial Services		31	31	31	31	31	31	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
29	AU	ASX	Palmer	AUD	PALAX.AU	AU000001566346	30.47	3E-09	3E+03	Financial	Financial Services		30.47	30.47	30.47	30.47	30.47	30.47	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
30	AU	ASX	Redback	AUD	REDBAX.AU	AU000001553202	3.03	2E-09	3E+03	Financial	Financial Services		3.03	2.94	2.94	2.65	2.65	2.65	-0.023	-0.023	-0.023	-0.023	-0.023	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
31	AU	ASX	Techno	AUD	PLAX.AU	AU000001553202	1.26	2E-09	3E+03	Financial	Financial Services		1.26	1.15	1.17	1.02	1.425	1.75	-0.053	-0.053	0.048	0.0422	0.0295	0.3614	0.1765	0.3890	-0.162	-0.1			
32	AU	ASX	Oriens	AUD	ORIAX.AU	AU000001553201	1.26	2E-09	3E+03	Financial	Financial Services		1.26	1.15	1.17	1.02	1.425	1.75	-0.053	-0.053	0.048	0.0422	0.0295	0.3614	0.1765	0.3890	-0.162	-0.1			
33	AU	ASX	Lightyear	AUD	LEIAX.AU	AU000001551287	0	15-03	3E+03	Financial	Financial Services		0	0	0	0	0	0	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
34	AU	ASX	Boral	AUD	BBLAX.AU	AU000001528670	3.21	2E-09	3E+03	Financial	Financial Services		3.21	3.21	3.21	3.21	3.21	3.21	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
35	AU	ASX	Jones R	AUD	JHJAX.AU	AU000001543297	4.25	15-03	3E+03	Financial	Financial Services		4.25	4.25	4.25	4.25	4.25	4.25	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
36	AU	ASX	Lord	AUD	LLCAX.AU	AU000001532004	6.49	15-03	3E+03	Financial	Financial Services		6.49	6.49	6.49	6.49	6.49	6.49	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
37	AU	ASX	Denver	AUD	DVAJAX.AU	AU000001543297	4.45	15-03	3E+03	Financial	Financial Services		4.45	4.45	4.45	4.45	4.45	4.45	-0.054	-0.054	-0.054	-0.054	-0.054	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
38	AU	ASX	United	AUD	UDJAX.AU	AU000001553202	3.03	2E-09	3E+03	Financial	Financial Services		3.03	2.94	2.94	2.65	2.65	2.65	-0.023	-0.023	-0.023	-0.023	-0.023	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
39	AU	ASX	Perpetual	AUD	PRTAX.AU	AU000001543294	3.03	2E-09	3E+03	Financial	Financial Services		3.03	2.94	2.94	2.65	2.65	2.65	-0.023	-0.023	-0.023	-0.023	-0.023	0.0502	0.2327	0.3245	0.3501	0.3501	-0.05		
40	AU	ASX	ASX1 Ltd	AUD	ASX1AX.AU	AU000001502225	3.03	5E-09	3E+03	Financial	Financial Services		3.03	2.94	2.94	2.65	2.65	2.65	-0.023	-0.023											

# Motivation of Geospatial Analytics

- Geospatial information in Smart Nation

Thursday, Jan 8, 2015

**THE STRAITS TIMES / Singapore**

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Singapore needs to be 'smart city' to stay ahead:  
PM

PUBLISHED ON NOV 24, 2014 11:13 AM

191 68 0 39



The need for Singapore to be a "smart nation", using the latest technology to benefit the country, goes beyond just making life better for the people, said Prime Minister Lee Hsien Loong at the launch of the Smart Nation initiative on Monday. -- PHOTO: ST FILE

One major initiative will be to let people access maps and build up geospatial databases by contributing information such as animal sightings, traffic incidents or the best mee pok eateries.

See more at: <http://www.straitstimes.com/news/singapore/more-singapore-stories/story/new-3d-map-collate-local-knowledge-part-smart-nation-pro#sthash.aUxbyCei.dpuf>

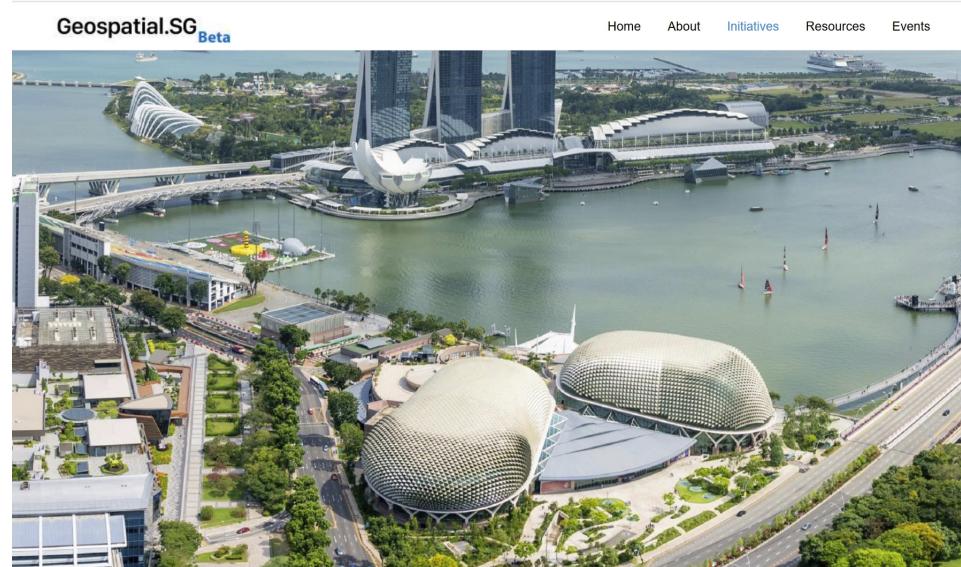
# Motivation of Geospatial Analytics

- The explosion in the availability of open geospatial data from both the public and private sectors at national and international levels



# Motivation of Geospatial Analytics

- The national geospatial master plan



## Singapore Geospatial Master Plan

The Singapore Land Authority (SLA), in partnership with the Government Technology Agency (GovTech), leads the Singapore Geospatial Master Plan to maximise the impact of geospatial information and technology for the economy and the wider society.

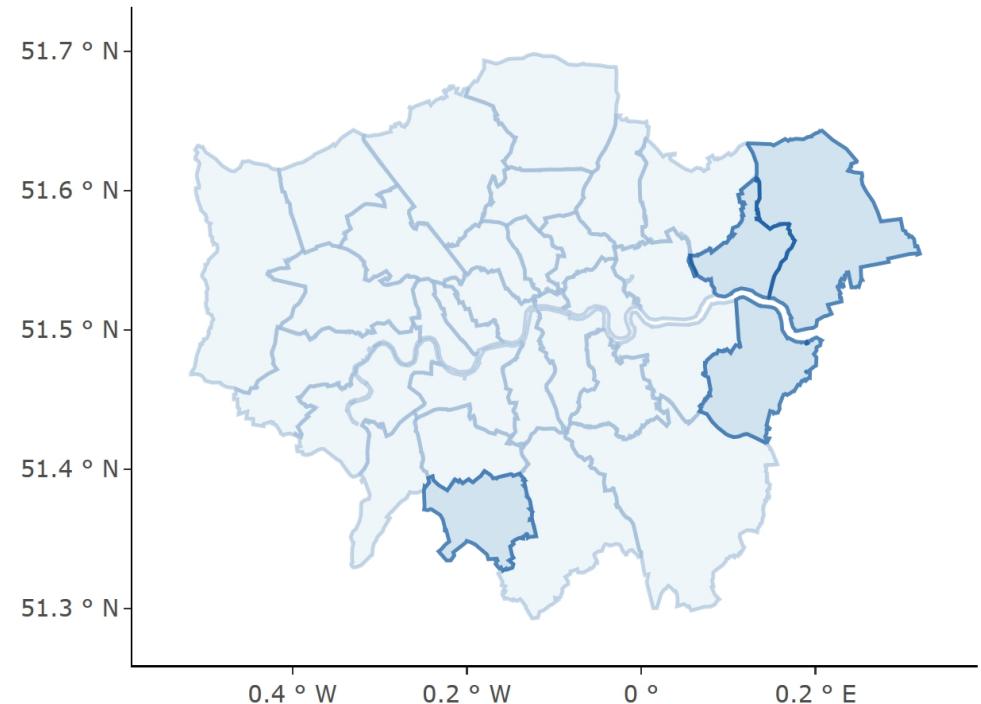
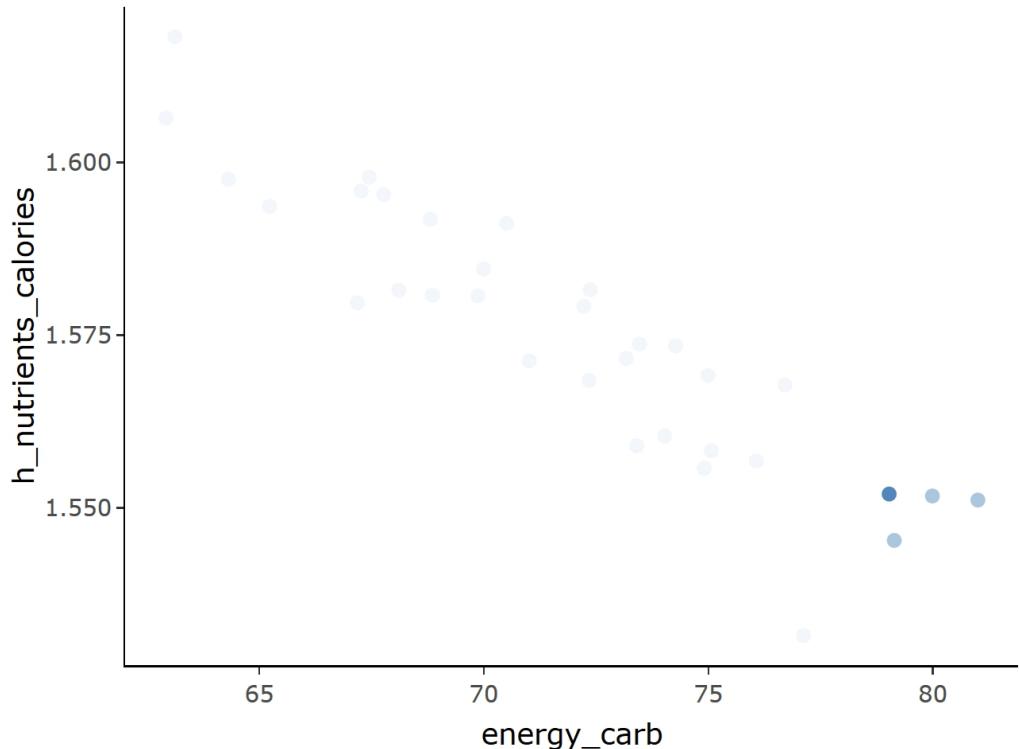
**Vision:** A Geospatial-Powered Singapore.

**Mission:** Empowering the Industry, People and Government with Geospatial Information and Technology to Enhance Decision-making, Create Opportunities and Lead Better Lives.

Source: <https://geospatial.sg/initiatives#masterplan>

# The role of Geospatial Analytics

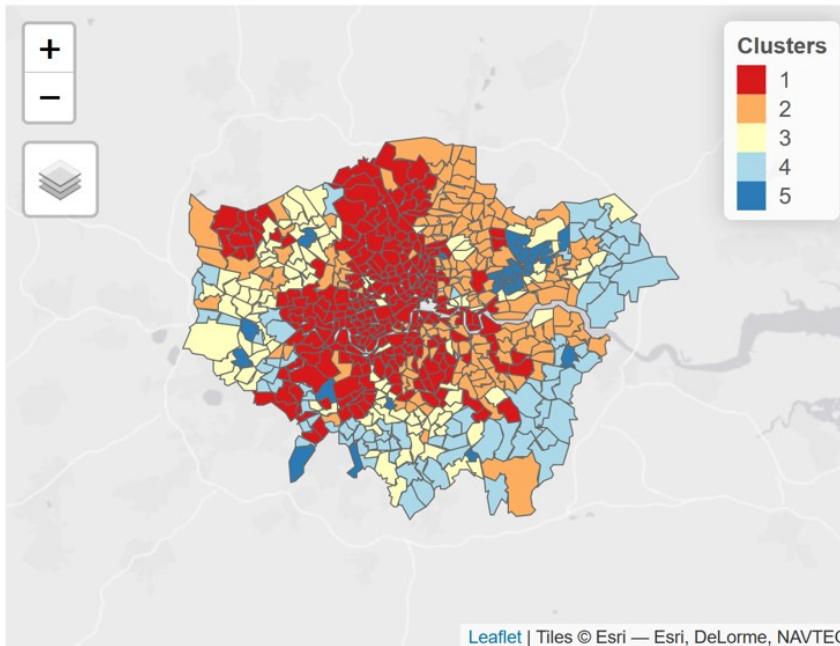
- Uncovering insights not found in statistical graphs and tables.



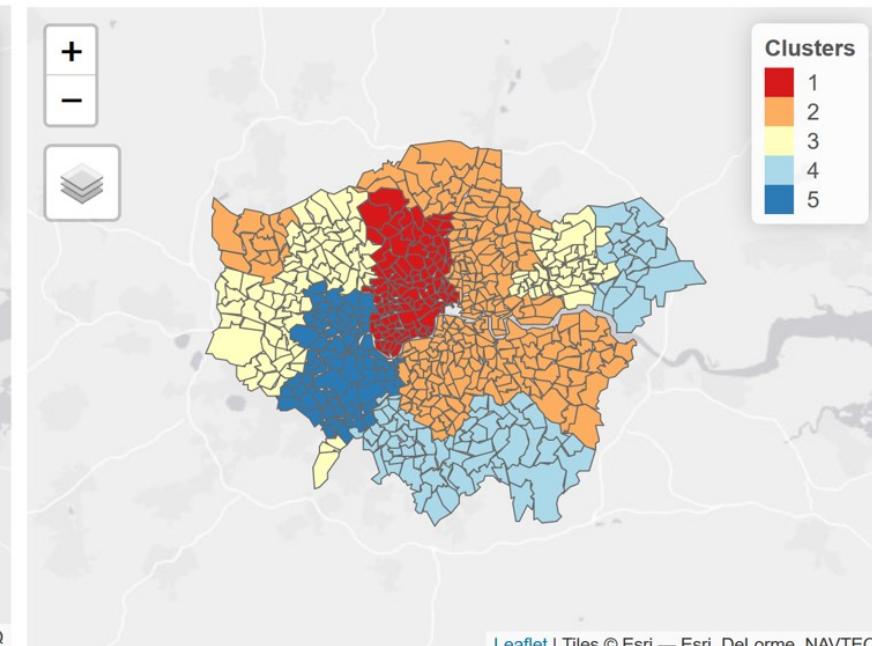
Source: <https://isss608.shinyapps.io/shiny/>

# The role of Geospatial Analytics

- To reveal the untapped property of spatial contiguity in geographic knowledge discovery in databases.



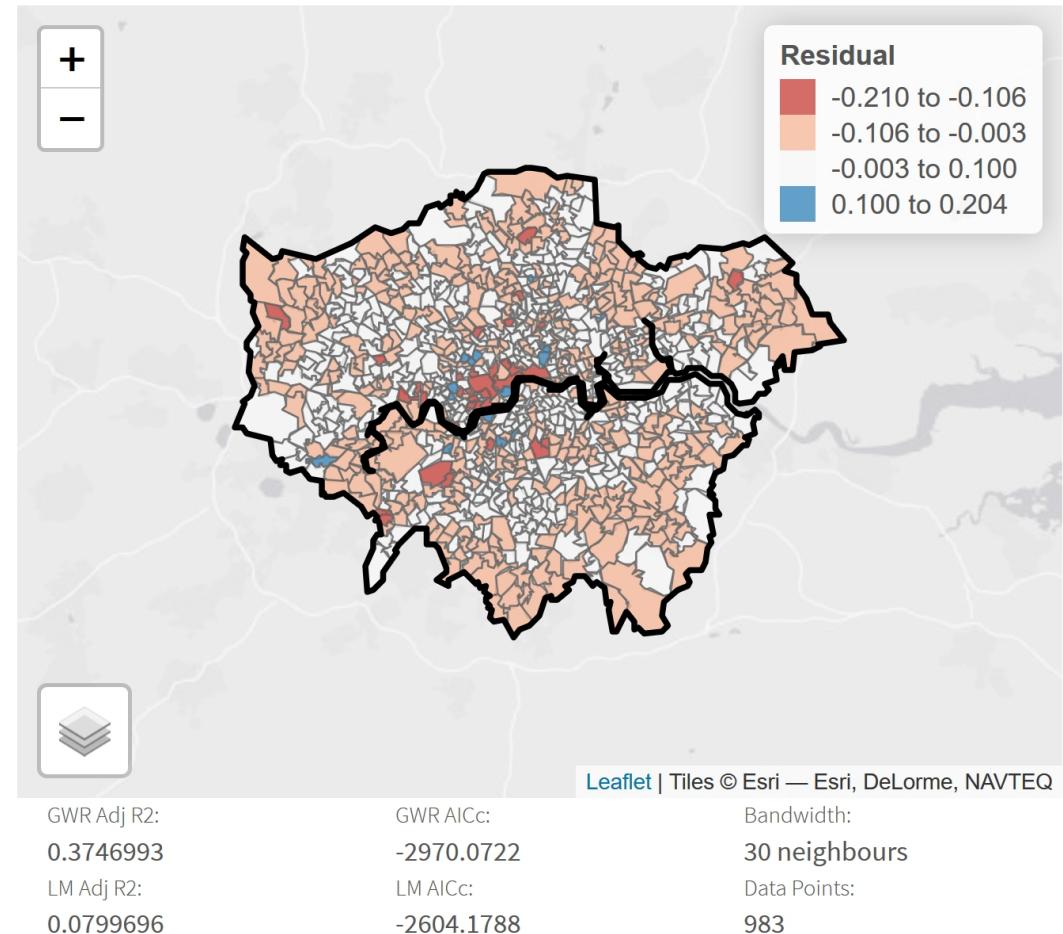
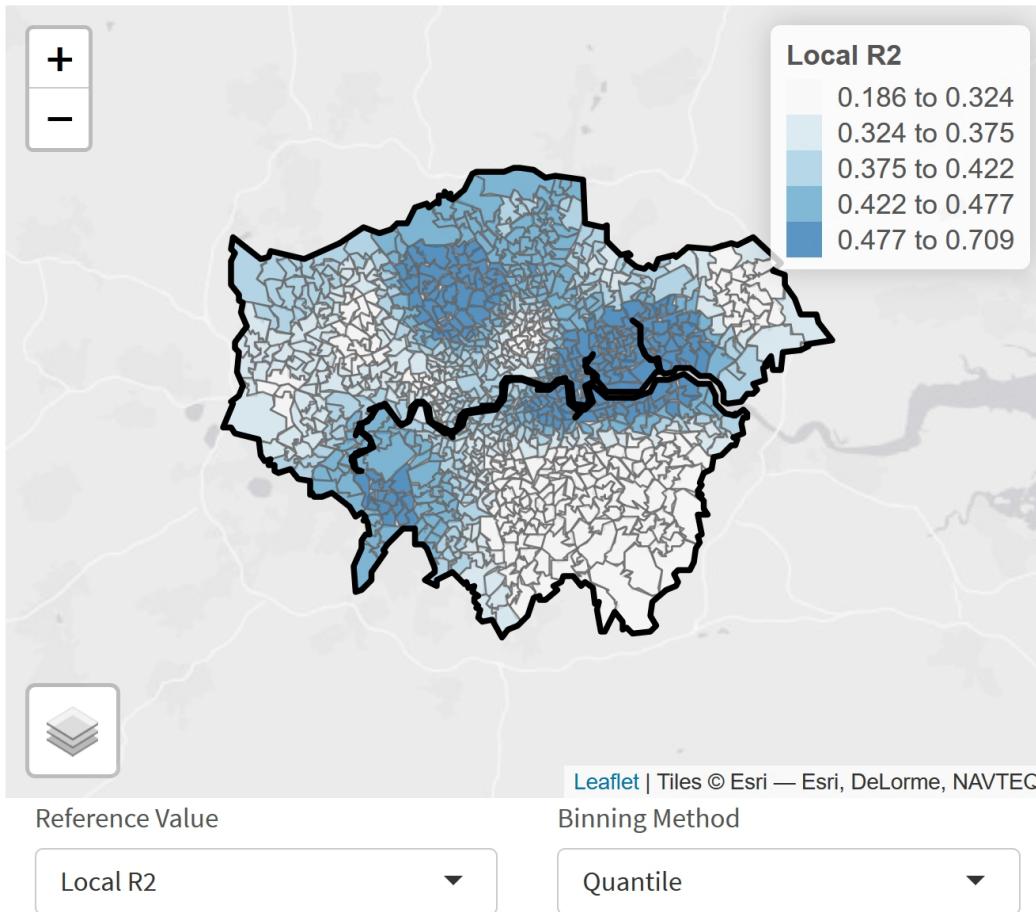
Hierarchical clustering



Spatially constrained clustering

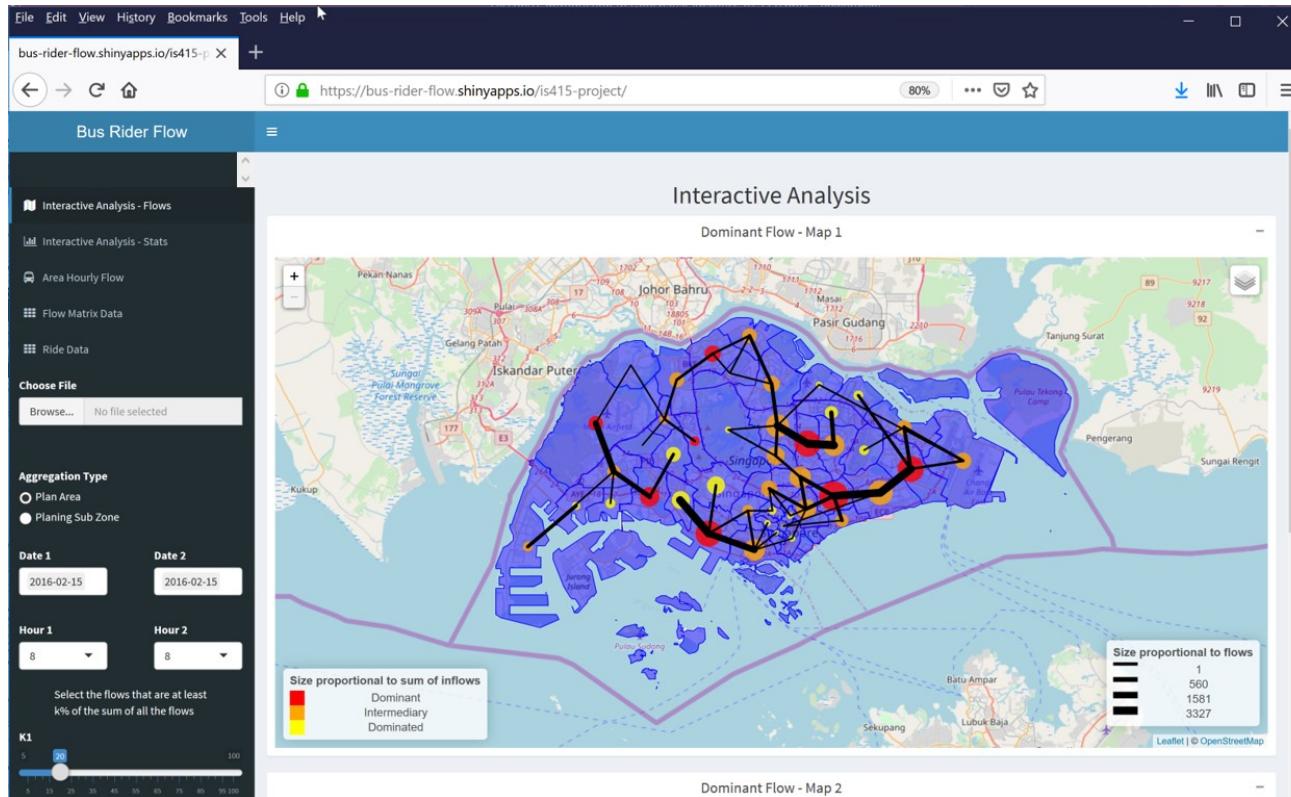
# The role of Geospatial Analytics

- To uncover the complexity of the real world relationship.



# The role of Geospatial Analytics

- To model spatial interactions and flows.



Source: [https://wiki.smu.edu.sg/17t2is415g1/IS415\\_TeamJSR\\_Project](https://wiki.smu.edu.sg/17t2is415g1/IS415_TeamJSR_Project)

# Geospatial Analytics and Social Consciousness

The true power of geospatial analytics is to provide decision makers and planners with data-driven and process information for better problem solving and more efficient use of resources.

