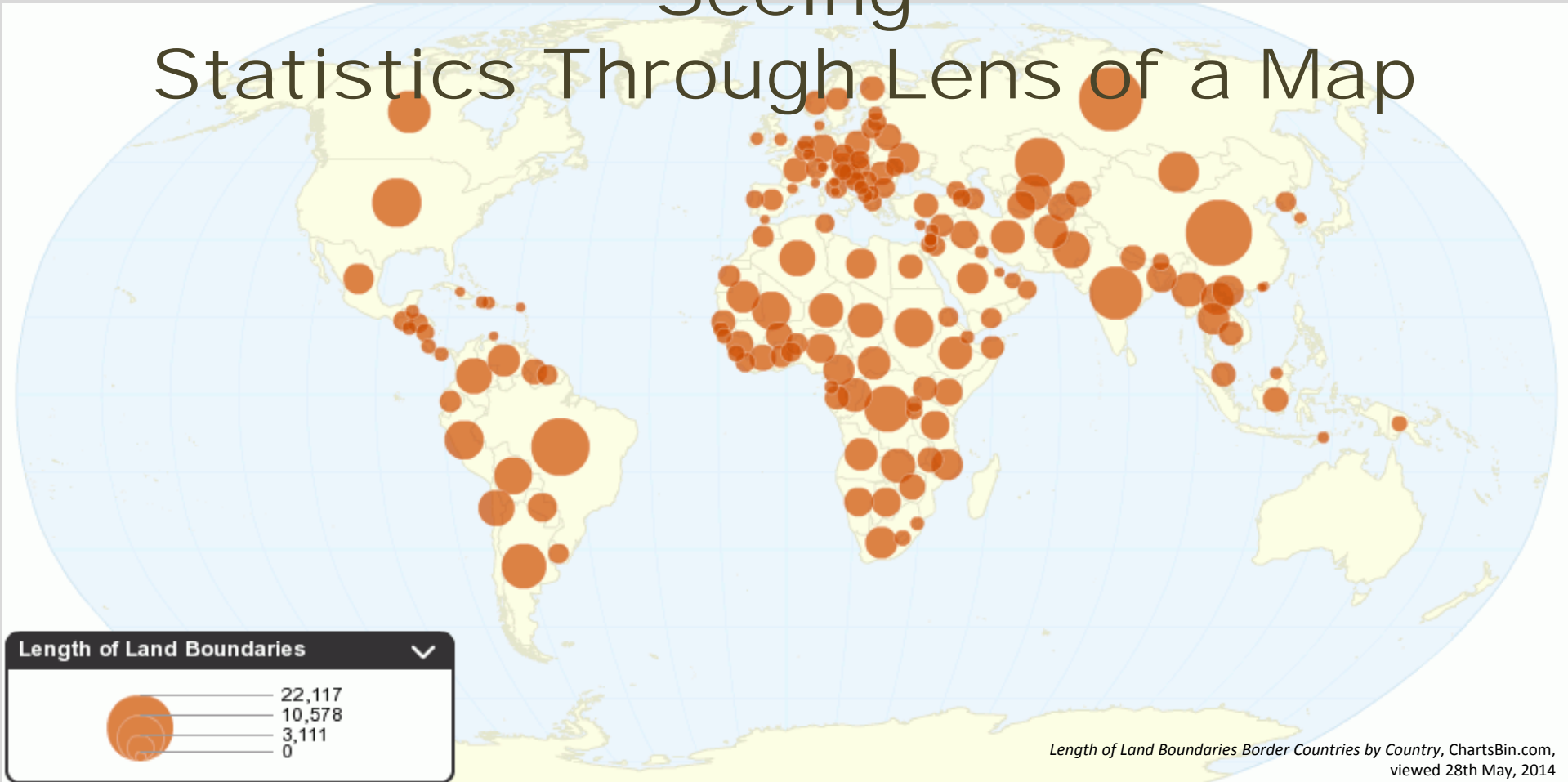


Seeing Statistics Through Lens of a Map

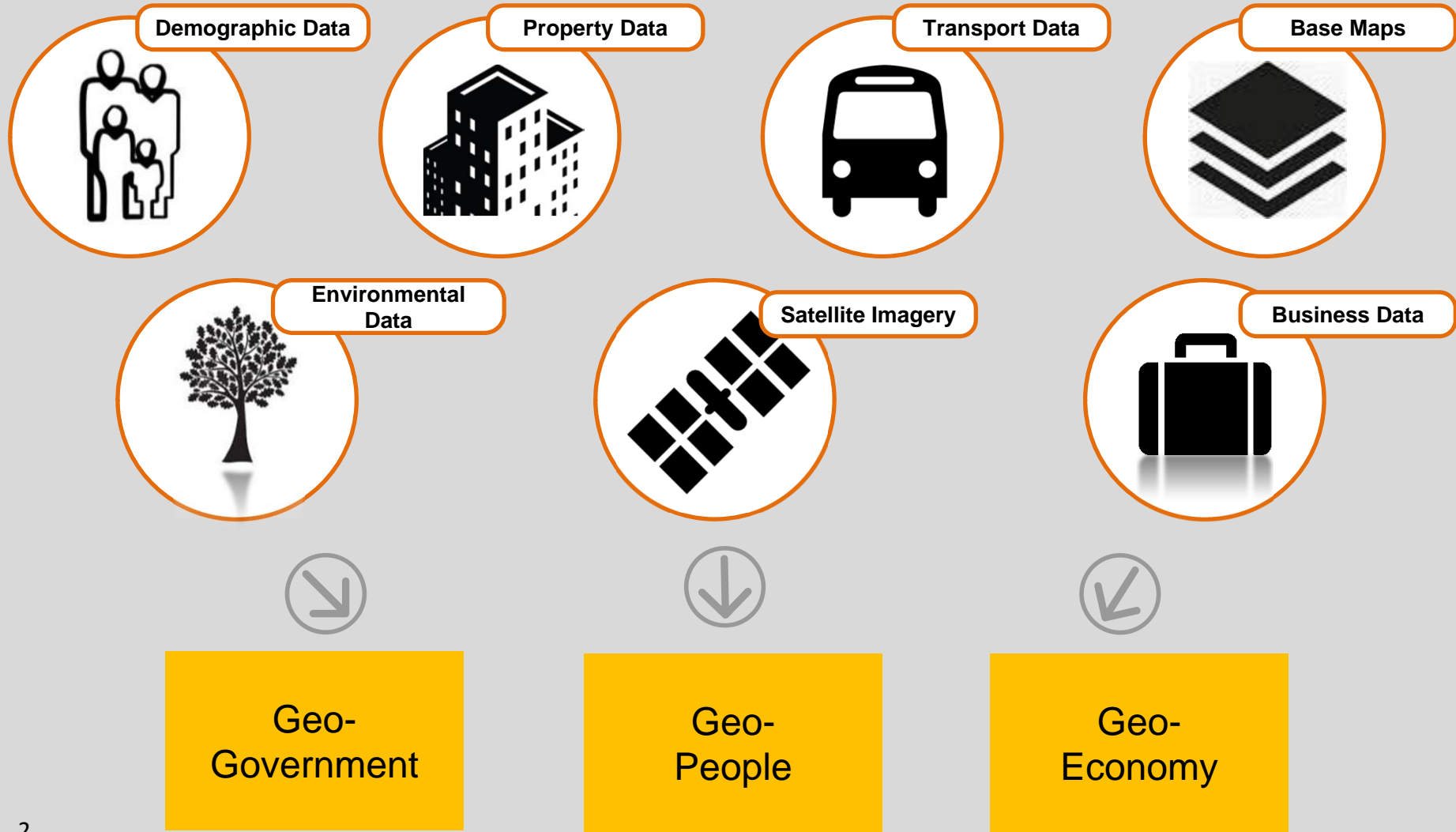


Singapore Geospatial Collaborative Environment



Synergistic Data

SG • SPACE



Singapore Geospatial Collaborative Environment



Synergistic Data

SG • SPACE



Extensive collection of GeoSpatial information



Overlay & consolidate GeoSpatial layers



Platforms for data sharing, analysis and solution generation





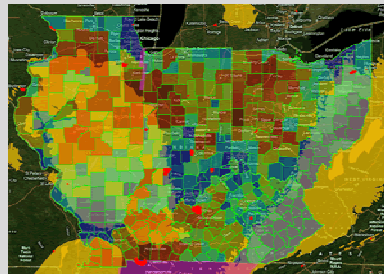
Stakeholders

Ministries & Agencies

Outcomes

1. Enhance Public Sector Service Delivery
2. Support Policy and Decision Making

1. Build Geospatial Competency within and across public sector



Geo Fund

US\$5.3mil

Worth of projects

17 Projects Awarded

36 Geo-Analytics Collaboration

28 Agencies

2. Facilitate multi/inter-agency data sharing, visualisation and geo-analytics



GeoCommunity

>4 Communities



Stakeholders

Public,
NGOs & Researchers

Outcomes

1. Develop nation-wide geospatial capability
2. Increase Geospatial literacy

1. Nurture Geo-talent



Singapore Geospatial Scholarship & Competency Framework

2. Enhance Public Geo-literacy



31 Geo-Events
>3000 Attendees



Stakeholders

Geospatial Industry,
Retail, Logistics
Manufacturing

Outcomes

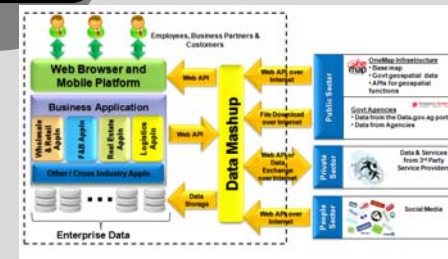
1. Grow Geospatial Industry in Singapore
2. Support Singapore's key economic drivers

1. Foster Private-Sector Innovation



Please tell me how to get from “大坡” to “小坡三马路”
Source: Pioneer Gen

USD \$40K
Seed Funding



i-Singapore Programme



Geospatial
R&D

2. New Geospatial Technologies to Support Next Wave of Economic Development

Singapore Geospatial Collaborative Environment



Geo-Platforms

SG • SPACE

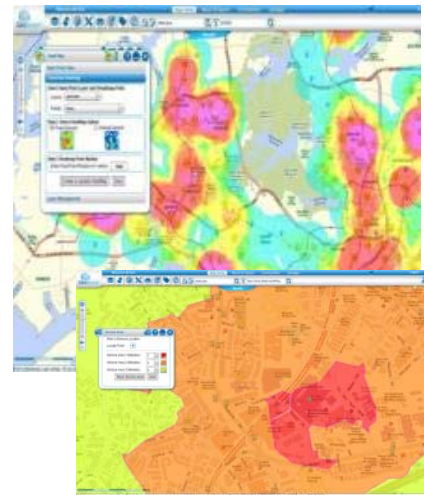


GEO DATA

- 494 data layers by 38 agencies
- Accessible to ALL public officers



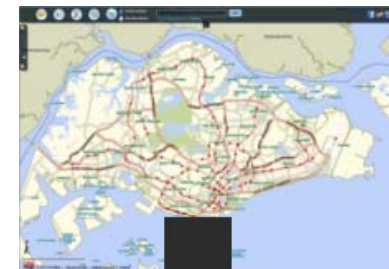
GEO-ANALYTICS TOOLS



- Heatmap
- Service Area
- Proximity Search



Multi-Window
Public Access



General
Public



Businesses



NGO:



Educational
Institutions

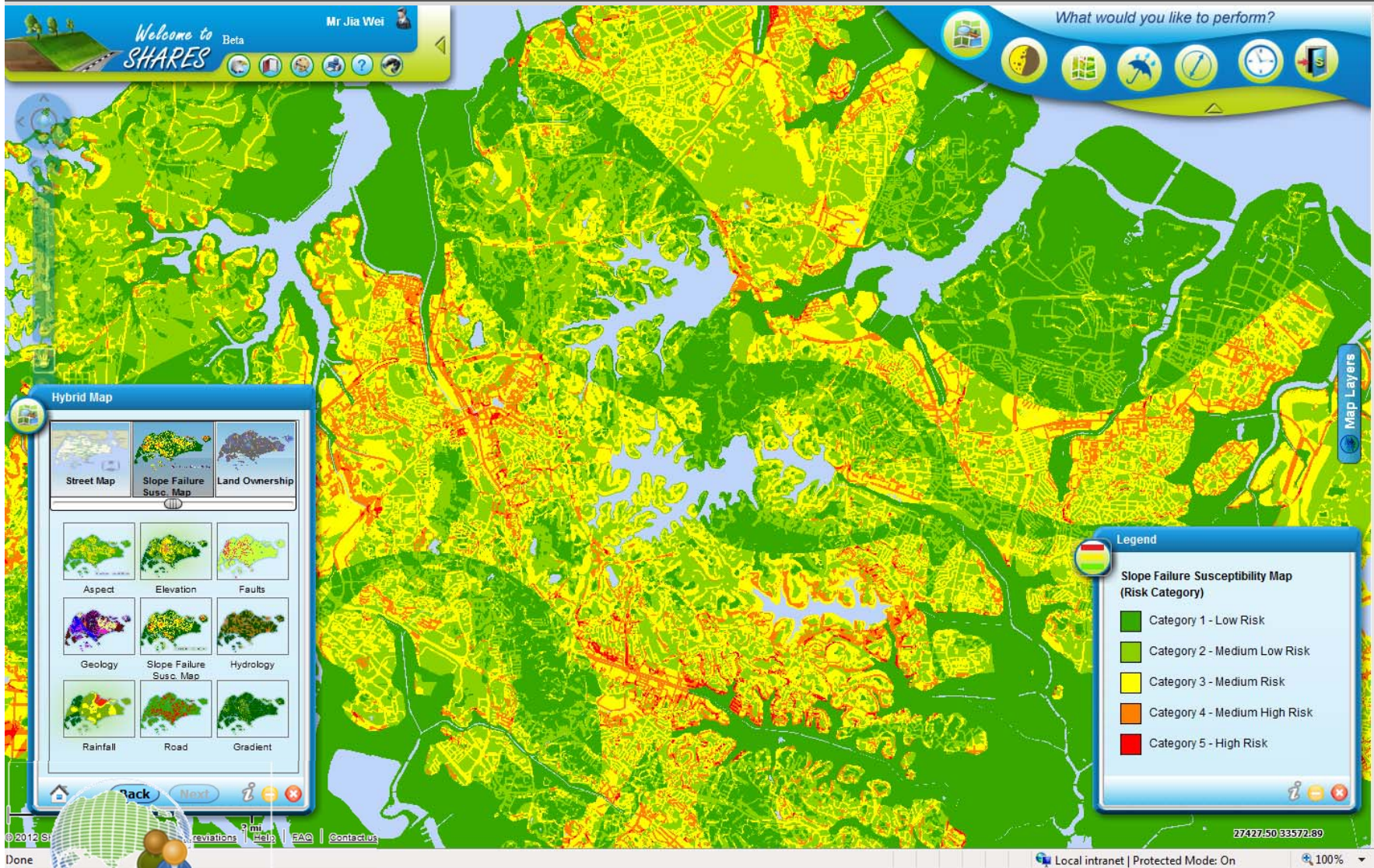


Singapore Geospatial Collaborative Environment



Geo-Platforms → GeoCommunities

SG • SPACE



Singapore Geospatial Collaborative Environment



Geo-Platforms → OneMap

SG • SPACE



Map Portal for Public Sector Data

- 88 Participating Agencies
- 37 Contributing Agencies
- 81 Data Themes
- 42 Web Services



Street Map
Building names, transport network and points of interest



Land Lot
Cadastral boundaries and lot numbers



Hybrid Map
Toggle between 2 base maps



Master Plan 2008
Designated uses of land



Electoral Division
Electoral boundaries



Parks and Waterbodies Plan
Existing and proposed green spaces and waterbodies



Community Use Sites by SLA and HDB

Popular themes available:

- Child Care Services
- Dengue Clusters
- Hawker Centres
- Hotels

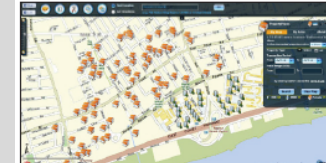


Community Clubs by PA

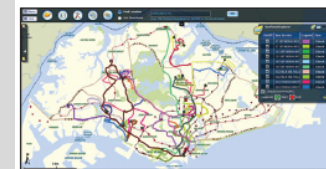
- Kindergartens
- Parks
- Sport Centres
- Tourist Attractions



TrafficQuery
Live traffic information



PropertyPrices
HDB and private property prices



BusRouteExplorer
Bus routes and services



BizQuery
Registered businesses



LandQuery
Land parcel ownership



PopulationQuery
Statistical data of the Singapore population



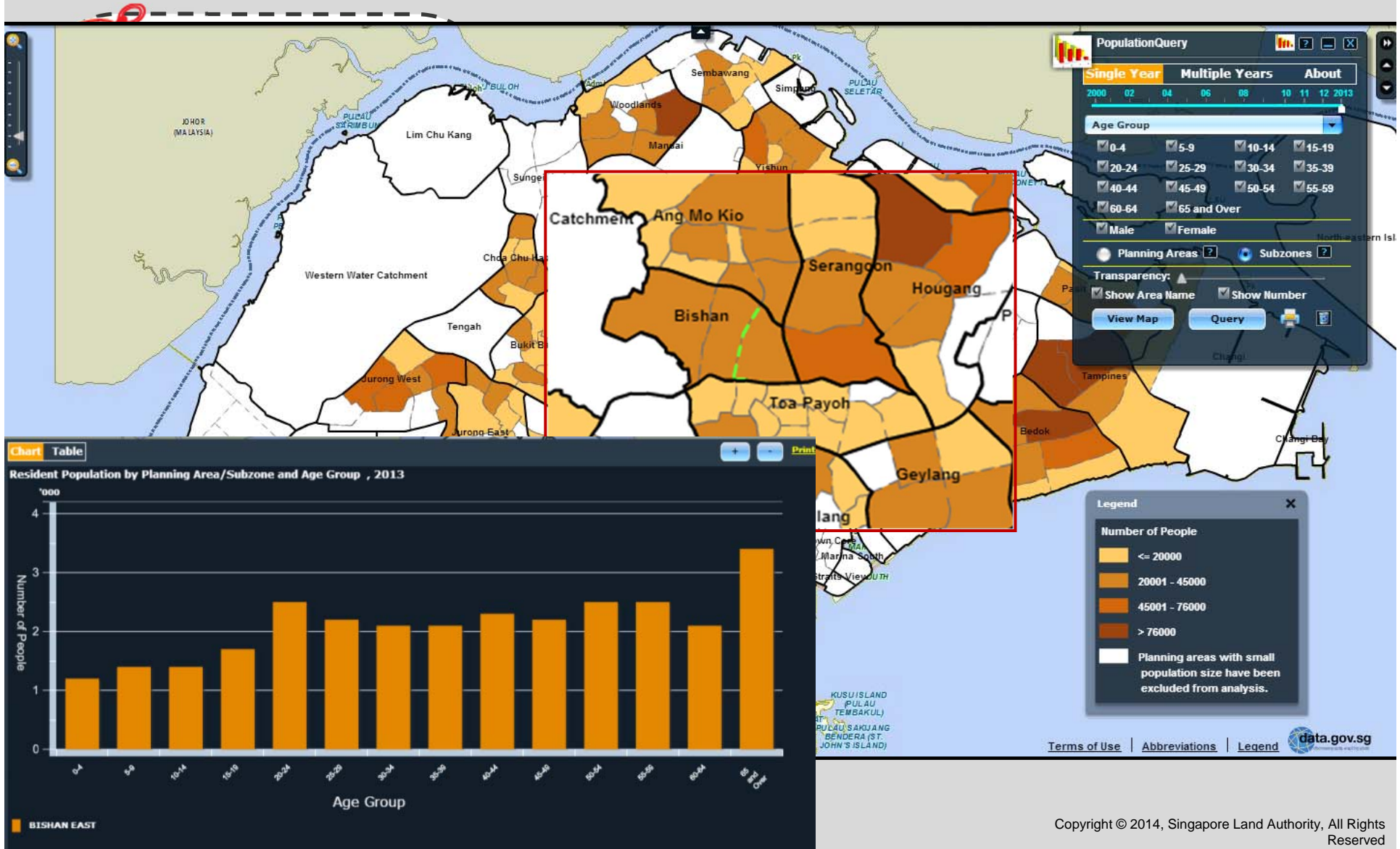
RentalQuery
HDB and private rental prices

Singapore Geospatial Collaborative Environment



Geo-Platforms → OneMap → Population Query

SG • SPACE



[Terms of Use](#) | [Abbreviations](#) | [Legend](#)

M-A-P the Libraries Data



Geo-analytics Collaboration NLB

Quick Facts about National Library Board of Singapore

Libraries

1 National Library
25 Public Libraries,
Other Libraries

Membership

More than 2m members

Visits

More than 36m visits

Loans

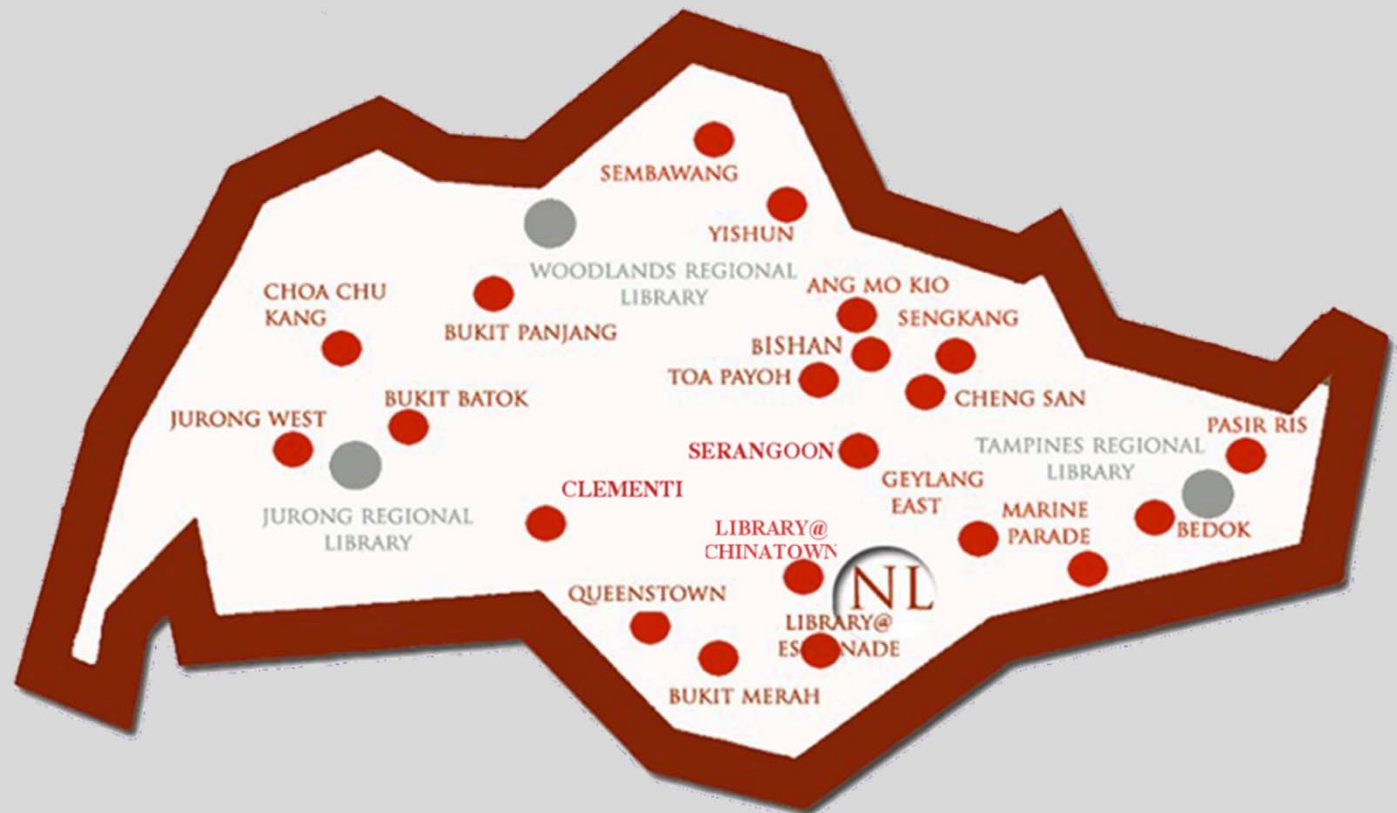
More than 30m loans

Collection

More than 1.5m titles
More than 8m items

Online Usage

Digital User Visits: > 8.1m
e-Retrievals: > 47.4m



Geo-analytics Collaboration

Using GIS to M-A-P Libraries Data

40 million rows of data

- 30,000,000 loans
- 8,000,000 titles
- 2,000,000 members

Age	Postal code	Age	Postal code	Age	Postal code	Age	Postal code	Age	Postal code	Age	Postal code	Age	Postal code	
81	457079	86	367304	86	429946	87	80027	88	547901	71	218899	72	653441	
73	238203	77	207304	76	429946	86	90021	61	737386	62	440232	61	30021	
83	242476	83	274113	89	89916	87	622134	87	110109	71	130130	75	120139	
85	279019	76	460544	89	520837	72	684617	86	712688	76	229620	76	529322	
85	287055	87	228964	77	400638	84	762384	71	130051	88	130099	80	132028	
84	381189	74	279001	84	334840	78	277787	88	760218	88	130141	88	134233	
80	381189	82	457817	82	524247	88	130099	77	176618	88	431091	85	277962	
78	403756	89	520534	76	524247	79	681132	78	150405	79	486202	76	451117	
85	597232	85	130018	89	287938	83	289922	88	638314	74	130209	80	533059	
81	318117	82	268902	77	420799	80	130077	89	408264	88	277124	83	240221	
89	270102	76	294372	67	130100	80	130494	77	170141	88	730844	85	531899	
86	587024	89	802476	81	557236	85	130325	72	628277	65	470251	75	128794	
81	427849	72	809048	77	339884	86	430719	89	772022	65	800109	75	128718	
77	389920	77	119108	79	339884	85	638217	78	905176	65	780227	72	330409	
77	81608	75	524246	86	511211	85	175461	88	762384	65	100786	76	179686	
74	561107	75	900210	75	655280	85	680865	85	760752	86	150176	84	233005	
75	598787	75	380118	85	130121	85	528147	78	900207	86	130241	87	471769	
79	426896	79	360223	80	170266	85	171212	73	190797	67	104775	75	268667	
76	738022	87	700701	85	903114	80	480071	88	800017	88	220569	87	760161	
81	580123	79	532010	85	150037	86	621171	83	110119	77	760120	82	279001	
75	370227	88	131886	86	389102	89	480278	87	240021	88	840061	87	909999	
69	91109	83	425961	86	119513	86	194261	84	149362	86	730182	70	145789	
88	422764	76	760886	86	495236	85	157364	84	179686	68	120027	77	807261	
77	349708	85	309908	86	287022	78	480042	88	158513	72	481121	73	549717	
80	598182	88	461701	88	344119	85	479982	88	397216	87	100796	78	112124	
77	144882	82	613147	86	130414	86	702447	88	408611	88	90109	88	486111	
88	67	716886	73	516257	85	482219	73	681886	87	788181	70	380139	77	280061
76	288109	82	679408	86	174622	88	181119	87	209424	74	190417	80	330227	
76	317124	81	170109	88	121970	83	480818	87	817899	89	179489	88	349176	
78	487018	83	380809	85	590281	85	90111	85	808811	78	890286	83	180176	

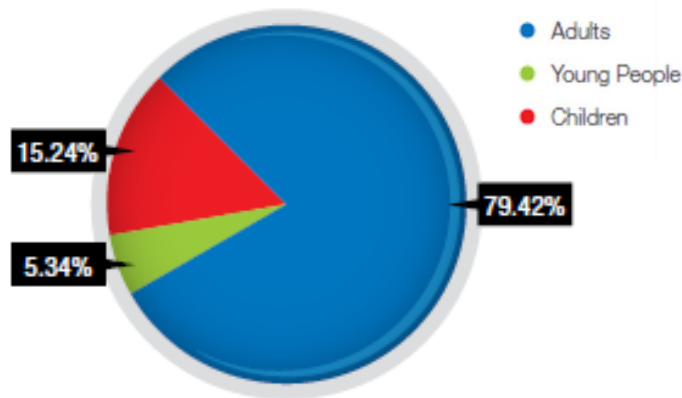
Name of Library	Notes	FY2009	FY2010
Ang Mo Kio Public Library		1,428,132	1,308,939
Bishan Public Library		2,097,912	2,133,587
Bedok Public Library		2,281,356	2,097,573
Bukit Batok Public Library		1,150,550	1,122,371
Bukit Merah Public Library		874,836	829,236
Bukit Panjang Public Library		1,216,707	1,213,891

Cumulative Loan Statistics

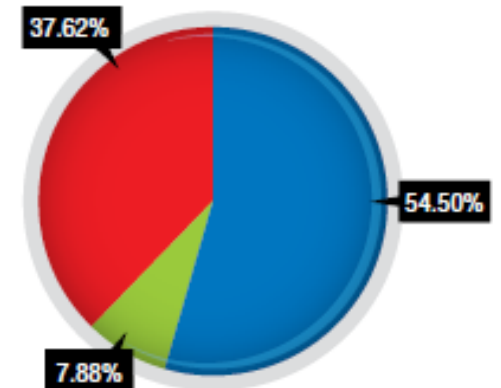
Financial Year Ending



No. of Chinese Titles By Age Group



No. of Malay Titles By Age Group



Geo-analytics Collaboration

Using GIS to M-A-P Libraries Data

Age	Postcode	Postal Code	Age	Postcode	Postal Code	Age	Postcode	Postal Code	Age	Postcode	Postal Code	Age	Postcode	Postal Code	
81	457613	86	207304	86	429686	87	80027	88	547746	73	238889	73	055141	63	
3	238929	78	207304	78	429686	88	80023	85	751786	85	449822	81	88213	63	
4	88	245476	83	278413	89	289838	87	822176	87	318309	73	330330	79	139318	63
5	95	278616	76	446564	88	526817	72	588857	88	763883	76	239623	75	535212	72
6	95	367055	87	258836	77	400836	84	368286	73	240051	88	330094	80	13328	64
7	86	389189	74	279871	84	374942	76	277787	86	762236	88	520742	88	534239	64
8	95	389189	82	451817	82	374247	88	338889	77	378481	88	431881	85	277661	65
9	90	451756	89	555826	76	574247	79	481132	78	158605	75	880631	75	454117	65
10	85	587222	85	108811	88	287388	82	229882	88	528214	76	322009	88	531059	64
11	88	378117	82	248502	77	493778	82	338077	89	481684	88	277154	81	548252	84
12	88	378117	78	298172	87	338330	85	374886	77	378161	88	378886	83	333899	63
13	85	383838	88	482876	81	573734	83	338883	72	488887	85	478051	75	128784	81
14	91	457849	72	809848	77	388884	85	488723	83	273222	85	880353	73	128728	88
15	77	388883	77	318838	75	388884	85	528817	78	388578	85	388527	77	388489	71
16	77	818888	75	528838	86	181235	85	378883	88	388888	88	388888	75	138888	64
17	76	588117	75	988338	75	652388	85	688885	85	788752	86	388176	84	238888	72
18	75	588117	71	388818	89	238121	85	528167	88	888887	88	388887	87	438789	64
19	79	488886	79	388223	89	378286	85	372132	75	388797	87	388797	75	388887	64
20	76	788322	87	788706	85	80116	85	888751	88	888817	88	238889	87	788885	72
21	82	788223	73	538883	85	538887	88	882131	89	882131	77	788752	82	278888	72
22	75	538217	88	318488	86	888830	88	488878	87	388833	89	488881	87	388889	85
23	68	881819	83	428881	86	118113	86	188216	88	388882	86	338882	90	388789	85
24	86	427884	78	788884	86	888838	83	578884	88	378888	88	328887	77	882882	75
25	77	348718	83	388889	86	288712	78	488842	88	388831	72	481222	73	548717	69
26	76	588182	88	487201	88	348128	85	478882	88	388728	87	338888	78	132124	88
27	75	141882	87	415747	86	388134	86	788487	88	848811	88	881888	88	488813	64
28	87	738888	73	338837	85	482115	73	488188	87	788813	78	338129	77	388885	64
29	76	288889	82	478884	86	378832	88	388123	87	288451	74	388457	88	338837	72
30	76	357124	83	378189	86	523790	88	488818	87	487809	85	528849	88	548183	75
31	78	487818	81	388889	85	888811	85	88111	83	888811	78	888848	81	148878	72

4 years worth of library data (FY09-FY12)
160 million (40x3) rows of data

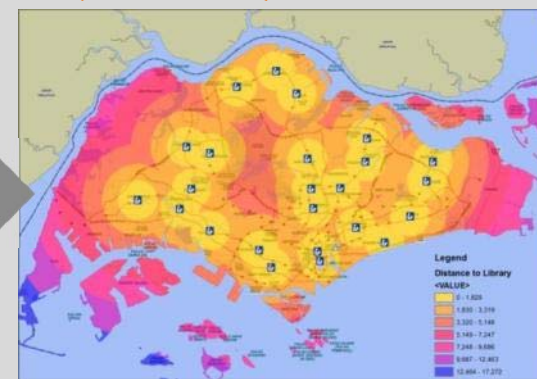


Other Agency Sources

M(AP)

A(NALYSE)

P(REDICT)



Geo-analytics Collaboration

Scope of Analysis

1. Current Situation

What is the **reach** of libraries to the community?

What do Singaporeans **read**?

Where are our **readers**?

2. Trends & Patterns

What are the factors that **influence** people to visit a library?

What is the **impact** on usage when a new library open?

3. Scenario Planning

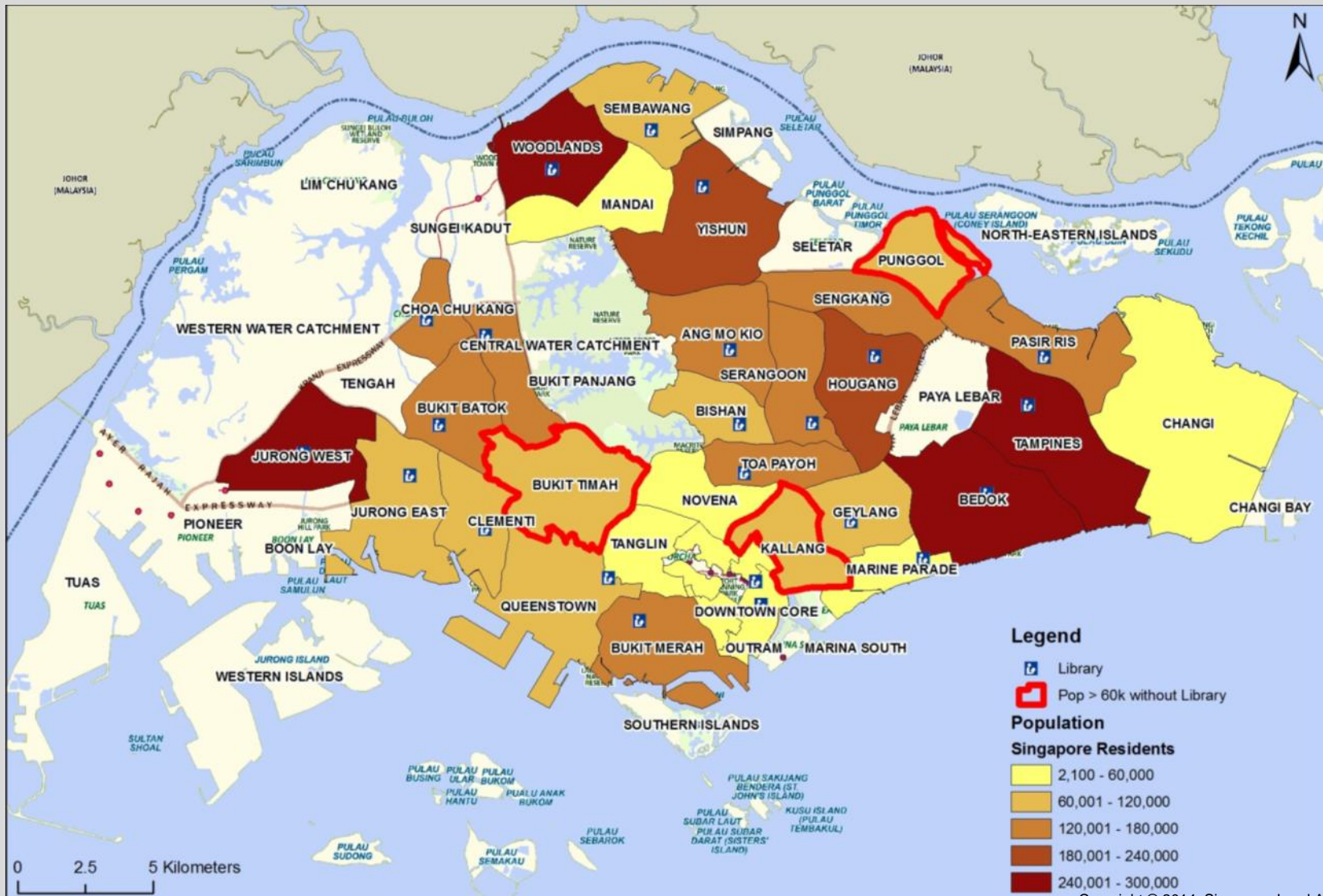
Where should we **locate** our libraries?

Can books collection be **redesigned** to meet local needs?



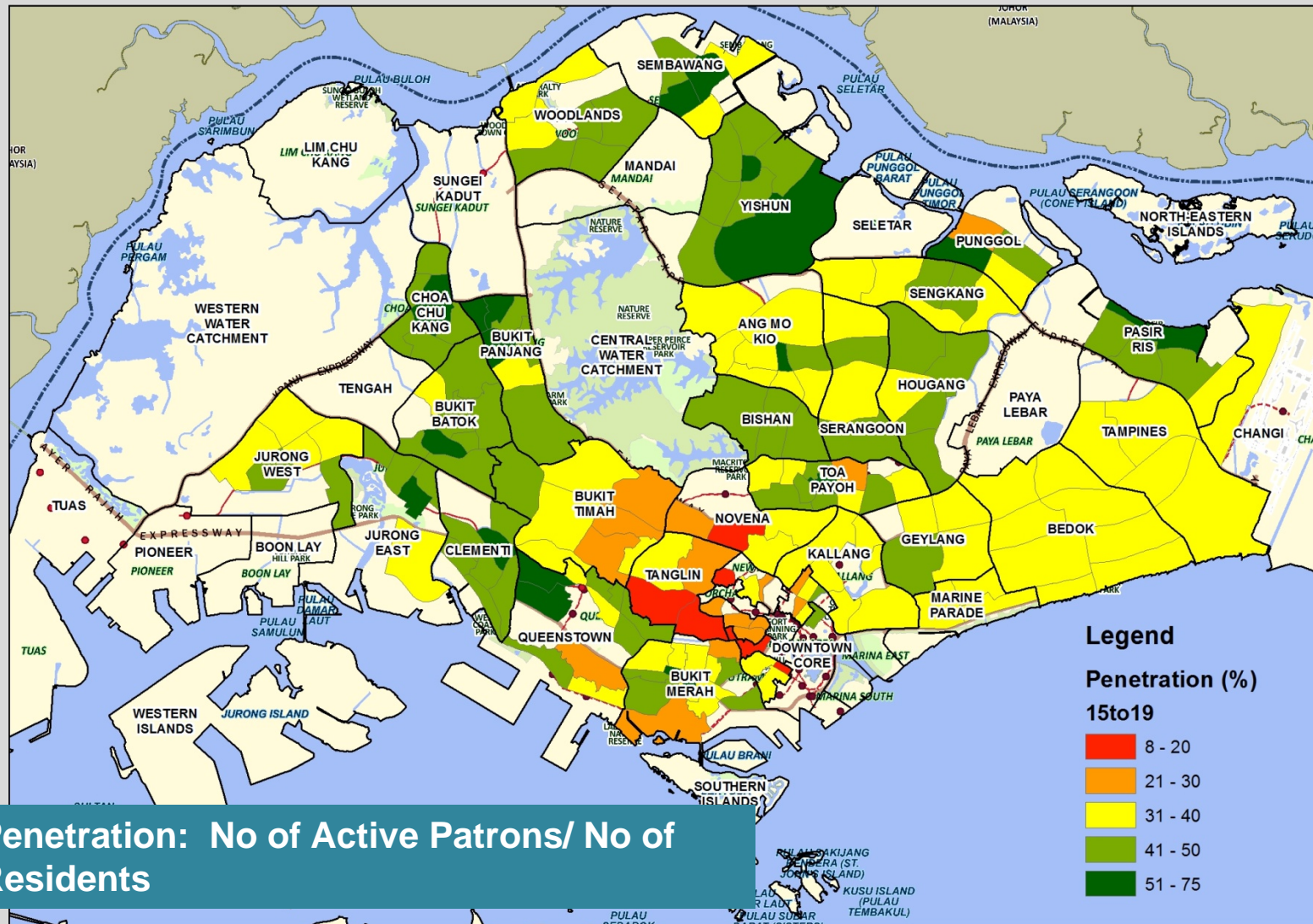
Geo-analytics Collaboration

Where are Our Libraries Located?



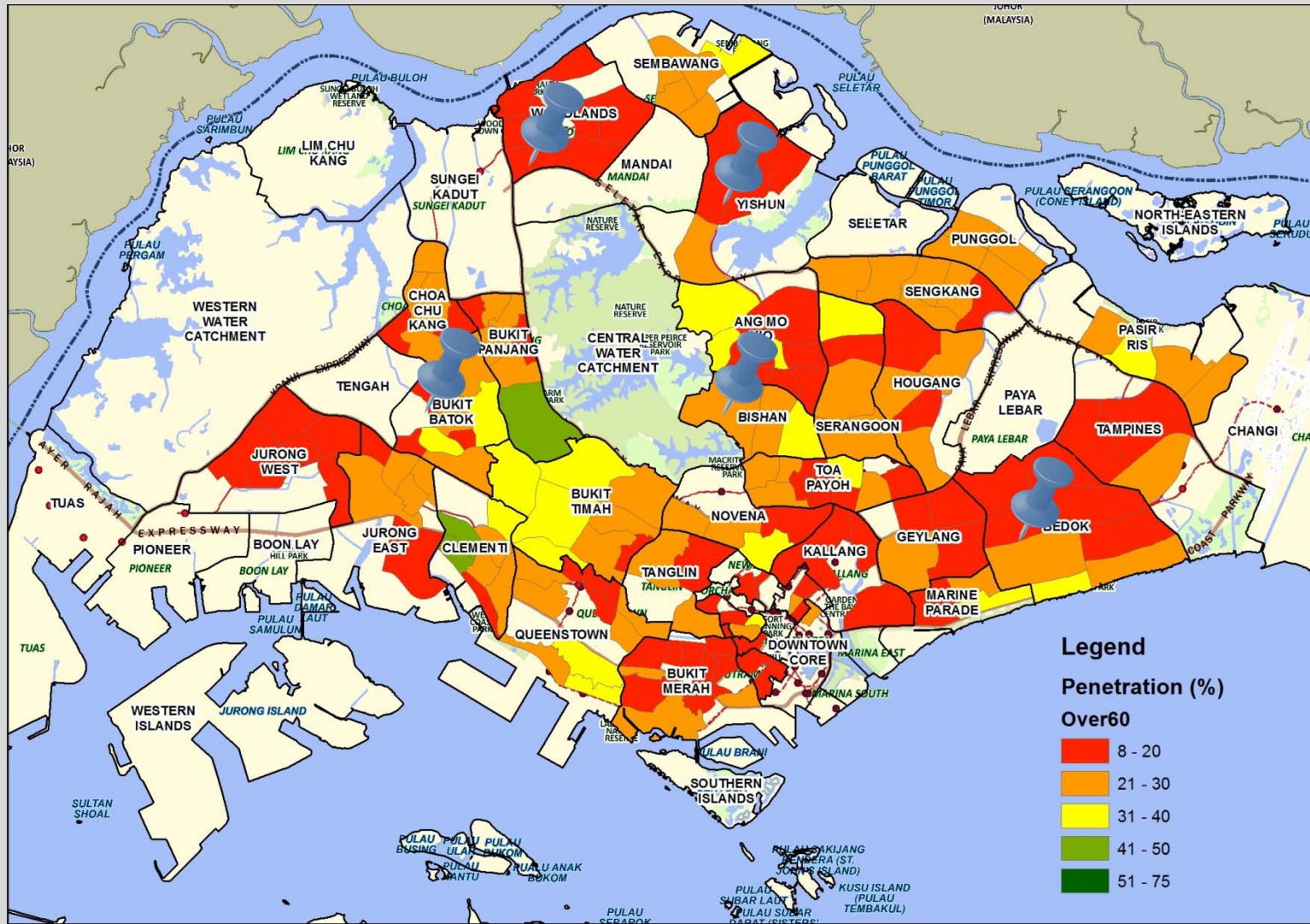
Geo-analytics Collaboration

Library Membership Penetration (Teens)



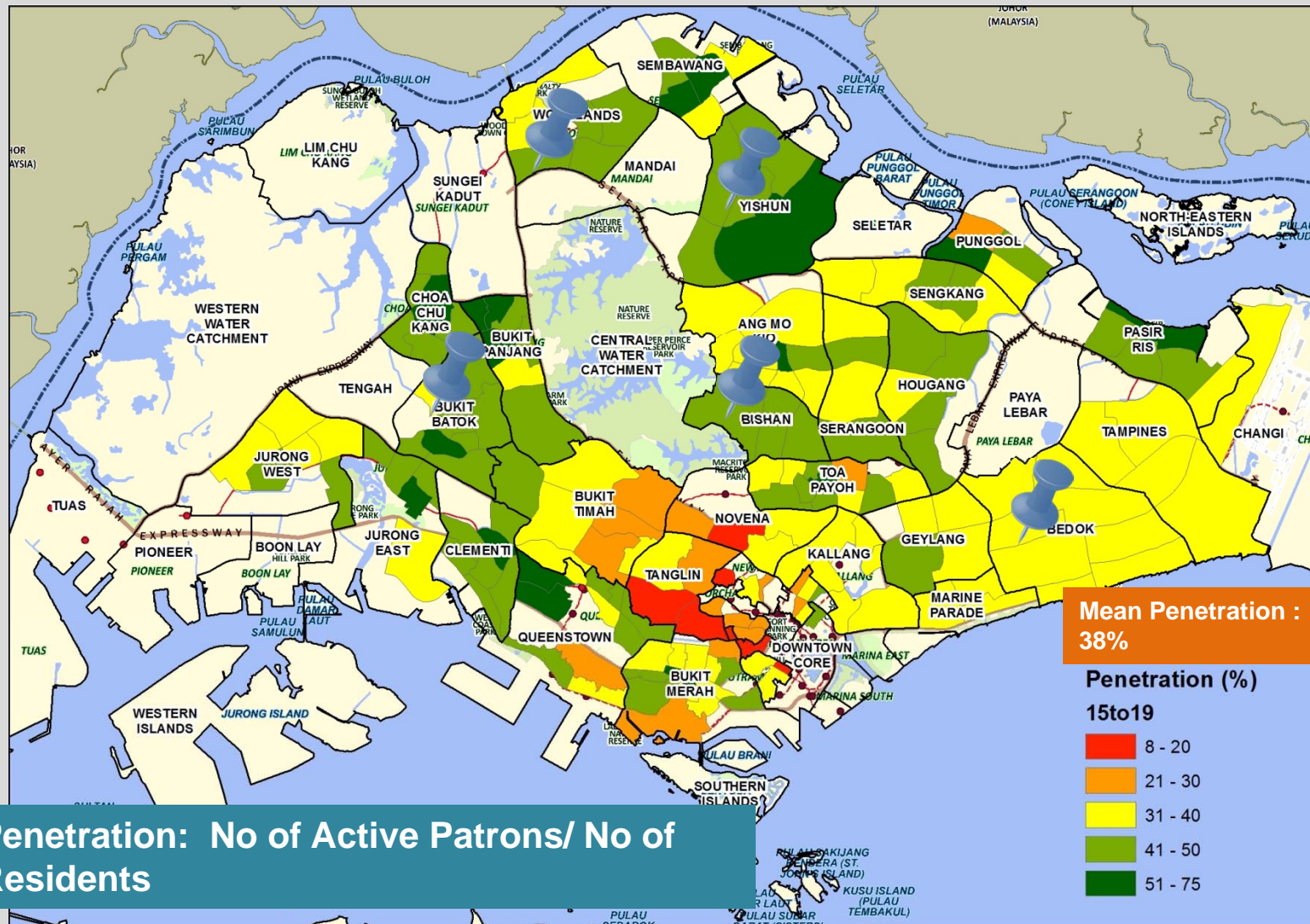
Geo-analytics Collaboration

Library Membership Penetration (Seniors)



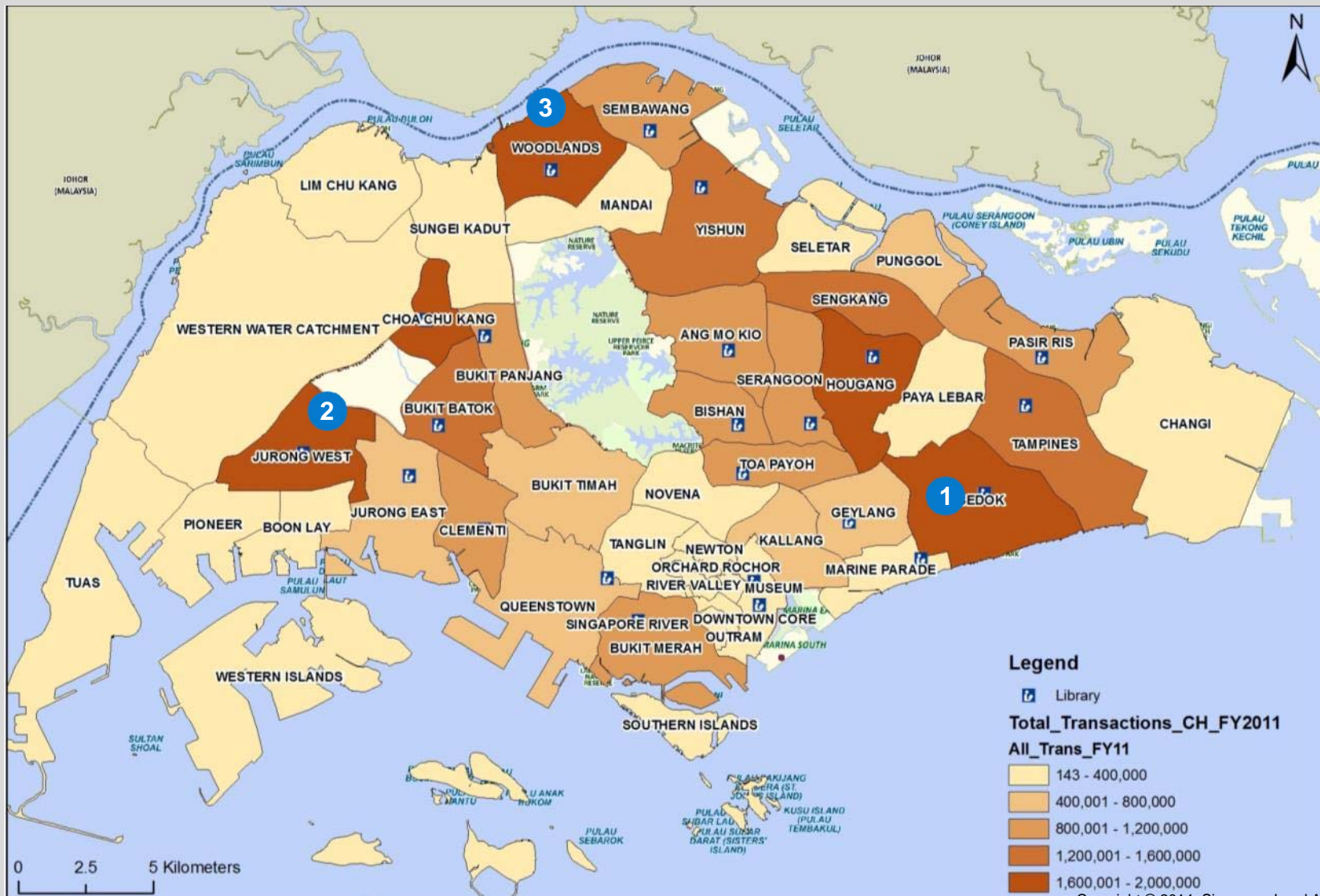
Geo-analytics Collaboration

Library Membership Penetration (Teens)



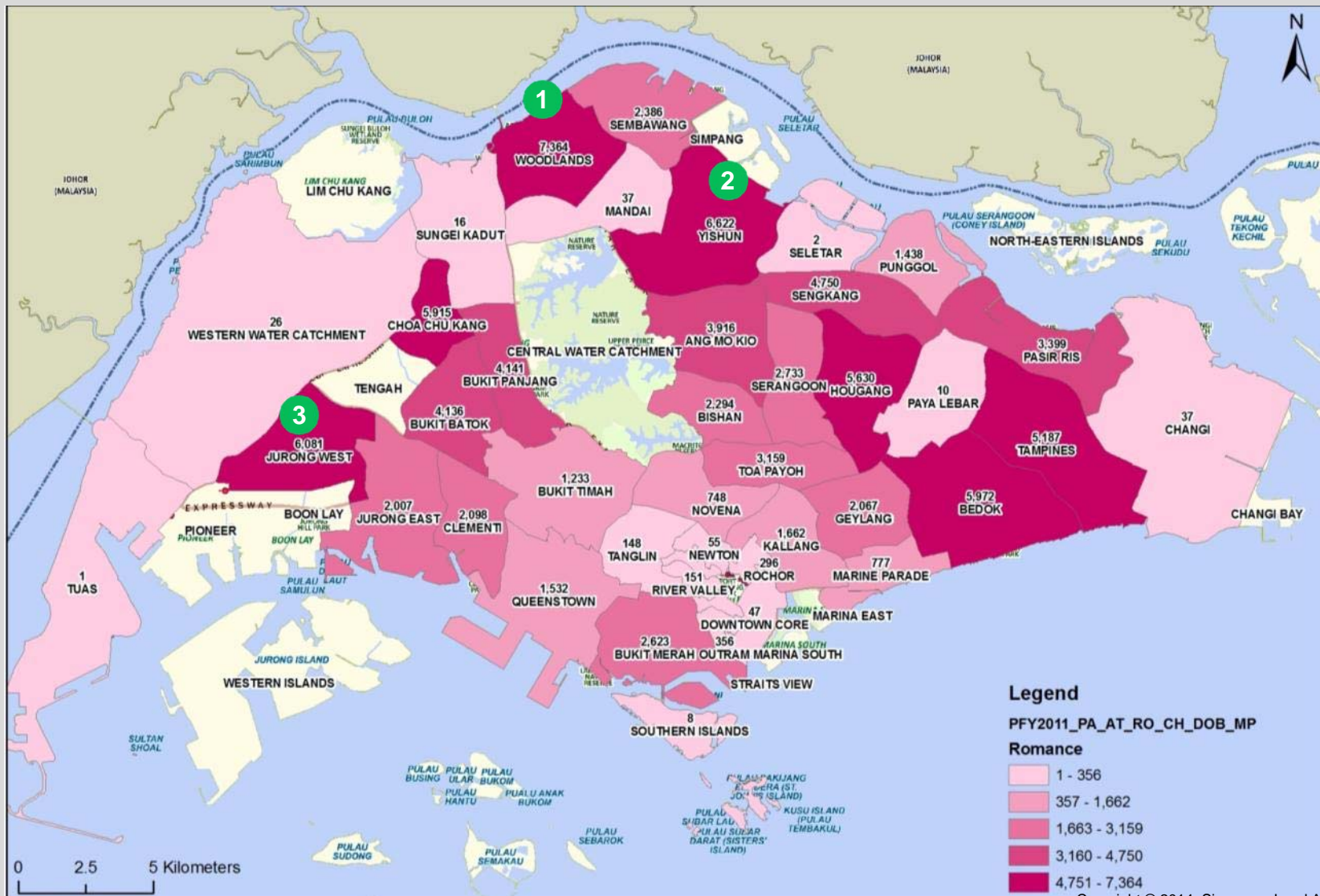
Geo-analytics Collaboration NLB

Where are Our Readers?



Geo-analytics Collaboration

What are Singaporeans Reading (Romance)?



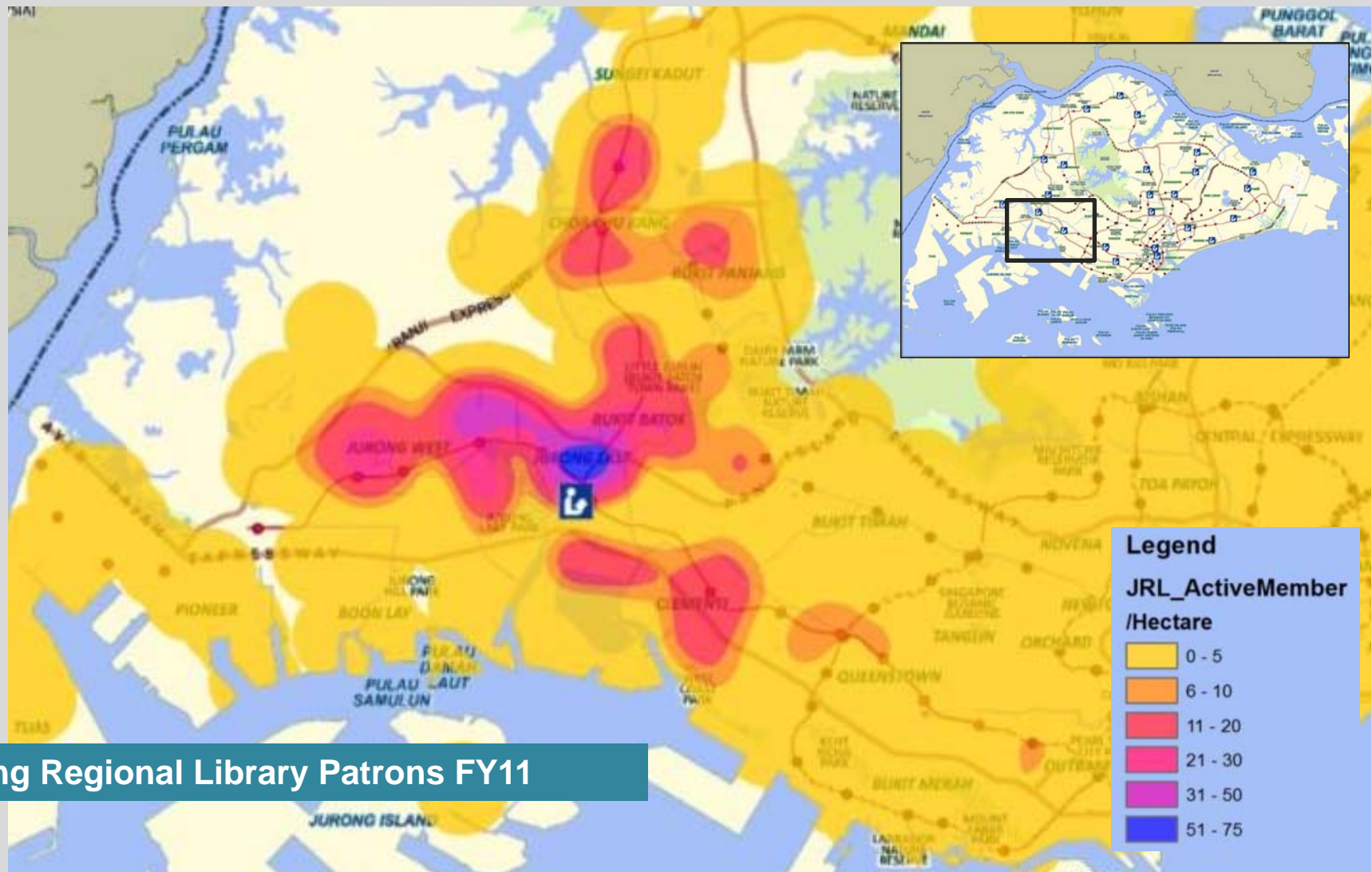
Geo-analytics Collaboration

What is the geographical reach of the libraries?



Geo-analytics Collaboration

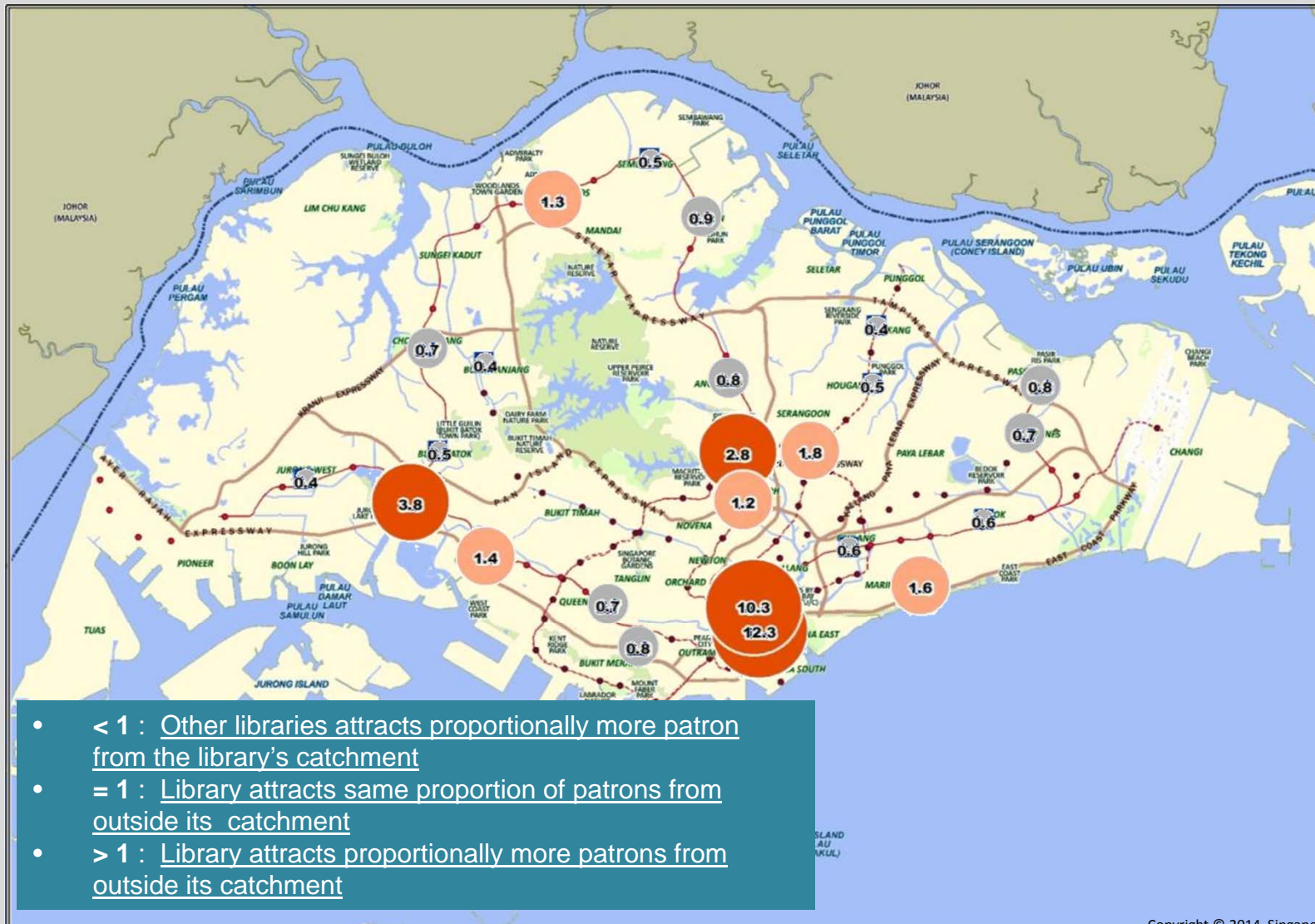
What is the geographical reach of the libraries?



Jurong Regional Library Patrons FY11

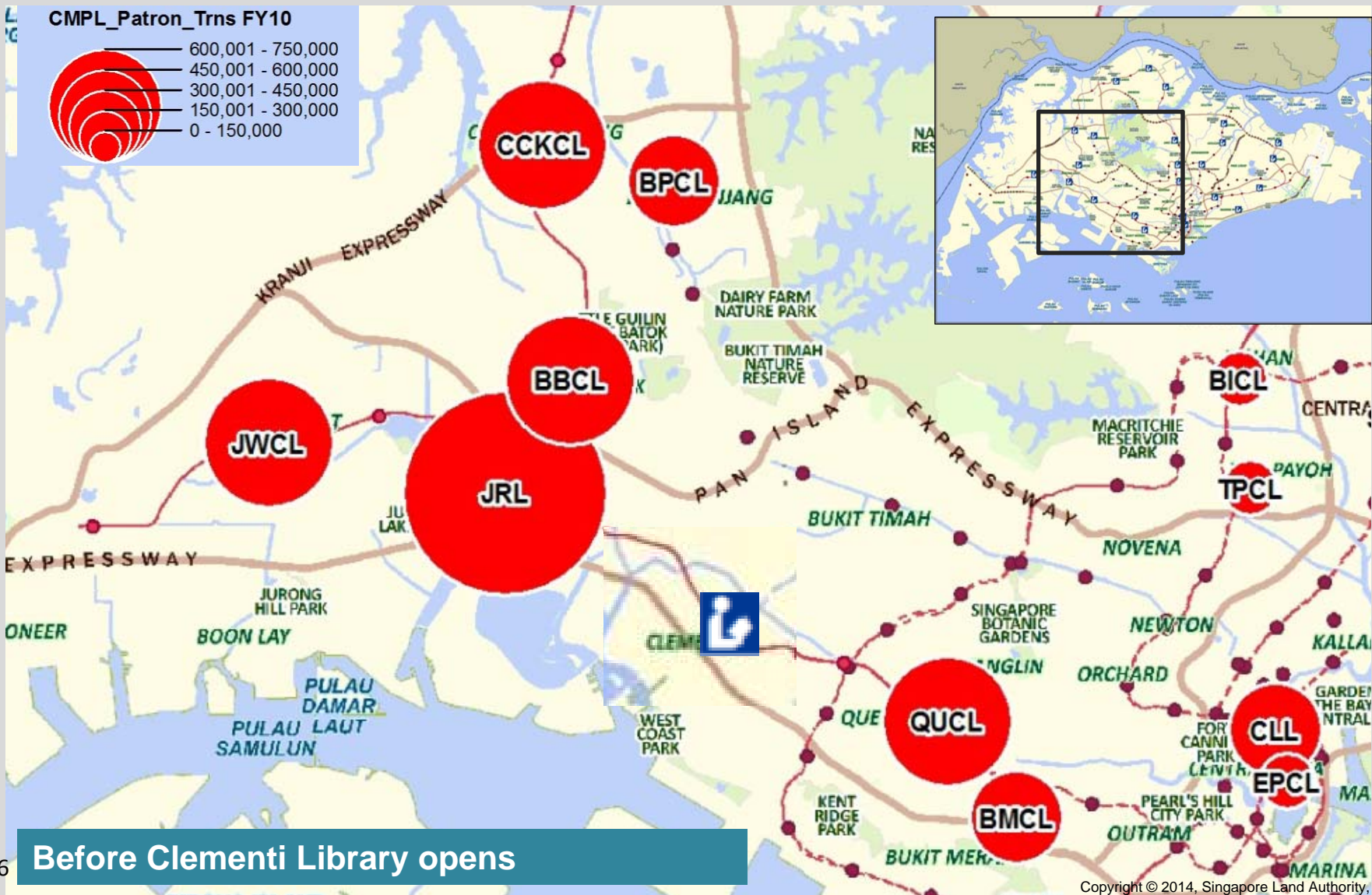
Geo-analytics Collaboration

What is the geographical reach of the libraries?



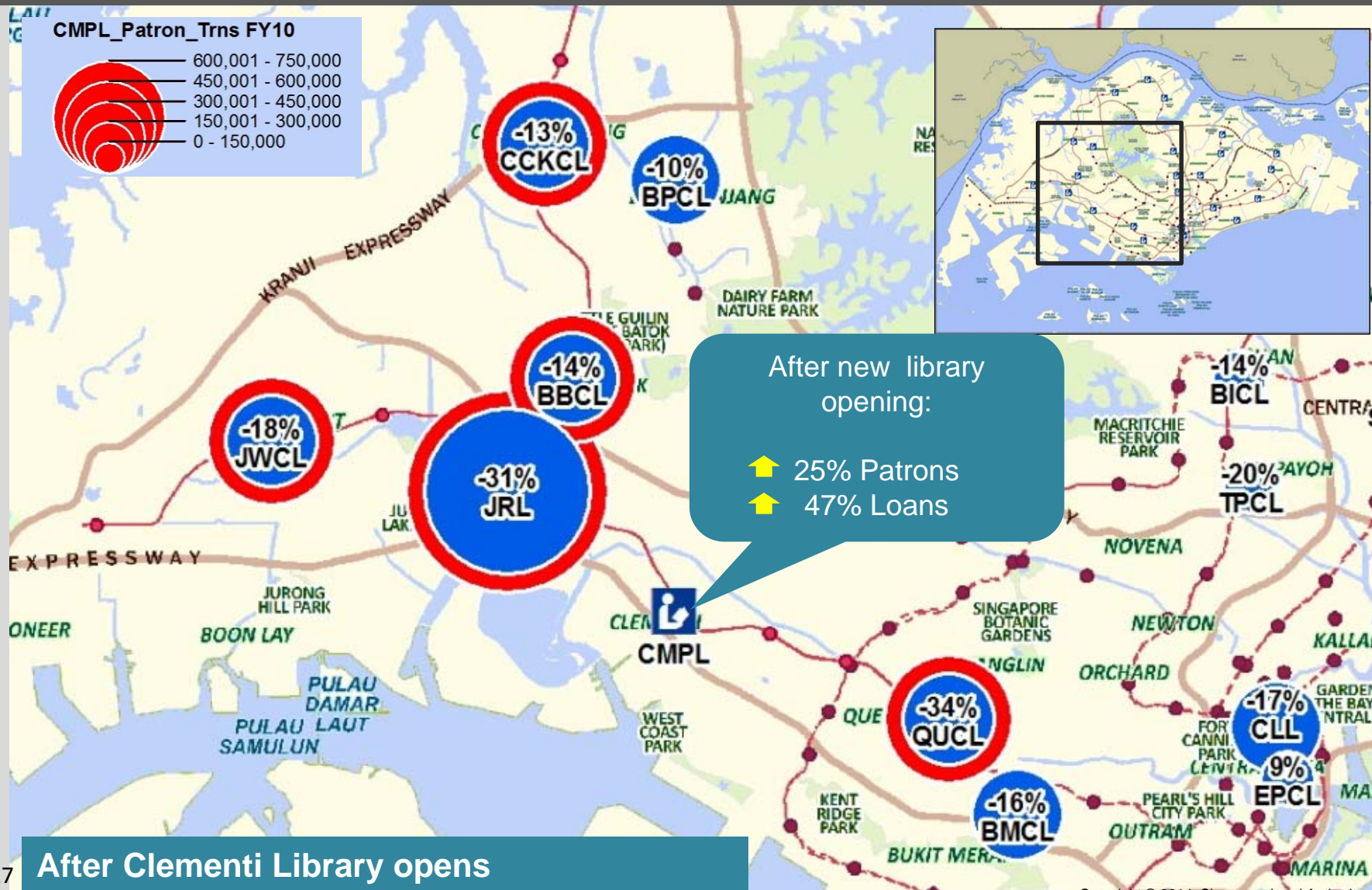
Geo-analytics Collaboration

New Library Impact Analysis



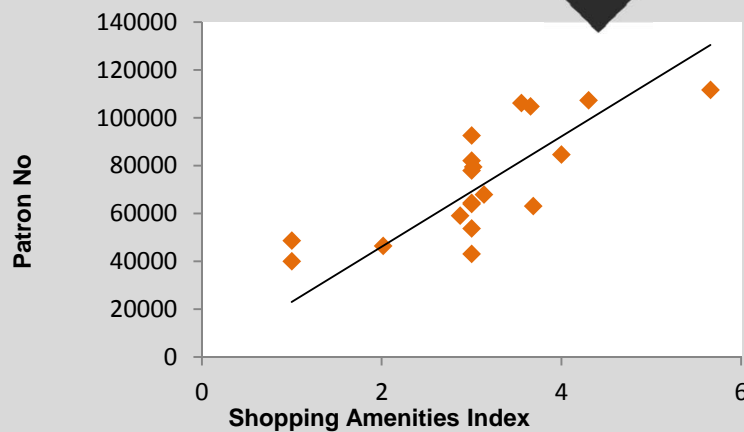
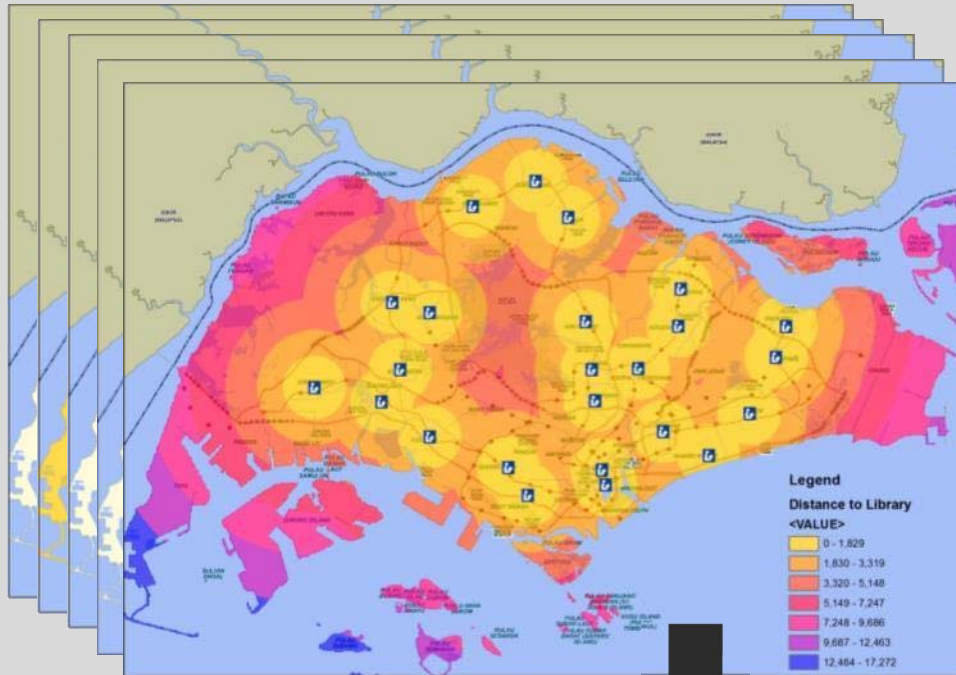
Geo-analytics Collaboration

New Library Impact Analysis



Geo-analytics Collaboration

Analyse location factors influencing library usage



Location Factors

1. Population
2. Shopping Amenities
3. Public Transport Accessibility
4. No of Schools Nearby
5. Distance between Libraries

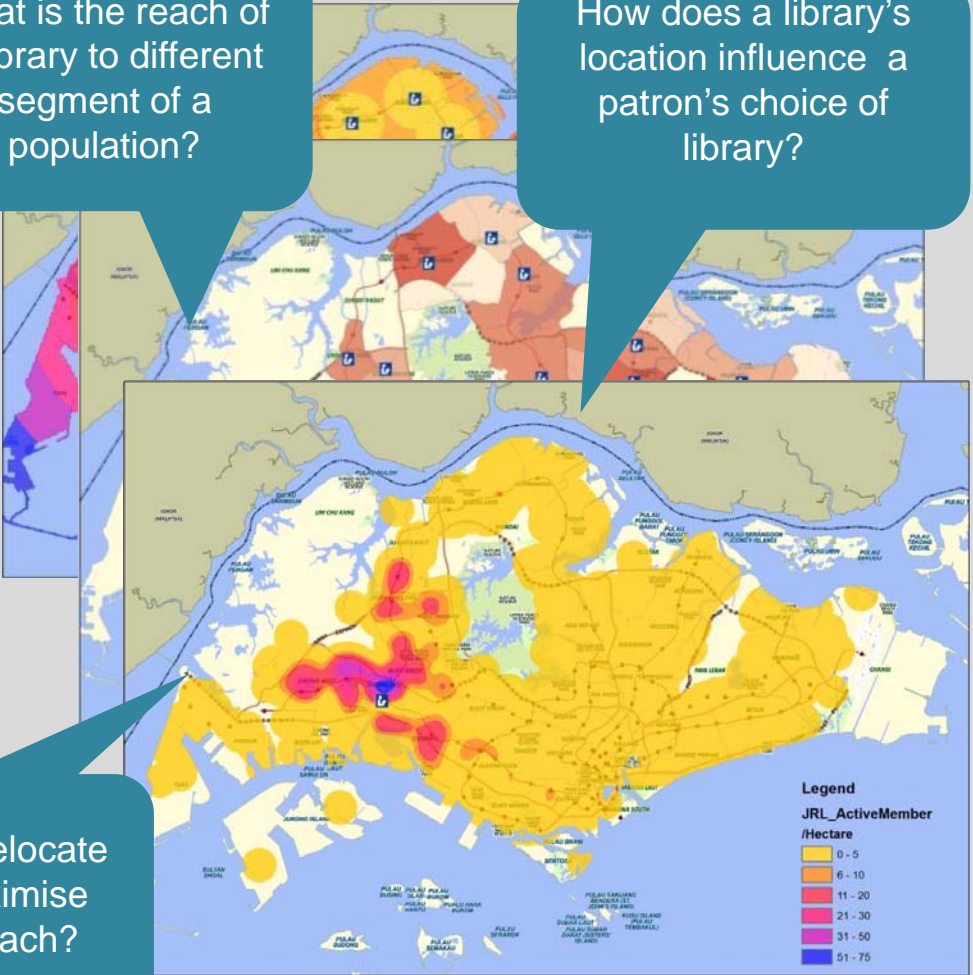
Geo-analytics Collaboration

Uncovering new insights through a geospatial lens



What is the reach of a library to different segment of a population?

How does a library's location influence a patron's choice of library?



Where do we relocate Library to maximise community reach?

Thank You!

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Singapore Land Authority
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Jonathan Goh
Principal Geospatial Consultant,
Geospatial Division
Singapore Land Authority
Jonathan_goh@sla.gov.sg

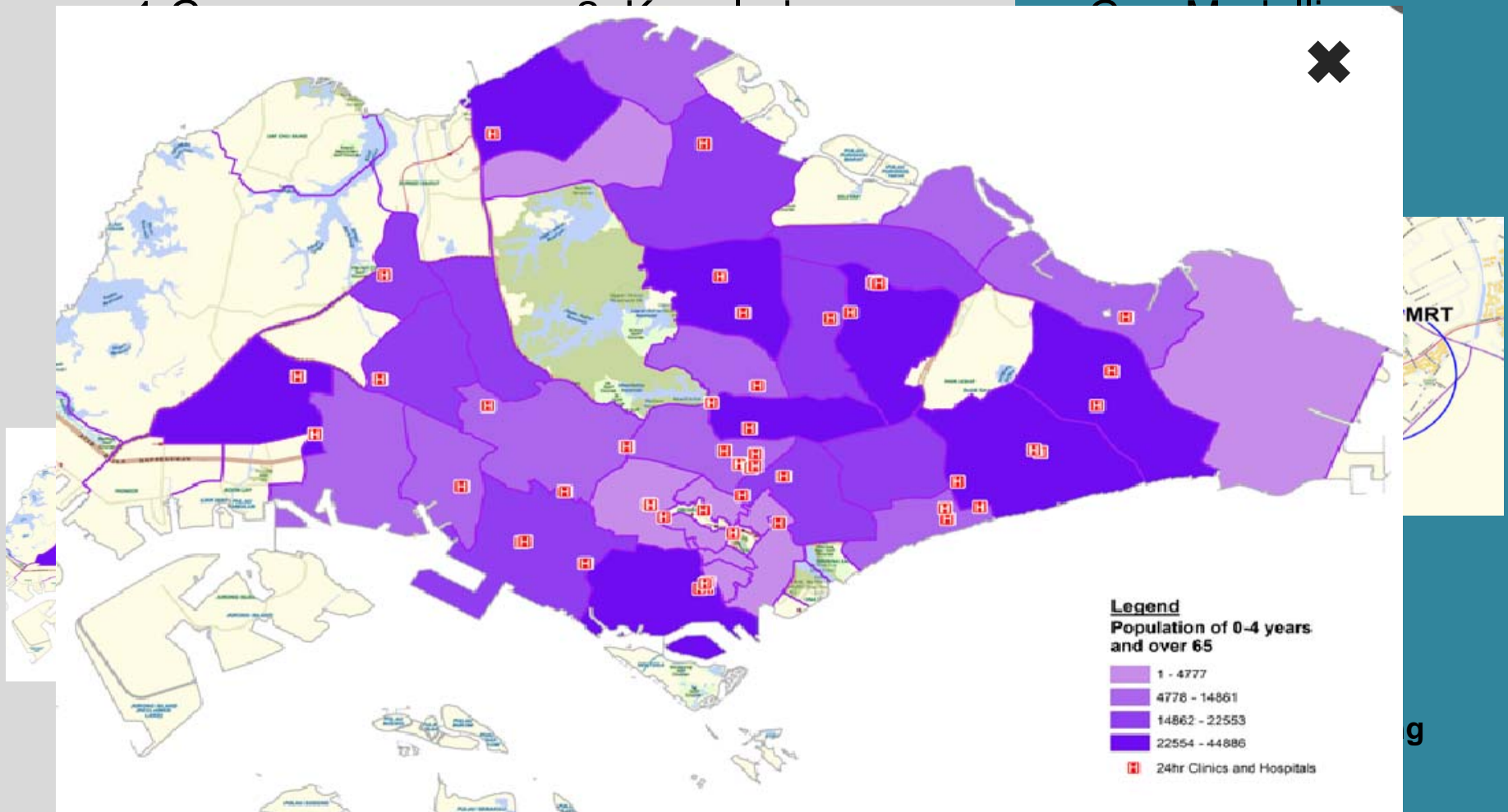
Geo-analytics Collaboration

Scenario Planning



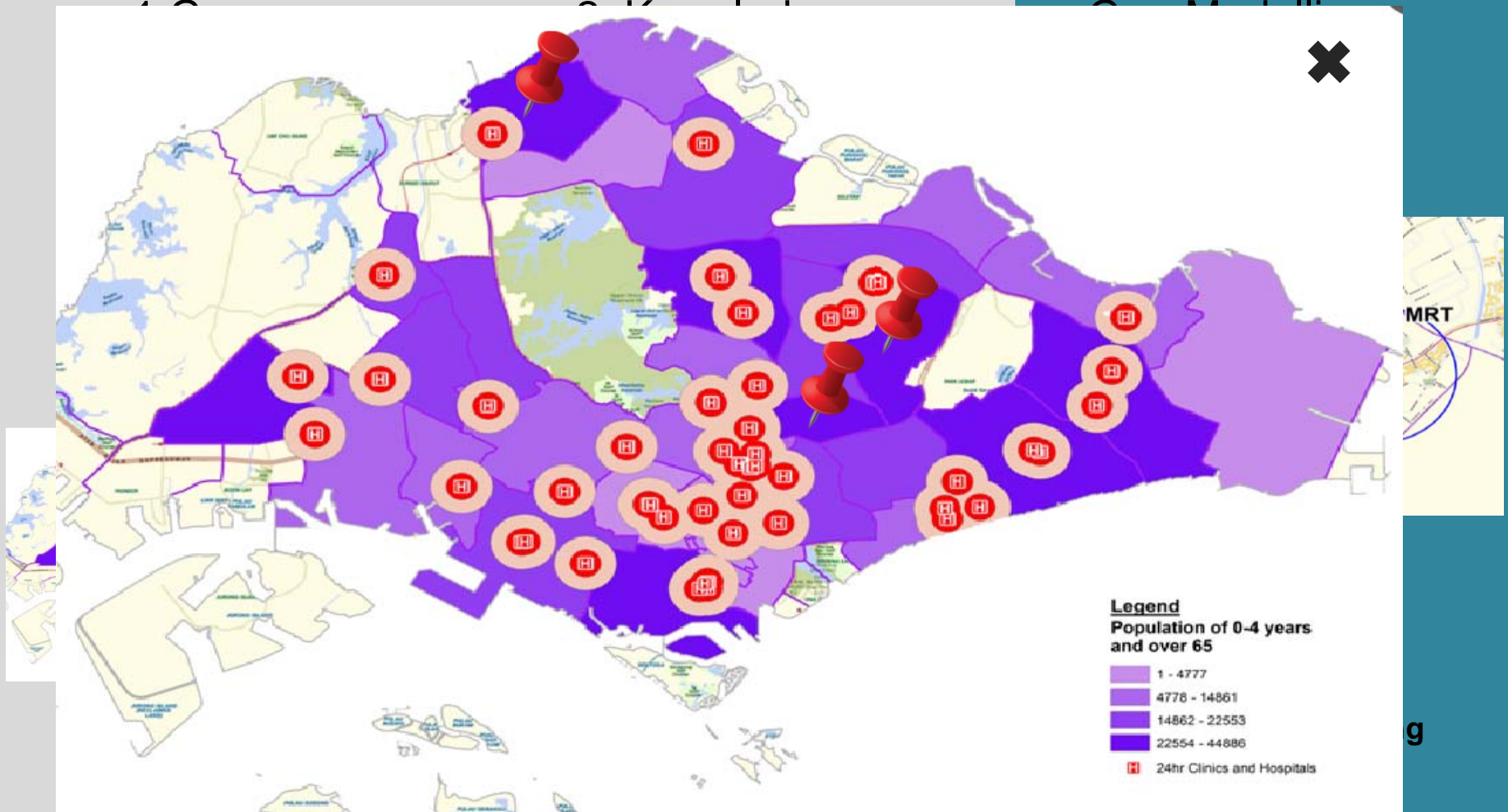
Singapore Geospatial Collaborative Environment

Geo-Government → Geo-Analytics Collaboration



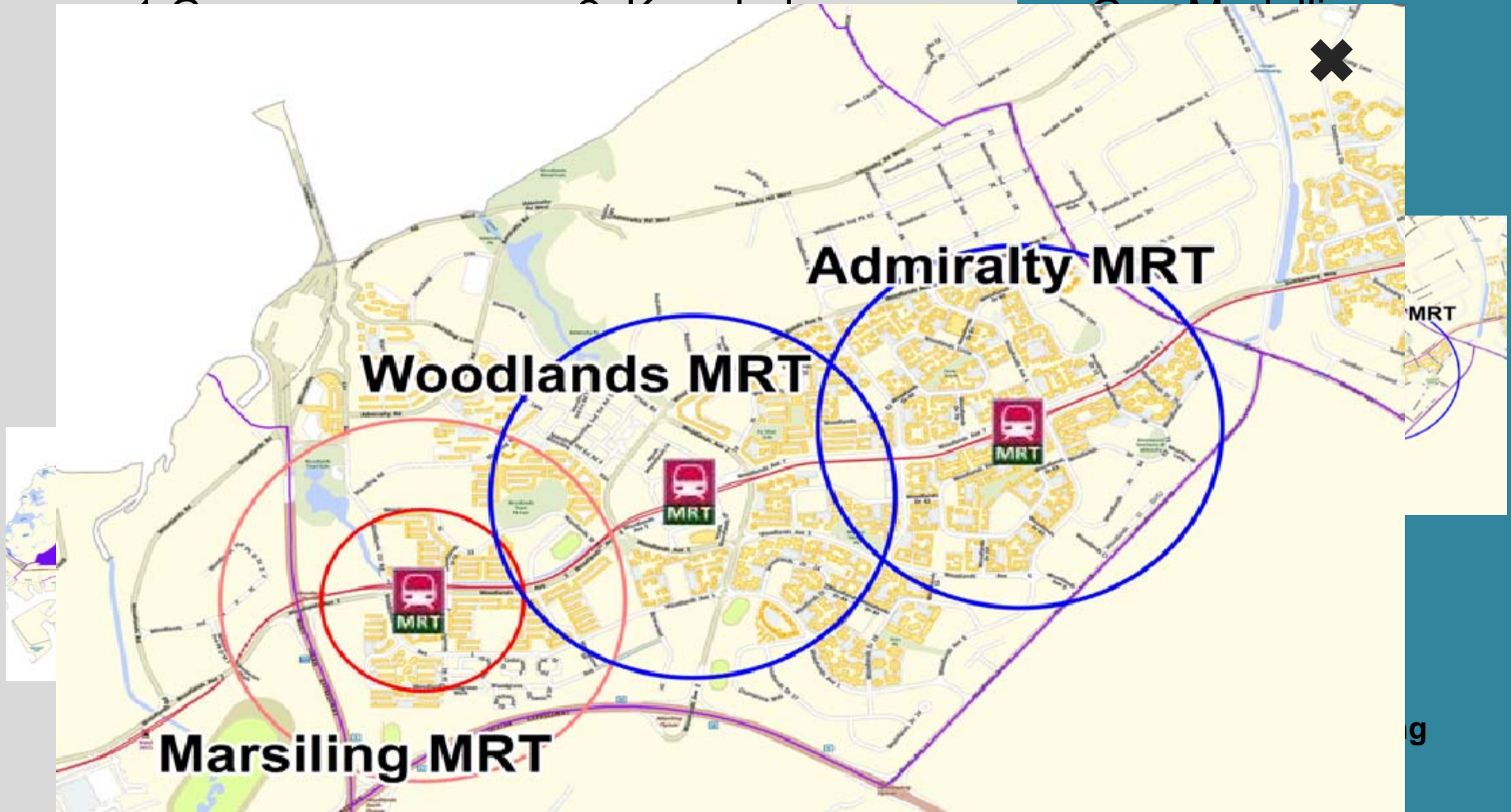
Singapore Geospatial Collaborative Environment

Geo-Government → Geo-Analytics Collaboration



Singapore Geospatial Collaborative Environment

Geo-Government → Geo-Analytics Collaboration



Singapore Geospatial Collaborative Environment

Vision & Goals

Vision

Spatially-Enabled Nation

Stakeholders

Government

Enterprise & Communities

Goals

Geo-Government

Geo-People

Geo-Economy

Singapore Geospatial Collaborative Environment



Geo-Platforms → GeoSpace

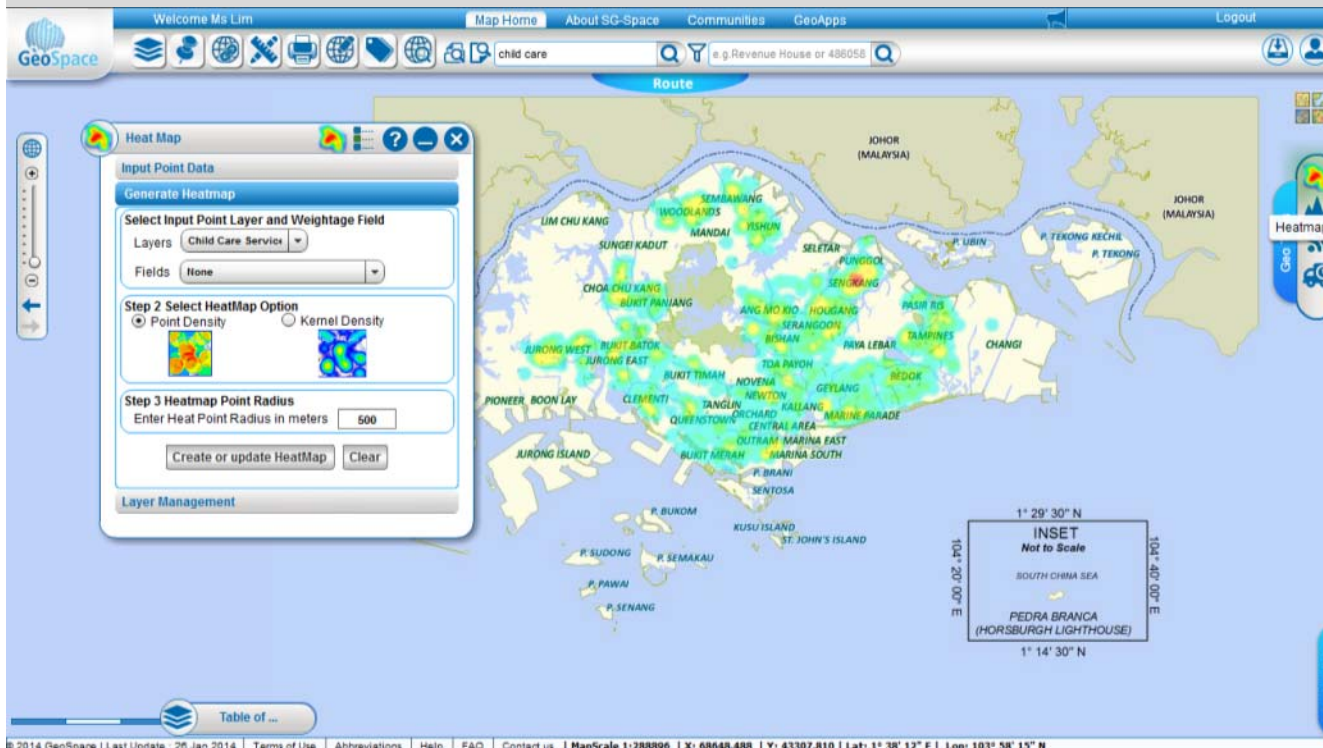
SG • SPACE

	A	B	C	D
1	Postal	Cot Block	Name	Road Name
2	523450	450C	HDB-TAMPINES	TAMPINES ST 42
3	520855	855	TAMPINES VILLE	TAMPINES ST 83
4	520288	288	HDB-TAMPINES	TAMPINES ST 22
5	570267	267	HDB-BISHAN	BISHAN ST 24
6	521127	127	HDB-TAMPINES	TAMPINES ST 11
7	150035	35	RUMAH TINGGI VIEW	JLN RUMAH TINGGI
8	163027	27A	MEMBINA COURT	JLN MEMBINA
	640522	522	HDB-JURONG WEST	JURONG WEST ST 52
	641665	665A	HDB-JURONG WEST	JURONG WEST ST 64
	600064	64	TEBAN PLACE	TEBAN GDNS RD
	120520	520	HDB-CLEMENTI	WEST COAST RD
	640208	208	BOON LAY PLACE	BOON LAY PL
	530238	238	HDB-HOUGANG	HOUGANG AVE 1
	530616	616	HDB-HOUGANG	HOUGANG AVE 8
	530657	657	HDB-HOUGANG	HOUGANG AVE 8
	550211	211	HDB-CHUAN ESTATE	SERANGOON AVE 4

Geo-Analytics Tools

- Geocoding
- Heat Map
- Proximity Search
- Service Area





Geo-Analytics Tools

- Geocoding
- Heat Map
- Proximity Search
- Service Area

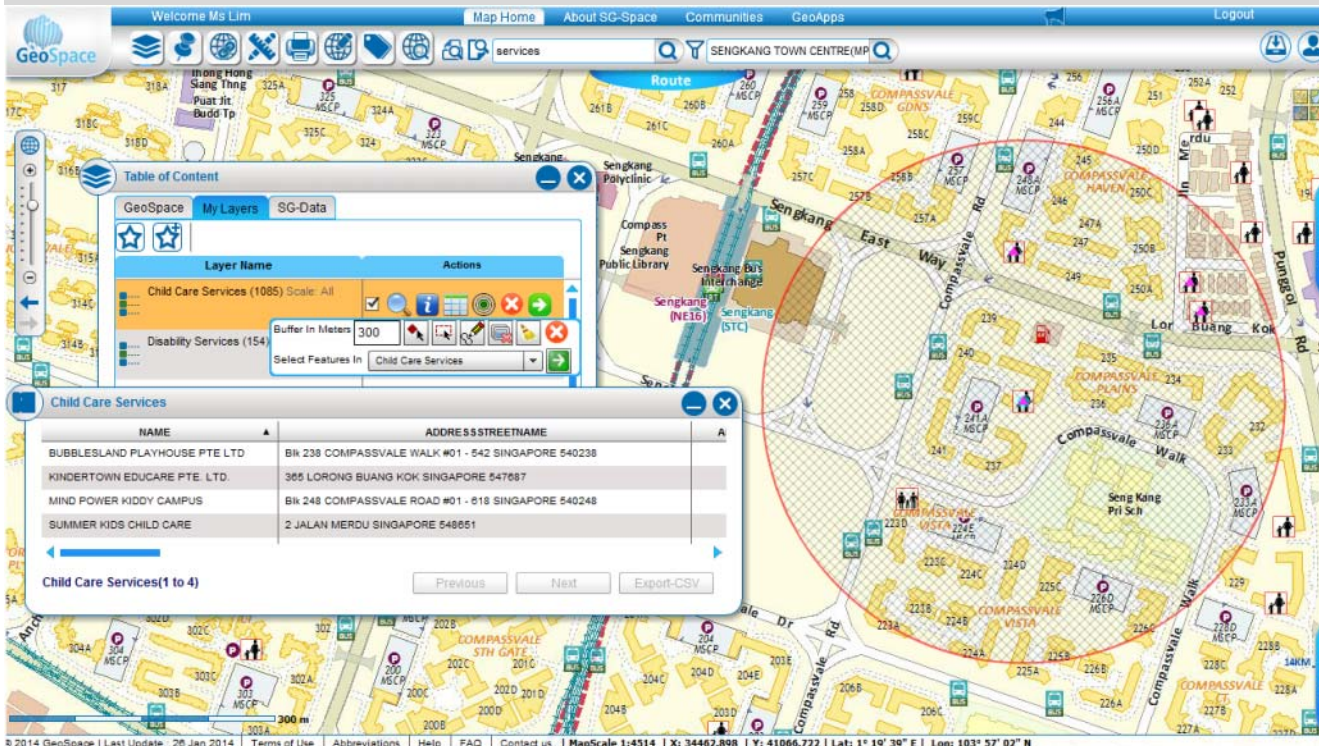


Singapore Geospatial Collaborative Environment



Geo-Platforms → GeoSpace

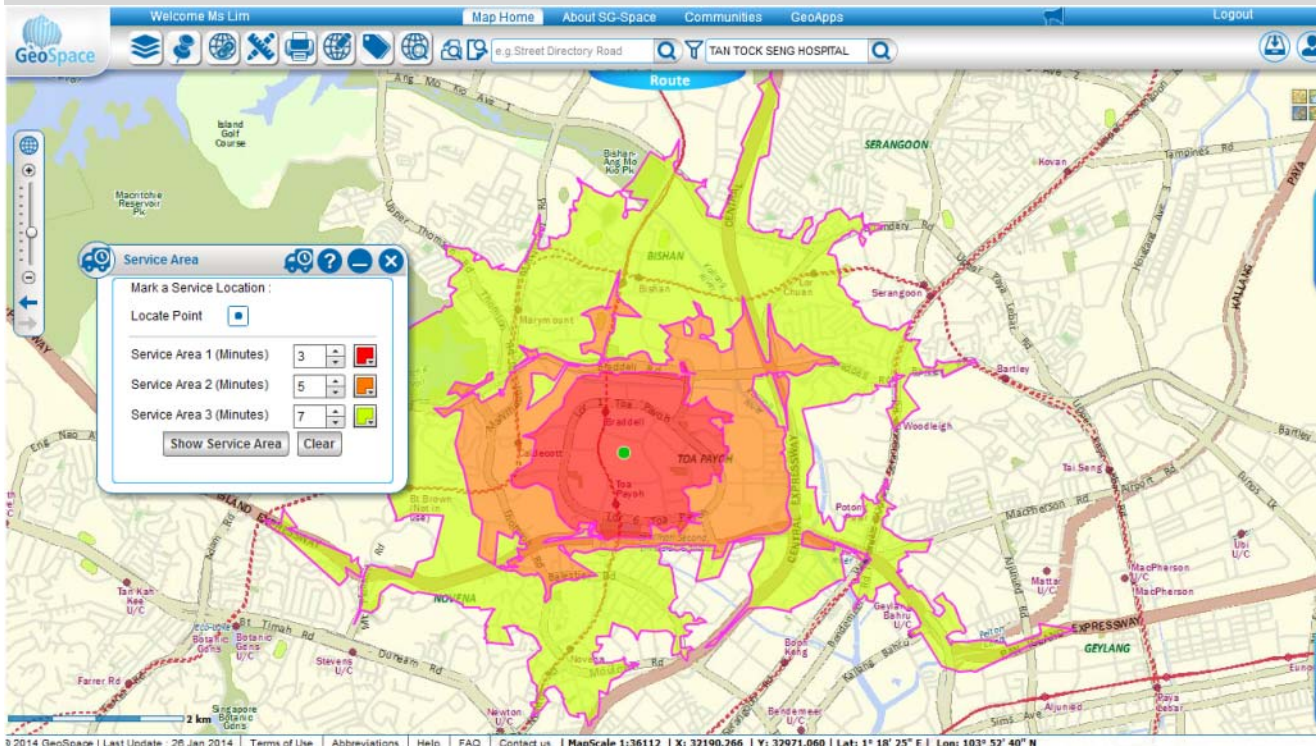
SG • SPACE



Geo-Analytics Tools

- Geocoding
- Heat Map
- Proximity Search
- Service Area





Geo-Analytics Tools

- Geocoding
- Heat Map
- Proximity Search
- Service Area



Singapore Geospatial Collaborative Environment



Geo-Platforms → OneMap → Private Sector

SG • SPACE



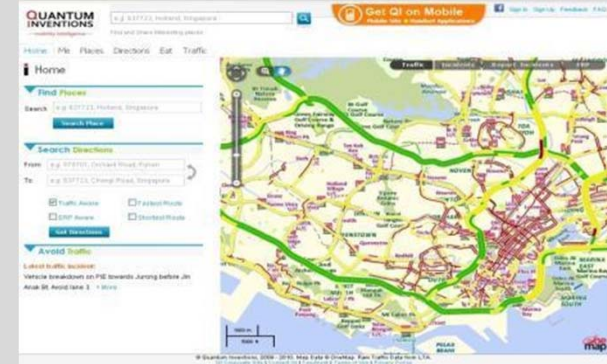
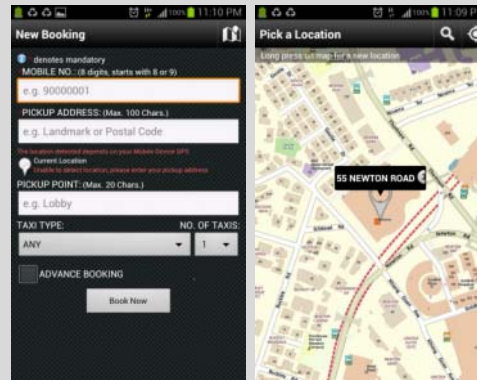
Catalyst for Private Sector Development

1. Comfort Delgro Taxing Booking
Taxi Booking Application

2. Global Yellow Pages
Business Directory Search

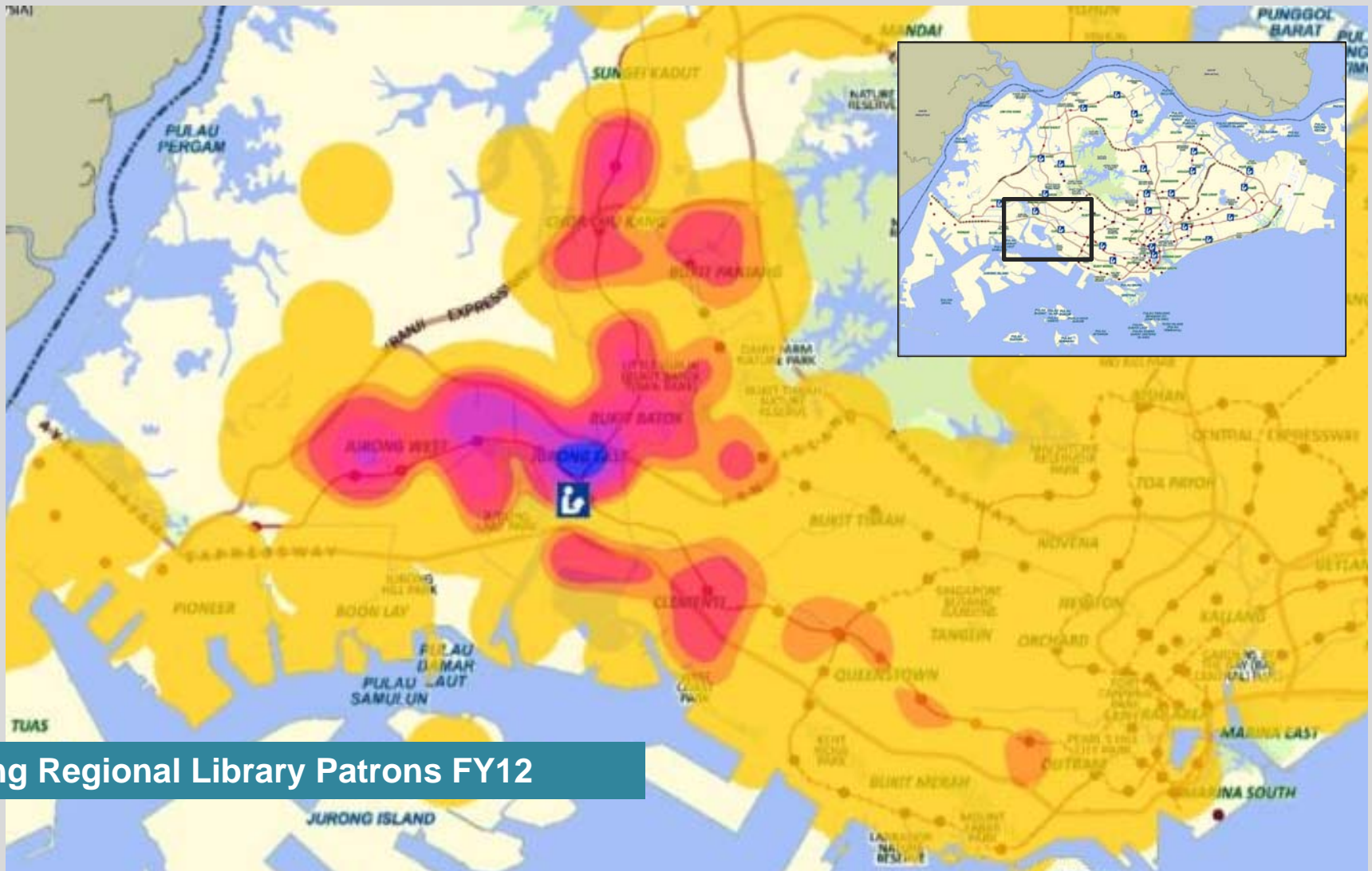
3. Quantum Inventions Pte Ltd
Customised Real Time Navigation

4. ShowNearby Pte Ltd
Show Nearby Analytics



Geo-analytics Collaboration

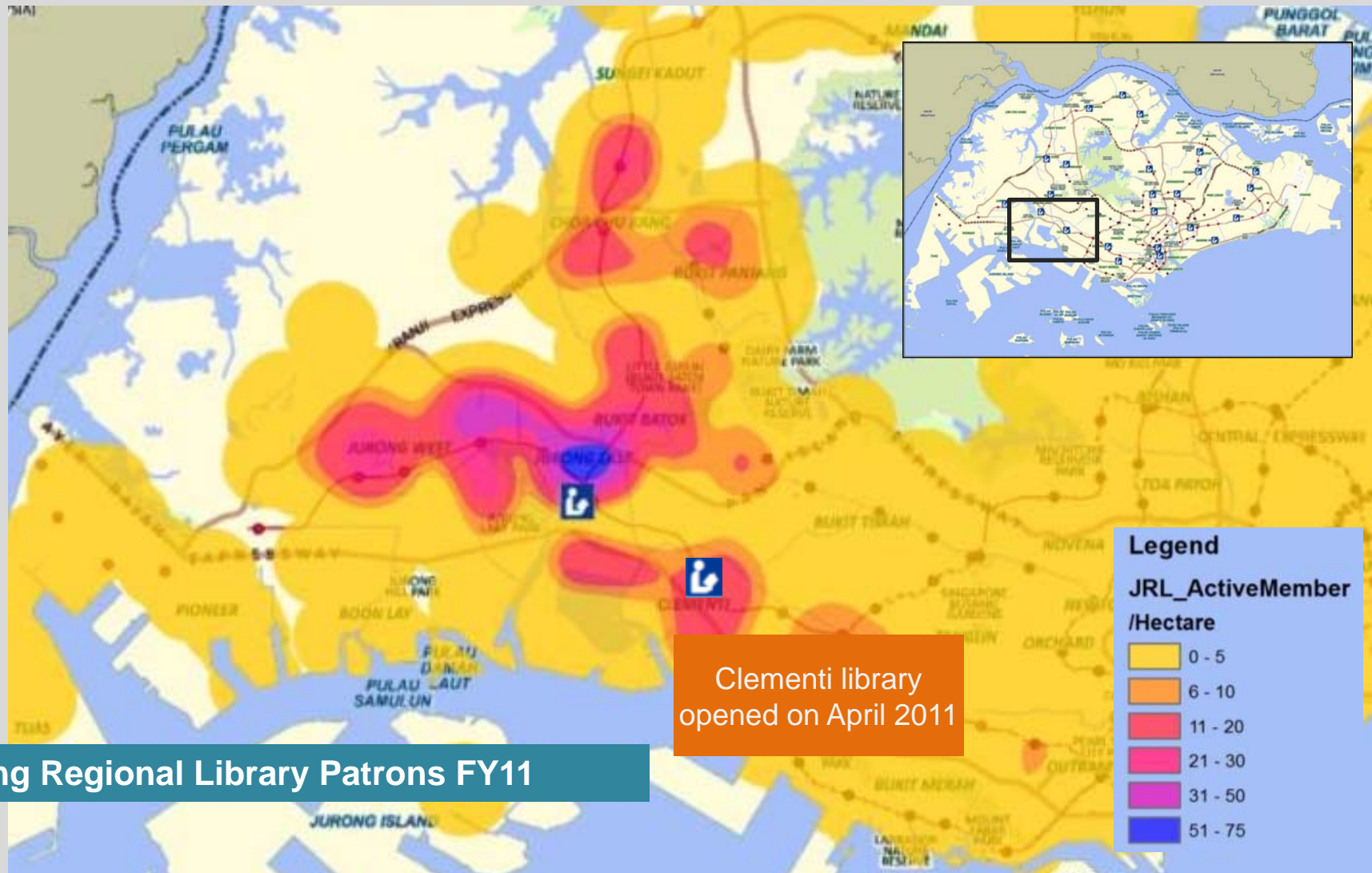
Trend Analysis on Library Patrons



Jurong Regional Library Patrons FY12

Geo-analytics Collaboration

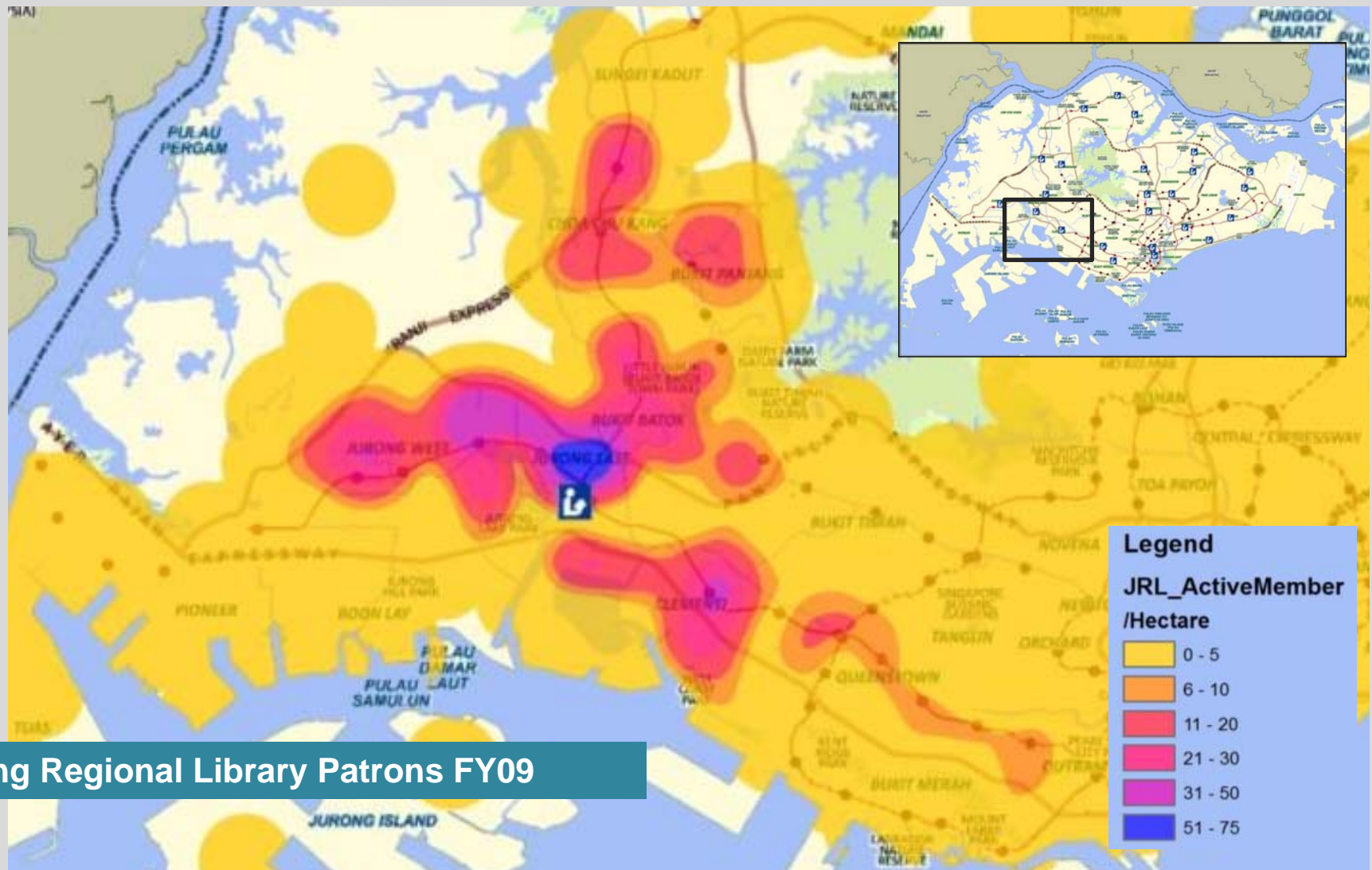
Trend Analysis on Library Patrons



Jurong Regional Library Patrons FY11

Geo-analytics Collaboration

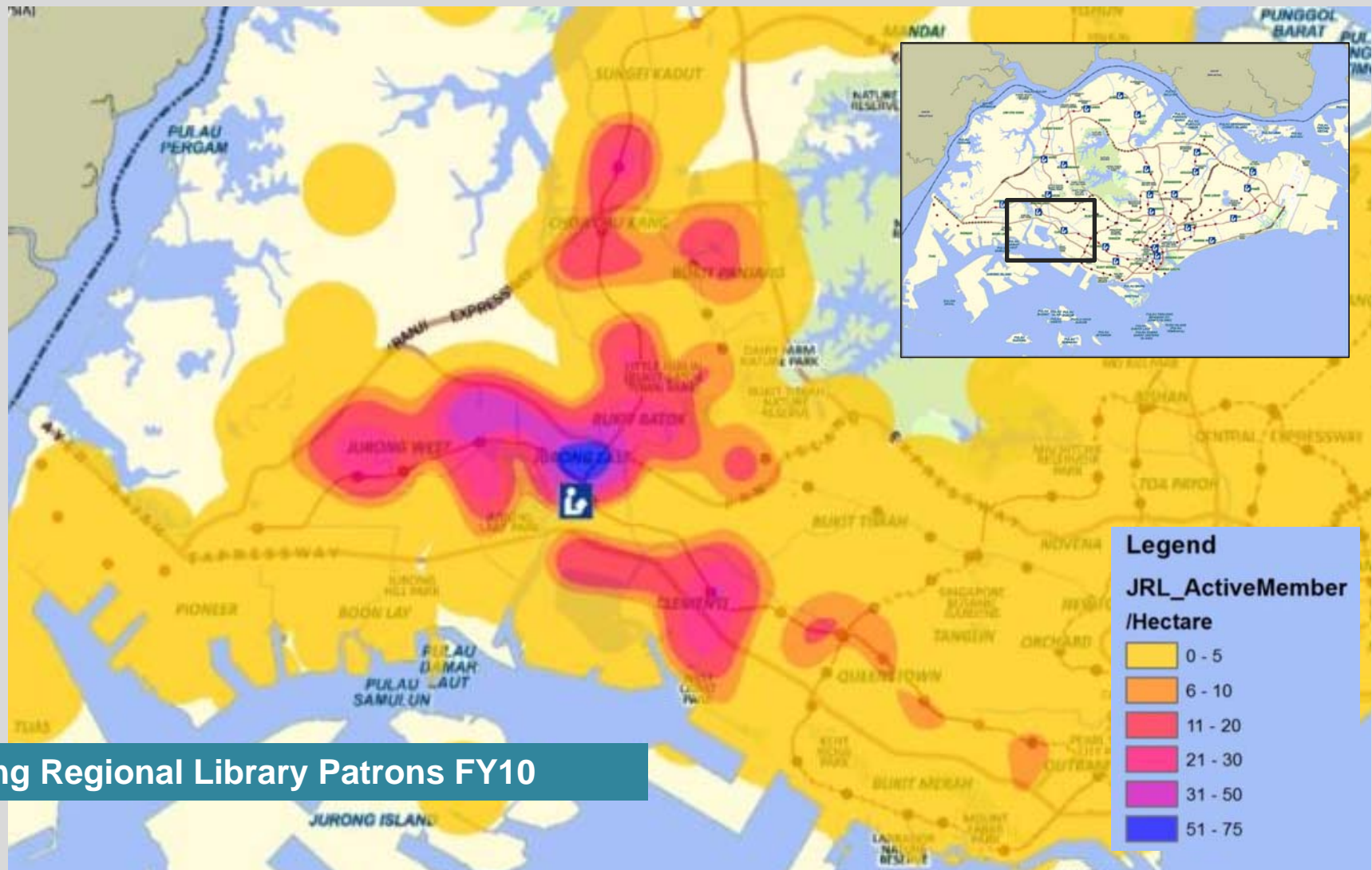
What is the geographical reach of the libraries?



Jurong Regional Library Patrons FY09

Geo-analytics Collaboration

What is the geographical reach of the libraries?



Jurong Regional Library Patrons FY10