

Access to justice: a geographical approach

Introduction

Access to justice is an issue in countries around the globe. In Singapore, is it as much of an issue? Numbers can begin to tell the story, but this report instead takes a visual and geographical approach to tackling that question in Singapore. It focusses on brick and mortar law firms, rather than primarily digital ones.

For simple private matters, are lawyers evenly distributed enough for people in residential areas in Singapore to have even access to lawyers¹? My hypothesis that most law firms would be concentrated in the Central Business District, and in the area around the State Courts. While this seems to be an obvious fact, it should not be taken for granted that this is an ideal arrangement. For simple matters, renown and reputation becomes less of an issue – as long as the lawyer is competent enough at handling simple matters. So, convenience and cost may be more relevant factors. Solving this question would be of interest to lawyers seeking new places to cite their practices, or for Singaporeans interested in knowing where to find lawyers closest to them, or more importantly, increasing access to justice, especially in lower-income areas or high-density areas. My guess would be that lawyers are predominantly situated in the Central Business District ('CBD'), and not frequently in residential areas. This would be in order to be closer to other law firms, the courts, companies (especially for corporate law practices), and to harness other efficiencies which accrue from agglomerative economies.

According to the Law Society of Singapore, there were 4834 registered locally-qualified lawyers and 1200 foreign lawyers in Singapore in 2017². As of June 2019, about 5.7 million people live in Singapore.³ Using these statistics, there is about 1 lawyer for every 944 persons (putting aside the fact that foreign lawyers would probably not be able to advise on issues of domestic law). Uruguay has 1 lawyer for every 240 persons, while Israel has 1 lawyer for every 139 persons⁴. However, numbers like these do not portray the full picture. Other important questions are left out of the picture: are the lawyers good; do simpler matters take up a larger proportion of the caseload; do more commercially profitable matters take up a larger proportion of the caseload; what areas of law are most well-represented, *etc.* For example, criminal law practice often sees fewer entrants due to the lower margins of profit when compared to corporate law practice. This paper focusses instead on 'geographical consistency': whether lawyers are distributed evenly throughout the country, or close to population centres, where there might be a greater need for

¹ Assuming that access to lawyers means access to justice.

² <https://learn.asialawnetwork.com/2017/08/30/how-many-lawyers-singapore-infographic/>. The Legal Regulatory Services Authority seems to have 3991 lawyers on their database, as of 11 June 2020: <https://eservices.mlaw.gov.sg/lra/search-lawyer-or-law-firm/>.

³ <https://www.singstat.gov.sg/modules/infographics/population>

⁴ <https://abovethelaw.com/2018/02/the-most-lawyers-in-the-world/>

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community lawyering *e.g.* involve everyday legal matters like conveyancing, wills, family disputes, simpler disputes, simple contracts, *etc.*.

Data

The following datasets will be used:

- Legal Services Regulatory Authority directory of law firms: to explore the locations of law firms;
- Foursquare data on common venues: to explore actual land use zones or clusters;
- Singapore Land Authority's Singapore Planning Districts: for districting, clustering, and to explore *planned* use⁵; and
- Singapore Land Authority's onemap.sg data on the distribution of dwelling types in each district: to explore land use zones.

I will use the Singapore Planning Districts as a starting point. I will then use both Foursquare calls, as well as onemap.sg data, to find out where residential districts are. This will be done using visualisation and KMeans clustering. I will then use the LSRA directory to examine where law practices are located, and their proximity to residential areas.

Methodology

The methodology I adopted is as follows:

1. Collect all planning districts from onemap.sg
2. Calculate the centroids for each planning district
3. Get the distribution of dwelling types in each planning district from onemap.sg: Housing Development Board Flats, Condominiums and Apartments, Landed Property, and Others.
4. Get the most common venues in each planning district from Foursquare
5. Carry out KMeans clustering on the most common venues to identify possible clusters
6. Query law firm information from LSRA
7. Get the coordinates of their location from onemap.sg
8. Query onemap.sg for which planning area that they are in
9. Calculate number of law firms per district
10. Show distribution on a Choropleth
11. Overlay law firm locations on
 - dwelling type distribution map
 - KMeans clustered map

Results

⁵ https://en.wikipedia.org/wiki/Planning_Areas_of_Singapore

As would have been guessed, law firms are predominantly situated in the CBD, with few having registered addresses outside the CBD. Few firms are actually situated in residential areas, or more densely-populated areas – at least as indicated by the number of dwellings.

The maps are discussed in the next section.

Discussion

Data

There were several issues with the data.

Onemap.sg

A full list of the planning districts is provided in the notebook.

First, onemap.sg did not have population density data in each district. This was why the data on the distribution of dwellings in each planning area was used. Further, for a particular year, not all districts had data, effort was therefore put into going back till 2010 to find such data. If there was still no data, the planning area was dropped from the dataset.

The second issue pertained to the calculation of centroids: the ‘central’ point of a bounded area, given all its point coordinates. Only one method was used to calculate the average of all the coordinates within a planning district’s GeoJSON FeatureCollection. The latter is a data structure that is ubiquitous in the data-mapping world, in its ability to provide coordinate and other data within one data structure, but has several complexities. The chief complexity was that a ‘MultiPolygon’ data structure was provided within the FeatureCollection. This is necessary given the irregularity of the planning areas’ shapes, as well as the possibility that planning areas might have other irregularities in them *e.g.* holes within them (like a donut), or be non-contiguous (*e.g.* Hawaii is separate from the continental United States). It would be useful to explore if other centroid calculation methods yield different results, and the degree to which they are different.

The third and final issue was one of labelling: a particular planning area was labelled ‘OTHERS’ but did not have any substantive data attached to it. Anytime that the planning areas were used, the ‘OTHERS’ exception had to be specifically handled. It is not clear what purpose the label serves.

Foursquare and the Legal Services Regulatory Authority

Foursquare did not provide a comprehensive listing of law firms, so recourse was had to the LSRA’s directory of law firms. While this project used law firm distribution, an interesting avenue to pursue would be to examine the directory of all lawyers and their registered addresses. Ostensibly, this could be approximated to some extent by using the data on the size of the firms, that is already present within the current dataset.

In terms of the LSRA’s data, some law firms did not have registered addresses (6 law firms), or had overseas registered addresses (5 law firms). Based on background knowledge, some

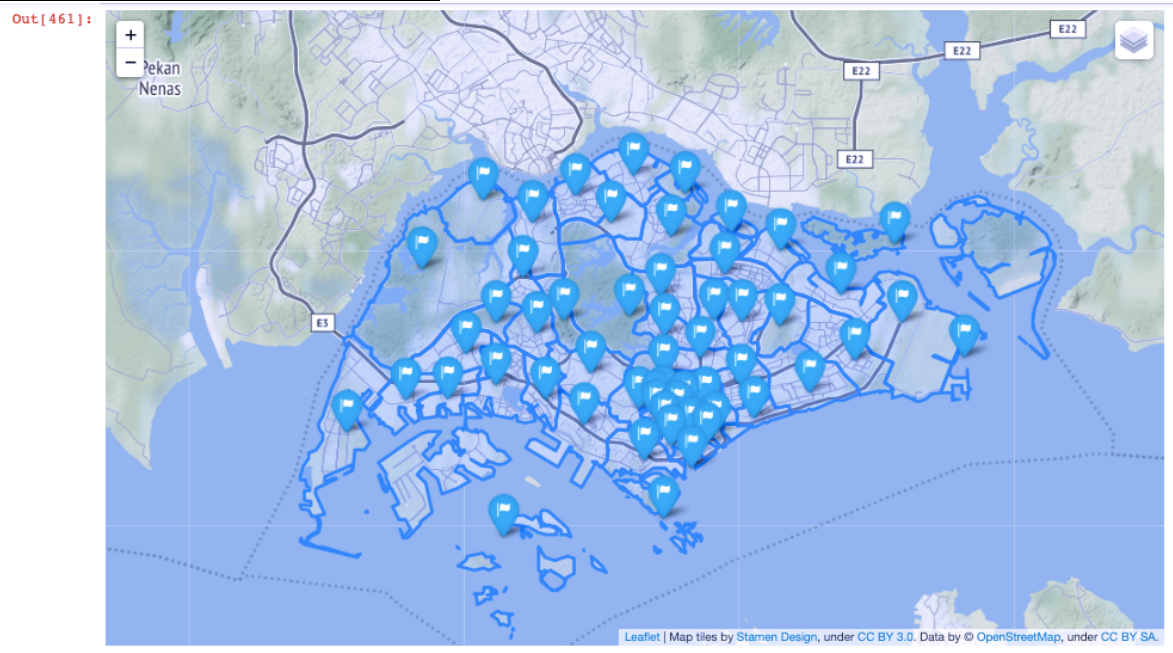
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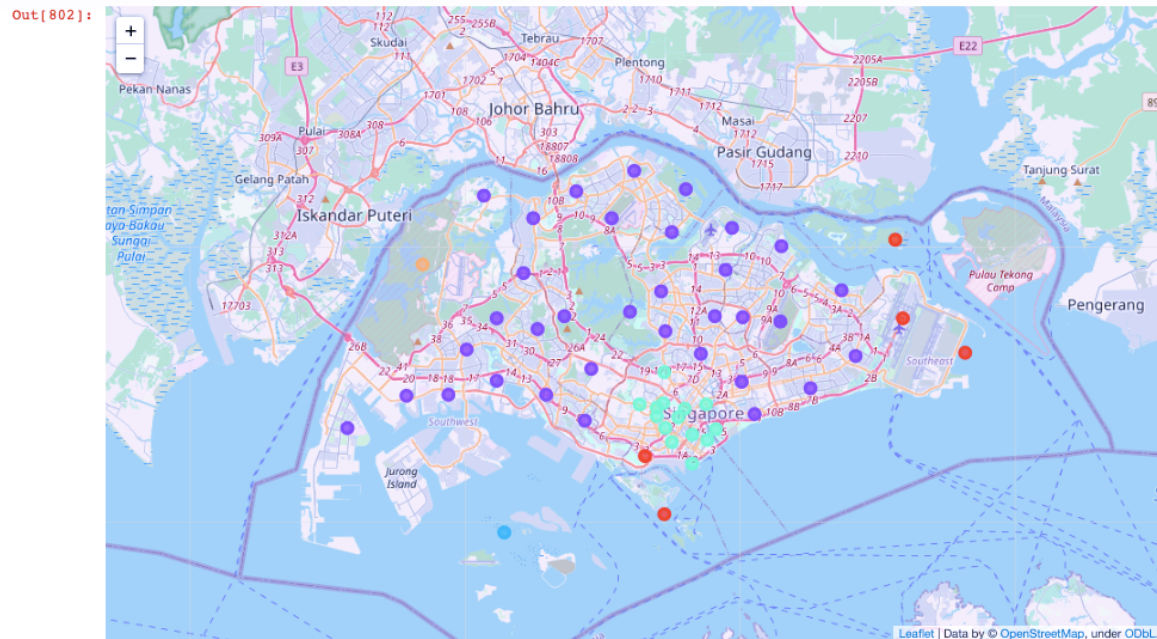
law firms, like Hoh Law Coporation, might have multiple branches and therefore addresses. Based on a quick search of Hoh, it seems that only the HQ is registered.

Figure 1: Map of planning districts



Using the data provided by onemap, boundaries around each planning district was drawn. Reasonable centroids were placed using the method outline in the notebook.

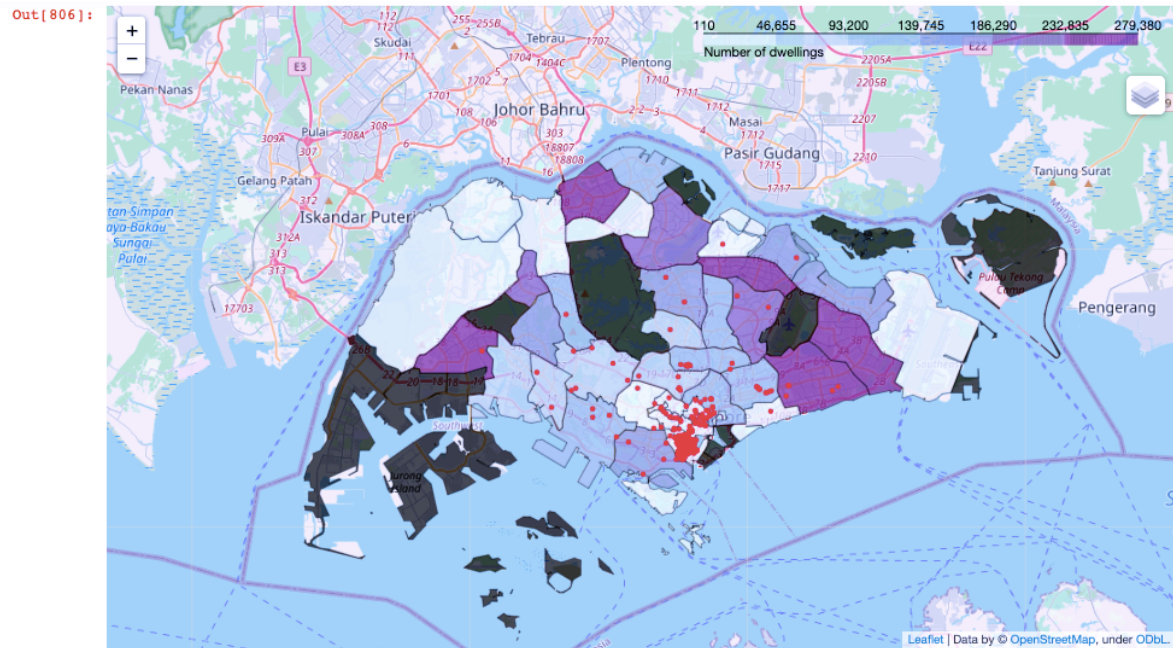
Fig 2: KMeans clusters (k=5, Top 10 most common venues, 200 venues within 3km radius of centroid)



The 5 clusters observed seemed reasonable. The red clusters suggest transportation hubs at Singapore's airport and port – along with Pulau Ubin and Sentosa. That seems anomalous, and would be interesting to explore. It seems that the presence of marine facilities was detected by the clustering algorithm. The light blue clusters are at Singapore's CBD. The purple clusters are the most numerous, and suggests a merger of residential, commercial, and industrial areas into one type of cluster – ostensibly due to the prevalence of food & beverage venues in all of these areas (Singaporeans are known to frequent famous restaurants in otherwise industrial areas). The light orange area seems to indicate a military training area, based on my background knowledge. The dark blue cluster seems to have picked up on the petroleum industry facilities on Jurong Island and Pulau Bukom.

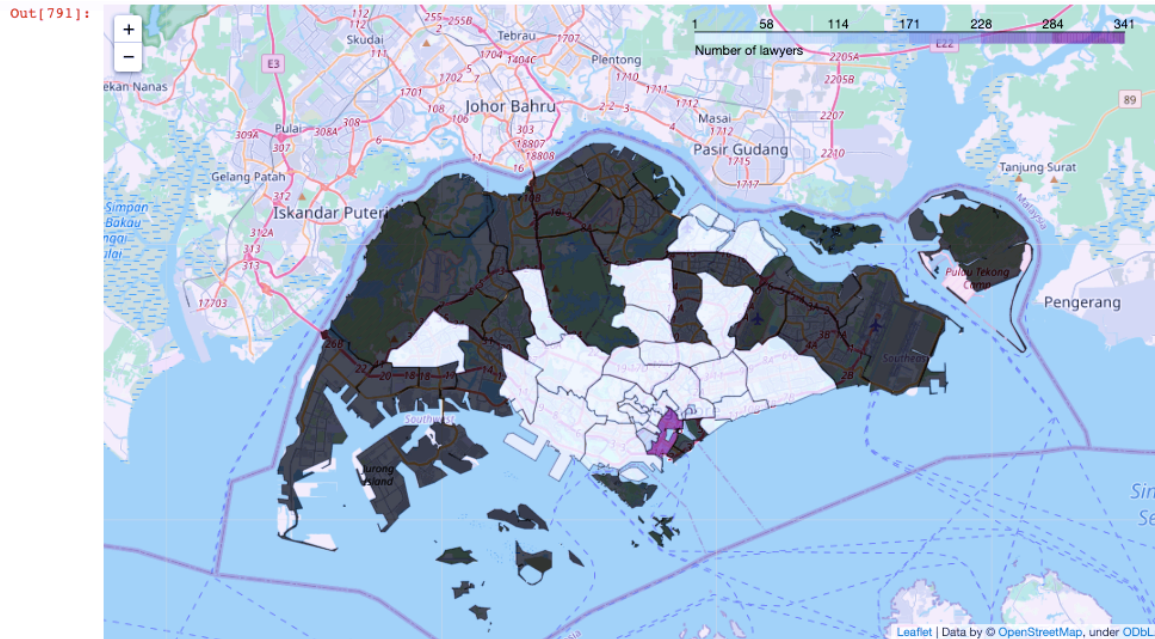
Figure 3: Distribution of dwellings and locations of law firms

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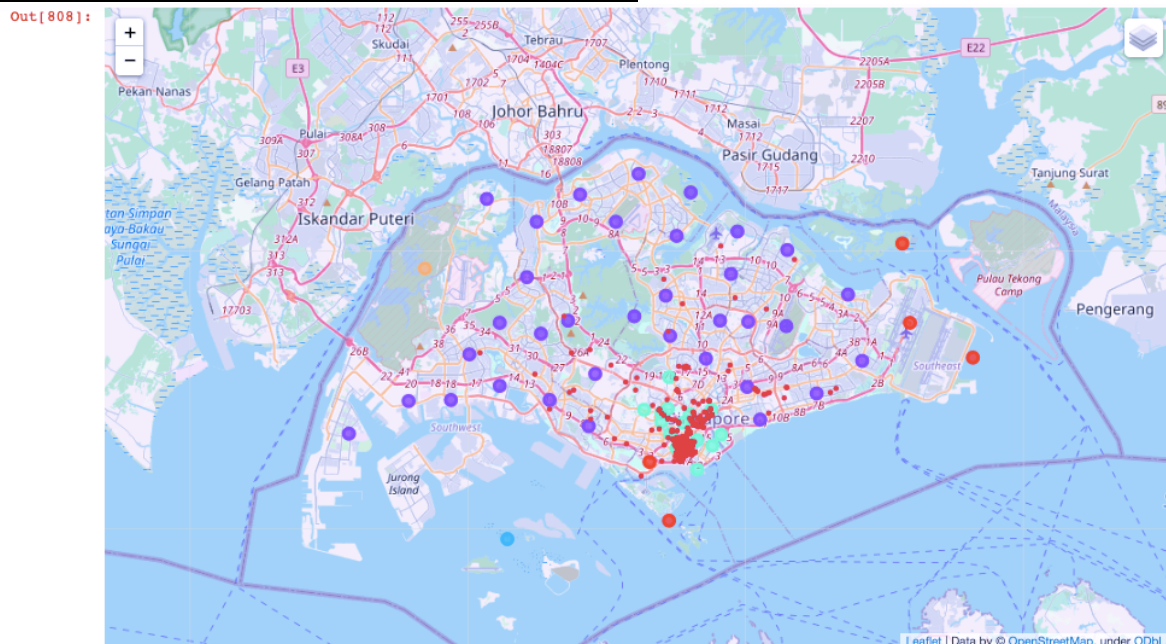
The following map highlights the distribution of dwellings, and pinpoints where law firms are located. From the map, it can be seen that law firms are primarily situated in the CBD, with sparse distribution in residential areas.

Figure 4: Distribution of lawyers



Using law firms' registered addresses, this map highlights the number of lawyers in each planning district. From this, it seems that lawyers are primarily concentrated in one district within the Central Business District, and away from the densest residential districts observed in Figure 3. As hypothesised at the outset, this is probably due to being able to harness agglomerative economies, quicker communication with other law firms, proximity to the courts and other dispute resolution facilities, and finally, to other companies. The latter is especially important for corporate transactional and disputes work.

Figure 5: Map of K-clusters and law firm locations



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This map contrasts law firms' locations with the clusters picked up by the KMeans algorithm. Law firms are primarily located in the light blue clusters, which coincide with the CBD, which again supports my hypothesis.

This study supports the hypothesis that law firms are primarily situated within the CBD, and away from residential areas. This is probably due to a variety of factors, as mentioned above. Beyond those factors mentioned above, it would be interesting to explore the proportions of revenue brought in by type of law practised. Presumably, the proportion of revenue brought in by corporate law practice would be much higher, and would also explain concentration in the CBD.

However, a more detailed analysis of this would perhaps yield interesting data on whether the advantages accruing from agglomerative efficiencies and convenient amenities are overstated. It might be more profitable to be situated closer to residential areas, whether because rent is cheaper, or because residents are more likely to patronise their neighbourhood legal practice for simpler matters rather than travel all the way to the CBD. In this way, it could be more economical to locate law firms in the manner of banks and their branches, rather than concentrating the entire company in one office in the CBD.

Pursuing this direction is even more viable with the shift to remote working arrangements given the ongoing COVID-19 crisis.

Future Directions

The following are possible steps which could perhaps yield further insight into this particular aspect of access to justice:

1. Use the directory of lawyers
2. Examine the proportion of legal industry revenue contributed by each practice area
3. Examine the relationship between Point 2 and the specialisations of law firms (already present in the dataset)
4. Examine income and population density metrics, if available
5. Examine extent of usage of digital legal services
6. Examine the relationship between *actual* land use and *planned* land use

Conclusion

The results support my hypothesis. Setbacks faced in the process of data collection and cleansing were adequately dealt with. Pursuing the future directions outlined above would arguably yield more insights into the question of access to justice, or perhaps prove irrelevant with the dawn of digital legal services.