

IBM Data Science Capstone project

The Battle of the Neighbourhoods - Moving to London?

By Panagiotis Karfakis. 07/12/2020

The Battle of the Neighbourhoods - Moving to London?

In every major city criminal activity in some of its forms takes place.

- London with a population of approximately 8.96 million people, is by far the largest city in the United Kingdom and its respective capital.
- Firstly in this report we will try to visualise the boroughs of London and their respective crimes numbers.
- Secondly we would try to find a suitable place to live/move within the city by comparing the house/rent prices and taking into consideration the criminal data and venues.
- Finally, we will leverage the power of the Foursquare database to explore what types of venues within a desired area with the one of the lowest criminal activity.

The Battle of the Neighbourhoods - Moving to London? - The Data

Criminal activity per Borough in London Area

This data counts the number of crimes at three different geographic levels of London (borough, ward, LSOA) per month, according to crime type. Data is available in two files for each level of geography - the most up to date data covering the last available 24 months only and one covering all historic full calendar years. In March 2019, the Metropolitan Police Service started to provide offences grouped by the updated Home Office crime classifications.

Source: https://data.london.gov.uk/dataset/recording_crime_summary

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The crime categories..

Major Category: Minor Category

Arson and Criminal Damage - Arson / Criminal Damage

Burglary: Burglary - Business and Community / Burglary - Residential**

Drug Offences: Drug Trafficking / Possession of Drugs

Miscellaneous Crimes Against Society: Absconding from Lawful Custody / Bail Offences / Bigamy / Concealing an Infant Death Close to Birth / Dangerous Driving / Disclosure, Obstruction, False or Misleading State / Exploitation of Prostitution / Forgery or Use of Drug Prescription / Fraud or Forgery Associated with Driver Records / Going Equipped for Stealing / Handling Stolen Goods / Making, Supplying or Possessing Articles for use i / Obscene Publications / Offender Management Act / Other Forgery / Other Notifiable Offences / Perjury / Perverting Course of Justice / Possession of False Documents / Profiting From or Concealing Proceeds of Crime / Soliciting for Prostitution / Threat or Possession With Intent to Commit Crimina / Wildlife Crime

Possession of Weapons: Other Firearm Offences / Possession of Firearm with Intent / Possession of Firearms Offences / Possession of Other Weapon / Possession of Article with Blade or Point

Public Order Offences: Other Offences Against the State, or Public Order / Public Fear Alarm or Distress / Racially or Religiously Aggravated Public Fear / Violent Disorder

Robbery: Robbery of Business Property / Robbery of Personal Property

Sexual Offences*: Other Sexual Offences / Rape

Theft: Bicycle Theft / Other Theft / Shoplifting / Theft from Person

Vehicle Offences: Aggravated Vehicle Taking / Interfering with a Motor Vehicle / Theft from a Motor Vehicle / - Theft or Taking of a Motor Vehicle

Violence Against the Person: Homicide / Violence with Injury / Violence without Injury



The Battle of the Neighbourhoods - Moving to London?

London Housing Data

The Mayor's 'Housing in London' report sets out the evidence base for his housing policies, summarising key patterns and trends across a wide range of topics relevant to housing in the capital. The report is the evidence base for the Mayor's London Housing Strategy, the latest edition of which was published in May 2018.

Housing in London 2020 is divided into nine sections, including six core thematic chapters:

- London Housing Strategy monitoring
- Key statistics for London boroughs

- 1. Demographic, economic and social context
- 2. Housing stock and supply
- 3. Housing costs and affordability
- 4. Housing needs
- 5. Mobility and decent homes
- 6. The impacts of Coronavirus
- Appendices

Source: <https://data.london.gov.uk/dataset/housing-london>



The Battle of the Neighbourhoods - Moving to London?

Statistical GIS Boundary Files for London Greater London Authority (GLA)

The Zip folder contains a range of key GIS boundary files for ESRI and Map Info covering Greater London.

The folder includes:

- Output Area (OA) 2011,
- Lower Super Output Area (LSOA) 2004 and 2011,
- Middle Super Output Area (MSOA) 2004 and 2011,
- London Wards (two files: City of London merged into single area and split into separate wards). There are separate download file for 2014 & 2018 boundaries.
- London Boroughs

Note: The OA to MSOA boundaries have been generalised to reduce file size/loading time.

On maps created using these boundaries the copyright must be stated. This is: "Contains National Statistics data © Crown copyright and database right [2015]" and "Contains Ordnance Survey data © Crown copyright and database right [2015]"

source: <https://data.london.gov.uk/dataset/statistical-gis-boundary-files-london>

The Battle of the Neighbourhoods - Moving to London? - The Data

Foursquare and Google API Data:

We will need data about different venues in different neighbourhoods of that specific borough. In order to gain that information we will use "Foursquare" locational information and latitude longitude values from the Google and Geopy API

Source: <https://developer.foursquare.com/>

Foursquare is a location data provider with information about all manner of venues and events within an area of interest. Such information includes venue names, locations, menus and even photos. As such, the foursquare location platform will be used as the sole data source since all the stated required information can be obtained through the API.

The Battle of the Neighbourhoods - Moving to London?

Wards and Boroughs in London

London has a total of 33 Boroughs and 610 Wards.

Wards is the same concept as a neighbourhood.

source-img:<https://londonmap360.com/london-boroughs-map>



The Battle of the Neighbourhoods - Moving to London?

Criminal Activity in the boroughs in the ten year duration 2001-2010, the data for the decade of 2020 has not been published yet hence this one was suitable as an indicator.

Remember we are looking for areas that have the least crimes which probably means it is safer than others!

Let us look at the overall occurrences to get an idea what is going on..

The Battle of the Neighbourhoods - Moving to London? - Crimes in each borough

We can see the total crimes committed in each Borough, but wouldn't be useful to see what are the types of crimes in each word?

With the analysis performed we can compare these details.

For example let us see what is the top crimes in the Ward of Alibon, in the Borough of Barking and Dagenham.

	Borough	Total Crimes		
0	Barking and Dagenham	189069	18	Kensington and Chelsea 214013
1	Barnet	264563	19	Kingston upon Thames 119253
2	Bexley	162583	20	Lambeth 374449
3	Brent	274466	21	Lewisham 274306
4	Bromley	248549	22	Merton 144455
5	Camden	370168	23	Newham 333159
6	Croydon	303534	24	Redbridge 224837
7	Ealing	307770	25	Richmond upon Thames 122038
8	Enfield	234849	26	Southwark 359458
9	Greenwich	262733	27	Sutton 131599
10	Hackney	304259	28	Tower Hamlets 284135
11	Hammersmith and Fulham	223792	29	Waltham Forest 253477
12	Haringey	287274	30	Wandsworth 264430
13	Harrow	149344	31	Westminster 619832
14	Havering	180024	32	City of London 47
15	Hillingdon	258081		
16	Hounslow	236538		
17	Islington	299161		

The Battle of the Neighbourhoods - Moving to London? - Crimes in each ward

We can clearly see the crimes per major and minor category in the Alscibon Ward.

We can apply the same for other Wards in other Boroughs in a similar fashion.

In the bottom right we can see the top five crimes!

Major Category	Minor Category	Crimes	Violence Against the Person	ABH
Burglary	Burglary in a Dwelling	424		410
	Burglary in Other Buildings	292		Offensive Weapon 88
Criminal Damage	Criminal Damage To Other Building	124		Murder 2
	Other Criminal Damage	227		Harassment 436
	Criminal Damage To Motor Vehicle	784		Grievous Bodily Harm 39
	Criminal Damage To Dwelling	456		Common Assault 738
Drugs	Drug Trafficking	47		Assault with Injury 332
	Other Drugs	2		Other violence 86
	Possession Of Drugs	373		Wounding/GBH 36
Fraud or Forgery	Other Fraud & Forgery	68		
	Counted per Victim	176		
Other Notifiable Offences	Going Equipped	9		
	Other Notifiable	115		
Robbery	Business Property	25		
	Personal Property	238		
Sexual Offences	Other Sexual	79		
	Rape	22		
Theft and Handling	Other Theft Person	48		
	Other Theft	650		
	Handling Stolen Goods	26		
	Picking Pockets, etc	42		
Motor Vehicle Interference & Tampering		35		
	Snatches	43		
	Theft From Motor Vehicle	518		
	Theft From Shops	143		
	Theft/Taking Of Motor Vehicle	617		
	Theft/Taking of Pedal Cycle	94		

Top 5 crimes in Alibon

Major Category	Minor Category	Crimes
Criminal Damage	Criminal Damage To Motor Vehicle	784
Violence Against the Person	Common Assault	738
Theft and Handling	Other Theft	650
	Theft/Taking Of Motor Vehicle	617
	Theft From Motor Vehicle	518

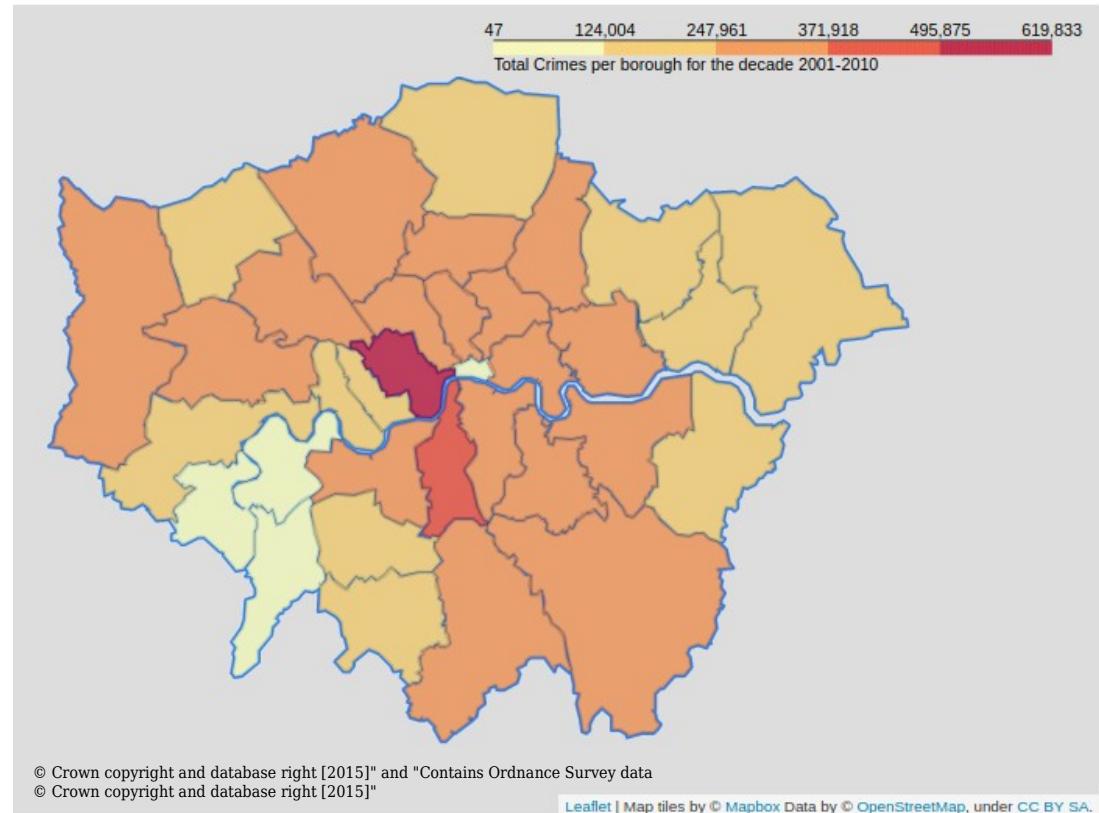
The Battle of the Neighbourhoods - Moving to London? The overall criminal activity map

From the analysis performed the safest boroughs in London were found to be:

- City of London
- Kingston upon Thames
- Richmond upon Thames

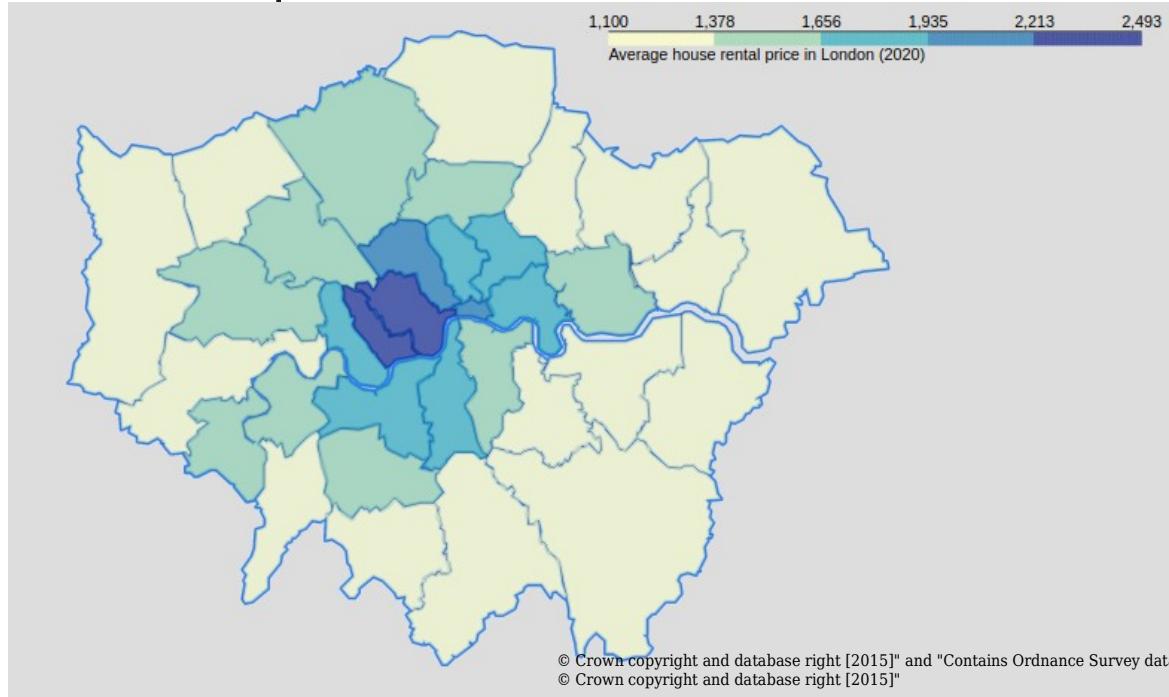
The most dangerous boroughs of london are :

- Westminster
- Lambeth around the city center.

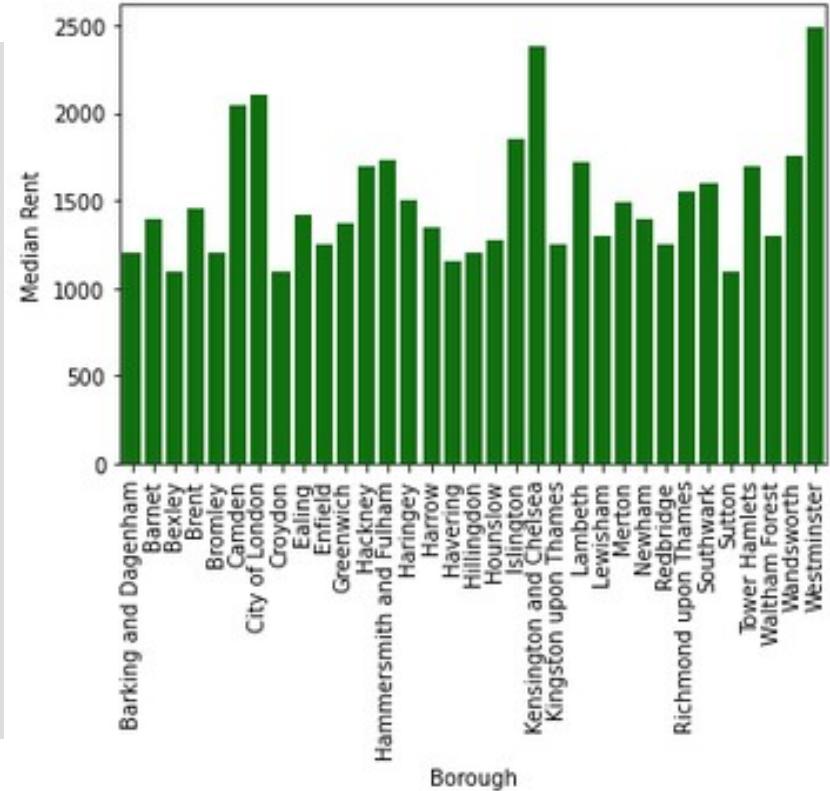


The Battle of the Neighbourhoods - Moving to London? - Renting in London

Let's have a look at renting a house. The outskirts of London seem to be the best option overall.

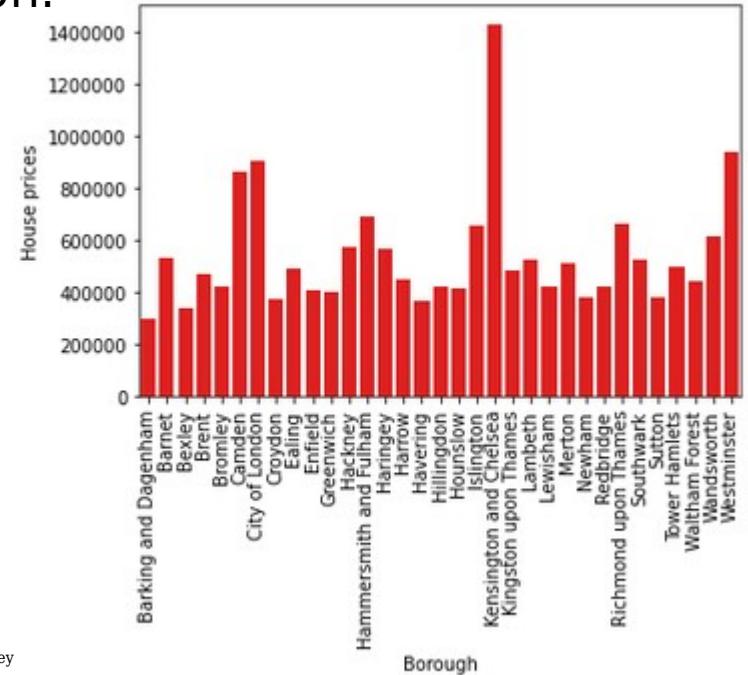
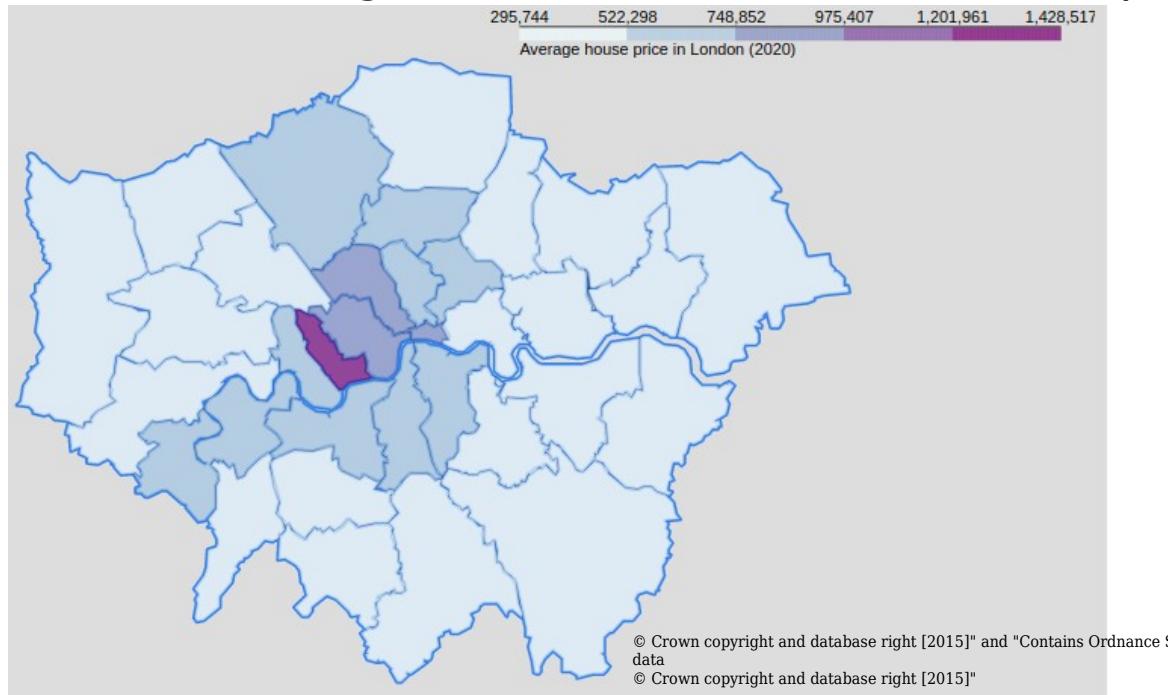


*All values are in £ GBP



The Battle of the Neighbourhoods - Moving to London? Housing in London

Let's have a look at buying a house. The outskirts of London seem to be the best option overall. Again the outskirts are a better option.



*All values are in £ GBP

The Battle of the Neighbourhoods - Moving to London? - Case Study: Kingston upon Thames

We have seen so far the criminal activity in each Borough, the rental prices and the housing prices.

By comparing the charts and map data I have selected the Borough of Kingston upon Thames as a potential place of residence which is in the Southwest of London. It consists of 14 Wards as can be seen in the image.

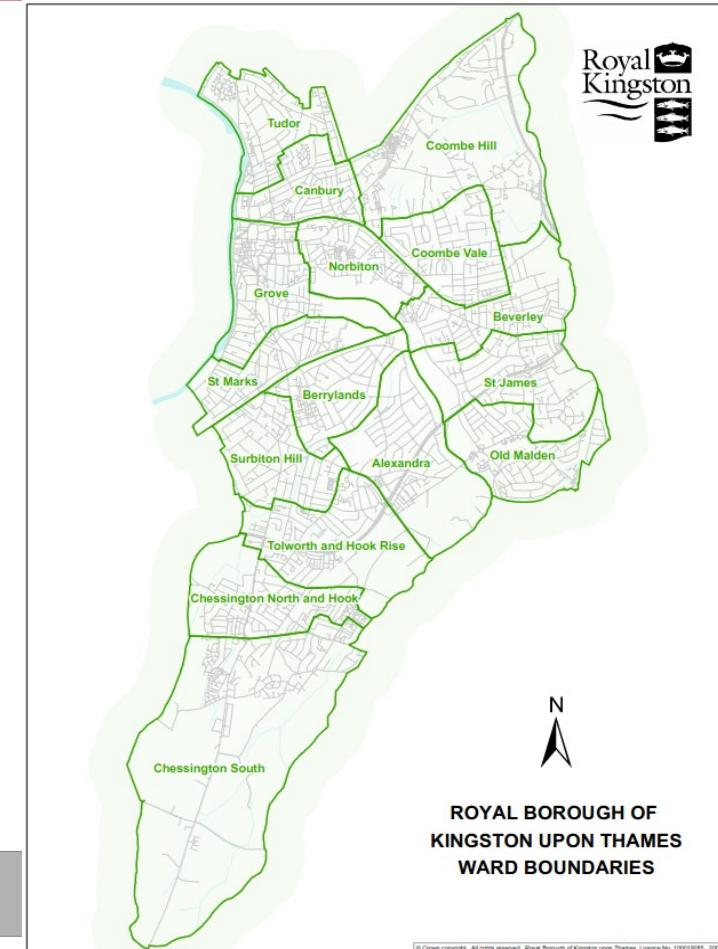
But still there are a few questions that need to be answered;

- How is crime in this Borough?
- What are the venues and options there in general?

Let us explore what is available via the **Foursquare API** and the overall data.



Source: https://www.kingston.gov.uk/download/downloads/id/1691/ward_map.pdf

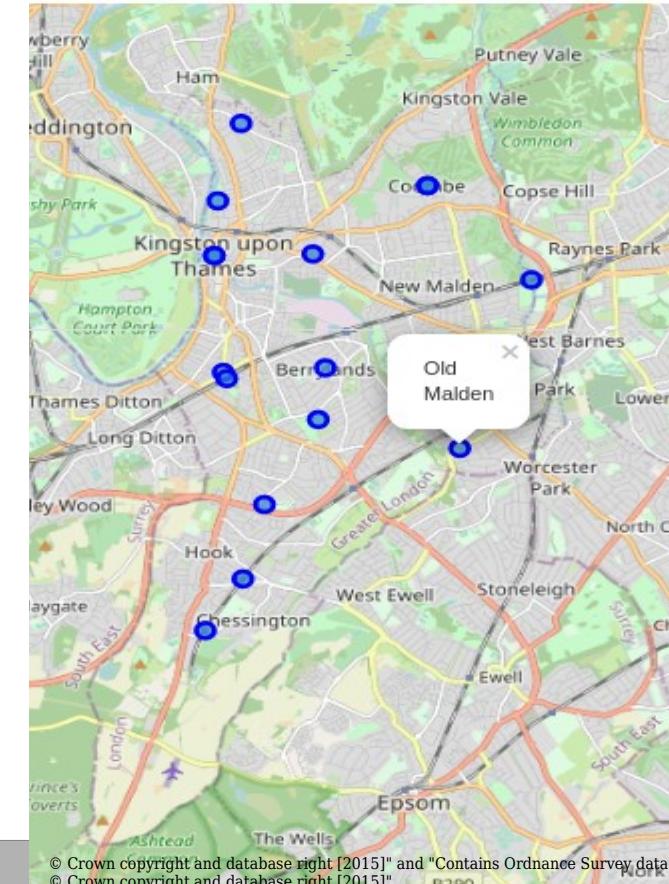


The Battle of the Neighbourhoods - Moving to London? - Case Study: Kingston upon Thames

We can see all 14 wards in the table on the right and their respected crimes overall.

By observing the values let us say we would like to explore the Ward of **Old Malden** as it has the least cases of reported crime in a duration of ten years.

Crimes	
Ward Name	
Alexandra	3905
Berrylands	4137
Beverley	7656
Canbury	6778
Chessington North and Hook	4721
Chessington South	5828
Coombe Hill	5615
Coombe Vale	3330
Grove	38718
Norbiton	9382
Old Malden	3104
St James	3679
St Mark's	7621
Surbiton Hill	3963
Tolworth and Hook Rise	6600
Tudor	4216



The Battle of the Neighbourhoods - Moving to London? - Case Study: Kingston upon Thames

We can clearly see that there are not many things around this area but only four venues which are:

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Old Malden	51.382484	-0.25909	Malden Manor Railway Station (MAL)	51.385210	-0.261264	Train Station
Old Malden	51.382484	-0.25909	The Manor	51.384902	-0.262429	Pub
Old Malden	51.382484	-0.25909	The Southern PAT Co.Ltd	51.379412	-0.256275	Construction & Landscaping
Old Malden	51.382484	-0.25909	The Manor Chippy	51.384961	-0.263321	Food

So it contains the basic stuff such as a means of transport which is very nice for commuting to the center and some restaurants for food and a pub.

Also there is a large construction company based in the area.

The Battle of the Neighbourhoods - Moving to London? - Case Study: Kingston upon Thames

Clustering the venues (K-MEANS)

Since we've only four venues in this Ward it is not worth performing a clustering algorithm as the distribution of each of the venues is equal and we will only have one cluster.

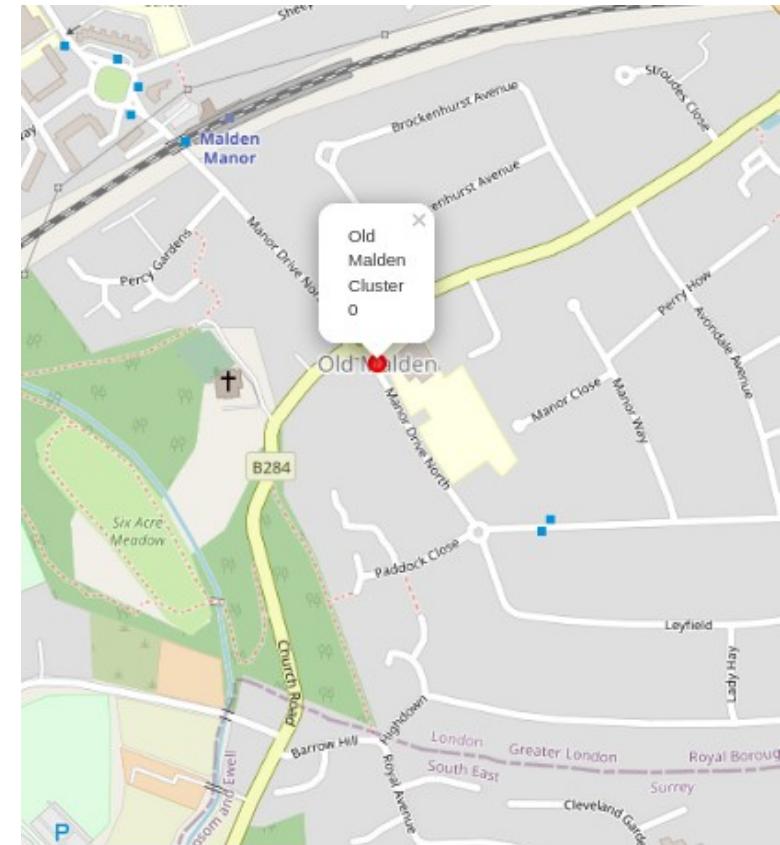
Neighborhood	Construction & Landscaping	Food	Pub	Train Station
0 Old Malden	0.25	0.25	0.25	0.25

For the analysis purposes, we have performed it anyway and here are the results:

Ward	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
0 Old Malden	51.382484	-0.25909	0	Train Station	Pub	Food	Construction & Landscaping

Finally we can see the most common venues by type in Old Malden:

Latitude	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
0 51.382484	Train Station	Pub	Food	Construction & Landscaping



The Battle of the Neighbourhoods - Moving to London? - Case Study: Kingston upon Thames

All in all, we can say that Old Malden :

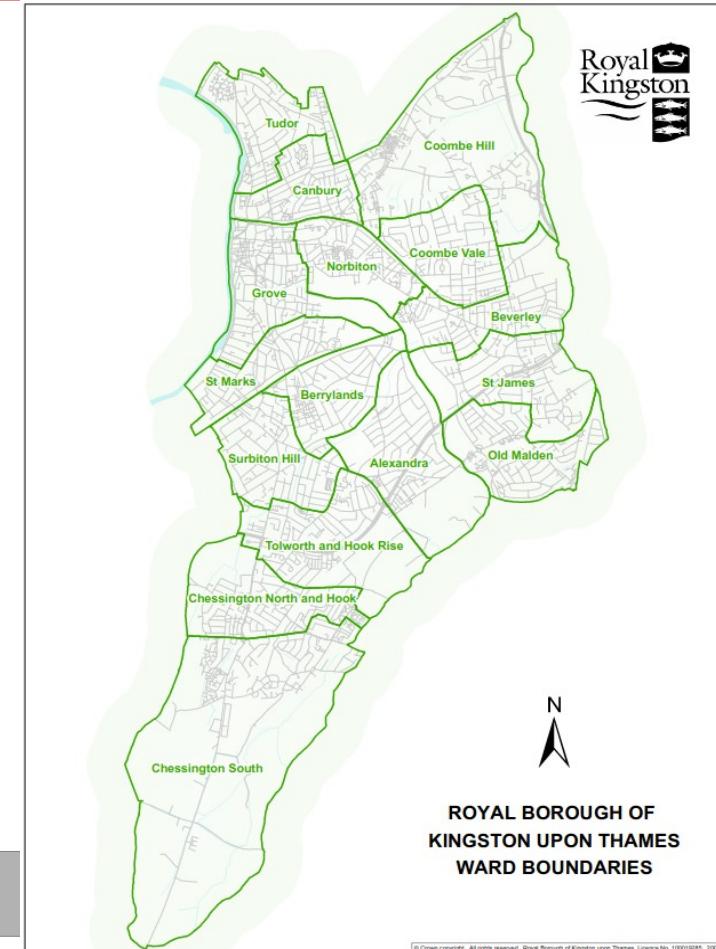
- is a safe place to move
- cheap place on average to buy a house or Rent
- Has train line as means of transport
- Has a pub, the English tradition to food and drinks
- A restaurant

Which are all aspects of a nice and calm residential neighbourhood.

This research can be used in so many ways having more data provided and the factors that are important when moving to a new place, such as:

- Transport types and lines data
- Market data and more

Source: https://www.kingston.gov.uk/download/downloads/id/1691/ward_map.pdf



The Battle of the Neighbourhoods - Moving to London? - Conclusion

Conclusion

Why is this research important?

- This research can be extremely useful for :
- People trying to move to London to buy a house or rent
- For people looking for employment in order to pick safe locations
- As a reference of which areas have less criminal activity or are more dangerous
- As a reference to view the types of crimes in each Borough and Ward.
- To explore the venues nearby a specific geographical region.

The Battle of the Neighbourhoods - Moving to London?

The end!
Thanks for your time!