
AFTER DARK TRANSPORTATION IN SYDNEY

Introduction

RBT means you need a Plan B. This NSW road safety campaign slogan is clear and concise. However, it's message on the perils of drink driving also highlights the key role an effective transportation system plays in the nightlight of a city.

With a wide and varying nightlife stretching across the city Sydney has many cafes, bars and clubs to offer. As the hub for international flights into Australia it receives over 4 million international visitors as well as 12 million domestic visitors a year. Clearly the transportation demand is there, and one of the crucial components of meeting that need is an efficient taxi and ride sharing economy.

A significant driver of the efficiency of this economy is the ability to pair providers with potential clients when and where the demand is. This report aims to identify the locations in Sydney where the demand for taxi's or ride sharing services are the greatest to assist in driver distribution.

Data

To solve the problem of allocating taxi and ride sharing services to the in demand locations in Sydney the following data has been used:

- Wikipedia for list of Sydney Suburbs https://en.wikipedia.org/wiki/List_of_Sydney_suburbs
- A file including all Australian Post Code location data from https://raw.githubusercontent.com/matthewproctor/australianpostcodes/master/australian_postcodes.csv
- Foursquare data for cafe's, restaurants, pubs and clubs in the Sydney area: establishment location, opening and closing hours, user ratings as a proxy for popularity and if the venue serves alcohol or not

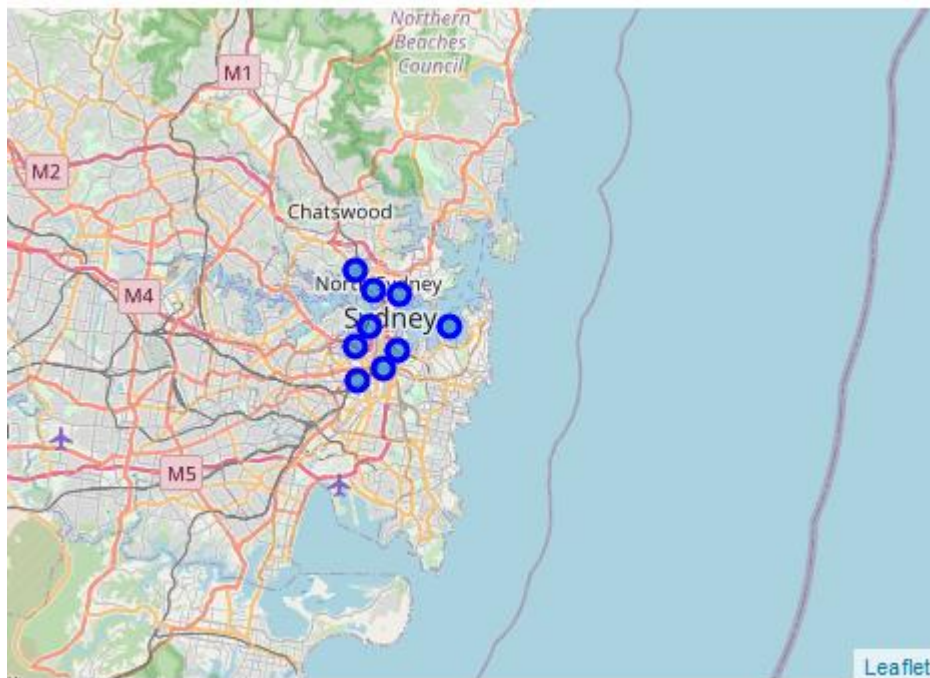
Methodology

An initial analysis was conducted by scraping the list of Sydney suburbs from the 'List of Sydney Suburbs' Wikipedia page. This page along with the list of suburb names also provide a brief overview of the each suburbs ie. intercity or family neighbourhood. These overviews then provide some indications of what suburbs to concentrate on.

After reviewing the data provided and based on the restriction on API calls to foursquare it was decided to focus on the identified inner city suburbs of Sydney. These were chosen as they are the heart of

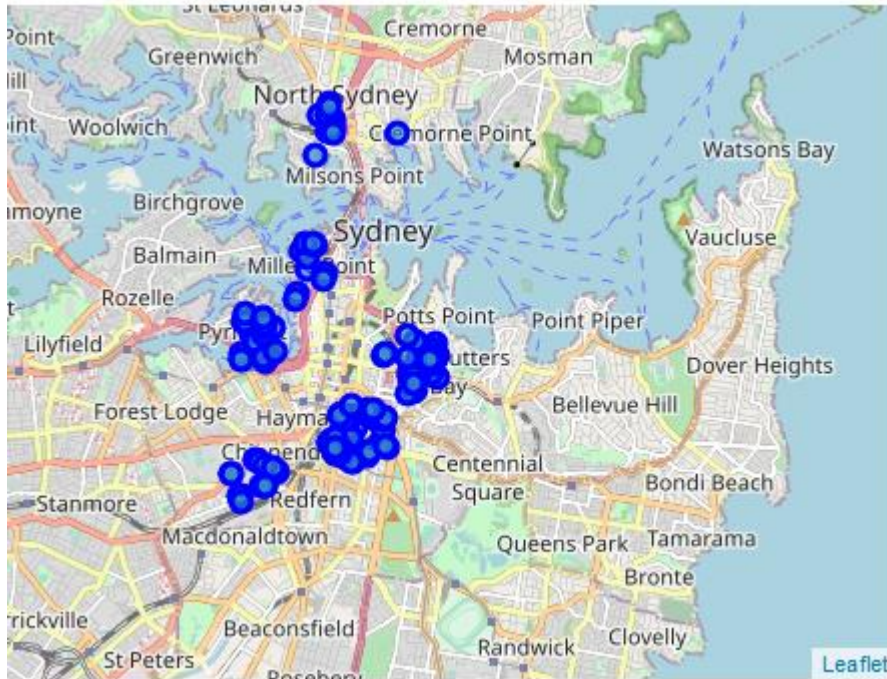
the city containing the Harbour precinct, the Harbour bridge, the Rocks and the Opera house all key attractions for both international and domestic tourists. With a high concentration of bars, restaurants and clubs they are also contain the bulk of the cities nightlife.

Once the initial review of the information was the Australian Suburbs postcode and location data was retrieved and entered into a data table. This data was then trimmed down to the Sydney area Suburbs by locality. The data was then further down whittled only Sydney city metro area suburbs as identified previously. Lastly the data was cleaned to remove duplicates, null entry rows and error rows. The final suburbs locations where then plotted on a map of Sydney to visualise the data.

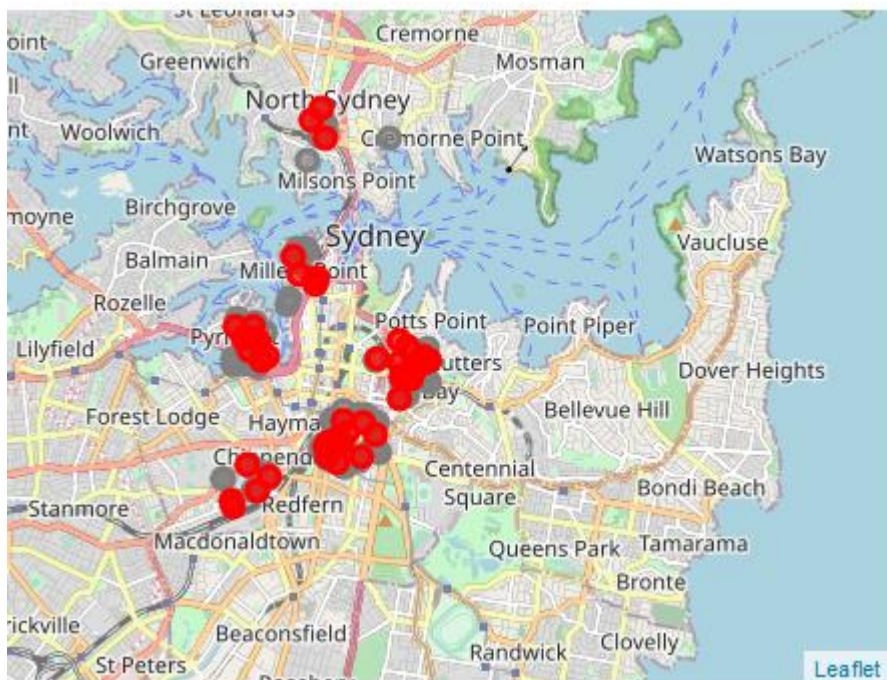


The foursquare API was then called to return the venue and venue locations in each suburb and the returned venues where the entered into a data table. A list of all the unique venue categories returns was then created. Analysing the list of venue categories, the data table was then restricted to Restaurants and Bars of various sorts. This was done as the goal of this report is to identify the key locations within Sydney City for transportation to facilitate the nightlife of the city.

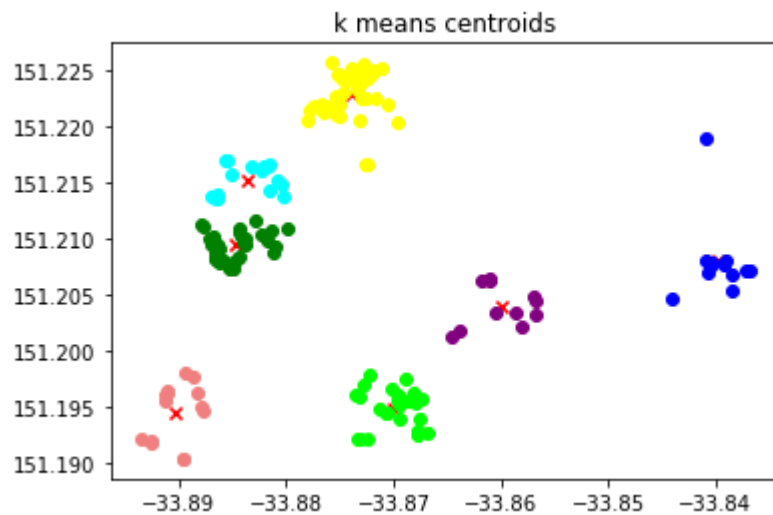
The locations of these venues where then plotted on the Sydney map to visualise any patterns. It was noted that the venues appear to cluster in six specific groupings.



For further analysis the data set was split into Bars and Food venues to see if there was any distinction in the groupings. These two groups were then plotted on the same Sydney map to visualise with Food venues marked in grey and Bars in red. It can be noted that the grouping of both types are mostly overlapping and as such indicate that there is limited benefit from the separation in analysis.



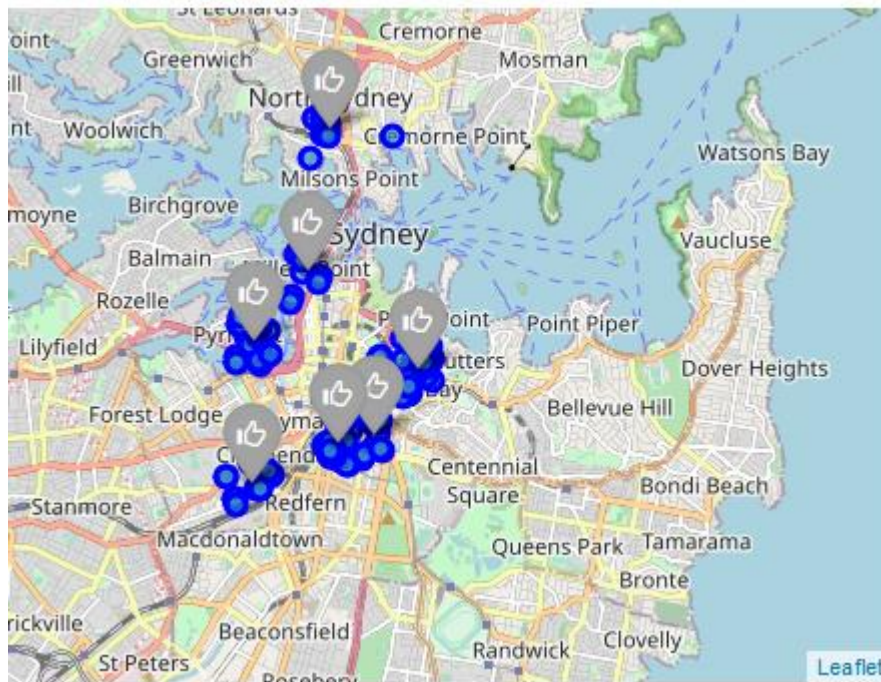
Having identified the grouping visually a k means algorithm was employed to identify the optimal grouping of the clusters and identify the centroids and hence best place to for transportation pickup/waiting areas.



Using the k means algorithm seven optimal groupings were identified and the coordinates for the centroid captured in a data table.

	lat	long
0	-33.839813	151.208058
1	-33.884722	151.209468
2	-33.869991	151.194872
3	-33.874001	151.223007
4	-33.890318	151.194512
5	-33.860022	151.204022
6	-33.883559	151.215346

Lastly the centroids were plotted on the map of Sydney with the venues included to visualise the locations.



Results

As a result of the analysis seven clusters of bars and restaurants within the Sydney metropolitan area have been identified. Base on the clustering of the venues at these locations the centre or optimal point for taxi ranks or ride sharing services to wait has been identified.

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Discussion

The results above show the optimal areas for ride sharing services or taxis to congregate in order to take passengers home after enjoying the Sydney nightlife.

However these recommendations do not take into account the proximity of other forms of public transportation such as busses or trains which maybe used as alternatives. Although from anecdotal evidence people are much less likely to use public transportation after a 'night out' which indicates that this may not be a factor in location although this hypothesis would have to be further substantiated.

Further this data is based on location and type of venue. There is likely also to be a time factor in identifying the of optimal transportation locations with variations due to the time of day. This would be something to investigate further to see if locations change due to differing venue closing times or day of the week and popularity of locations ie bars may have later times compared to family orientated restaurants.

Conclusion

In conclusion this report provides the optimal locations for transportation pickup point with in the Sydney city area to provide services for locals and tourists enjoying the local nightlife.

It is recommended that these locations are noted by taxi and ride sharing companies so that they can maximise the efficiency of their service as well as ensuring the safe enjoyment of the patrons of the venues.