Venue Characteristics Near the Rapid Transit Stations and Their Relationship to the Ridership

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Introduction

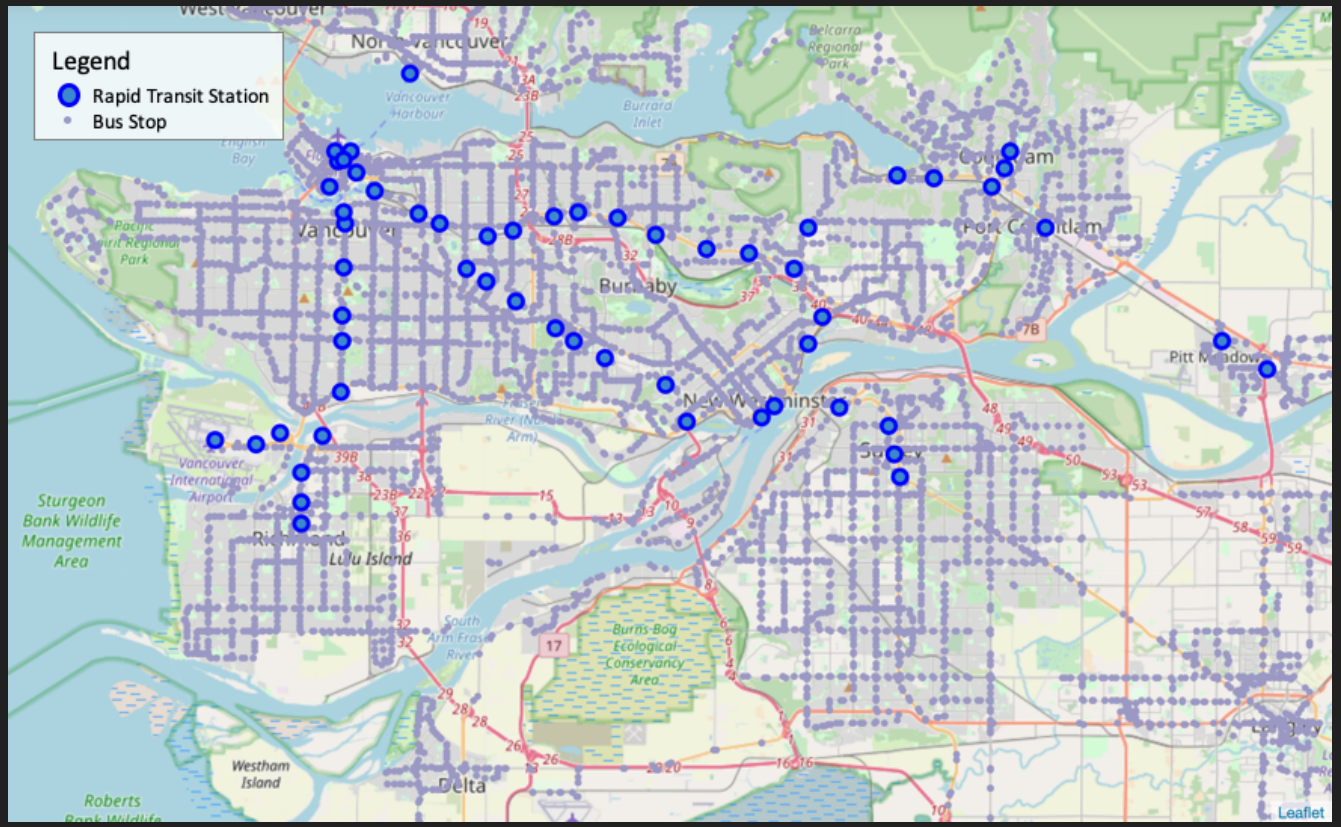
- Metro Vancouver is expected to accommodate an additional 1 million resident and 500,000 jobs by 2040, but the road infrastructure cannot handle so much growth – the transit network is the solution.
- The transit agency needs to grow the ridership to maintain their financial sustainability. If we can show them the type of business around the stations with high ridership, the transit agency can develop policy that promotes the type of business stimulating the ridership growth around the transit stations.

Data Sources

1. Rapid Transit Station Locations (GTFS)
2. Venue Database (Foursquare API)
3. Transit Ridership (2017 TSPR)

1. Rapid Transit Station Locations

Source: TransLink GTFS Data

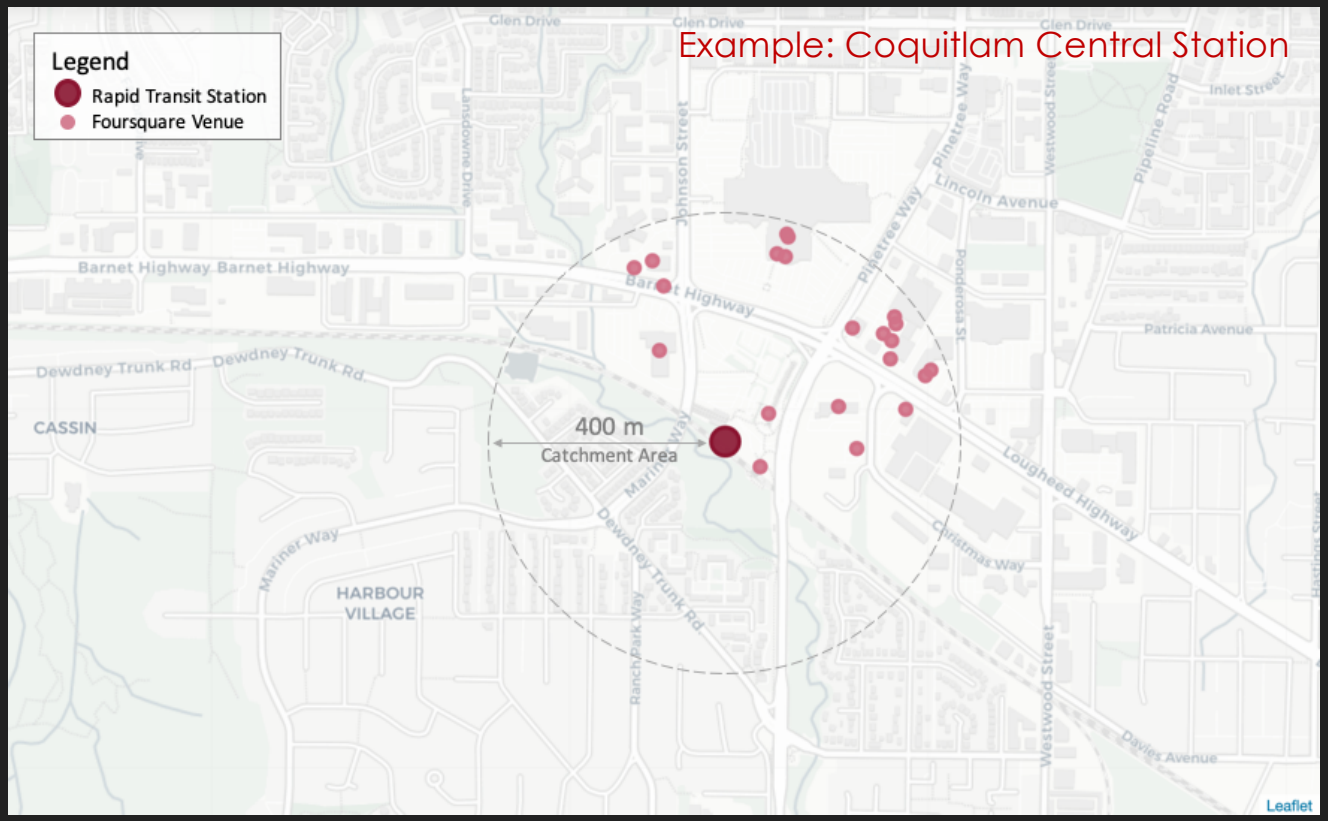


Rapid Transit Services

- SkyTrain
- SeaBus
- West Coast Express

2. Venue Database

Source: Foursquare API



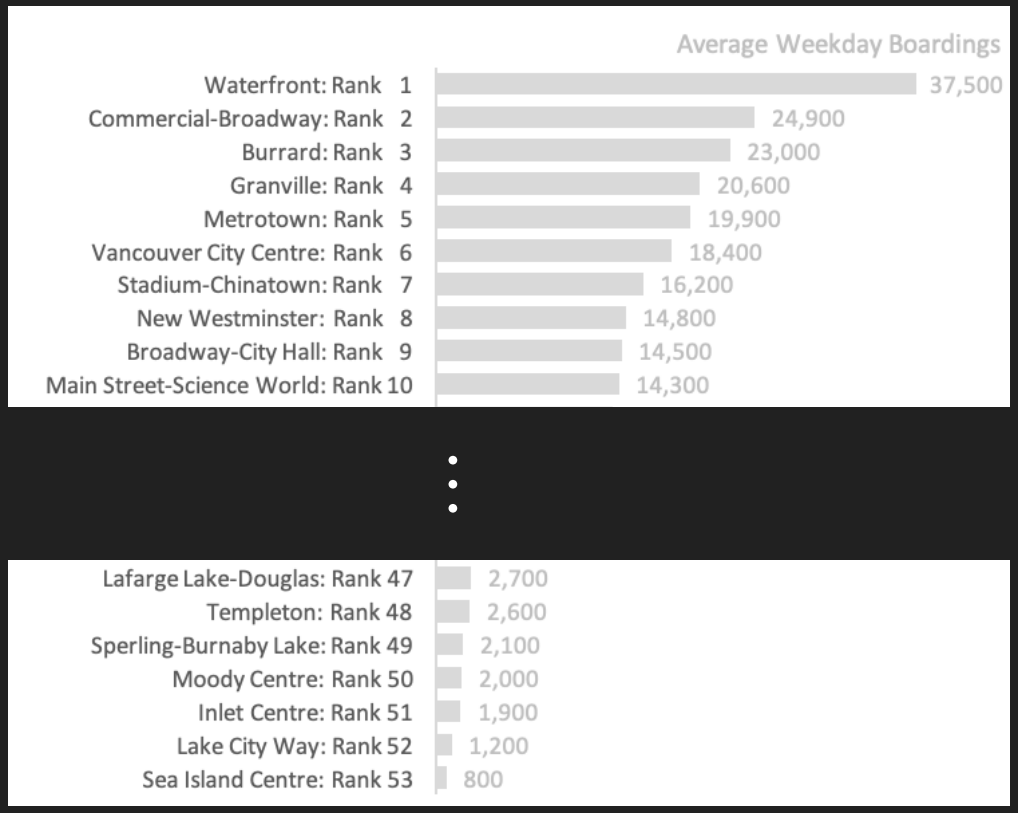
- Data queried for each station
- Catchment area of 400m

Venue Database Attributes:

- Transit Stop (the query location)
- Venue ID
- Venue name
- Venue type
- Venue location (latitude, longitude)

3. Transit Ridership

Source: TransLink 2017 TSPR



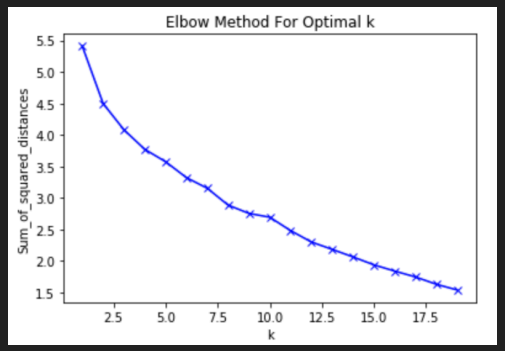
The stations are ranked by ridership (measured by average weekday boardings):

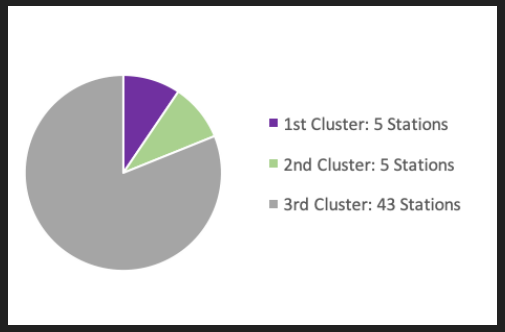
- Waterfront Station has the highest ridership
- Sea Island Centre ranks the last

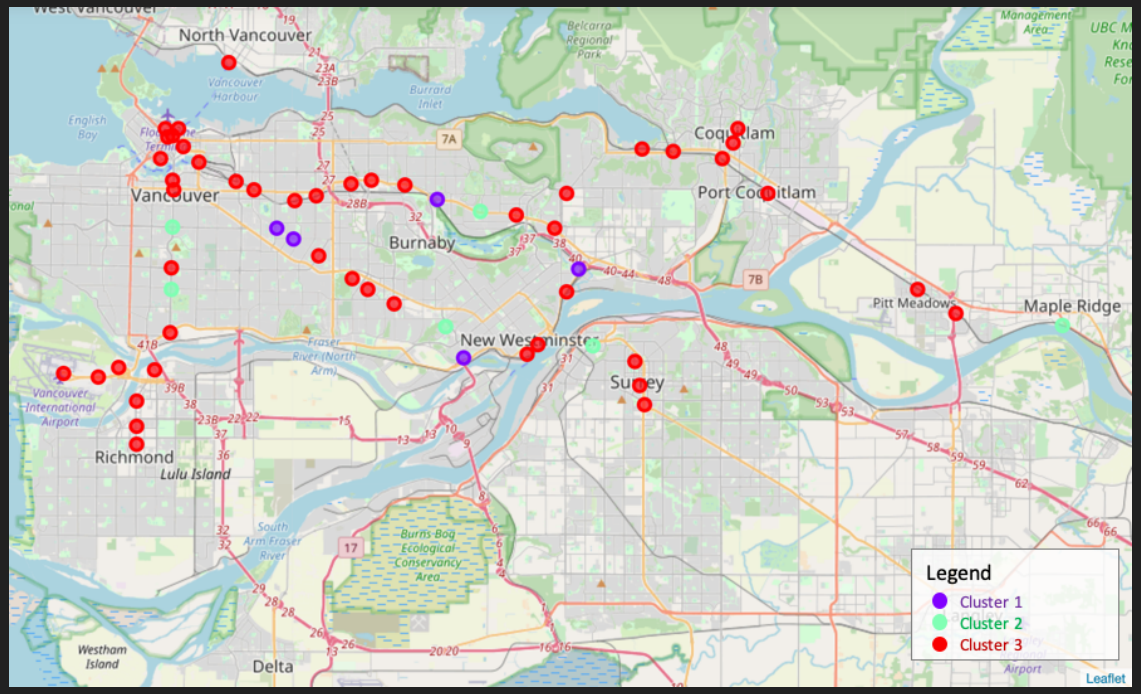
Methodology

- Data collection
- Create the station clusters based on the surrounding venue types
- Summarize the cluster patterns and review their relationship to the ridership ranking

- K-Mean Clustering the Rapid Transit Stations
  - Three station groups are created using the k-mean clustering algorithm
  - The attributes are the top ten venue categories (by frequency) for each station



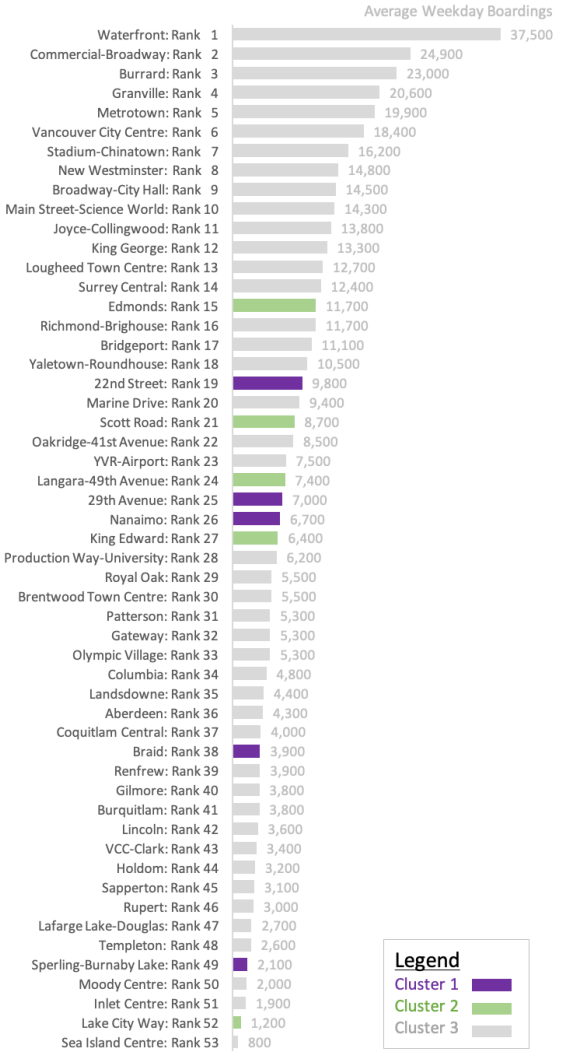




Result

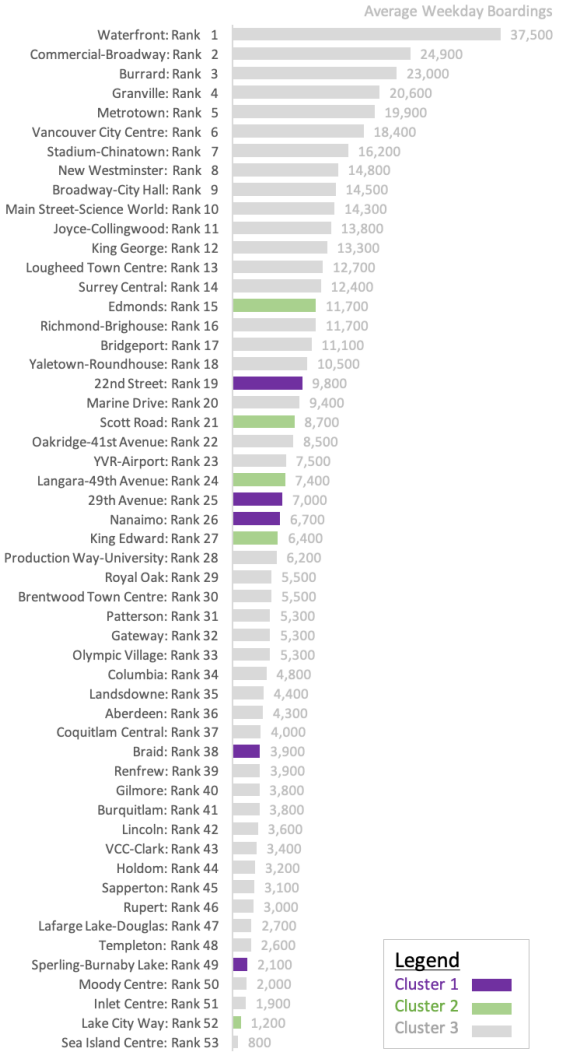
- The first cluster is dominated by the bus stop
- The second cluster is surrounded by park and light rail station
- The third cluster is "everything else"

- The first two clusters are in less-dense part of the region



Discussion

- There is no obvious pattern in the type of business and the ridership performance. The business near the station such as the coffee shop and the bank might trigger an intermediate stop but these are not a rider's final destination.



Conclusion

- The business types surrounding the transit station **do not have an impact** on the transit ridership.
- The transit agency should not focus on business development policy surrounding one station to stimulate the ridership growth.