



# Visualisation Project

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South East Queensland: Translink™ Data

**Ryan Phelan** 43935707

**COSC3000** Visualisation, Computer Graphics and Data Analysis

# Project Overview → 'What'

Aim:

- To analyse public transport trends and statistics using open source Translink™ data.

Data:

- Downloaded direct from [translink.com.au](http://translink.com.au)
- "Open Data" section provided links to various data sets and text files

# Project Overview

## Data Acquired from Translink™:

### ➤ **Stop Information**

- Stop Names
- Stop ID's
- Latitude and Longitude for each Bus, Train and Ferry Stop

### ➤ **Stop Times**

- Every instance of a bus arriving/departing a location

### ➤ **Go-Card® Technology Data**

- List of every Go-Card® retailer (Locations included)
- Total Trips taken using a Go-Card®

### ➤ **Travel Data**

- Total number of trips for each week

# Project Overview

## Specific Data Visualisation Goals:

- Visualising transport usage with respect to the time of the year
- How much travelling is done using Go-Card<sup>©</sup> technology
- Where are the easiest areas to buy a Go-Card<sup>©</sup>
- What time of day is Translink<sup>™</sup> most active
- What is the distribution of stops across SE Queensland
- Where is public transport the most active

# Why?

- Public Transport is never 100% useful/efficient across an entire city, analysis will seek to pinpoint precisely where and when Translink™ is the most useful for the general public.
- Mapping transport across a region can be important for future urban development/planning.
- As a daily user of public transport, I personally wanted to investigate the 'best' areas in Brisbane.

# Methods

## Organisation/Filtering:

- Excel™
  - General data managing and selecting
  - Pivot Tables
- Java
  - Data Sorting

## Graphing/Visualising:

- MATLAB™
- QGIS™: Geographic Information System
  - Used for complex region mapping

	A	B	C	D	E	F	G	H	I	J
1	stop_id	stop_code	stop_name	stop_lat	stop_lon	zone_id	stop_url	location_type	parent_station	platform_code
2	1	1	Herschel Street Stop 1 near North Quay	-27.467834	153.019079	1	http://translink.com.au	0		
3	10	10	Ann Street Stop 10 at King George Square	-27.468003	153.02397	1	http://translink.com.au	0		
4	100	100	Parliament Stop 94A Margaret St	-27.473751	153.026745	1	http://translink.com.au	0		
5	1000	1000	Handford Rd at Songbird Way	-27.339069	153.043907	2	http://translink.com.au	0		
6	10000	10000	Balcara Ave near Allira Cr	-27.344106	153.024982	2	http://translink.com.au	0		
7	10001	10001	Nudgee Rd at Golf Course, stop 35/32	-27.372728	153.098237	2	http://translink.com.au	0		
8	10002	10002	Nudgee Rd at Golf Course, stop 32/35	-27.372787	153.098416	2	http://translink.com.au	0		
9	10003	10003	Approach Rd near Mellifont St, stop 31	-27.382612	153.090391	2	http://translink.com.au	0		
10	10005	10005	Handford Rd at Songbird Way	-27.339592	153.042985	2	http://translink.com.au	0		
11	10006	10006	Redwood St at Farrant Street	-27.402593	153.007388	2	http://translink.com.au	0		
12	10007	10007	Ridge St at St Vincents, stop 19	-27.385924	153.062459	2	http://translink.com.au	0		
13	10008	10008	Ridge St at Scott Street, stop 18	-27.387328	153.063647	2	http://translink.com.au	0		
14	10009	10009	Ridge St at Scott Street, stop 18	-27.386816	153.063368	2	http://translink.com.au	0		
15	1001	1001	Queen Street, 1E	-27.470552	153.024575	1	http://translink.com.au	0	place_QSBS	1E
16	10010	10010	Saint Vincents Rd near Ridge St, stop 19	-27.385663	153.061812	2	http://translink.com.au	0		

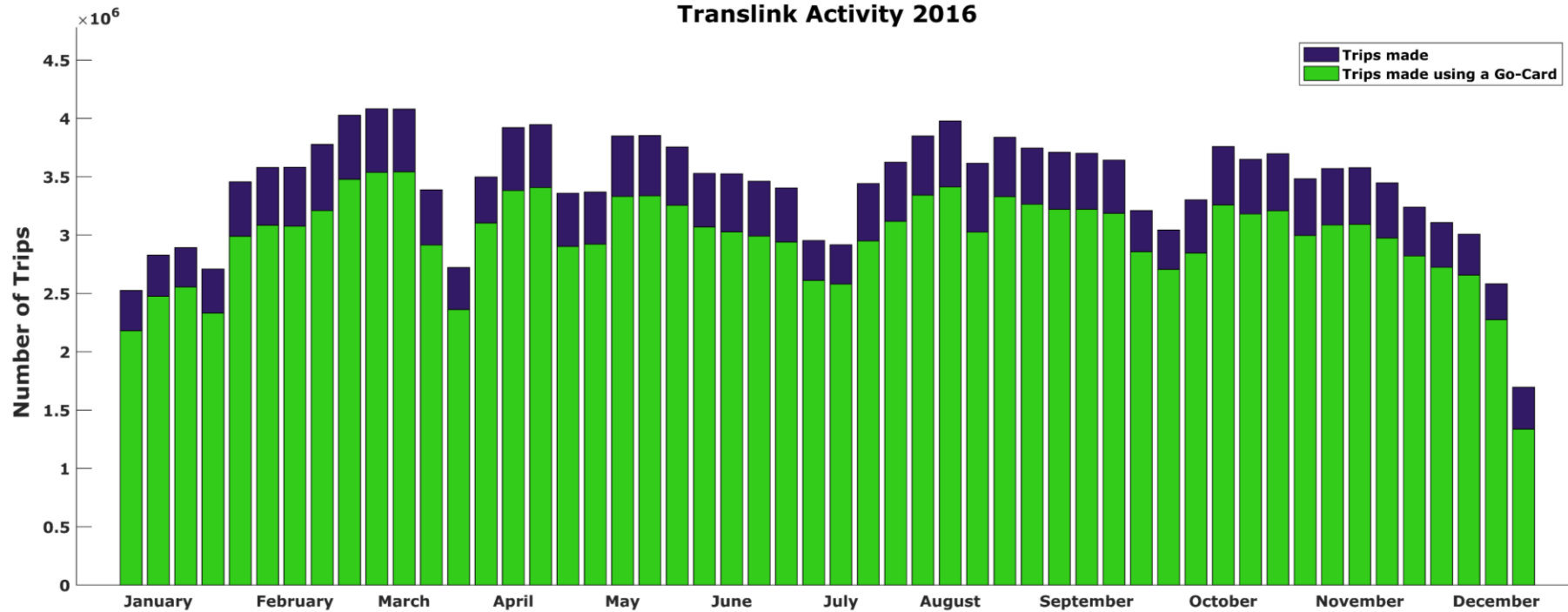
Sample Data from one of the Translink™ data files. Information came as csv files which made them idea for manipulating in Excel™

# ANALYSIS & RESULTS

# Yearly Transport Usage



Translink Activity 2016



Plotted using MATLAB™

Snippet:

```
bar(y1,'FaceColor',[.2 .1 .4],'LineWidth',0.5)
hold on
bar(y2,'FaceColor',[.2 .8 .1],'LineWidth',0.5)
hold off
```

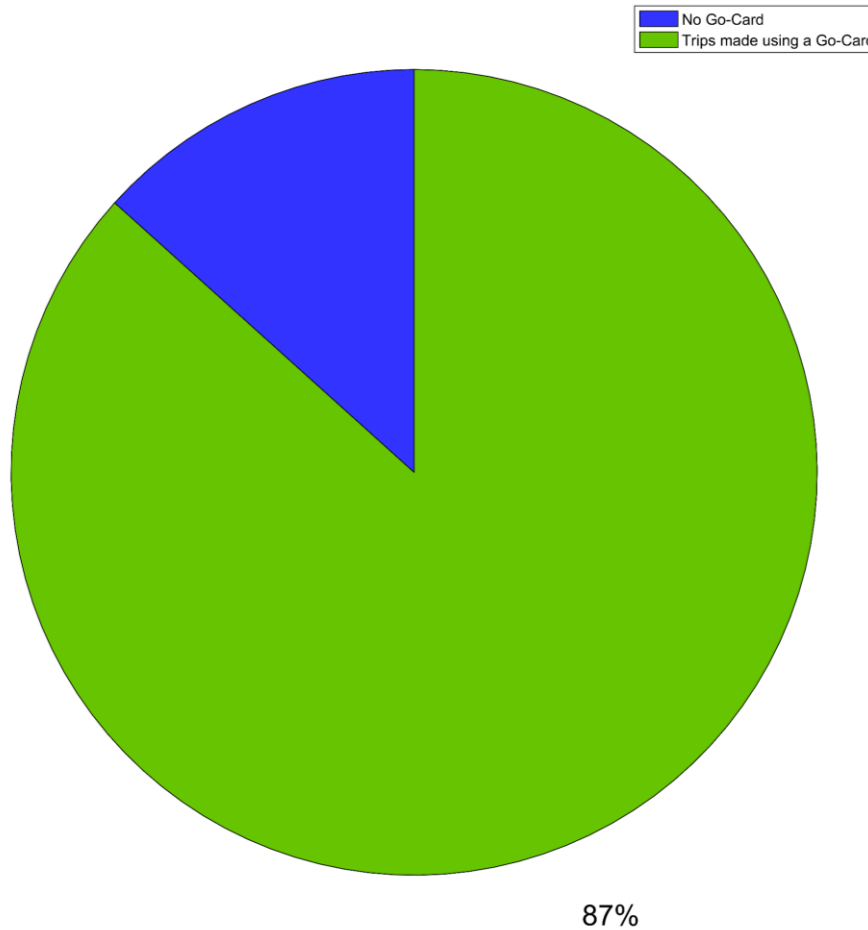
→ January: Least active month

→ Final Week of the year: Least active week

→ Notable 'dips', occurring four times per year.

Most likely coincide with end of term holidays for schools.

**Translink 2016 Go-Card Usage**



→ Majority of trips utilise Go-Card technology

→ 1 in 10 travellers purchase paper tickets. Likely tourists/locals using transport only a few times per year

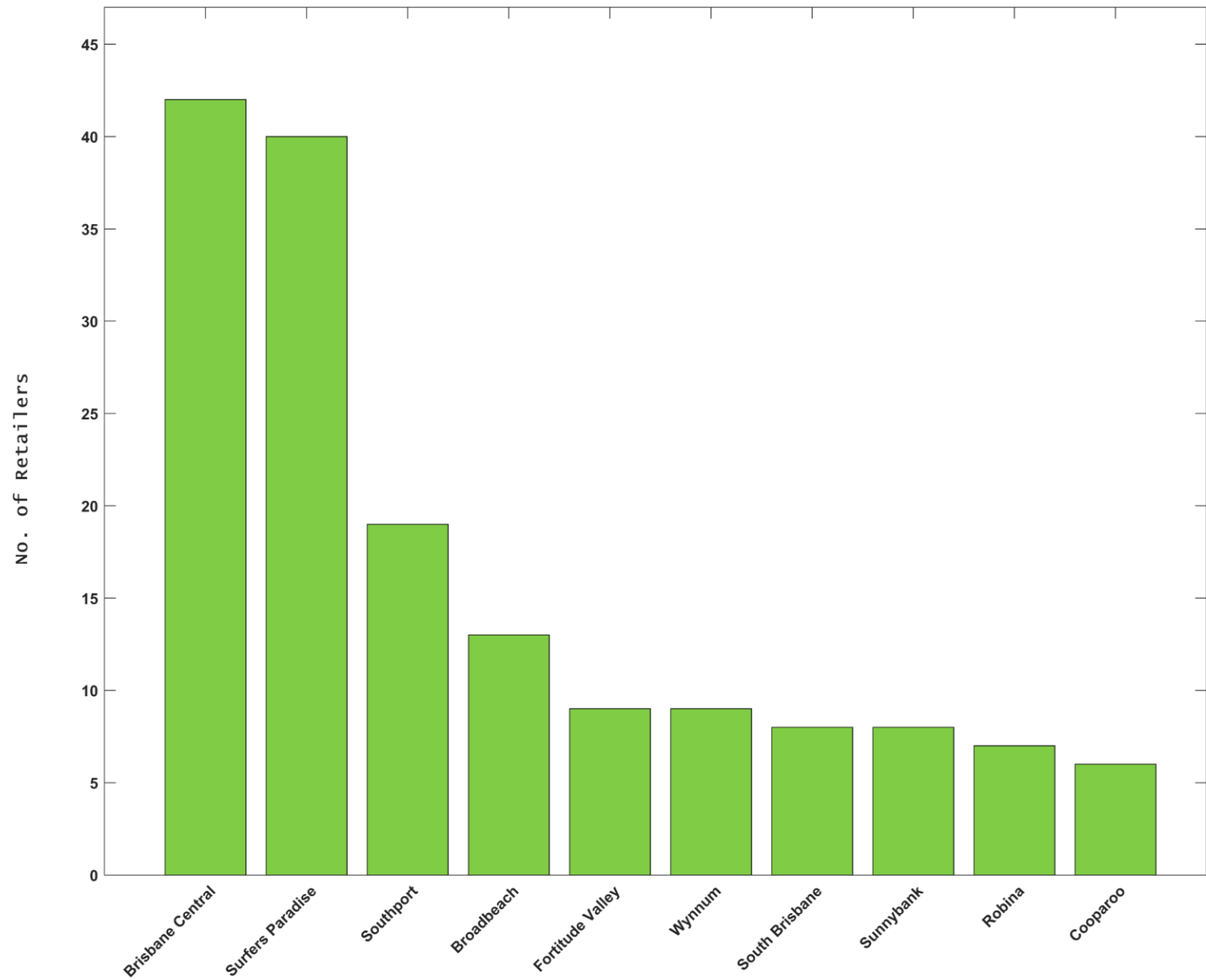
Go-Card© Retailers

# Sample Data:

1	id	name	address	latitude	longitude	region	type_id	type_name	notes	product	pr p	service	service	service	se
2	1771	7-Eleven	100 Ferny Avenue, Surfers Paradise, Queensland, Australia	-27.995306	153.427407	Gold Coast	1	Standard retailer							
3	18	7-Eleven	1120 Edward Street, Brisbane , Brisbane Central	-27.4702	153.028	Brisbane Central	1	Standard retailer		go card		Buy	Top up	Change expi	
4	19	7-Eleven	1136 Queen Street (Cnr Albert and Burnett Lane), Brisbane , Brisbane	-27.4693	153.025	Brisbane Central	1	Standard retailer		go card		Buy	Top up	Change expi	
5	20	7-Eleven	1174 Adelaide Street, Brisbane , Brisbane Central	-27.4675	153.026	Brisbane Central	1	Standard retailer		go card		Buy	Top up	Change expi	
6	21	7-Eleven	1189 George Street, Brisbane , Brisbane Central	-27.4714	153.024	Brisbane Central	1	Standard retailer		go card		Buy	Top up	Change expi	
7	22	7-Eleven	2231 George Street, Brisbane , Brisbane Central	-27.4706	153.023	Brisbane Central	1	Standard retailer		go card		Buy	Top up	Change expi	
8	25	7-Eleven	3 corner George and Turbot Streets, Brisbane , Brisbane Central	-27.4687	153.022	Brisbane Central	1	Standard retailer		go card		Buy	Top up	Change expi	
9	697	7-Eleven	A47 - 59 Adelaide Street, Brisbane , Brisbane Central	-27.46957	153.023727	Brisbane Central	1	Standard retailer		go card		Buy	Top up	Change expi	
10	6	7-Eleven	A70 Albany Creek Road, Albany Creek, Brisbane North	-27.364	153.013	Brisbane North	1	Standard retailer		go card		Buy	Top up	Change expi	
11	28	7-Eleven	A97 Albert Street, Brisbane , Brisbane Central	-27.4715	153.027	Brisbane Central	1	Standard retailer		go card		Buy	Top up	Change expi	
12	3	7-Eleven	A169 Algester Road, Algester, Brisbane South	-27.6125	153.039	Brisbane South	1	Standard retailer		go card		Buy	Top up	Change expi	
13	1246	7-Eleven	A268 Waterworks Road, Ashgrove, Queensland, Australia	-27.446136	152.990995		1	Standard retailer							
14	5	7-Eleven	A400 Nerang Road, Southport, Queensland, Australia	-27.979071	153.379559	Gold Coast	1	Standard retailer		go card		Gold Buy	Top up	Change expi	
15	961	7-Eleven	A579 Ashmore Road, Molendinar, Queensland, Australia	-27.984646	153.365587		1	Standard retailer		go card		Gold Buy	Top up	Change expi	
16	1251	7-Eleven	A1429 Gympie Road, Aspley, Queensland, Australia	-27.358375	153.017324		1	Standard retailer							
17	1811	7-Eleven	A581 Robinson Road West, Aspley, Queensland, Australia	-27.364937	153.026186	Brisbane	1	Standard retailer							

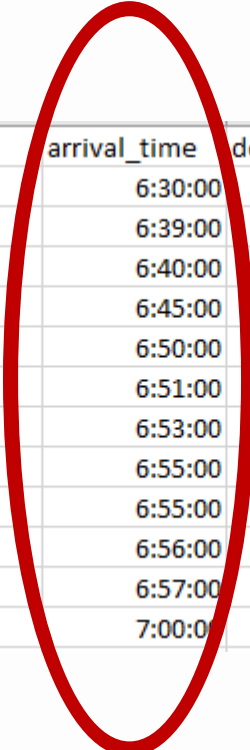
go-card-retailer-locations.csv

**Top Go-Card Retailer Areas**



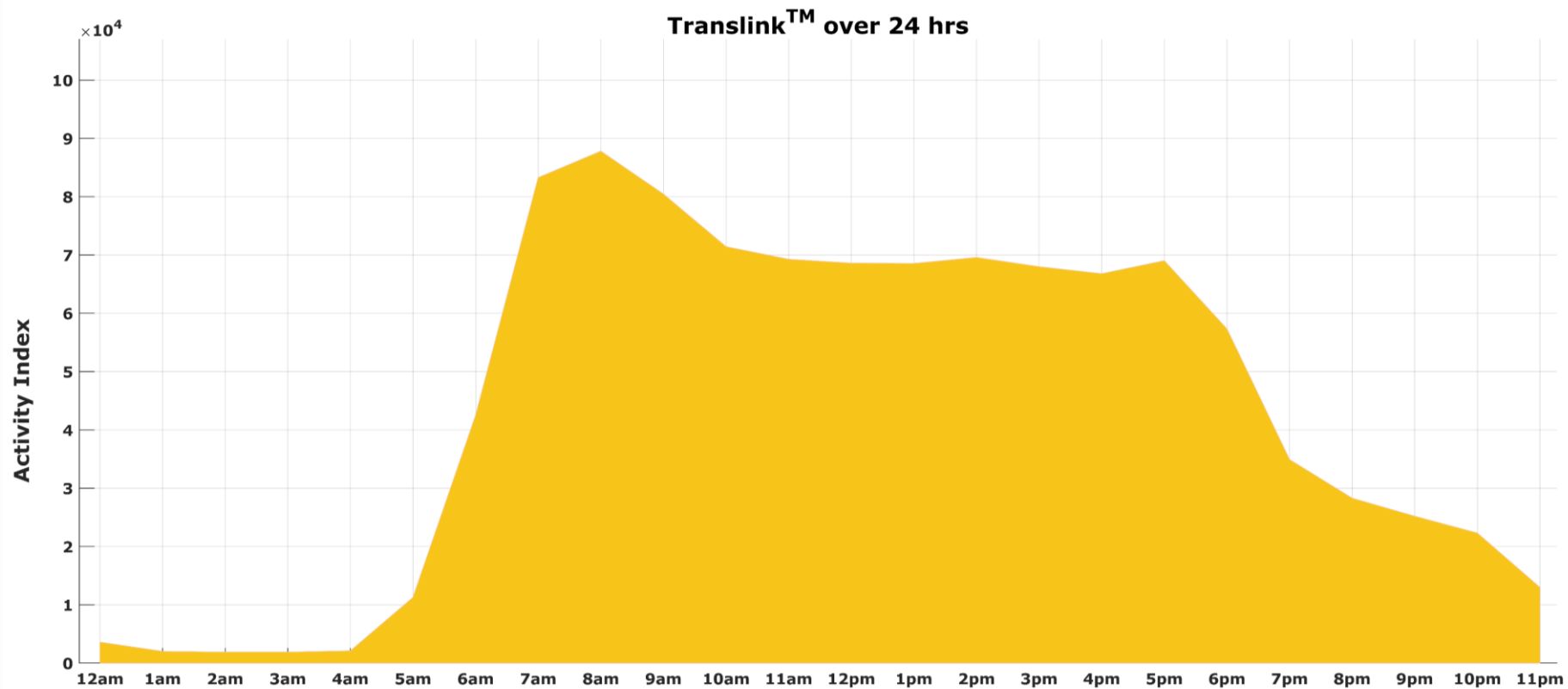
# Daily Translink™ Activity

# Sample Data:



1	trip_id	arrival_time	departure_time	stop_id	stop_sequence	pickup_type	drop_off_type
2	7440078-BBL 16_17-399-Weekday-01	6:30:00	6:30:00	12096	1	0	0
3	7440078-BBL 16_17-399-Weekday-01	6:39:00	6:39:00	313180	2	0	0
4	7440078-BBL 16_17-399-Weekday-01	6:40:00	6:40:00	313177	3	0	0
5	7440078-BBL 16_17-399-Weekday-01	6:45:00	6:45:00	316811	4	0	0
6	7440078-BBL 16_17-399-Weekday-01	6:50:00	6:50:00	316812	5	0	0
7	7440078-BBL 16_17-399-Weekday-01	6:51:00	6:51:00	316814	6	0	0
8	7440078-BBL 16_17-399-Weekday-01	6:53:00	6:53:00	315277	7	0	0
9	7440078-BBL 16_17-399-Weekday-01	6:55:00	6:55:00	315278	8	0	0
10	7440078-BBL 16_17-399-Weekday-01	6:55:00	6:55:00	315280	9	0	0
11	7440078-BBL 16_17-399-Weekday-01	6:56:00	6:56:00	315281	10	0	0
12	7440078-BBL 16_17-399-Weekday-01	6:57:00	6:57:00	315279	11	0	0
13	7440078-BBL 16_17-399-Weekday-01	7:00:00	7:00:00	316815	12	0	0

stop\_times.csv



- 7am – 9am Most Active Time of day
- Activity 'plateau's' until most people go home around 6pm-7pm
- Dead of the Night, 1am – 4am
- Services during these morning hours could aid people currently working abnormal schedules

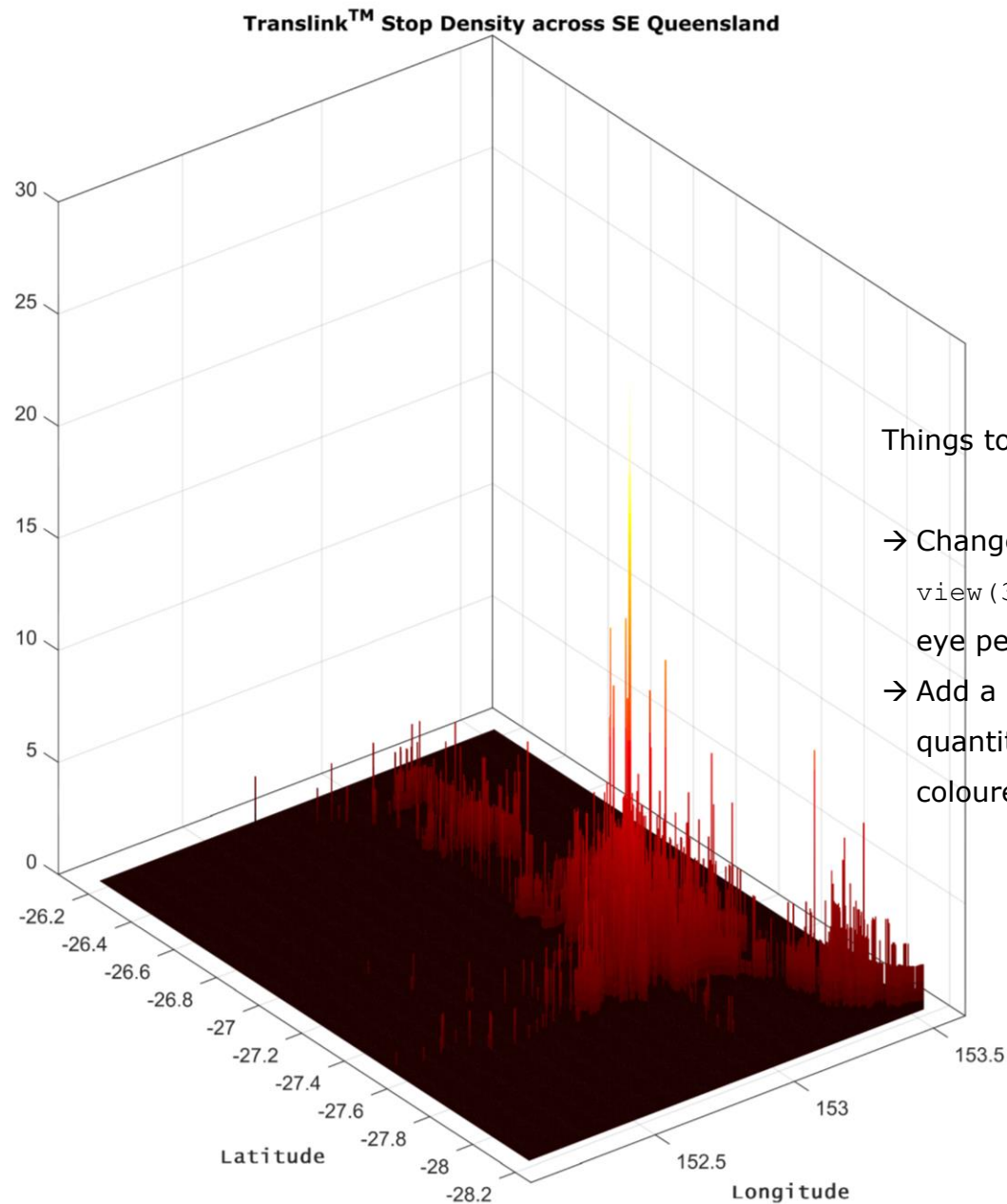


Stop Density in Queensland

# Sample Data:

	A	B	C	D	E	F	G	H	I
1	stop_id	stop_code	stop_name	stop_lat	stop_lon	zone_id	stop_url	location_type	parent_station
2	1	1	Herschel Street Stop 1 near North Quay	-27.467834	153.019079	1	http://translink.com.au	0	
3	10	10	Ann Street Stop 10 at King George Square	-27.468003	153.02397	1	http://translink.com.au	0	
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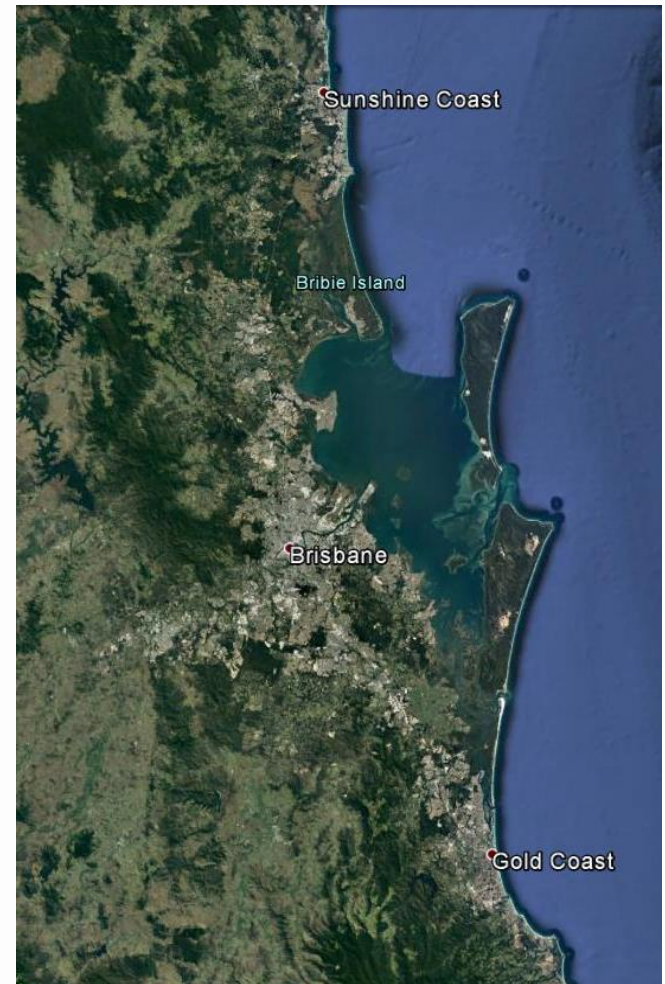
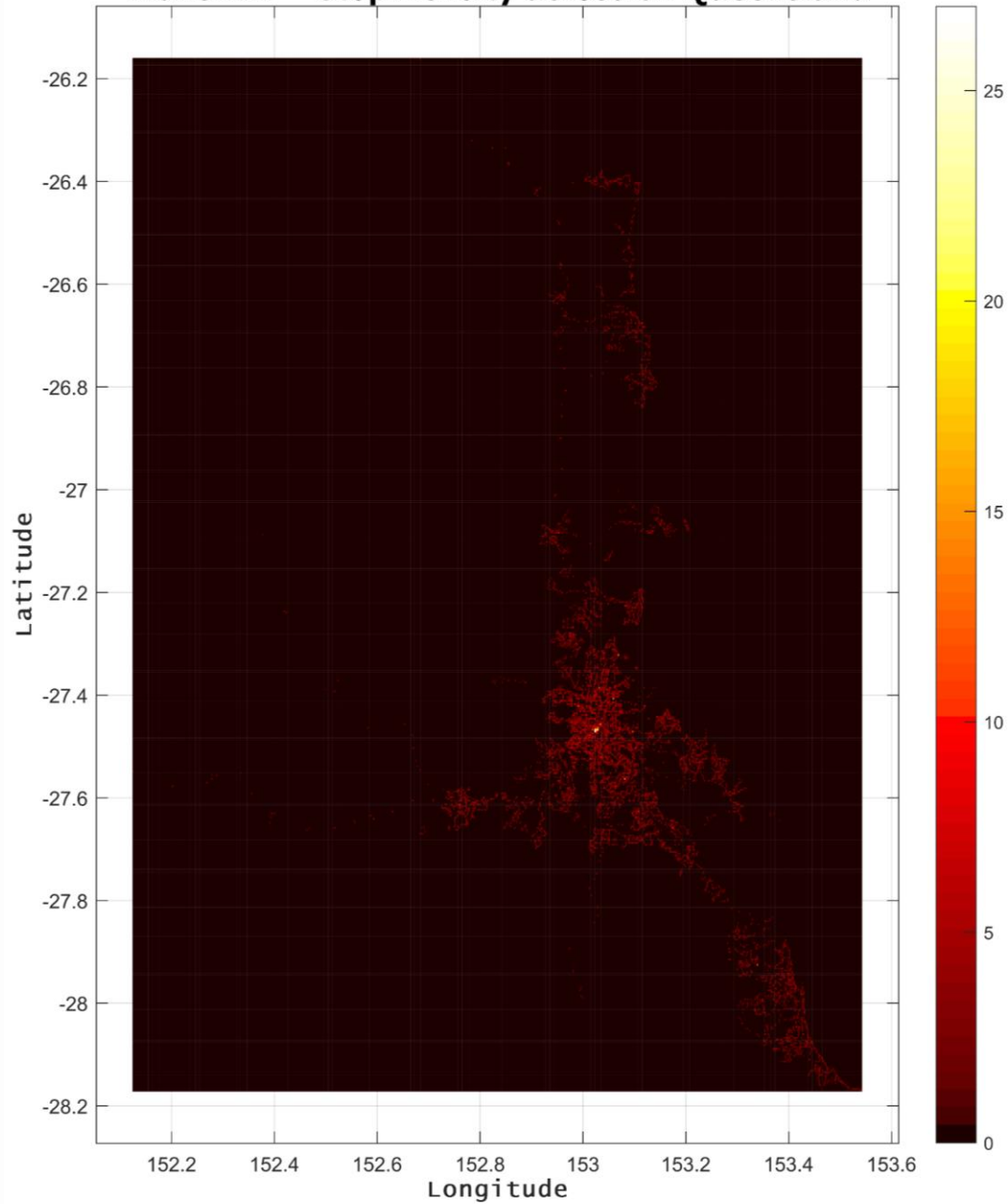
stop.csv



Things to add:

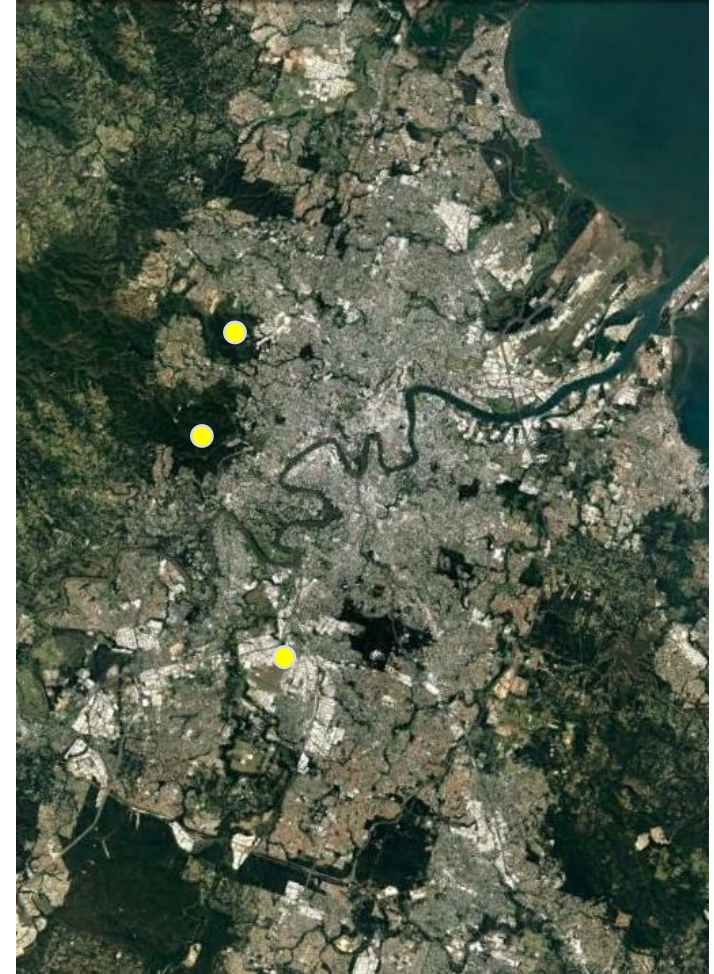
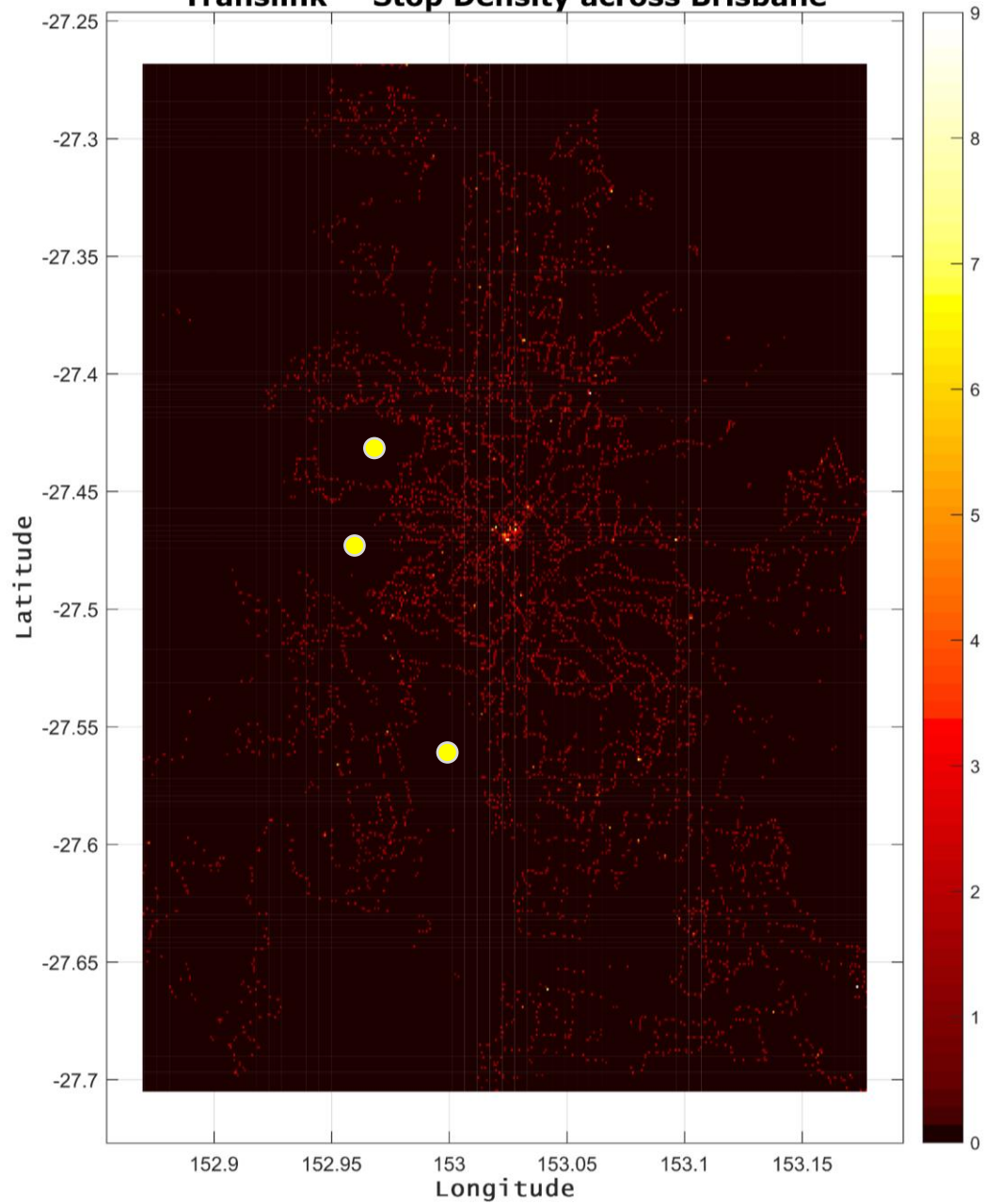
- Change perspective from `view(3)` to `view(2)` (birds eye perspective)
- Add a `colorbar` to give a quantitative measure to the coloured z values

## Translink™ Stop Density across SE Queensland

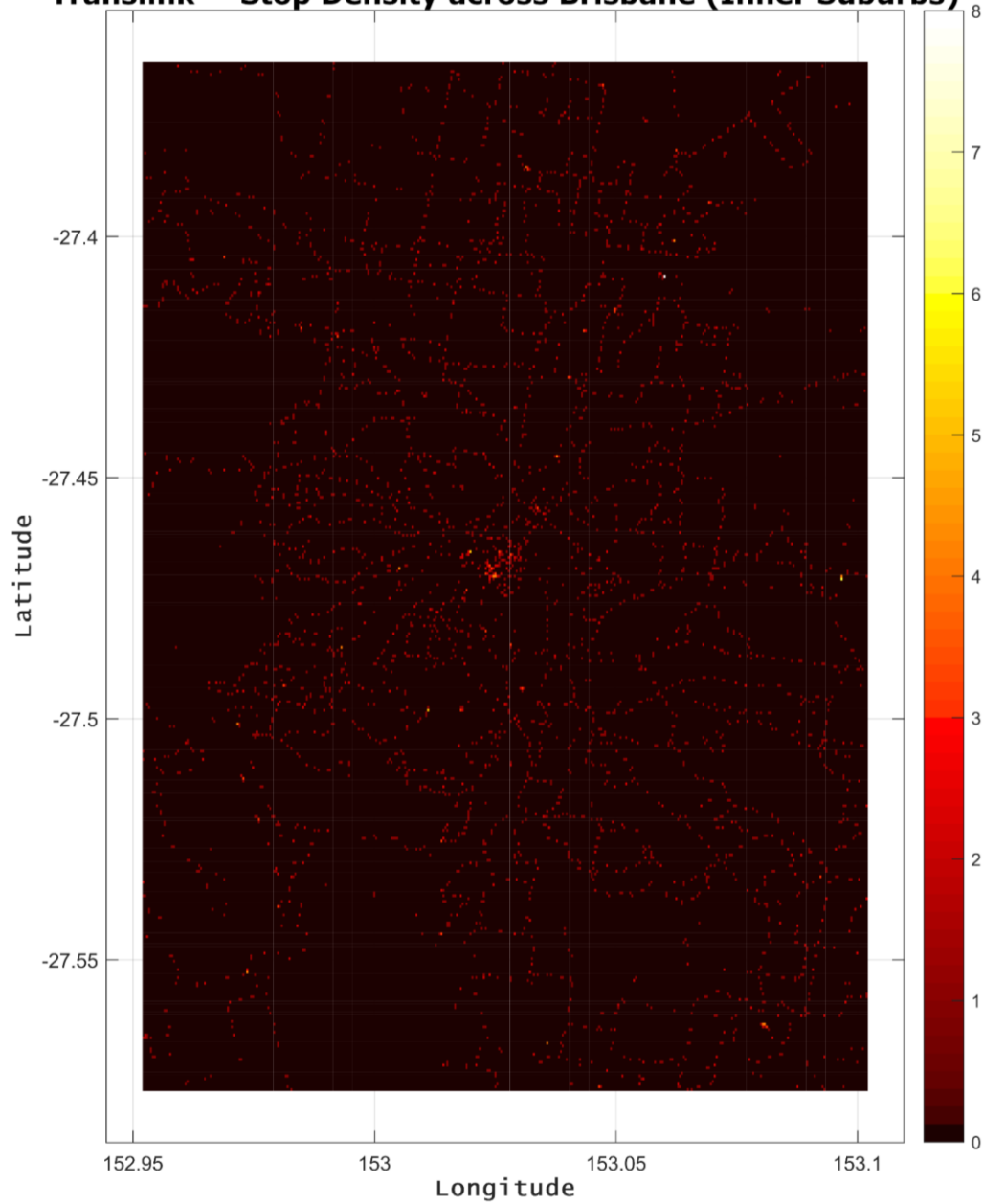




## Translink™ Stop Density across Brisbane

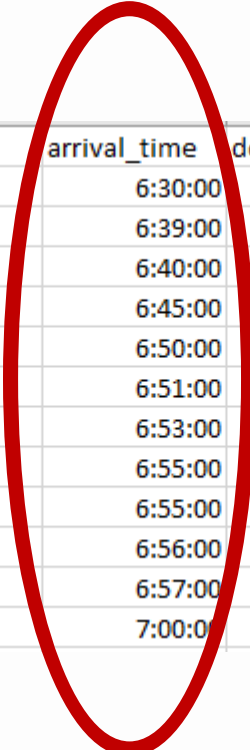


# Translink™ Stop Density across Brisbane (Inner Suburbs)



Stop Efficiency/Effectiveness

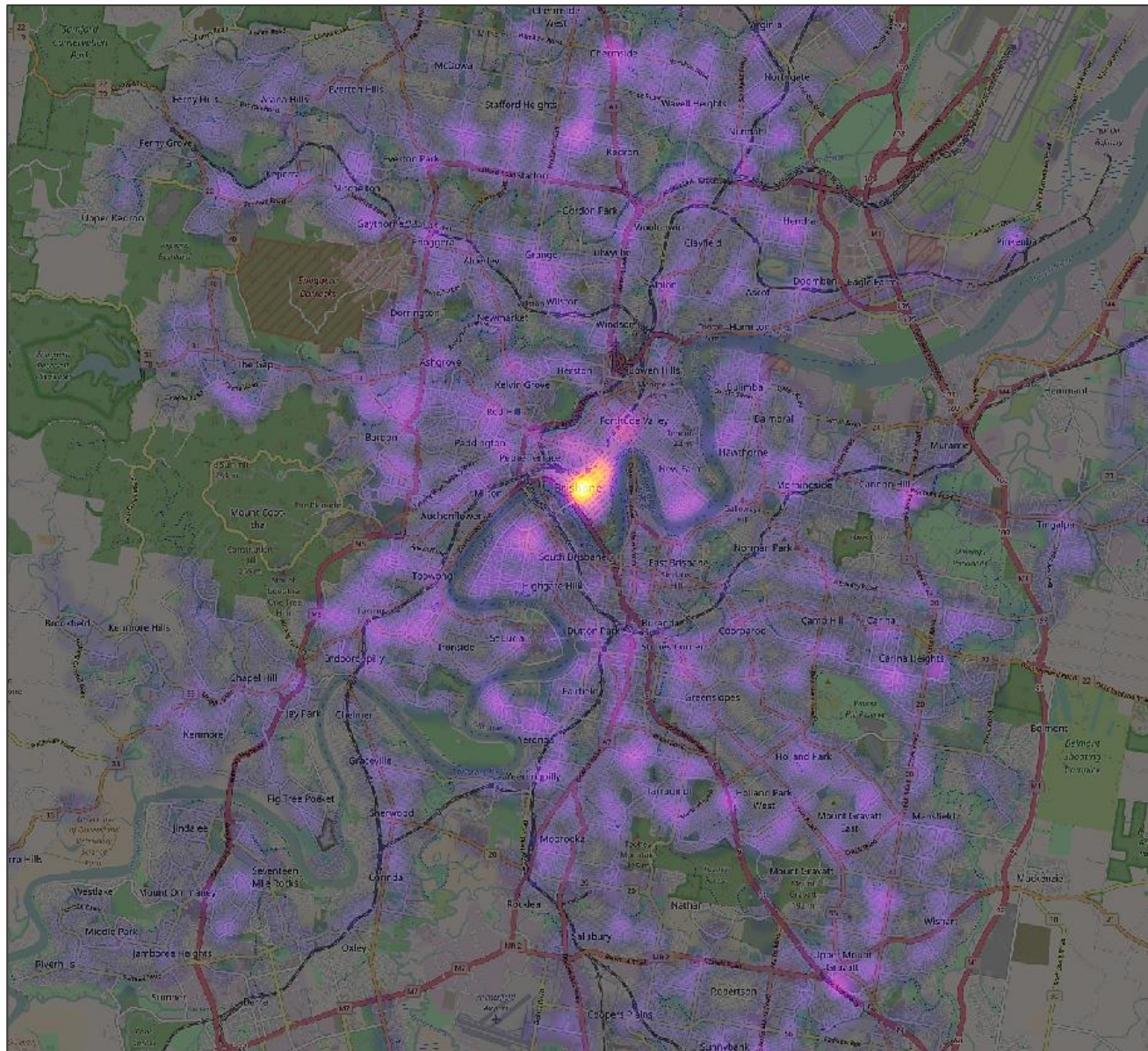
# Sample Data:



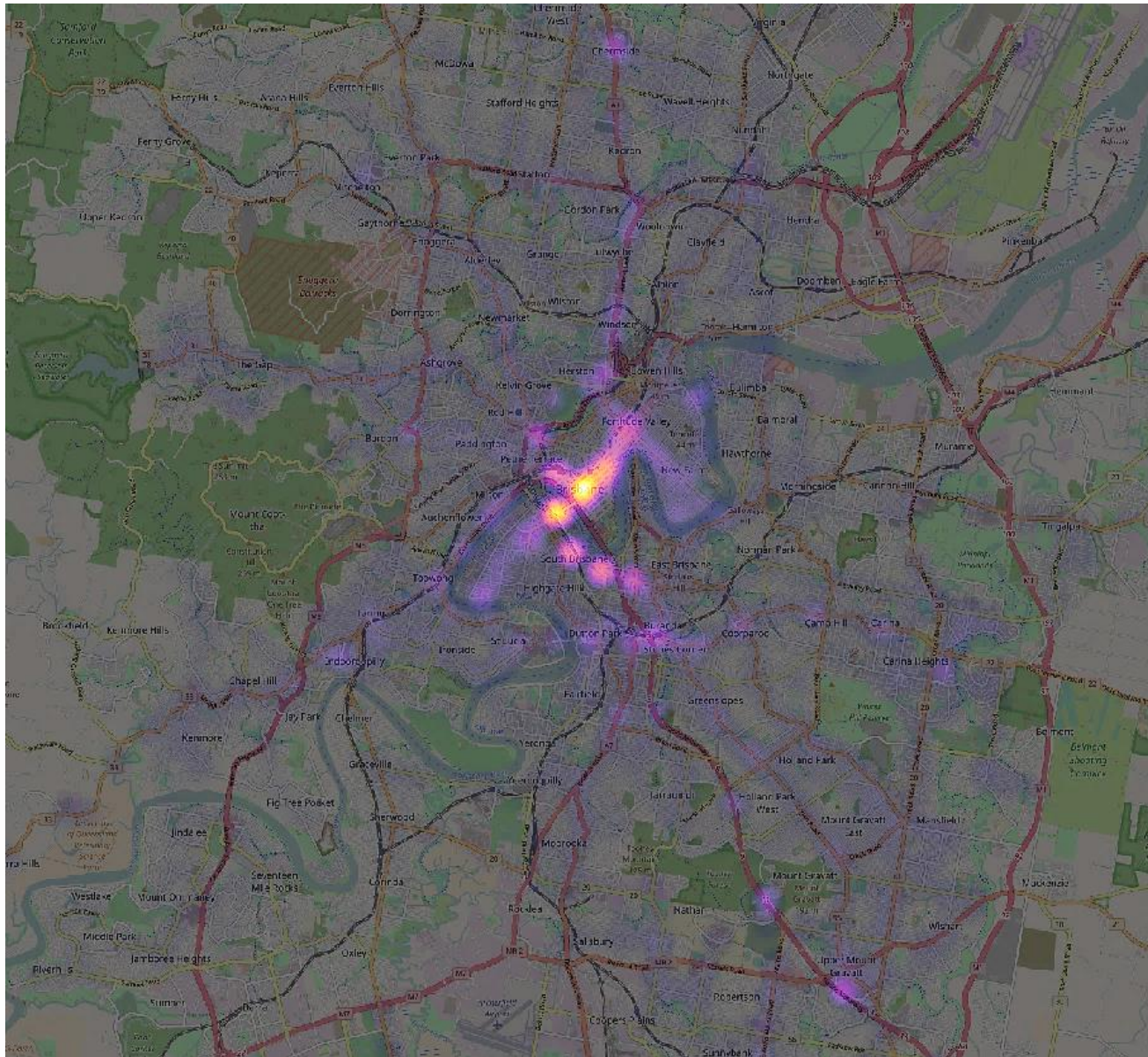
1	trip_id	arrival_time	departure_time	stop_id	stop_sequence	pickup_type	drop_off_type
2	7440078-BBL 16_17-399-Weekday-01	6:30:00	6:30:00	12096	1	0	0
3	7440078-BBL 16_17-399-Weekday-01	6:39:00	6:39:00	313180	2	0	0
4	7440078-BBL 16_17-399-Weekday-01	6:40:00	6:40:00	313177	3	0	0
5	7440078-BBL 16_17-399-Weekday-01	6:45:00	6:45:00	316811	4	0	0
6	7440078-BBL 16_17-399-Weekday-01	6:50:00	6:50:00	316812	5	0	0
7	7440078-BBL 16_17-399-Weekday-01	6:51:00	6:51:00	316814	6	0	0
8	7440078-BBL 16_17-399-Weekday-01	6:53:00	6:53:00	315277	7	0	0
9	7440078-BBL 16_17-399-Weekday-01	6:55:00	6:55:00	315278	8	0	0
10	7440078-BBL 16_17-399-Weekday-01	6:55:00	6:55:00	315280	9	0	0
11	7440078-BBL 16_17-399-Weekday-01	6:56:00	6:56:00	315281	10	0	0
12	7440078-BBL 16_17-399-Weekday-01	6:57:00	6:57:00	315279	11	0	0
13	7440078-BBL 16_17-399-Weekday-01	7:00:00	7:00:00	316815	12	0	0

stop\_times.csv

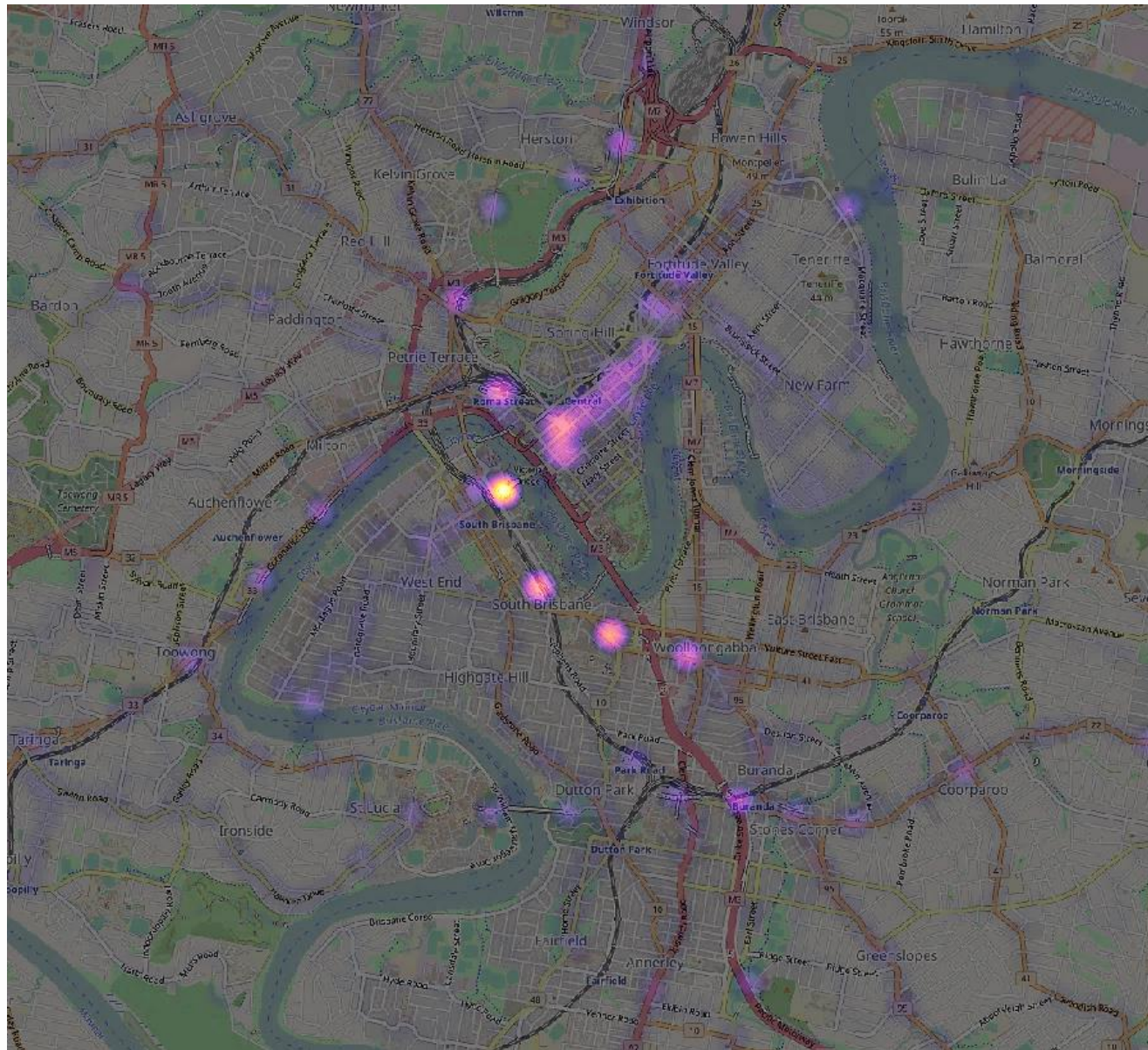












# Conclusion

# Future Improvements

- Combine these visualisations and data sets with census data across SE Queensland
- Correlate the data sets to possibly reveal areas of high population that have very few transport services
- Perform a similar analysis on other major Australian cities to find the best overall public transport system.
- Use these findings to improve transport across the country

