

Data Analysis of Candidate Areas of New Preschools in Singapore

For IBM Data Science Capstone Project

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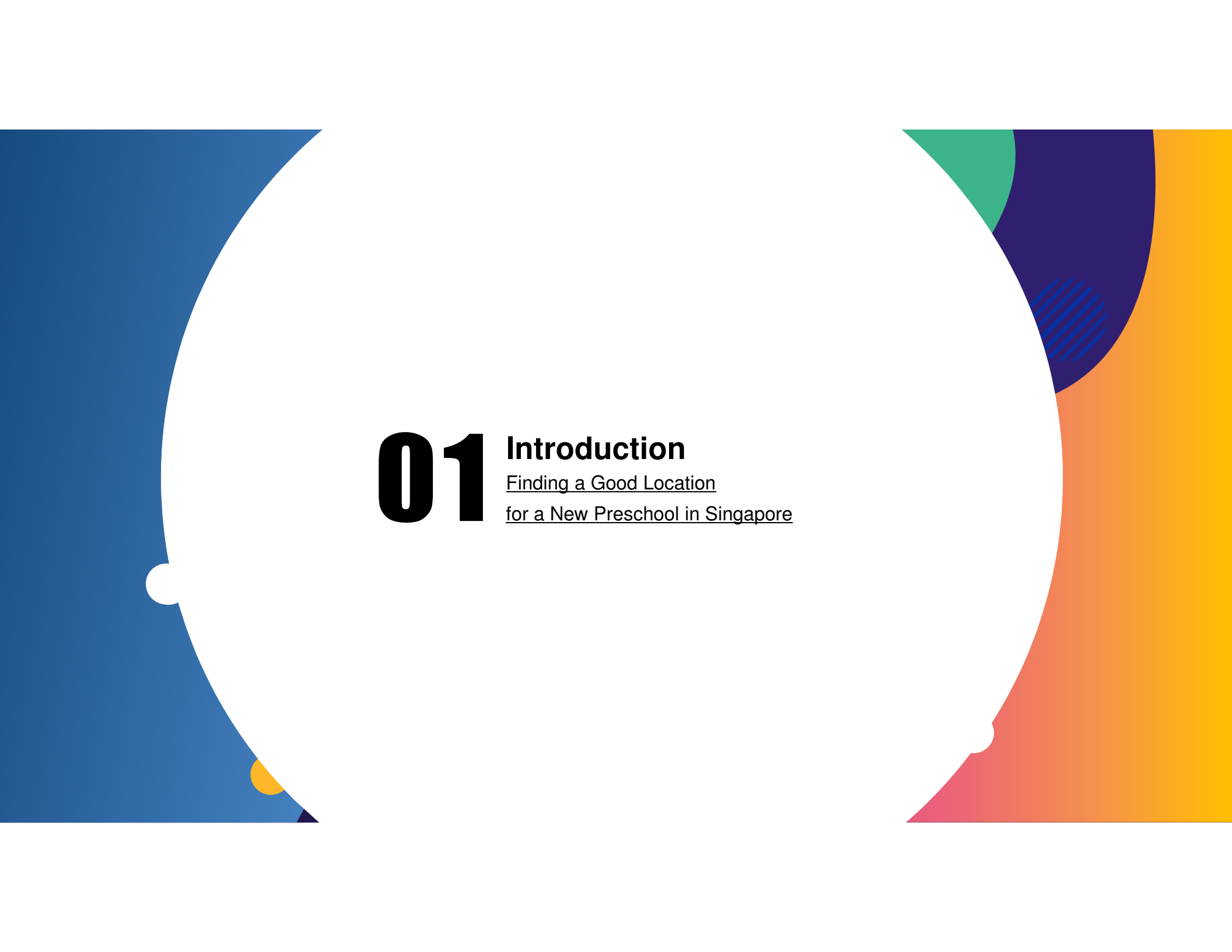
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01 Introduction

Finding a Good Location
for a New Preschool in Singapore

Many Opportunities for More Quality Preschools in Singapore

1

Many have experienced long waiting lists and difficulties on transport during the preschool hunting process.

2

Research done by Economist Intelligence Unit (EIU) in year 2012 also ranked Singapore 29th out of 45 countries in early childhood education.

3

Companies in the early childhood education sector may be interested in investing on new centres in Singapore.

Definition of a Good Location for a New Preschool

1

Close to one MRT (Mass Rapid Transit) station

2

Close to as many residences as possible

3

Close to as many bus stations as possible

4

Not already crowded with preschools



02

Data

Influence Factors and Data Sources

Influence Factors

1

Number of existing preschools in the neighbourhood of a MRT station

2

Number of residences in the neighbourhood of a MRT station

3

Number of bus stops in the neighbourhood of a MRT station

Data Sources

1

List of Singapore MRT stations with latitude and longitude information will be scraped from a data file shared in github.

2

Number of preschools, bus stations or residences in the neighbourhood of every MRT station will be obtained using Foursquare API.



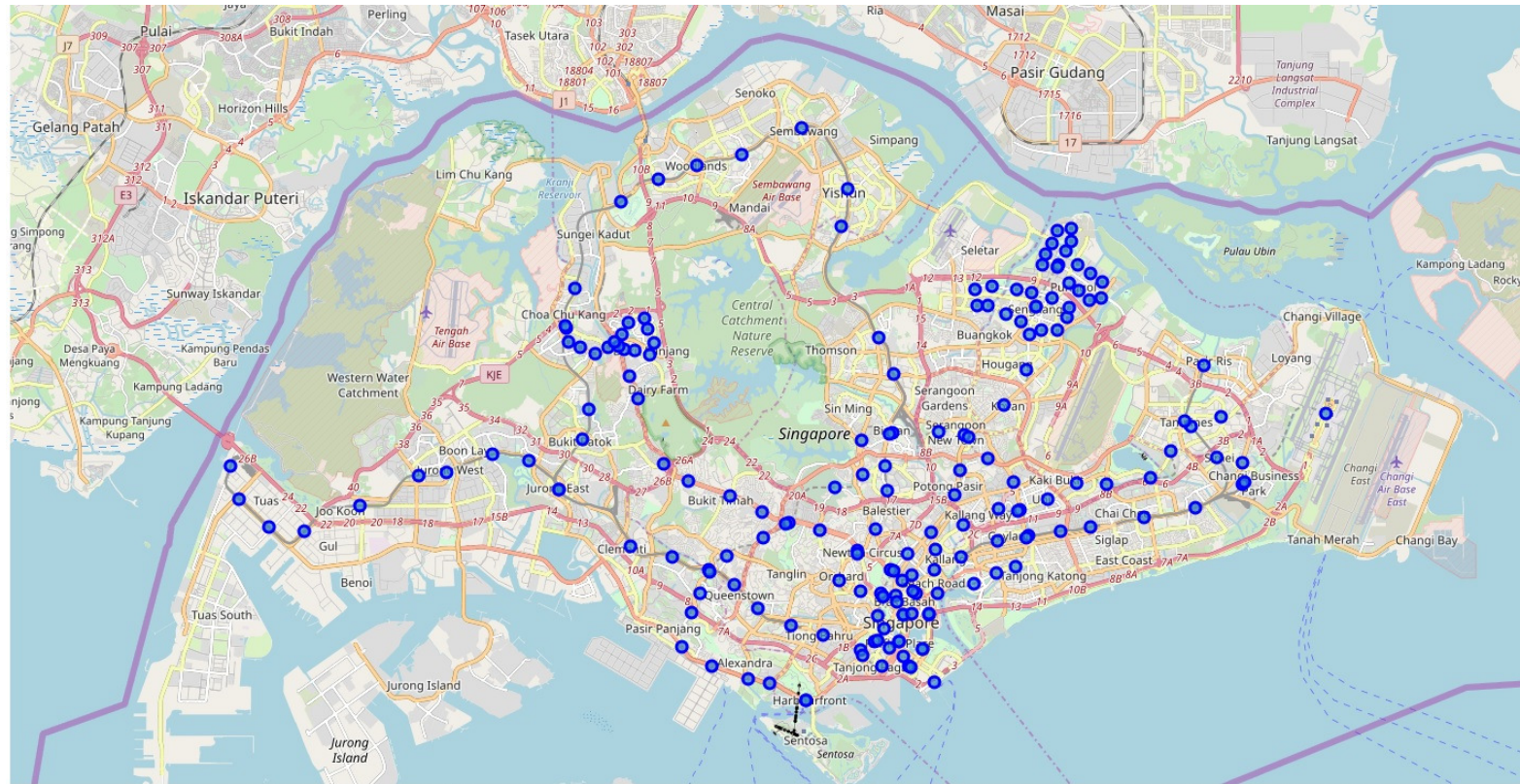
03

Methodology

Data Processing and Visualization Techniques

Foursquare API

Visualization of the Valid MRT Stations in Singapore



No. of Preschools/Residences/Bus Stations near MRT Stations

	Neighbourhood	No. of Preschool	No. of Bus Station	No. of Residence
0	HARBOURFRONT MRT STATION	0.0	82.0	10.0
1	PROMENADE MRT STATION	0.0	54.0	2.0
2	MACPHERSON MRT STATION	0.0	35.0	44.0
3	NICOLL HIGHWAY MRT STATION	0.0	32.0	16.0
4	OUTRAM PARK MRT STATION	0.0	27.0	33.0
5	CHINATOWN MRT STATION	0.0	27.0	28.0
6	CLARKE QUAY MRT STATION	0.0	24.0	24.0
7	BAYFRONT MRT STATION	0.0	24.0	16.0
8	UBI MRT STATION	0.0	23.0	22.0
9	TAMPINES MRT STATION	0.0	22.0	17.0
10	BOON LAY MRT STATION	0.0	21.0	26.0
11	BUKIT BATOK MRT STATION	0.0	21.0	24.0
12	MARINA BAY MRT STATION	0.0	21.0	8.0
13	PHOENIX LRT STATION	0.0	20.0	24.0
14	CHOA CHU KANG LRT STATION	0.0	19.0	22.0
15	DHOBY GHAUT MRT STATION	0.0	18.0	24.0
16	JOO KOON MRT STATION	0.0	18.0	0.0
17	PIONEER MRT STATION	0.0	16.0	32.0
18	CHOA CHU KANG MRT STATION	0.0	16.0	25.0
19	TELOK BLANGAH MRT STATION	0.0	16.0	24.0
20	SERANGOON MRT STATION	0.0	16.0	13.0
21	UPPER CHANGI MRT STATION	0.0	15.0	27.0
22	SENGKANG LRT STATION	0.0	15.0	16.0
23	SENGKANG MRT STATION	0.0	15.0	16.0
24	LAKESIDE MRT STATION	0.0	14.0	36.0
25	QUEENSTOWN MRT STATION	0.0	14.0	29.0
26	KAKI BUKIT MRT STATION	0.0	14.0	28.0
27	TANAH MERAH MRT STATION	0.0	14.0	28.0
28	MATTAR MRT STATION	0.0	14.0	24.0
29	HAW PAR VILLA MRT STATION	0.0	14.0	15.0
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132	LITTLE INDIA MRT STATION	2.0	28.0	32.0
133	BENDEMEER MRT STATION	2.0	21.0	23.0
134	WOODLANDS MRT STATION	2.0	19.0	24.0
135	NOVENA MRT STATION	2.0	16.0	29.0
136	BARTLEY MRT STATION	2.0	15.0	18.0
137	MOUNTBATTEN MRT STATION	2.0	14.0	26.0
138	CASHEW MRT STATION	2.0	13.0	12.0
139	NEWTON MRT STATION	2.0	12.0	20.0
140	LORONG CHUAN MRT STATION	2.0	11.0	32.0
141	BEDOK NORTH MRT STATION	2.0	11.0	31.0
142	SIXTH AVENUE MRT STATION	2.0	11.0	7.0
143	DAKOTA MRT STATION	2.0	10.0	32.0
144	HOLLAND VILLAGE MRT STATION	2.0	8.0	36.0
145	SUMANG LRT STATION	2.0	6.0	19.0
146	PUNGGOL MRT STATION	2.0	4.0	10.0
147	OASIS LRT STATION	2.0	1.0	8.0
148	SOO TECK LRT STATION	2.0	1.0	4.0
149	PAYA LEBAR MRT STATION	3.0	26.0	28.0
150	BOTANIC GARDENS MRT STATION	3.0	25.0	9.0
151	ONE-NORTH MRT STATION	3.0	22.0	4.0
152	KEMBANGAN MRT STATION	3.0	15.0	30.0
153	KOVAN MRT STATION	3.0	14.0	25.0
154	DAMAI LRT STATION	3.0	10.0	26.0
155	COMPASSVALE LRT STATION	3.0	9.0	20.0
156	SAM KEE LRT STATION	3.0	5.0	15.0
157	JURONG EAST MRT STATION	4.0	68.0	22.0
158	BEAUTY WORLD MRT STATION	4.0	12.0	22.0
159	GEYLANG BAHRU MRT STATION	4.0	12.0	22.0
160	TAMPINES WEST MRT STATION	4.0	8.0	30.0
161	POTONG PASIR MRT STATION	5.0	18.0	23.0

162 rows x 4 columns

Areas with Only One Existing Preschool

	Neighbourhood	No. of Preschool	No. of Bus Station	No. of Residence
0	CHANGI AIRPORT MRT STATION	1.0	29.0	5.0
1	KENT RIDGE MRT STATION	1.0	29.0	0.0
2	TELOK AYER MRT STATION	1.0	24.0	20.0
3	BUGIS MRT STATION	1.0	21.0	9.0
4	DOWNTOWN MRT STATION	1.0	20.0	17.0
5	FORT CANNING MRT STATION	1.0	19.0	26.0
6	ROCHOR MRT STATION	1.0	18.0	27.0
7	MARYMOUNT MRT STATION	1.0	17.0	26.0
8	YIO CHU KANG MRT STATION	1.0	17.0	26.0
9	BEDOK MRT STATION	1.0	17.0	23.0
10	TAI SENG MRT STATION	1.0	16.0	16.0
11	STEVENS MRT STATION	1.0	15.0	32.0
12	CHINESE GARDEN MRT STATION	1.0	15.0	30.0
13	REDHILL MRT STATION	1.0	14.0	28.0
14	EUNOS MRT STATION	1.0	14.0	25.0
15	CALDECOTT MRT STATION	1.0	14.0	18.0
16	CLEMENTI MRT STATION	1.0	14.0	13.0
17	LABRADOR PARK MRT STATION	1.0	14.0	3.0
18	PENDING LRT STATION	1.0	13.0	30.0
19	COMMONWEALTH MRT STATION	1.0	12.0	28.0

20	FARMWAY LRT STATION	1.0	12.0	23.0
21	MARSILING MRT STATION	1.0	11.0	32.0
22	BUKIT GOMBAK MRT STATION	1.0	11.0	31.0
23	KHATIB MRT STATION	1.0	11.0	31.0
24	ORCHARD MRT STATION	1.0	11.0	8.0
25	KING ALBERT PARK MRT STATION	1.0	10.0	25.0
26	TONGKANG LRT STATION	1.0	10.0	24.0
27	ADMIRALTY MRT STATION	1.0	9.0	38.0
28	FARRER ROAD MRT STATION	1.0	7.0	21.0
29	BENCOOLEN MRT STATION	1.0	7.0	9.0
30	THANGGAM LRT STATION	1.0	6.0	17.0
31	TANJONG PAGAR MRT STATION	1.0	5.0	9.0
32	LAYAR LRT STATION	1.0	4.0	25.0
33	RUMBIA LRT STATION	1.0	4.0	16.0
34	FERNVALE LRT STATION	1.0	4.0	10.0
35	LAVENDER MRT STATION	1.0	4.0	5.0
36	PUNGGOL LRT STATION	1.0	3.0	8.0
37	KADALLOOR LRT STATION	1.0	2.0	9.0
38	TECK LEE LRT STATION	1.0	0.0	2.0

Areas Having More Than 20 Residences

	Neighbourhood	No. of Preschool	No. of Bus Station	No. of Residence
0	FORT CANNING MRT STATION	1.0	19.0	26.0
1	ROCHOR MRT STATION	1.0	18.0	27.0
2	MARYMOUNT MRT STATION	1.0	17.0	26.0
3	YIO CHU KANG MRT STATION	1.0	17.0	26.0
4	BEDOK MRT STATION	1.0	17.0	23.0
5	STEVENS MRT STATION	1.0	15.0	32.0
6	CHINESE GARDEN MRT STATION	1.0	15.0	30.0
7	REDHILL MRT STATION	1.0	14.0	28.0
8	EUNOS MRT STATION	1.0	14.0	25.0
9	PENDING LRT STATION	1.0	13.0	30.0
10	COMMONWEALTH MRT STATION	1.0	12.0	28.0
11	FARMWAY LRT STATION	1.0	12.0	23.0
12	MARSILING MRT STATION	1.0	11.0	32.0
13	BUKIT GOMBAK MRT STATION	1.0	11.0	31.0
14	KHATIB MRT STATION	1.0	11.0	31.0
15	KING ALBERT PARK MRT STATION	1.0	10.0	25.0
16	TONGKANG LRT STATION	1.0	10.0	24.0
17	ADMIRALTY MRT STATION	1.0	9.0	38.0
18	FARRER ROAD MRT STATION	1.0	7.0	21.0
19	LAYAR LRT STATION	1.0	4.0	25.0

Final Candidate Areas Labelled with Region

STN_NAME	No. of Preschool	No. of Residence	No. of Bus Station	Region
STEVENS MRT STATION	1	32	15	Central
REDHILL MRT STATION	1	28	14	Central
COMMONWEALTH MRT STATION	1	28	12	Central
ROCHOR MRT STATION	1	27	18	Central
FORT CANNING MRT STATION	1	26	19	Central
MARYMOUNT MRT STATION	1	26	17	Central
KING ALBERT PARK MRT STATION	1	25	10	Central
FARRER ROAD MRT STATION	1	21	7	Central
EUNOS MRT STATION	1	25	14	East
BEDOK MRT STATION	1	23	17	East
ADMIRALTY MRT STATION	1	38	9	North
MARSILING MRT STATION	1	32	11	North
KHATIB MRT STATION	1	31	11	North
YIO CHU KANG MRT STATION	1	26	17	North
LAYAR LRT STATION	1	25	4	North
TONGKANG LRT STATION	1	24	10	North
FARMWAY LRT STATION	1	23	12	North
BUKIT GOMBAK MRT STATION	1	31	11	West
CHINESE GARDEN MRT STATION	1	30	15	West
PENDING LRT STATION	1	30	13	West



04

Discussion

Identifying the Most Suitable Areas

7 Areas in the North Region Identified

North is the Most Suitable Region

- ✓ ADMIRALTY MRT STATION
- ✓ MARSILING MRT STATION
- ✓ KHATIB MRT STATION
- ✓ YIO CHU KANG MRT STATION
- ✓ LAYAR LRT STATION
- ✓ TONGKANG LRT STATION
- ✓ FARMWAY LRT STATION



East

- Least population density
- Just a few candidate areas



West

- Appropriate population density
- Just a few candidate areas



Central

- Appropriate population density
- Adequate candidate areas
- Highest cost of living



North

- Appropriate population density
- Adequate candidate areas
- Lowest cost of living



05

Conclusion

Summary and Future Direction

Summary and Future Direction

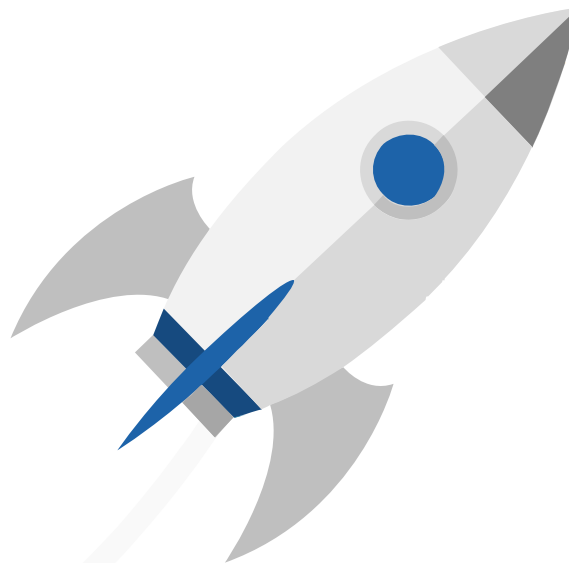
Summary

- ☐ Venue data around each MRT station in Singapore explored
- ☐ Number of preschools, residences and bus stations computed
- ☐ Candidate areas visualized
- ☐ Most suitable areas identified

Data Analysis of Candidate Areas of New Preschools in Singapore

Future Direction

This study can be further refined to recommend the type of the preschool, e.g. infant care, child care or kindergarten.





Thank You!