An analysis of potential theme park locations for the metropolitan Melbourne Area

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1 Introduction

Melbourne, Victoria is the second largest metropolitan area in Australia, with an estimated 5.191 million inhabitants as of 2019 [1]. Considered one of the cities with the highest quality of life in the world [2], Melbourne has one of the best education systems in the country [3], making it an attractive city for families. However, Melbourne lacks of large theme and attraction parks. The only two parks in the region are [4]:

- Luna Park located in the inner city suburb of St. Kilda, at 8 kilometres from the central business district, with an area of over 11 thousand square metres. It opened in 1912, contains 20 attractions and operates year round.
- Adventure Park located in the nearby city of Geelong, at 92 kilometres from the central business district, with an area of over 2 square kilometres. It opened in 1994, contains 20 attractions and operates from October to April, which correspond to the summer months in Australia.

Therefore, **the aim of this project is to identify the location of a new attraction park** closer to the central business district than Adventure Park, and an available area for expansion larger than Luna Park. The location should be within the metropolitan region, close to population growth corridors, with a high number of families nearby. Ideally, the location should be close to a suburban train station and other amenities like shopping centres, museums or zoological parks. The project would not focus on the economical feasibility of the park, but the families in the vicinity should have a moderate income that would allow them visit the park often. Interested parties would be developers, government entities, and families.

This report is organised as follows: Section 2 describe the data used and its sources. Section 3 discusses the methodology employed. Section 4 presents the results, which are discussed in Section 5. The report concludes making some recommendations for further research in Section 6.

2 Data

For this project, four sources of data were used:

1. Geographical coordinates of the Victorian suburb boundaries, as defined by the Australian Bureau of Statistics in 2011 [5]. The data was provided by Stephen Muss [6] in GeoJSON format. Suburbs are sorted alphabetically. Figure 1 shows the first 10 rows of this dataset, as imported using the `pandas` package. The variable `'geometry'` contains a dictionary type, whose field `'coordinates'` corresponds to the latitude and longitude of each boundary point. The variable `'properties'` contains a dictionary type, whose field `'Suburb_Name'` is corresponds to the name.

Out[46]:

	geometry	type	properties
0	{'type': 'Polygon', 'coordinates': [[[145.0012...	Feature	{'SSC_NAME': 'Abbotsford (Vic.)', 'State': 'Vi...
1	{'type': 'Polygon', 'coordinates': [[[144.8894...	Feature	{'SSC_NAME': 'Aberfeldie', 'State': 'Victoria'...
2	{'type': 'Polygon', 'coordinates': [[[145.6416...	Feature	{'SSC_NAME': 'Acheron', 'State': 'Victoria', '...
3	{'type': 'Polygon', 'coordinates': [[[144.1021...	Feature	{'SSC_NAME': 'Aireys Inlet', 'State': 'Victori...
4	{'type': 'Polygon', 'coordinates': [[[144.8894...	Feature	{'SSC_NAME': 'Airport West', 'State': 'Victori...
5	{'type': 'Polygon', 'coordinates': [[[144.7569...	Feature	{'SSC_NAME': 'Albanvale', 'State': 'Victoria',...
6	{'type': 'Polygon', 'coordinates': [[[144.9701...	Feature	{'SSC_NAME': 'Albert Park (Vic.)', 'State': 'V...
7	{'type': 'Polygon', 'coordinates': [[[146.6472...	Feature	{'SSC_NAME': 'Alberton (Vic.)', 'State': 'Vict...
8	{'type': 'Polygon', 'coordinates': [[[144.8153...	Feature	{'SSC_NAME': 'Albion (Vic.)', 'State': 'Victor...
9	{'type': 'Polygon', 'coordinates': [[[145.8805...	Feature	{'SSC_NAME': 'Alexandra (Vic.)', 'State': 'Vic...

Figure 1: Postal codes for the State of Victoria. First 10 rows are shown.

Out[9]:

	Postcode	Suburb	Region
0	3000	MELBOURNE	MELBOURNE CITY
1	3001	MELBOURNE	MELBOURNE CITY
2	3002	EAST MELBOURNE	MELBOURNE CITY
3	3003	WEST MELBOURNE	MELBOURNE CITY
4	3004	MELBOURNE	MELBOURNE CITY
5	3006	SOUTH WHARF	MOORABBIN
6	3006	SOUTHBANK	MOORABBIN
7	3008	DOCKLANDS	MELBOURNE CITY
8	3010	UNIVERSITY OF MELBOURNE	MELBOURNE CITY
9	3011	FOOTSCRAY	FOOTSCRAY

Figure 2: Postal codes for the State of Victoria. First 10 rows are shown.

2. Postal codes for the State of Victoria, as provided by Zen10, a Search Engine Optimisation Consultancy based on Melbourne [7]. Figure 2 shows the first 10 rows of this dataset, which is in CSV format and was imported using the `pandas` package.

3. Population by age (in five year increments) and weekly income per postal code from the 2016 Australian Census Data, as provided by the Australian Bureau of Statistics [8], through the TableBuilder Application [9]. Figure 3 shows the first 10 rows for each one of these datasets, which are in CSV format and were imported using the `pandas` package.

4. Information about playground venues extracted using the Foursquare Places API v20180605 [10] accessed by Python directly using the `requests` package.

Suburbs do have more than one postal code associated, often corresponding to a PO Box address, Universities and Military installations. As such, only the main postcode for a suburb will be used. This may influence the population values, but the effect is expected to be minor.

Out[8]:

	POA (UR)	0-4 years	5-9 years	10-14 years	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	...	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85-89 years	90-94 years	95-99 years	100 years and over	Total
0	3000, VIC	735	320	161	3561	11898	8697	5045	2325	1246	...	572	448	256	127	73	42	31	6	0	37979
1	3002, VIC	157	83	60	86	343	725	680	444	274	...	365	301	242	105	77	93	40	17	6	4957
2	3003, VIC	184	115	97	193	915	1252	933	488	355	...	112	91	74	45	12	13	4	0	0	5516
3	3004, VIC	284	177	106	257	819	1432	1365	907	600	...	482	507	349	214	124	131	70	41	8	9311
4	3005, VIC	32	16	6	14	56	90	96	62	29	...	11	16	6	7	0	0	0	0	0	523
5	3006, VIC	584	206	118	814	3211	4165	3436	1757	975	...	489	454	255	149	66	40	8	3	5	18811
6	3008, VIC	524	135	81	427	1513	2281	1696	891	561	...	333	289	139	61	32	11	7	0	0	10438
7	3010, VIC	3	0	6	756	658	80	28	14	4	...	11	7	10	0	0	0	0	0	0	1595
8	3011, VIC	1348	827	511	825	2287	3183	2847	2134	1465	...	723	584	385	381	295	242	112	34	5	21464
9	3012, VIC	1987	1470	996	1071	2118	3035	3093	2539	2061	...	997	734	532	482	423	288	141	33	4	26295

10 rows × 23 columns

(a)

Out[11]:

	POA (UR)	Negative income	Nil income	1–149 (1–7,799)	150–299 (7,800–15,599)	300–399 (15,600–20,799)	400–499 (20,800–25,999)	500–649 (26,000–33,799)	650–799 (33,800–41,599)	800–999 (41,600–51,999)	1,000–1,249 (52,000–64,999)	1,250–1,499 (65,000–77,999)	1,500–1,749 (78,000–90,999)	1,750–1,999 (91,000–103,999)	2,000–2,999 (104,000–155,999)	3,000ormore(156,000 or more)	Not stated	appli
0	3000, VIC	379	9718	1259	1878	2162	2051	2168	1913	2100	2231	1618	1321	890	1475	925	4687	
1	3002, VIC	23	231	96	154	125	168	198	209	296	383	382	372	272	529	615	607	
2	3003, VIC	36	586	150	242	252	247	258	273	336	456	331	310	202	351	223	865	
3	3004, VIC	32	777	170	248	263	315	333	405	608	798	698	650	485	935	787	1234	
4	3005, VIC	5	33	0	25	14	18	21	23	22	25	25	29	20	42	36	135	
5	3006, VIC	103	2404	386	585	644	690	799	914	1342	1625	1285	1099	856	1584	1145	2454	
6	3008, VIC	86	1574	217	322	347	313	408	450	622	791	736	640	456	867	636	1232	
7	3010, VIC	8	444	422	318	107	44	48	19	14	13	6	11	5	26	16	80	
8	3011, VIC	94	1685	655	1478	1518	1364	1278	1195	1498	1608	1218	960	661	1094	409	2074	
9	3012, VIC	110	2109	728	1621	1739	1651	1425	1549	1910	1919	1416	1186	816	1169	481	2013	

(b)

Figure 3: Population by (a) age and (b) weekly income per postal code for the State of Victoria. First 10 rows of each dataset are shown.

3 Methodology

4 Results

5 Discussion

6 Conclusion

References

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