

Accident Analysis Software Executive Summary

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Abstract

The analysis of road accidents within the state of Victoria, from 2015-2016 has illustrated a few key findings. Firstly, alcohol related incidents occur more frequently between Friday and Sunday, within the heart of Melbourne city, and especially within the month of December. Accidents involving alcohol are typically a collision with another vehicle, or a collision with a fixed object. Using all the information stated, an ad campaign can be targeted at the right place, at the right time. For reducing non-alcohol related road incidents, understanding additional findings is also important. Most accidents occur between 8am-10am, and 3pm-6pm. This suggests the school/work rush impacts the likelihood of road accidents. It is recommended for future research that the department of transport for Victoria investigates the infrastructure of the city of Melbourne and surrounding roads, to find correlations between the data produced by this software, and the quality of roads accessible to domestic transport.

Introduction

The purpose of this report is to demonstrate the features of the Accident Analysis Software.

To do this, a systematic approach will be taken, where each feature will be demonstrated individually to analyze data from within a 12-month period. This period will be from 01/01/2015 – 01/01/2016. Each demonstration will include the results, additional comments, images, and further analysis. Within this 12-month period, the following functions will be used to demonstrate the requirements of the software, and the benefits it may bring to potential users:

- For a user-selected period, display the information of all accidents that happened in the period.
- For a user-selected period, produce a chart to show the number of accidents in each hour of the day (on average).
- For a user-selected period, retrieve all accidents caused by an accident type that contains a keyword (user entered), e.g., collision, pedestrian.
- Allow the user to analyse the impact of alcohol in accidents – ie: trends over time, accident types involving alcohol, etc.
- Produce a Visualisation view for the user to understand accident data relating to geographical location information. This will be categorised into Local Government Areas.

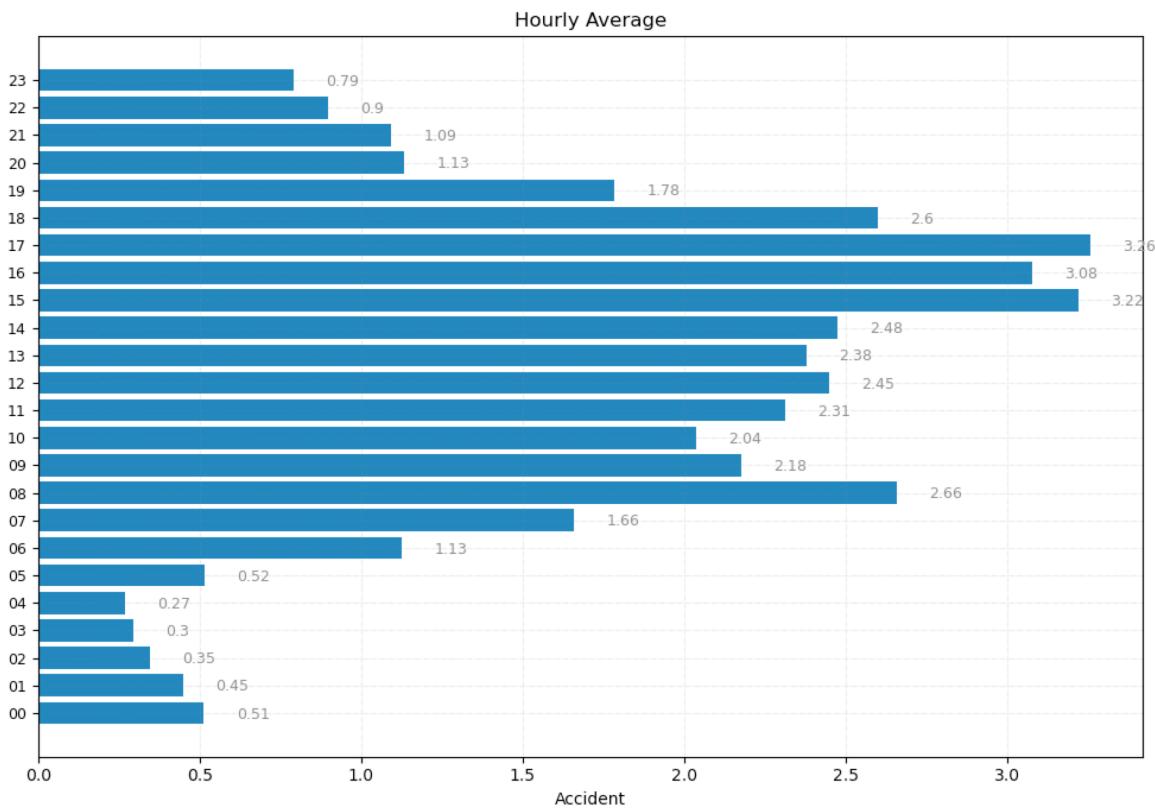
Analysis 1: All Accident Information

Dataset		Analyse		Alcohol		Location						
Date	1/ 1/2015	to	1/ 1/2016	Search								
Accident Type	All types											
No	Date	Time	Type	Day	Severity	Longitude	Latitude	LGA	Region	Fatalities	Injuries	Alcohol
T201500001	2015-01-01	16:25:00	Vehicle overturned (no collision)	Wednesday	Other injury accident	146.51791	-38.25054	LATROBE	EASTERN REGION	0	0	0
T201500001	2015-01-01	17:10:00	Collision with a fixed object	Thursday	Other injury accident	144.75298	-37.72428	MELTON	METROPOLITAN NORTH	0	0	0
T201500001	2015-01-01	18:20:00	Vehicle overturned (no collision)	Thursday	Serious injury accident	147.47334	-38.10808	WELLINGTON	EASTERN REGION	0	1	0
T201500001	2015-01-01	19:00:00	Collision with vehicle	Thursday	Other injury accident	145.1363	-37.83041	WHITEHORSE	METROPOLITAN SOUTH	0	0	0
T201500001	2015-01-01	20:00:00	Collision with vehicle	Thursday	Other injury accident	146.00996	-36.01502	MOIRA	NORTH EASTERN REGION	0	0	0
T201500001	2015-01-01	19:30:00	Struck animal	Thursday	Serious injury accident	143.54428	-38.42132	COLAC OTWAY	SOUTH WESTERN REGION	0	1	0
T201500001	2015-01-01	12:00:00	Collision with vehicle	Thursday	Serious injury accident	144.39144	-38.17063	GEELONG	SOUTH WESTERN REGION	0	1	0
T201500001	2015-01-01	19:30:00	No collision and no object struck	Thursday	Serious injury accident	145.19521	-37.70043	NILLUMBIN	METROPOLITAN NORTH	0	1	1
T201500001	2015-01-01	17:05:00	Collision with some other object	Wednesday	Serious injury accident	145.08817	-36.79084	STRATHBOGIE	NORTH EASTERN REGION	0	1	0
T201500001	2015-01-07	18:02:00	Collision with vehicle	Tuesday	Other injury accident	144.95847	-37.80404	MELBOURNE	METROPOLITAN NORTH	0	0	0
T201500001	2015-01-07	15:15:00	Collision with vehicle	Wednesday	Other injury accident	144.82984	-37.75216	BRIMBANK	METROPOLITAN NORTH	0	0	0
T201500001	2015-01-07	19:00:00	Collision with vehicle	Tuesday	Other injury accident	144.35001	-38.12738	GEELONG	SOUTH WESTERN REGION	0	0	0
T201500001	2015-01-07	15:20:00	Collision with vehicle	Wednesday	Serious injury accident	143.5798	-38.34409	COLAC OTWAY	SOUTH WESTERN REGION	0	1	0
T201500001	2015-01-07	16:00:00	Collision with vehicle	Wednesday	Other injury accident	145.10764	-37.69969	BANYULE	METROPOLITAN NORTH	0	0	0
T201500001	2015-01-07	20:10:00	Collision with vehicle	Wednesday	Other injury accident	145.1638	-37.90373	MONASH	METROPOLITAN SOUTH	0	0	0
T201500001	2015-01-07	14:55:00	Collision with vehicle	Wednesday	Other injury accident	145.17366	-37.8303	WHITEHORSE	METROPOLITAN SOUTH	0	0	0
T201500001	2015-01-04	16:20:00	Collision with vehicle	Sunday	Other injury accident	145.10184	-37.72849	BANYULE	METROPOLITAN NORTH	0	0	0
T201500001	2015-01-07	21:26:00	Collision with vehicle	Wednesday	Other injury accident	144.30246	-38.17086	GEELONG	SOUTH WESTERN REGION	0	0	0
T201500001	2015-01-08	05:00:00	Collision with vehicle	Thursday	Serious injury accident	144.8083	-37.79113	BRIMBANK	METROPOLITAN NORTH	0	1	0
T201500001	2015-01-08	06:05:00	Collision with vehicle	Wednesday	Other injury accident	145.10184	-37.72849	BANYULE	METROPOLITAN NORTH	0	0	0
T201500001	2015-01-01	17:50:00	Collision with vehicle	Thursday	Other injury accident	144.74744	-38.3418	MORNINGTON	METROPOLITAN SOUTH	0	0	0
T201500001	2015-01-07	10:30:00	Collision with a fixed object	Wednesday	Other injury accident	145.92016	-37.56706	YARRA RANGES	METROPOLITAN SOUTH	0	0	0
T201500001	2015-01-11	16:55:00	Collision with vehicle	Sunday	Other injury accident	145.48456	-38.15801	CARDINIA	METROPOLITAN SOUTH	0	0	0
T201500001	2015-01-12	11:50:00	Collision with vehicle	Monday	Other injury accident	145.02261	-37.74256	DAREBIN	METROPOLITAN NORTH	0	0	0
T201500001	2015-01-12	16:00:00	Collision with vehicle	Monday	Serious injury accident	144.66186	-37.87543	WYNNDHAM	METROPOLITAN NORTH	0	1	0
T201500001	2015-01-12	17:00:00	Collision with vehicle	Monday	Other injury accident	145.18062	-37.06104	MITCHELL	NORTHERN REGION	0	0	0
T201500001	2015-01-12	19:05:00	Collision with a fixed object	Monday	Serious injury accident	145.29836	-37.9131	YARRA RANGES	METROPOLITAN SOUTH	0	1	0
T201500001	2015-01-12	17:15:00	Collision with vehicle	Monday	Other injury accident	144.97121	-37.79342	MELBOURNE	METROPOLITAN NORTH	0	0	0
T201500001	2015-01-12	18:50:00	Collision with vehicle	Monday	Other injury accident	145.34262	-37.80989	YARRA RANGES	METROPOLITAN SOUTH	0	0	0
T201500001	2015-01-12	16:00:00	Collision with a fixed object	Monday	Serious injury accident	141.79708	-36.37787	HINDMARSH	WESTERN REGION	0	1	0

Analysis:

All accident information can be seen for the selected period. All data for the accidents are visible, including Date, Time, Type, Region, Severity, LGA, Fatalities, and Alcohol.

Analysis 2: Accident Hourly Average



Analysis:

Within the selected period, accidents are more likely to occur between 3pm-6pm. It can be argued that this is due to peak hour traffic, caused by school and work finishing.

Furthermore, accidents have a high average between 8am-10am. This may justify the previous statement, as peak traffic occurs in this time also, due to work and school commencing. It is between 2am-4am that the least number of accidents generally occur.

Analysis 3: Accidents Containing User Entered Accident Type

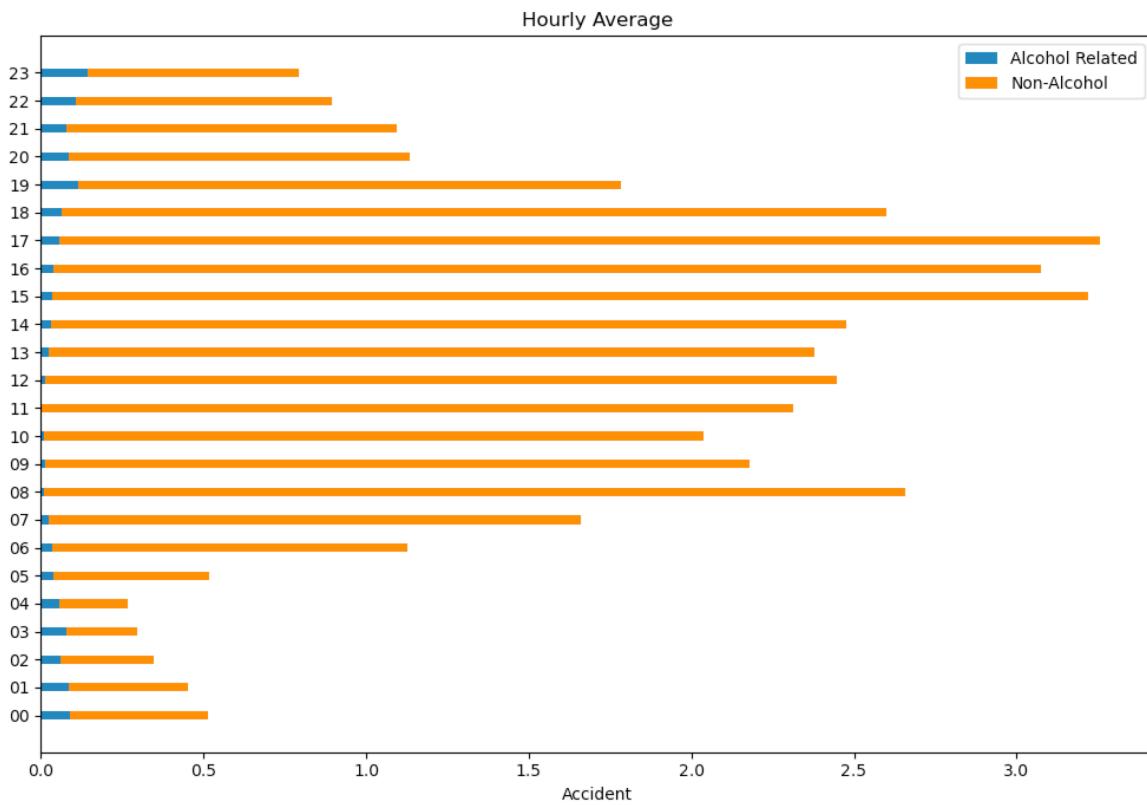
No	Date	Time	Type	Day	Severity	Longitude	Latitude	Loc	Region	Fatalities	Injuries	Alcohol
T201500001	2015-01-01	19:30:00	Struck animal	Thursday	Serious injury accident	143.5442E -38.42132	COLAC OTWAY	SOUTH WESTERN REGION	0	1	0	
T201500002	2015-01-03	14:55:00	Struck animal	Saturday	Other injury accident	146.20191 -36.94698	MANSFIELD	NORTH EASTERN REGION	0	0	0	
T201500003	2015-01-03	23:00:00	Struck animal	Saturday	Other injury accident	146.43152 -36.043	INDIGO	NORTH EASTERN REGION	0	0	0	
T201500004	2015-01-10	15:15:00	Struck animal	Saturday	Serious injury accident	146.64981 -37.31416	MACEDON RAN	NORTHERN REGION	0	1	0	
T201500005	2015-01-12	04:50:00	Struck animal	Sunday	Other injury accident	146.4500E -36.58841	WANGARATTA	NORTH EASTERN REGION	0	0	0	
T201500006	2015-02-12	23:30:00	Struck animal	Thursday	Serious injury accident	144.74617 -37.43613	MACEDON RAN	NORTHERN REGION	0	1	0	
T201500007	2015-02-01	17:00:00	Struck animal	Sunday	Other injury accident	144.3536E -37.12982	MOUNT ALEXAI	NORTHERN REGION	0	0	0	
T201500008	2015-02-10	06:10:00	Struck animal	Monday	Other injury accident	144.3996 -36.77113	BENDIGO	NORTHERN REGION	0	0	0	
T201500009	2015-02-08	08:30:00	Struck animal	None	Other injury accident	142.2836E -37.37656	SOUTHERN GR/	SOUTH WESTERN REGION	0	0	0	
T201500010	2015-02-14	10:30:00	Struck animal	Saturday	Other injury accident	142.4997 -37.13259	NORTHERN GR/	WESTERN REGION	0	0	0	
T201500011	2015-02-07	15:00:00	Struck animal	Saturday	Other injury accident	143.60147 -36.45712	LODDON	NORTHERN REGION	0	0	0	
T201500012	2015-01-06	05:30:00	Struck animal	Tuesday	Serious injury accident	142.7594E -38.36122	MOYNE	SOUTH WESTERN REGION	0	1	0	
T201500013	2015-02-01	10:00:00	Struck animal	Sunday	Other injury accident	146.6933E -36.65797	ALPINE	NORTH EASTERN REGION	0	0	0	
T201500014	2015-01-28	20:00:00	Struck animal	Tuesday	Other injury accident	144.22974 -36.76042	BENDIGO	NORTHERN REGION	0	0	0	
T201500015	2015-01-22	23:00:00	Struck animal	Wednesday	Other injury accident	144.3799E -36.76687	BENDIGO	NORTHERN REGION	0	0	0	
T201500016	2015-02-03	21:26:00	Struck animal	Tuesday	Serious injury accident	144.7803E -37.68197	BRIMBANK	METROPOLITAN NORTH	0	1	0	
T201500017	2015-01-13	22:37:00	Struck animal	Tuesday	Other injury accident	143.83151 -37.49116	BALLARAT	WESTERN REGION	0	0	0	
T201500018	2015-01-30	23:20:00	Struck animal	Friday	Other injury accident	142.3676E -38.32817	MOYNE	SOUTH WESTERN REGION	0	0	0	
T201500019	2015-01-26	08:30:00	Struck animal	Monday	Serious injury accident	142.90754 -37.24162	ARARAT	WESTERN REGION	0	1	0	
T201500020	2015-02-02	13:30:00	Struck animal	Sunday	Serious injury accident	144.02081 -38.06383	GOLDEN PLAIN	SOUTH WESTERN REGION	0	1	0	
T201500021	2015-01-16	23:05:00	Struck animal	Friday	Other injury accident	142.44274 -36.24592	YARRIAMBIAK	WESTERN REGION	0	0	0	
T201500022	2015-03-12	15:00:00	Struck animal	Thursday	Other injury accident	141.8618E -38.24021	GLENELG	SOUTH WESTERN REGION	0	0	0	
T201500023	2015-03-18	23:50:00	Struck animal	Wednesday	Other injury accident	146.7646E -36.59157	ALPINE	NORTH EASTERN REGION	0	0	0	
T201500024	2015-03-04	21:50:00	Struck animal	Wednesday	Serious injury accident	145.3419E -36.36734	SHEPPARTON	NORTH EASTERN REGION	0	1	0	
T201500025	2015-03-26	07:00:00	Struck animal	Thursday	Other injury accident	145.01811 -37.33543	MICHELL	NORTHERN REGION	0	0	0	
T201500026	2015-04-02	20:08:00	Struck animal	Thursday	Serious injury accident	143.5200E -38.33593	COLAC OTWAY	SOUTH WESTERN REGION	0	3	0	
T201500027	2015-03-19	06:10:00	Struck animal	Thursday	Other injury accident	146.34017 -36.33805	WANGARATTA	NORTH EASTERN REGION	0	0	0	
T201500028	2015-03-29	08:14:00	Struck animal	Sunday	Serious injury accident	146.5945E -36.38272	WANGARATTA	NORTH EASTERN REGION	0	1	0	
T201500029	2015-02-12	20:30:00	Struck animal	Wednesday	Other injury accident	142.7935E -38.30154	MOYNE	SOUTH WESTERN REGION	0	0	0	
T201500030	2015-03-26	06:30:00	Struck animal	Thursday	Serious injury accident	144.32274 -36.48731	LODDON	NORTHERN REGION	0	1	0	

Chart Hourly Average Accident Types By Month By Day

Analysis:

'Struck animal' was entered in the search bar, and all results with accident type 'Struck animal' have been returned.

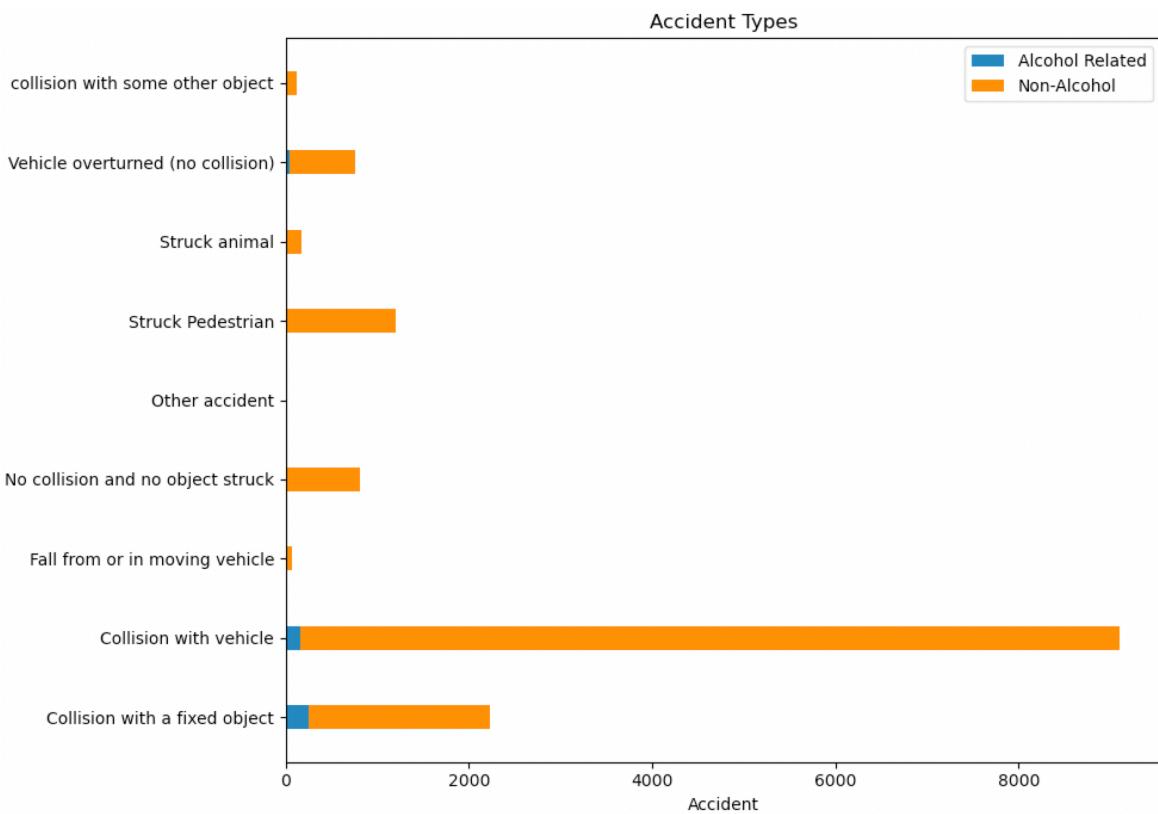
Analysis 4: Impact of Alcohol Within Accidents



Hourly Average Involving Alcohol Related Incidents Chart

Analysis:

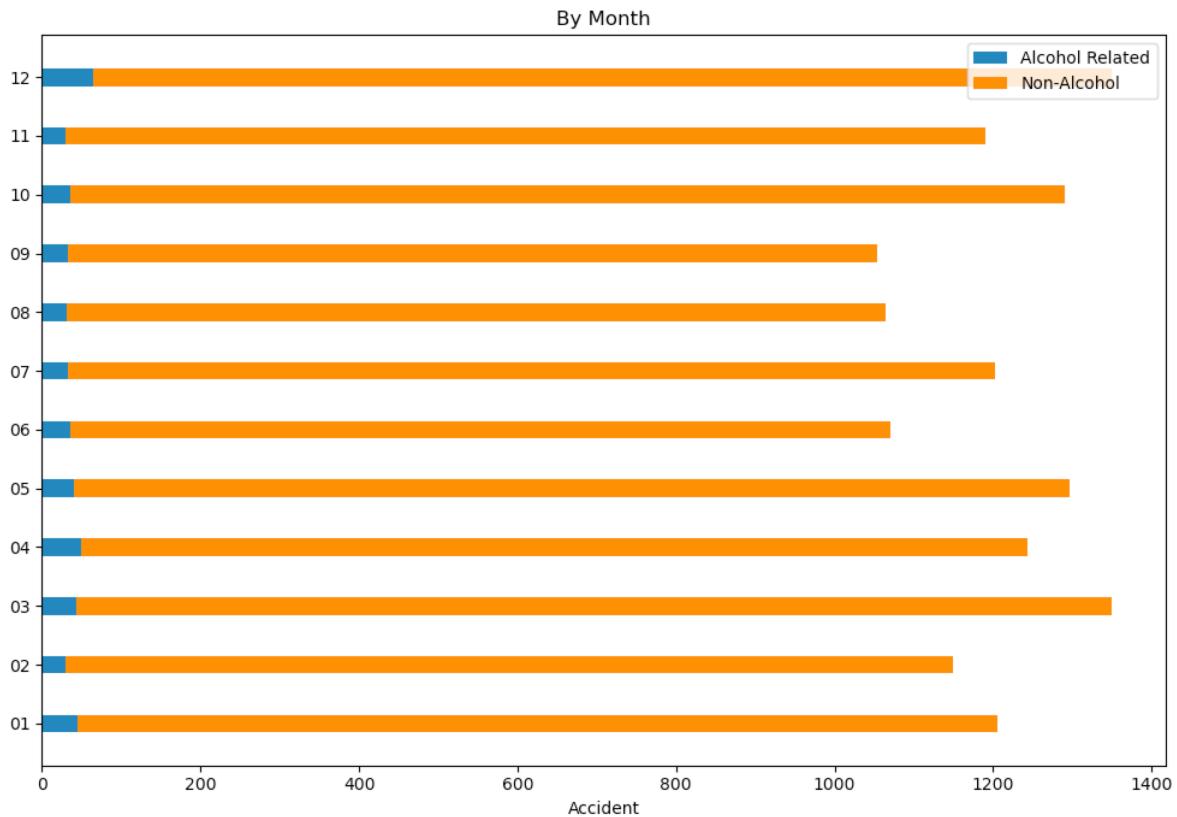
Within the selected period, alcohol related accidents occur more frequently during the night. All hours of the night have a significant portion of accidents containing alcohol related incidents. It is also important to note that almost no alcohol related incidents tend to occur from 8am-12pm.



Accident Type Chart Involving Alcohol Related Incidents

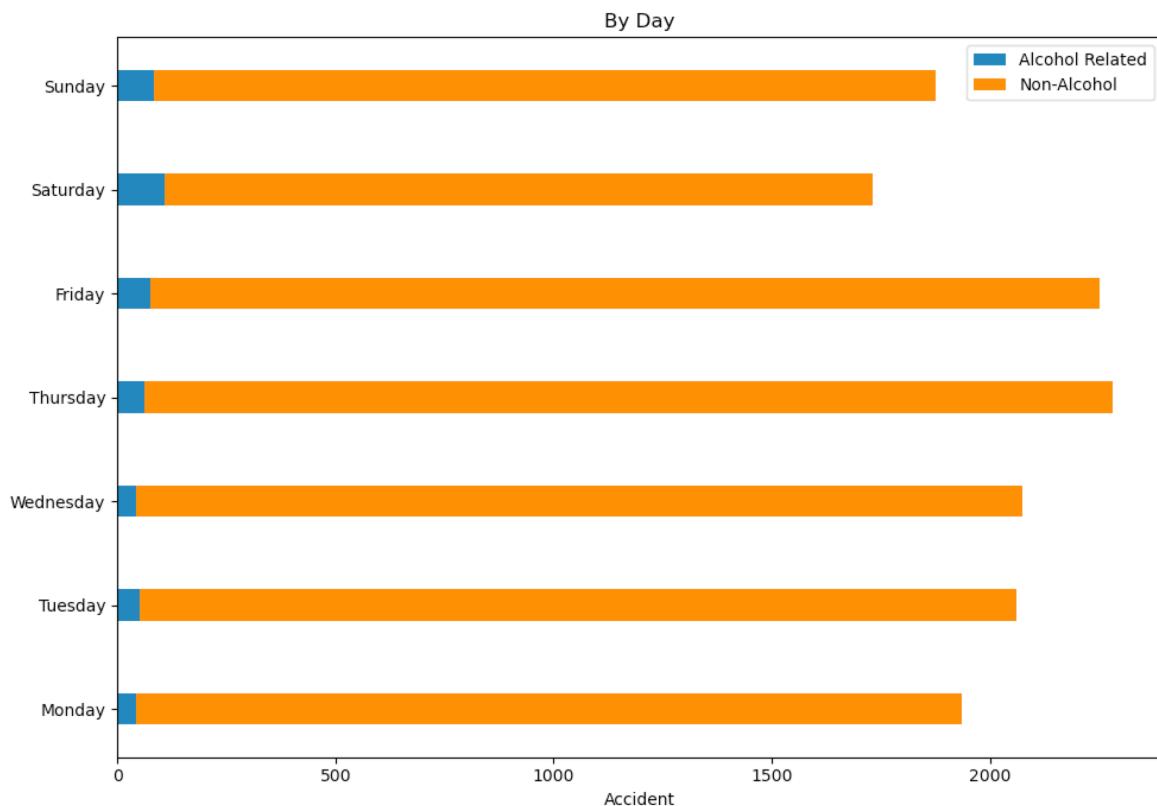
Analysis:

Within the selected period, alcohol related incidents typically occur with a collision with a vehicle, or a collision with a fixed object. As no alcohol related incidents occur for some accident types, this analysis justifies that an ad campaign for drunk drivers should focus on the collision with objects or vehicles, and not something like a pedestrian being struck.



By Month Chart Involving Alcohol Related Incidents

Within the selected period, alcohol related incidents across the year are relatively even. It is the month of December however that has an increase in alcohol related incidents. One may argue that this is because of Christmas, Boxing Day, or New Year's Eve where an increase in alcohol consumption occurs.

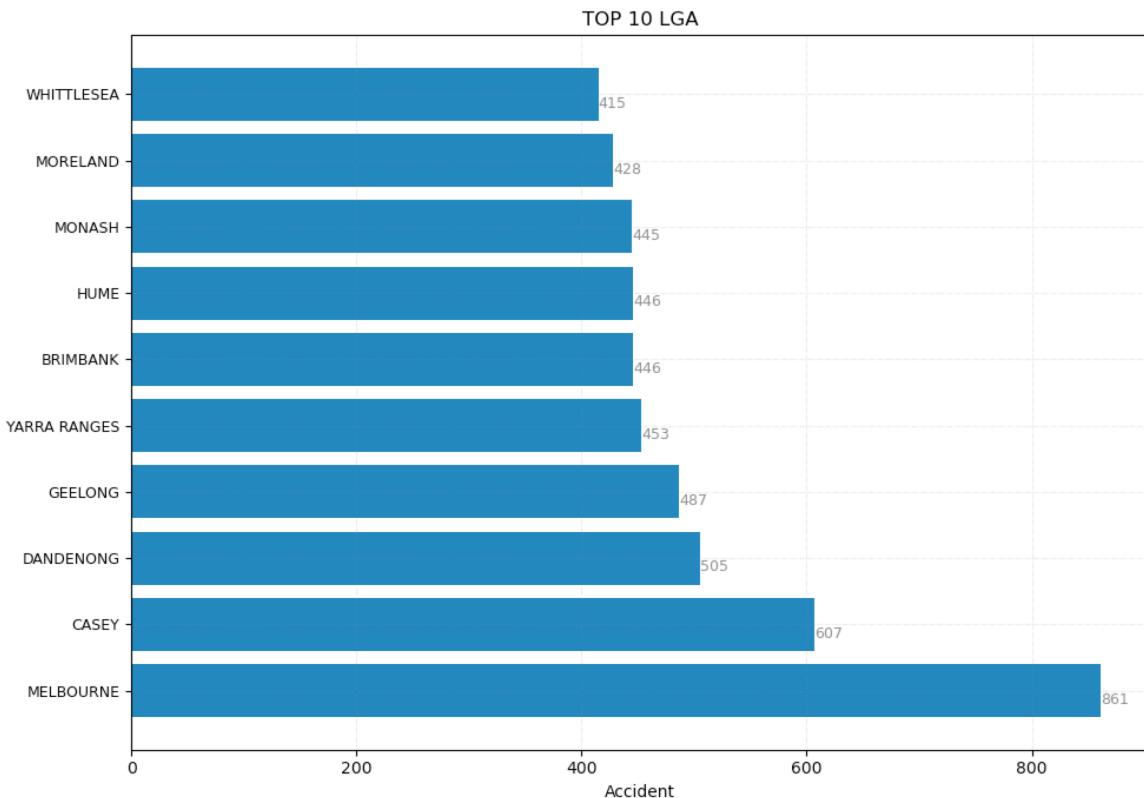


By Day Chart Involving Alcohol Related Incidents

Analysis:

Within the selected period, Alcohol related incidents occur more frequently from Friday-Sunday. This is due to the working week finishing and an increase in people consuming alcohol due zero work commitments on the weekend.

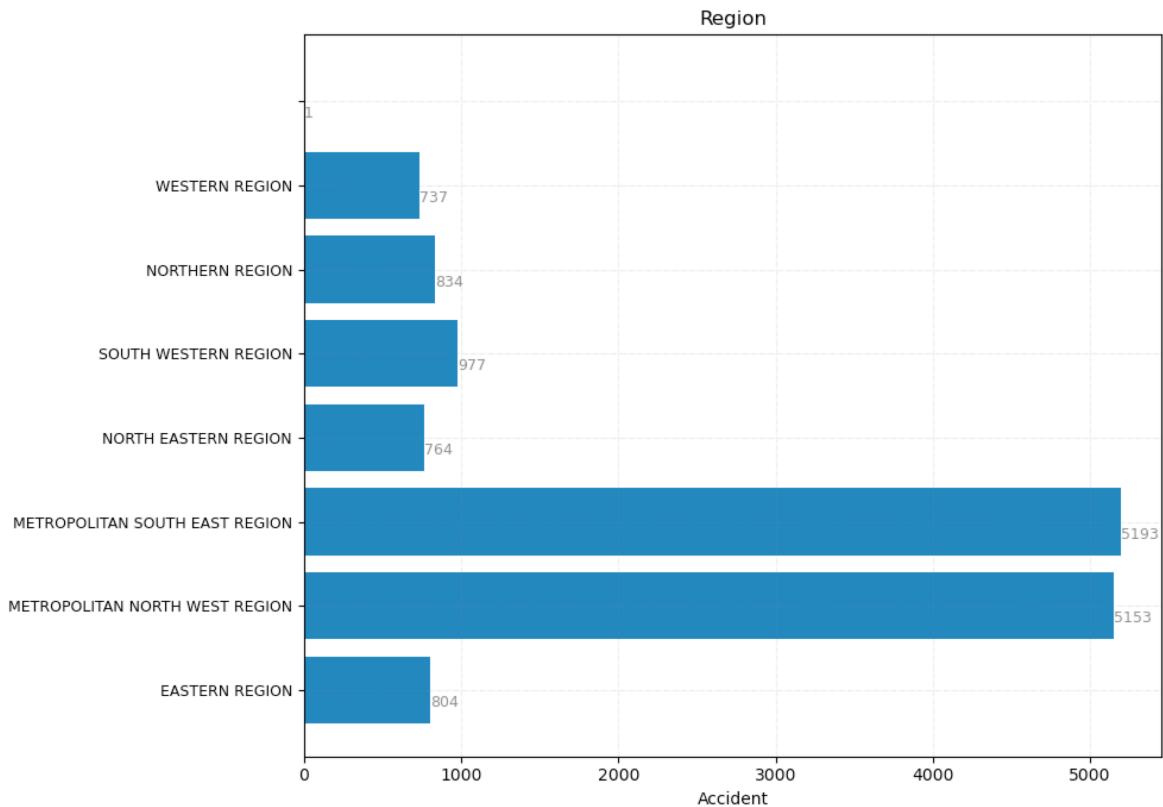
Analysis 5: Geographical Analysis of Accident Data



Top 10 LGA Chart

Analysis:

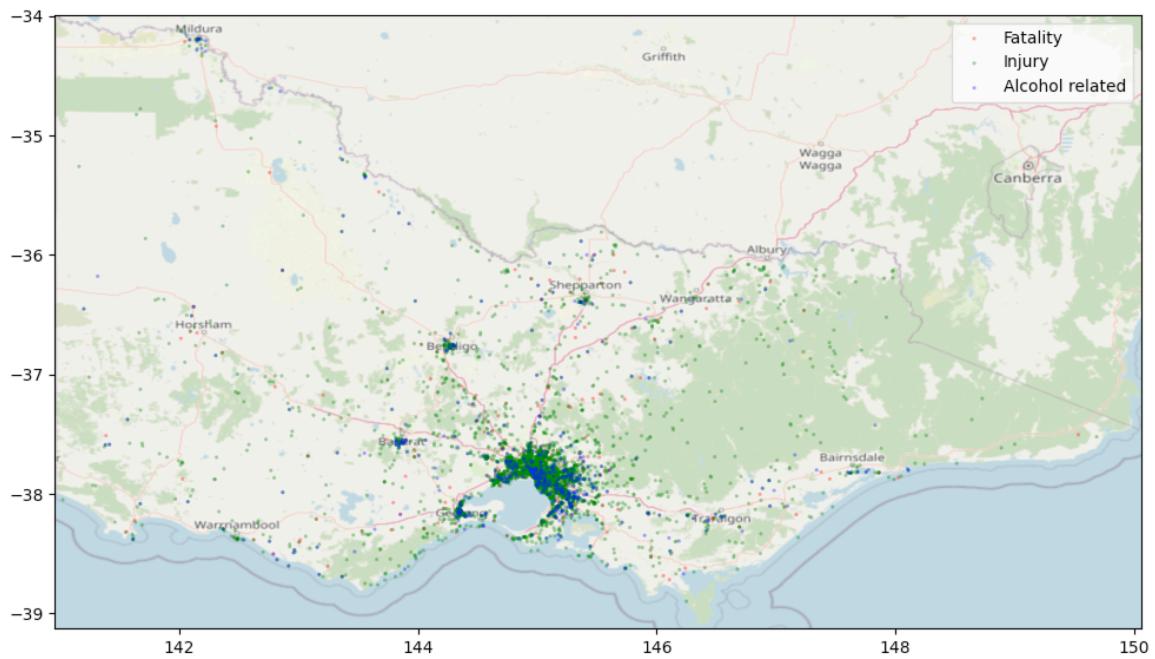
Within the selected period, Melbourne is the local government area with the most road accidents. Due to the large number of accidents that Melbourne leads by, it can be argued that targeted ads or further investigation could be specifically applied solely to Melbourne, in an effort to reduce road accidents.



Region Chart

Analysis:

Within the selected period, a significant number of accidents is shared between Metropolitan Southeast Region, and Metropolitan North West Region. This indicates that efforts to investigate methods into reducing road accidents should be targeted towards these two regions.



Map Chart

Analysis:

Most accidents have occurred within or around the city of Melbourne. This makes reasonable sense, as most of the Victorian population resides within Melbourne. Another important discovery is that alcohol related incidents appear more frequently within the heart of the city. One possible explanation may be the large presence of bars, nightclubs, and restaurants that appear in the heart of Melbourne.