Executive Report

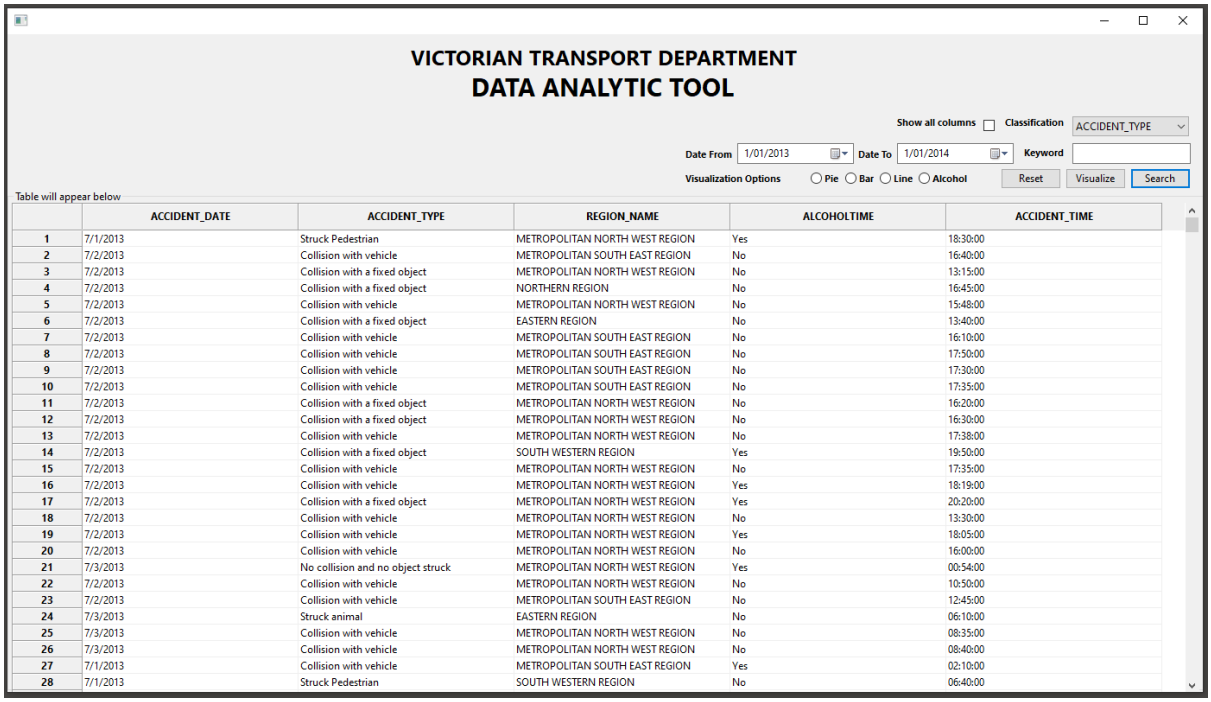
Abstract

This report records the use of the Victorian Transport Department Analytic Tool to analyse accident data from Victoria in 2013. By using this tool, we have disproved some of our initial assumptions about road traffic accidents. We assumed that alcohol-related vehicle accidents would increase the severity of injuries and that they occur more often than non-alcohol related accidents. In addition, we thought that darkness or low-light conditions would lead to more accidents, however the analysis on the program demonstrated that accidents occurred more often during the daytime than in dust or dawn low-light conditions. Furthermore, the rate of alcohol-related accidents was lower than non-alcohol related accidents, and the severity of injury was, on average, lower for alcohol-related accidents. However, as we expected, more accidents were recorded in areas where many people live in Victoria, such as the central business district in Melbourne. The tool has therefore helped us to understand and unpack data about road traffic accidents in Victoria.

Introduction

The Victorian accident dataset consist of 64 columns and 74909 rows of data from 2013 to 2019. The dataset is exceedingly large to analyse at once, so in this report, data recorded in 2013 will be analysed by using the Victorian Transport Department Data Analytic Tool. The data analysis is performed using the elements located on the top right of the program. There are five primary methods of data analysis for the tool. First, users are able to retrieve data by selecting a period. The second is that, extracted data can be visualised into a pie, bar or line graph for users to easily display and understand it. Third, the desired data can be identified and sorted through keywords. Fourth, alcohol-related accidents can be specifically analysed, and finally, alcohol-related accidents can be analysed in advanced detail to use several charts at once.

1. Analysis of data for a period determined by a user.



VICTORIAN TRANSPORT DEPARTMENT
DATA ANALYTIC TOOL

Show all columns ☐ Classification ACCIDENT_TYPE

Date From 1/01/2013 Date To 1/01/2014 Keyword

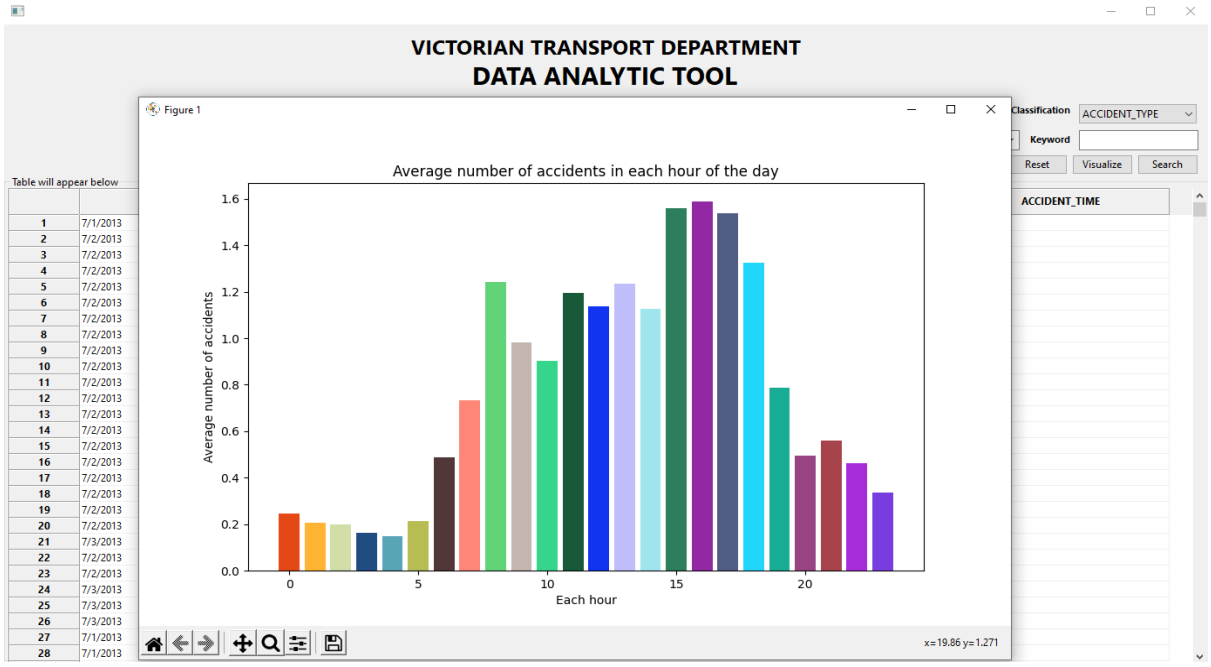
Visualization Options ○ Pie ○ Bar ○ Line ○ Alcohol Reset Visualize Search

Table will appear below

	ACCIDENT_DATE	ACCIDENT_TYPE	REGION_NAME	ALCOHOLTIME	ACCIDENT_TIME
1	7/1/2013	Struck Pedestrian	METROPOLITAN NORTH WEST REGION	Yes	18:30:00
2	7/2/2013	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	16:40:00
3	7/2/2013	Collision with a fixed object	METROPOLITAN NORTH WEST REGION	No	13:15:00
4	7/2/2013	Collision with a fixed object	NORTHERN REGION	No	16:45:00
5	7/2/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	15:48:00
6	7/2/2013	Collision with a fixed object	EASTERN REGION	No	13:40:00
7	7/2/2013	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	16:10:00
8	7/2/2013	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	17:50:00
9	7/2/2013	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	17:30:00
10	7/2/2013	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	17:35:00
11	7/2/2013	Collision with a fixed object	METROPOLITAN NORTH WEST REGION	No	16:20:00
12	7/2/2013	Collision with a fixed object	METROPOLITAN NORTH WEST REGION	No	16:30:00
13	7/2/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	17:38:00
14	7/2/2013	Collision with a fixed object	SOUTH WESTERN REGION	Yes	19:50:00
15	7/2/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	17:35:00
16	7/2/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	Yes	18:19:00
17	7/2/2013	Collision with a fixed object	METROPOLITAN NORTH WEST REGION	Yes	20:20:00
18	7/2/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	13:30:00
19	7/2/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	Yes	18:05:00
20	7/2/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	16:00:00
21	7/3/2013	No collision and no object struck	METROPOLITAN NORTH WEST REGION	Yes	00:54:00
22	7/2/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	10:50:00
23	7/2/2013	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	12:45:00
24	7/3/2013	Struck animal	EASTERN REGION	No	06:10:00
25	7/3/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	08:35:00
26	7/3/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	08:40:00
27	7/1/2013	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	Yes	02:10:00
28	7/1/2013	Struck Pedestrian	SOUTH WESTERN REGION	No	06:40:00

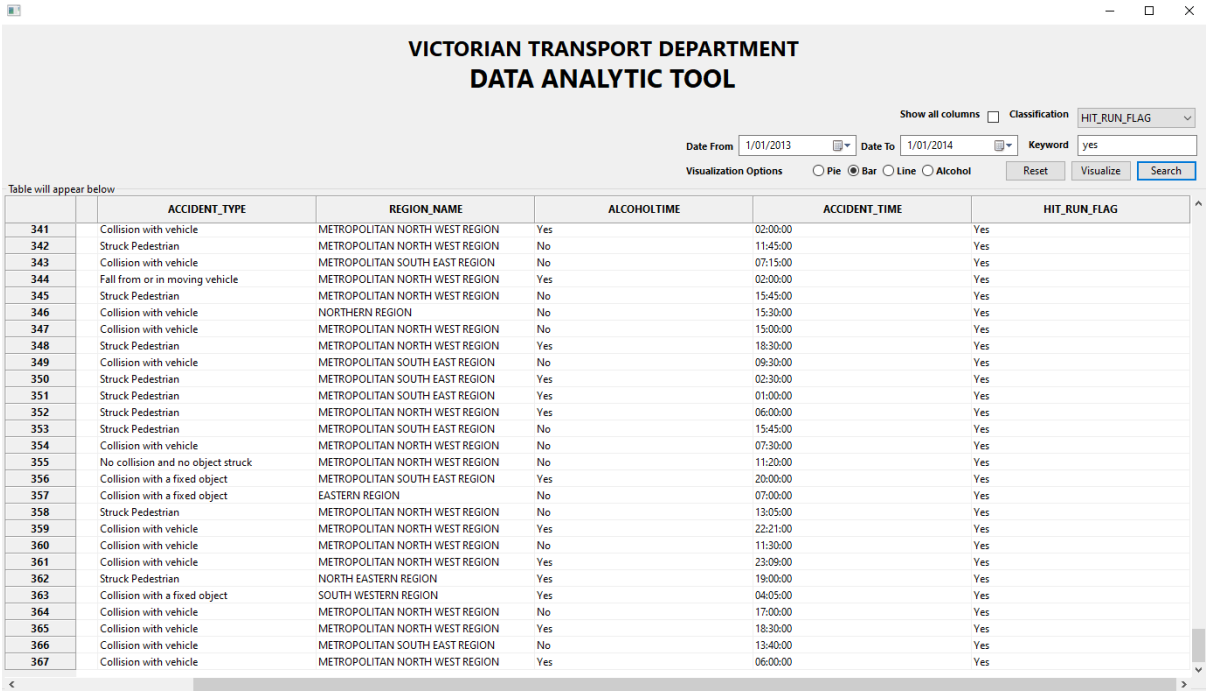
There are a total of 6,891 accidents recorded in 2013. Collision-type accidents accounted for the largest number. Regarding the average number of accidents by region, more than half of the accidents occurred in the metropolitan area, and among the area, the metropolitan north west region had the highest number of accidents. The north west region includes not only 14 local governments, but also the heart of the commercial districts of Melbourne. Therefore, it might be expected that more accidents occur in the area than other regions.

2. Visualization for the average number of accidents by hour



The graph above shows the average number of accidents per hour by the 24-hour system. The graph shows a relatively small number of accidents from 00:00 to 5:00, probably because there are not many cars on the road during that time. The average number of accidents increases over time, and many accidents occur during the day time. The peak hour for accidents is 16:00 and its number of accidents is 8 times larger than the average of accidents at 4:00.

3. Finding data using keywords



	ACCIDENT_TYPE	REGION_NAME	ALCOHOLTIME	ACCIDENT_TIME	HIT_RUN_FLAG
341	Collision with vehicle	METROPOLITAN NORTH WEST REGION	Yes	02:00:00	Yes
342	Struck Pedestrian	METROPOLITAN NORTH WEST REGION	No	11:45:00	Yes
343	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	07:15:00	Yes
344	Fall from or in moving vehicle	METROPOLITAN NORTH WEST REGION	Yes	02:00:00	Yes
345	Struck Pedestrian	METROPOLITAN NORTH WEST REGION	No	15:45:00	Yes
346	Collision with vehicle	NORTHERN REGION	No	15:30:00	Yes
347	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	15:00:00	Yes
348	Struck Pedestrian	METROPOLITAN NORTH WEST REGION	Yes	18:30:00	Yes
349	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	09:30:00	Yes
350	Struck Pedestrian	METROPOLITAN SOUTH EAST REGION	Yes	02:30:00	Yes
351	Struck Pedestrian	METROPOLITAN SOUTH EAST REGION	Yes	01:00:00	Yes
352	Struck Pedestrian	METROPOLITAN NORTH WEST REGION	Yes	06:00:00	Yes
353	Struck Pedestrian	METROPOLITAN SOUTH EAST REGION	No	15:45:00	Yes
354	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	07:30:00	Yes
355	No collision and no object struck	METROPOLITAN NORTH WEST REGION	No	11:20:00	Yes
356	Collision with a fixed object	METROPOLITAN SOUTH EAST REGION	Yes	20:00:00	Yes
357	Collision with a fixed object	EASTERN REGION	No	07:00:00	Yes
358	Struck Pedestrian	METROPOLITAN NORTH WEST REGION	No	13:05:00	Yes
359	Collision with vehicle	METROPOLITAN NORTH WEST REGION	Yes	22:21:00	Yes
360	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	11:30:00	Yes
361	Collision with vehicle	METROPOLITAN NORTH WEST REGION	Yes	23:09:00	Yes
362	Struck Pedestrian	NORTH EASTERN REGION	Yes	19:00:00	Yes
363	Collision with a fixed object	SOUTH WESTERN REGION	Yes	04:05:00	Yes
364	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	17:00:00	Yes
365	Collision with vehicle	METROPOLITAN NORTH WEST REGION	Yes	18:30:00	Yes
366	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	No	13:40:00	Yes
367	Collision with vehicle	METROPOLITAN NORTH WEST REGION	Yes	06:00:00	Yes

Classifications	Results
Hit and run	Yes: 367 No: 6524
Light condition	Day: 463 Dark street: 1456 Dusk / dawn: 595
Police atttend	Yes: 5017 No: 1874

Three classifications were set and relevant, keywords were entered to conduct a more detailed investigation into retrieved data. The table above illustrates the results by different keywords according to the program.

Hit and run

In 2013, 5.3% of the total number of traffic incidents involved a hit and run.

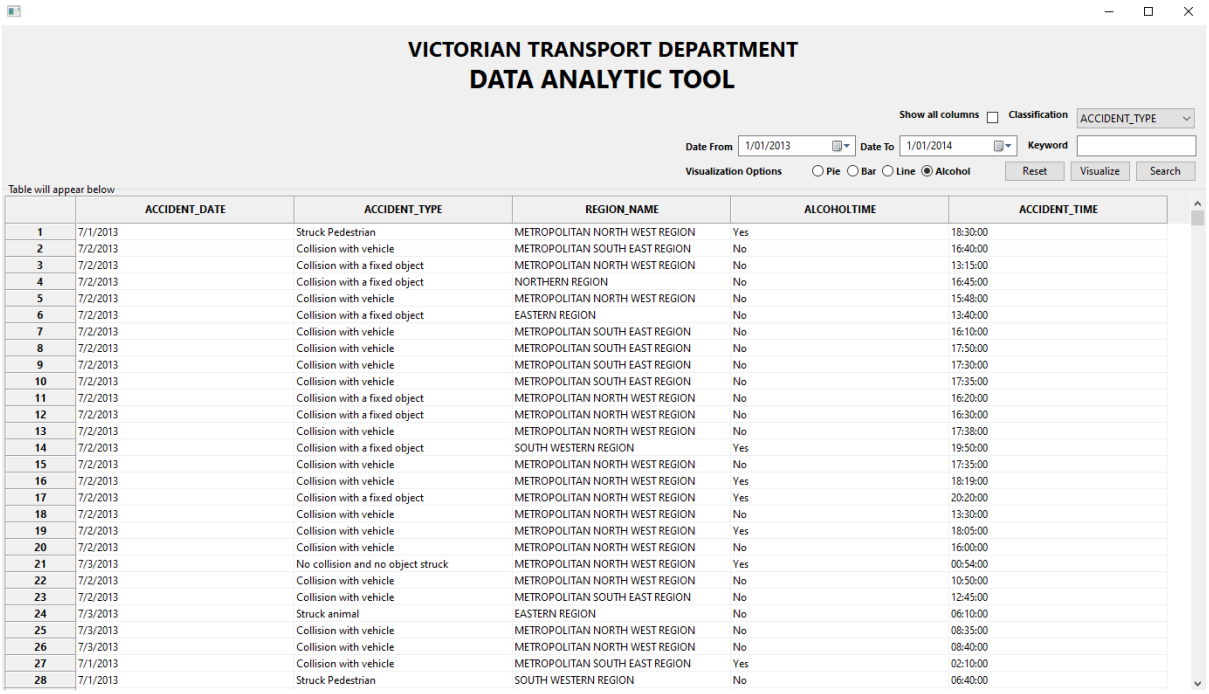
Light condition

The accident rate by hour and the accident rate by light condition show similar data, which is unsurprising. Many accidents occurred during the day time, and the accident rate drops significantly at dawn.

Police attend

The police attendance rate by accident is 72%, which shows that Victorian police are reasonably responsive to traffic incidents.

4. Analysis of alcohol-related accidents



VICTORIAN TRANSPORT DEPARTMENT
DATA ANALYTIC TOOL

Show all columns | Classification: ACCIDENT_TYPE
Date From: 1/01/2013 | Date To: 1/01/2014 | Keyword:
Visualization Options: Pie | Bar | Line | Alcohol | Reset | Visualize | Search

Table will appear below

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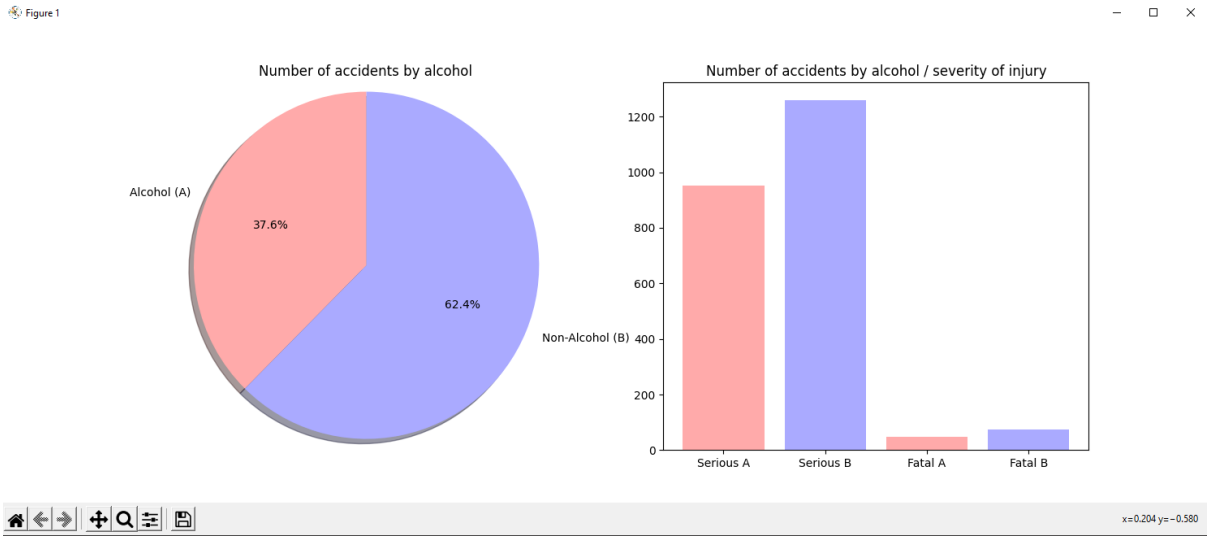
24	7/3/2013	Struck animal	EASTERN REGION	No	06:10:00
25	7/3/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	08:35:00
26	7/3/2013	Collision with vehicle	METROPOLITAN NORTH WEST REGION	No	08:40:00
27	7/1/2013	Collision with vehicle	METROPOLITAN SOUTH EAST REGION	Yes	02:10:00
28	7/1/2013	Struck Pedestrian	SOUTH WESTERN REGION	No	06:40:00

Filtering the data to include alcohol-related incidents shows that 2589 accidents were related to alcohol, and the accidents were distributed from 6 pm to 12am. Rarely, some alcohol-related accidents occurred during the day time.

5. Advanced analysis of alcohol-related accidents with visualisation



This advanced analysis function for alcohol-related incidents shows data in multiple chart at once. The left pie chart indicates the proportion of alcohol-related accidents, and the right bar chart illustrates the severity of injury from the retrieved alcohol-related data. As the above two graphs show, 37.6% of accidents are related to alcohol, and the severity of alcohol-related accidents does not show much difference from alcohol-related accidents. Rather, the accidents that not related to alcohol show greater seriousness.

Conclusion

This report has demonstrated the use of the Victorian Transport Department Analytic Tool to analyse traffic incident data from Victoria in 2013. By using the features of the tool, we have shown that, in 2013, accidents occurred more often during the day time than at dusk or dawn. The rate of alcohol-related incidents. However, as we expected, accidents were concentrated in densely populated areas such as the central business district in Melbourne. The tool therefore helped us to understand and unpack data about road traffic accidents in Victoria. It could be used the Government to provide valuable insights into the data and when considering its priorities for road safety policies.