Road Accidents Analysis in Victoria

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This dashboard aims to provide insights to VicRoads for reducing the number of road accidents and their social damage in Victoria. Majorly, I have analysed the relationship of the total accidents (daily, weekly, monthly and yearly) with the various cities, their traffic volume, the traffic cameras count in that location, road geometry, speed zone and its accident type. The total number of hospitals in an area are also analysed against the total accidents in that area to reduce the social damage.

1) **Worksheet 1-Traffic Volume and Accidents (Dual Axis Map):** Here, each city in Victoria has been colour coded with respect to its total number of accidents and its traffic volume is also represented by a colour coded circle symbol. This map has a play-axis which plays the weekly data for the selected year and month.
2) **Worksheet 2-Calendar (Highlight Tables):** This worksheet is used as a weekly calendar in which each day is colour coded according to the number of accidents in that month. Week numbers and specific dates are used as filters for the dashboard.
3) **Worksheet 3- Accidents per Speed Zone (Tree Map):** This worksheet shows a visualization of the total number of accidents in different speed zones across Victoria. Each speed zone can be used as a filter to determine granular details about that speed zone. The colour coding for map, calendar, and speed zones distribution is synchronised for ease of understanding.
4) **Worksheet 4-Hospital Count and Accident Count (Packed Bubble Graph):** This worksheet shows the total accidents and hospitals for all cities in Victoria. The colour gradient is dependent on the Hospital count and the bubble size is dependent on the Accident count. It shows yearly data as default. For example," Melbourne" *has* 105,900 accidents (Biggest size) and 25 hospitals (Green). Typically, the cities for which bubbles are red and big need to have more Hospitals, example" Moreland*"* with 8760 accidents and only 4 Hospitals.
5) **Worksheet 5-Road Geometry and Accident Type (Pie Chart):** This worksheet shows different accident types and total accidents belonging to each type as a separate pie chart for each Road Geometry. This can be filtered for different years, months, and cities. It shows yearly data as default. For example, pedestrians are struck more *at Dead End and collision with fixed objects are mostly at non-intersections.*
6) **Worksheet 6-Camera Count and Police Attended (Horizontal Bars):** This worksheet shows the correlation between accidents that are/ are not attended by the police and the total number of traffic cameras in different cities. Here, there are 2 parameters that are given as input by the user via the slider: Top N Areas and Bottom N areas. The user can filter the Top N areas having maximum accidents and get the corresponding cameras count in those areas and vice versa for Bottom N areas. Clear correlation can be seen that areas having more accidents that are not police attended are the ones having less traffic cameras implying the need for more traffic cameras and police in these areas. It shows yearly data as default for example, Melbourne and Casey.

-Dashboard Level Filters (Mandatory Filters): **Year and Month** are single select filters and **City** is Multiple select filter.

-***Dashboard Working and Examples:*** All the six worksheets are inter-connected using join conditions and thus, interaction between them can be conducted using filters and actions. Examples are given below:

- For January 2016 (given in filters), we can clearly see that more accidents are on Friday and weekends with maximum accidents occurring at 60km/hr. On selecting Week 4 in calendar, we see Melbourne has maximum number of accidents i.e. 200, highest traffic volume i.e. 2088788 units and maximum struck pedestrians on cross intersection roads.
- For January 2016, on selecting the 100 km/hr speed zone, the cities like- East Gippsland and Baw Baw are highlighted. Out of which, East Gippsland has high traffic volume and significantly large total accidents count i.e. 656 out of which 492 are conducted at 100km/hr. On selecting East Gippsland from the City filter for 2016 and 100km/hr speed zone, we can see that it has 1164 accidents and only 3 private hospitals. On clicking the bubble in worksheet 4, all visualizations zoom to show only East Gippsland. The map shows accident count for January 2016 and, Worksheet 6 shows cumulative data for all past years highlighting that there were 648 non police attended accidents and comparatively smaller number of traffic cameras i.e. 9.

Appendix

1) File Name: *Crashes_Last_Five_Years.csv* (consisting road crashes data of Victoria for last 5 years)
   Source: https://discover.data.vic.gov.au/dataset/crashes-last-five-years

2) File Name: Hospital_Location_1.xlsx (consisting details of all Hospitals in Victoria)
   Source : https://discover.data.vic.gov.au/dataset/hospital-locations-spatial

3) File Name: camera-locations.xlsx (mobile and fixed camera locations for monitoring traffic in Victoria)
   Source: https://discover.data.vic.gov.au/dataset/road-safety-camera-network-mobile-camera-locations

4) File Name: Traffic_Volume.csv(area wise traffic volume and details for all Victoria regions and roads)
   Source: https://vicroadsopendata-vicroadsmaps.opendata.arcgis.com/datasets/5512df2ff41e4941bacf868053dbfba9_0