

FIT5147 Data Visualization Project

--Five Design Sheet

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Crash Data And Road Safe Cameras in Vic

There are 5,157,172 registered vehicles in Victoria in the year 2021. (2021, Motor vehicle census, ABS)

According to the Australian census data, 91.3% of households have at least one vehicle, and 52.7% (6,347,498 people) of the Australian workforce drive to work by car. Safety has always been a big issue for travelers as more than 200 lives are lost, and an average of 13,000 people are injured from road accident every year in Victoria. (2022, Road User Statistic, TAC)

Motivation and aim:

There are many road safety cameras on the way while the number of road accident are increasing .

Especially the traffic issues around Monash freeway appear in the news frequently. Data shows a 15% increase of life lost in Victoria due to road accident in 2022 compared with the previous year.

Thus, this data visitation is aim to inspire people using the crash data to see the factors that will impact the cause of an accident and how road safety cameras helped to lower the chance of accidents.

IDEAS

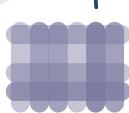
Topics:

- Top Rented Road Crash type
- Top Ranked Road Sections.

- Location of Accidents
 - By suburb / postcode
 - By section (Highway)

- Number of Accidents
 - By Year
 - By Month
 - By Date.

X1 Heatmap:



- Frequency



No.

Time

- continuous data.
- Animation?
- roller bar?



Factors

Road condition
weather ...

X4 Map:



- show locations
- camera
- crash

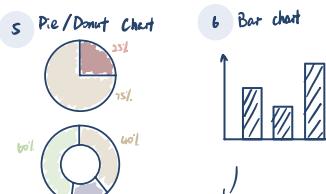
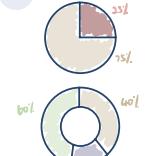
X7 Boxplot



X8 Density Plot



5 Pie/Doughnut Chart



6 Bar chart



9 Circulated Bar?



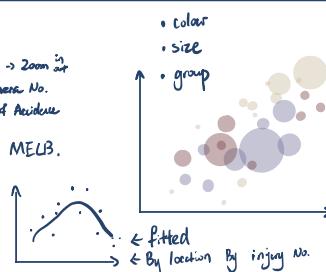
- group
- colour

Combine and Refine



- ① GED Location → zoom in
- ② Bubble → Camera No.
- ③ Colour → No. of Accidents

- mainly in Metropolitan MELB.
- filter boxes.

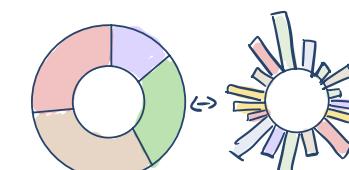


• color

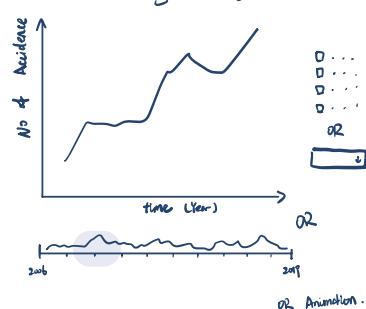
• size

• group

By location By injury No.



- select variable
- interactive
- colour
- different Variable
- will change together According to selected Variables.



No. of Accidents

time (Year)

OR

OR Animation.

FILTER

Interactive Plots:

- 2 - Line - Historical Crash Data.
- 3 - Scatterplot - Categorical Variables.
- 4 - Map - Location of Crash & Camera
- 5 + 9 - Barchart + Pie - use together to show multiple variables.
- 10 - Bubble chart - Categorical Variable + Density

- 1, 7, 8 Not considered.

- Hard for general user to understand.
- Not many interactive elements can be used.

Categorize

- 2 + 3 → Also show fitted Regressions.

- 2 + 3 + 10

- 4 + 3 + 10

- 5 + 9 + 10

Questions

Road Safety

- Road Accident
- time
- Condition
- Location
- Weather
- Speed.

→ Map

Injury on Road

- Before Road Safe Camera
- After Camera.
- Trend / Severity

Layout

All in one.



Sheet 2

Focus

Pie & circular bar chart:

- will focus on using same set of colour for same Variables.
once a factor has been selected from check box for Pie chart (Accident type)
the circular bar chart will automatically update the plot of Road Sections where each Accident type happened.

- Bubble plot on map with different size and colour. to show the No. of Accident in VIC.
Zoom Buttons will also allow user to look at different region.

Title: Data Visualization Project

Author: Suyue Wang

Date: 14 May 2023

Sheet: Sheet Two

Task: Road Crash Data - Artical Layout.

Operations

- By moving the mouse over the dots and bubbles will show some information.
- Range Slider, allows user to explore the timeseries line chart by dragging the bar in the slider to adjust time frame.
- check list will provide a list of factors to be selected from.
- Interactive Map
 - Zoom in & out: can look for more detail at a particular region.
 - Move on by points
 - will show No of crash record and postcode of the suburb.

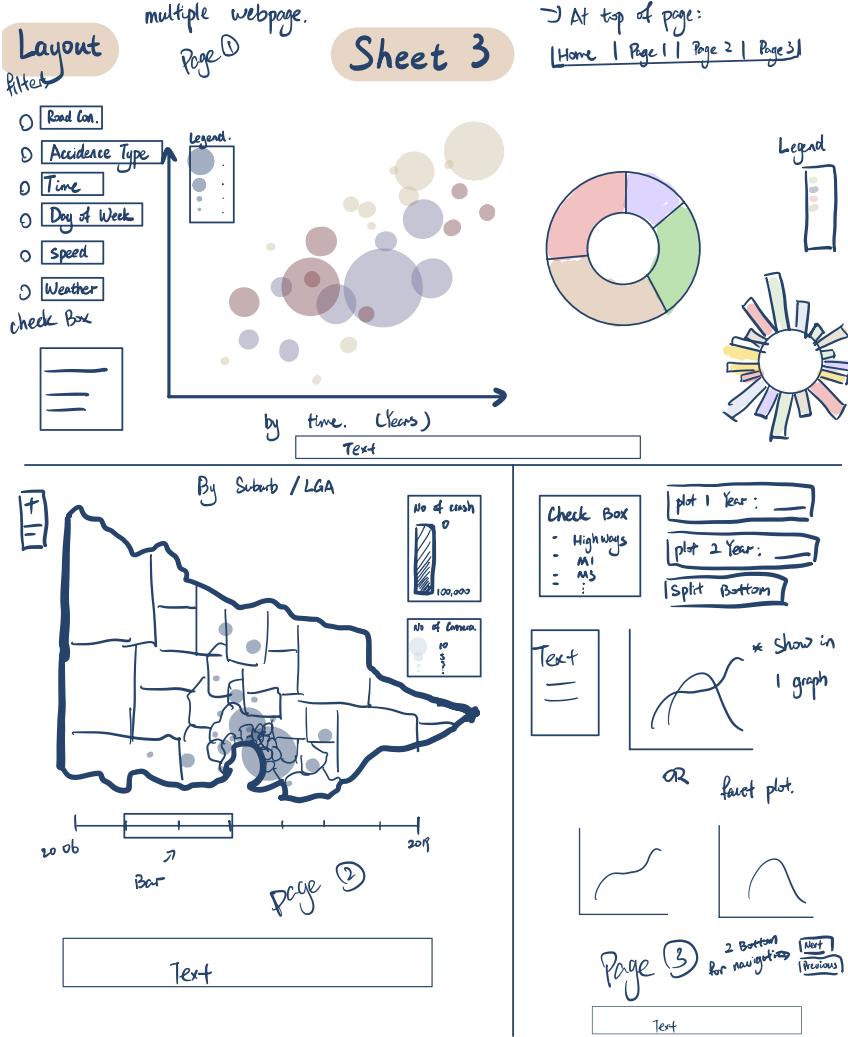
Discussion

Pros:

- All plots are fitted in one page, easy operation for users.
- Users can look through graphs easily.
- Graphs are easy to understand with short explanation on the side.

Cons:

- Some graph seems plain. (Line graph)
- The layout is a bit messy. No sectioning.
- Map might also need a Year filter to be able to show more data by year.
- Lack of other variables, can provide more info.



Focus

Page 1

- only 1 Variable can be selected from filer box
- the pie chart will also show the percentage of each factor in the selected variable.
- the circular bar will show the accident type of the corresponding Variable.

Page 2

- will have colour with gradient to show No of crash in each suburb.
- Saturation: lighter → darker.
- Bubble size shows the No. of Cameras in each suburb.

Page 3 - will be able to show 1 graph
 or split it into 2 graphs, for comparison.

* Pages involves [Home](#) | [P1](#) | [P2](#) | [P3](#)

Title: Data Visualization Project

Author: Sueye Wong

Date: 14 May 2023

Sheet: Sheet Three

Task: Road Crash Data

Operations

3 Individual Pages

with Bottom of top for Users to look through.
 Next and Previous Bottom also available at bottom right corner of each Page to give notice to the user for other contents available in this website

Page 1:

- By moving the mouse over the dots and bubbles will show some information.

• checklist will provide a list of factors to be selected from.

Page 2:

Interactive Map

→ Zoom in & out: can look for more detail at a particular region.

→ Move on by points suburb.

will show No of crash record and pictures of the suburb.

- Range Slider, allows user to explore the timeseries line chart by dragging the bar in the slider to adjust time frame.

Page 3: check Box provided to select Year and graph layout.

Discussion

Pros:

- separate pages allows the users to explore the data with steps and guidance.
- Not too much information provided at once.
- All graphs are interactive. ⇒ More engagement.

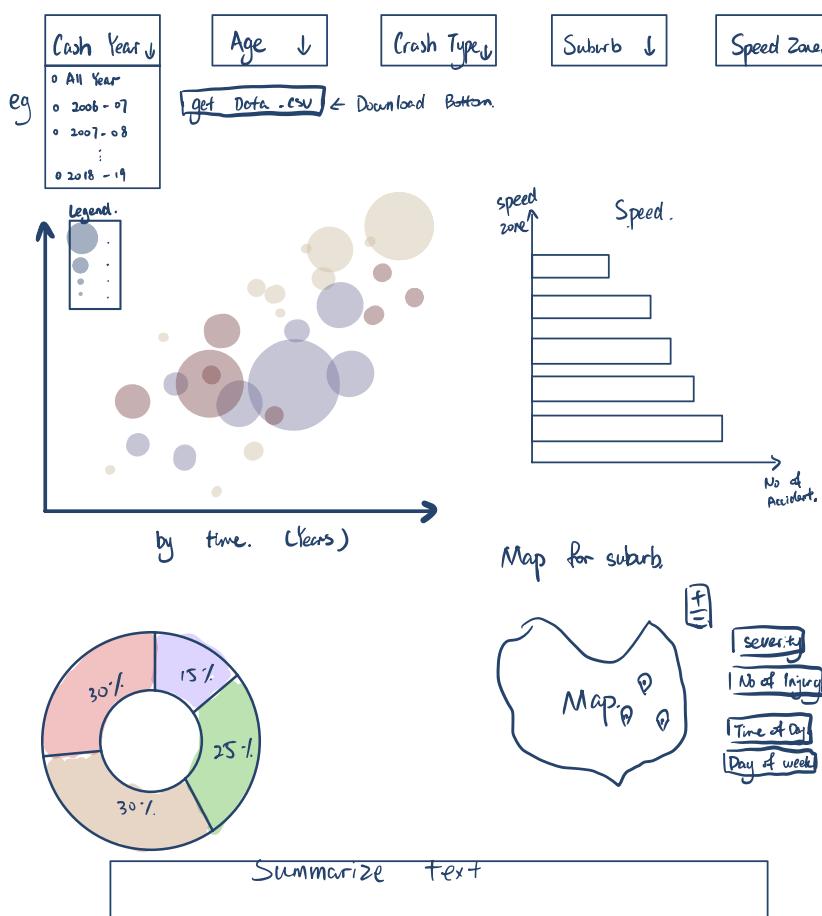
Cons:

- The graphs are separated by Pages thus it might be difficult looking back and forth between topics.

Layout

Dashboard.

Sheet 4



Focus

- to make sure the checkbox will apply to All graphs on the webpage.
- the Data generate from the check boxes are to be download in .csv form.
- the check box for the map will require the map to be at the right size for each suburb. (base on postcode).

Title: Data Visualization Project

Author: Suyue Wang

Date: 14 May 2023

Sheet: Sheet Four

Task: Road Crash Data

Operations

- Animation the Bubble chart will show an animation of the selected variables over time.
- Check on the bar chart will only coloured the selected speed zone by highlighting the selected bar.
- Mouseon will allow User to see the Number of crash recorded from selected Variables.
- Data download in .csv form in case if the user are interested
- Map of the selected Suburb, each icon on the map represent an accident happen this suburb.
 - more check box are provided
 - Mouse on the icon will also provide the information for each Variable.

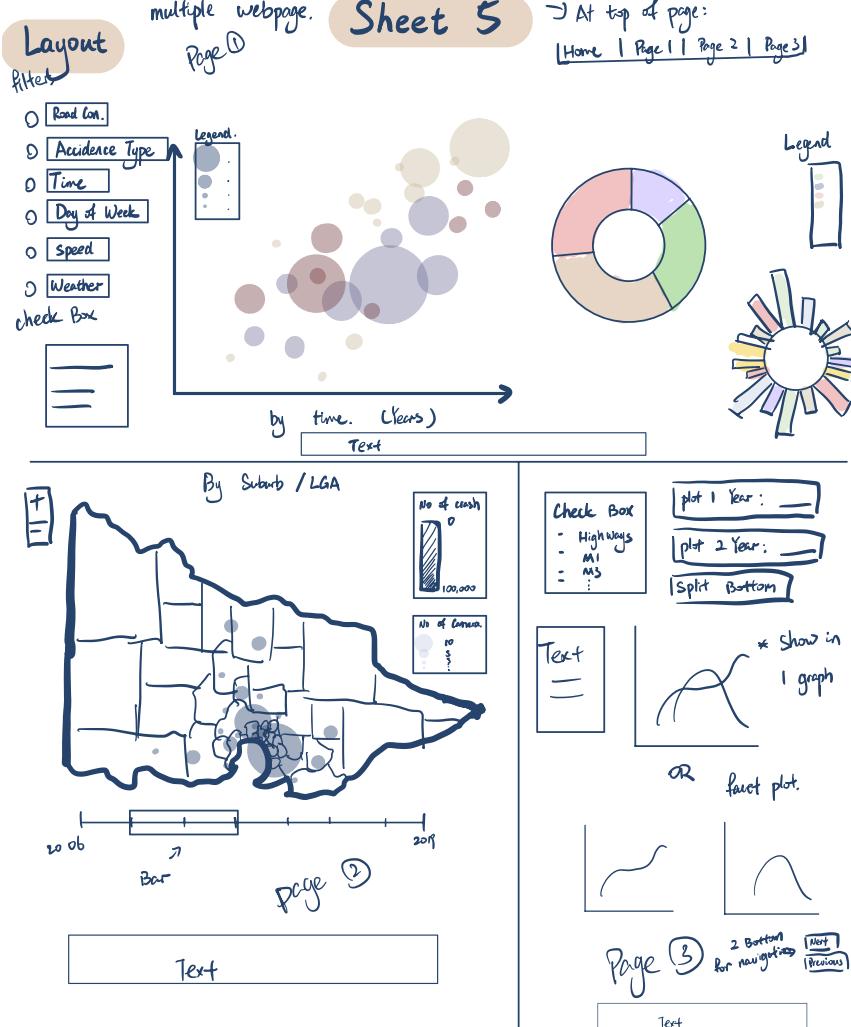
Discussion

Pro:

- Allow the User to Export the Data.
- Multiple checkbox provided for all graphs at once.

Con:

- lack of basic information.
- the top panel might be hard to use and not everyone wants to use all of them at once.



Focus

Page 1

- only 1 Variable can be selected from filter box
- the pie chart will also show the percentage of each factor in the selected variable
- the circular bar will show the accident type of the corresponding Variable.

Page 2

- will have colour with gradient to show No of crash in each suburb.
- Saturation:
Lighter → darker.
- Bubble size shows the No. of cameras in each suburb.

Page 3 - will be able to show 1 graph
or split it into 2 graphs, for comparison.

* Pages involves Home | P1 | P2 | P3

Title: Data Visualization Project

Author: Sugue Wong

Date: 14 May 2023

Sheet: Sheet Five

Task: Road Crash Data

Operations

3 Individual Pages

with Bottom of top for Users to look through

[Next] and [Previous] Bottom also available at bottom right corner of each Page to give notice to the user for other contents available in this website

Page 1:

- By moving the mouse over the dots and bubbles will show some information.
- check list will provide a list of factors to be selected from.

Page 2:

- Interactive Map
 - Zoom in & out: can look for more detail at a particular region.
 - Move on by points
 - will show No of crash record and postcode of the suburb.
- Range Slider, allows user to explore the timeseries line chart by dragging the bar in the slider to adjust time frame.

Page 3: check Box provided to select Year and graph layout.

Detail

• use R shiny for this Project.

• Main Package : tidyverse
ggplot2.
Lucidate.

• Estimated submission Date : 05 June 2023.

• Algorithms and Methods: R shiny
R language