Project Plan

<Victorian Crash Sight>

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# Introduction

## Background

Governmental bodies and transport manufacturers have made significant efforts to reduce the severity of road incidents, resulting in a notable decrease (~10%) in road-related fatalities across Australia over the decade from 2010 to 2020 (BITRE, 2023). While these efforts have contributed to decreasing trauma rates among drivers, the safety levels for vulnerable road users, including pedestrians, cyclists, and motorcyclists, have shown a more limited improvement (BITRE, 2023). Vulnerable road users are susceptible to serious injuries even in low-speed accidents, a concern that is particularly pronounced in densely populated areas like major cities.

The main objective of this project is to develop an interactive visualization tool tailored to a specific dataset of road accident information. This project serves as a proof-of-concept to demonstrate the value of such tools for both governmental and business stakeholders who want to understand road incidents within Victoria. By offering an intuitive and visually interesting platform, this tool will present pertinent data based on user queries. As a result, an understanding of recurring accident patterns will become clear. Addressing this emerging need empowers stakeholders to leverage the information to create better preventive practices, and identify infrastructural enhancements aimed at increasing the safety of pedestrians, cyclists, motorcyclists, and other vulnerable commuters.

Once this need has been met and conclusions drawn, the potential benefits both economic and societal are substantial. A reduction in road incidents, both fatal and non-fatal, will not only alleviate suffering but also contribute to the fluidity of road networks while improving targeted government spending. Government bodies will get insights into accident prone zones, allowing them to better allocate resources to these areas. The proof-of-concept shown in this project will lead to more valuable tools that help stakeholders identify issues, this way they can effectively meet the needs of the public.

## Scope

The scope of this project will be self-contained. The project does not have access to live data so will use provided datasets to develop its visual tools. The project will consist largely of data analysis and visualisation tools, manipulating the given dataset to present information to the user’s specification. The user interface will be intuitive and visually interesting, and will incorporate features such as heatmaps, robust filtering, zooming, and panning to effectively explore the data. Basic information about selected incidents will show when prompted, giving incident type, location, timestamps and severity description. All developed tools will be focussed towards the easier visualisation of the dataset. Any features outside this purpose will be outside our scope. The program will be written to allow for future scalability in the case of project expansion by the end-user within the triple restraint.

## Document contents \*\*WIP

From this point, the document will contain the work breakdown structure, detailing the tasks needed to complete this project, breaking them down to smaller manageable tasks. This organises the scope of the project, and outlines the deliverables which would otherwise be given to a client for feedback. We’ll use this outline to allocate an appropriate amount of time for these tasks so they can be completed at a high standard. The activity definition & estimation will give a more detailed view into the aforementioned tasks, and finally the Gantt chart will visualise the work process for the coming weeks.

<https://www.bitre.gov.au/publications/ongoing/road_deaths_australia_annual_summaries>

# Work Breakdown Structure

1. **Initial Phase**
   1. Define the Project Scope and Objectives
   2. Identify Stakeholders and their Requirements
2. **Planning Phase**
   1. Scope Planning & Work Breakdown
      1. Define Functional and Non-Functional Requirements
      2. Define Boundaries / Limitations of Project Scope
   2. Activity Definition & Sequencing
      1. Identify High-Level activities for Project
      2. Sequence Activities based on Dependencies
   3. Resource Planning
      1. Allocate Tasks to Group Members
   4. Time Planning
      1. Create Project Schedule / Gantt Chart
3. **Execution Phase**
   1. Design and Development
      1. User Interface Design
         1. Gather UI Requirements
         2. Develop Wireframes & Prototypes
         3. Review and Finalise UI Design
      2. User Interface Development
         1. Develop User Interface from Previous Designs
      3. Data Processing
         1. Develop Functions to Fetch and Process Data
            1. Function: For a user-selected period, display the information of all accidents within that period.
            2. Function: For a user-selected period, produce a chart to show the number of accidents in each hour of the day (average).
            3. Function: For a user-selected period, retrieve all accidents caused by a specific user-entered keyword.
            4. Function: Allow the user to analyze the impact of alcohol in accidents (trend over time).
            5. Function: +1 of our choice
      4. Visualisation Development
         1. Develop Graphical Visualisation Functions
         2. Add Interactive Features
   2. Testing & Quality Assurance
      1. Develop Test Cases
      2. Write Unit Tests and Conduct User Acceptance Tests
      3. Address Found Issues
4. **Support Phase**
   1. Create a user manual.

# Activity Definition & Estimation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Activity Definition & Time Estimation** | | | | |
| **ID** | **Activity Definition** | **Est. Time** | **Act. Time** | **Group Member** |
| ***Planning Phase*** | | | | |
| P-A1 | ***Scope Planning & Work Breakdown***: Determine the functional and non-functional requirements within the project’s scope. Develop use case diagrams / descriptions to visualise. | 1 Week | 1 Week | Jack Brighton Nicholas Webster |
| P-A2 | ***Activity Definition & Sequencing:*** Identify high-level tasks, create an activity list, and define the sequencing. | 1 Day | 1 Day | Jack Brighton |
| P-A3 | ***Resource Planning:*** Allocate tasks to group members based on their strengths. | 1 Day | 1 Day | Jack Brighton Nicholas Webster |
| P-A4 | ***Time Planning:*** Estimate approximate timelines for completion of tasks. Create a Gantt chart and identify critical paths. | 3 Days | 4 Days | Nicholas Webster |
| ***Execution Phase*** | | | | |
| Design and Development | | | | |
| E-DD1 | ***User Interface Design:*** Research designs for inspiration, develop wireframes and prototypes for each page, review and finalise the UI design. | 1 Week |  | Nicholas Webster |
| E-DD1-1 | ***Develop User Interface:*** Create a functional version of the user interface, following the previous designs. | 3 Weeks |  | Nicholas Webster |
| E-DD2 | ***Data Processing:*** Develop functions to fetch and process data requested by the user. Complete 5 stated required functions: (cont.) | 3 Weeks |  | Jack Brighton |
| E-DD2-1 | * For a user-selected period, display the information for all accidents within that period. |  |  |  |
| E-DD2-2 | * For a user-selected period, produce a chart to show the number of accidents in each hour of the day (on average). |  |  |  |
| E-DD2-3 | * For a user-selected period, retrieve all accidents involving a specific user-entered keyword. |  |  |  |
| E-DD2-4 | * Allow the user to analyse the impact of alcohol in accidents via a trend graph. |  |  |  |
| E-DD2-5 | * +1 function of our choice :) |  |  |  |
| E-DD3 | ***Visualisation Development:*** Develop interactive graphical functions such as scrolling, zooming, panning. Heatmap of accident locations. | 2 Weeks |  | Nicholas Webster |
| Testing & Quality Assurance | | | | |
| E-QA1 | ***Develop Test Cases:*** Develop test cases to check whether the project to this point has met its need. | 1 Week |  | Jack Brighton |
| E-QA2 | ***Write Unit Tests:*** Write unit tests checking that each variable is getting and setting information as expected. | 3 Days |  | Jack Brighton |
| E-QA3 | ***Conduct User Acceptance Tests:*** Stress test the application by attempting each combination of actions available on the platform. | 3 Days |  | Nicholas Webster |
| E-QA4 | ***Address Found Issues:*** Each test will reveal faults in the programming / project. Resolve these issues, optimize functions for faster building, execution, and response time. | 1 Week |  | Nicholas Webster |
| ***Support Phase*** | | | | |
| S-A1 | ***Create User Manual:*** Write a user manual so that clients have a comprehensive guide on using the program. Develop FAQ for common problem solving. | 3 Days |  | Jack Brighton |

# Gantt Chart