Mission Statement

*PEEWEE* (Predictive Environment for Easy Wayfinding with Enhanced Efficiency) is an application that informs drivers of real-time traffic congestion levels and incidents to help them better plan their driving routes before heading out of their homes, or when out on a journey.

Other mapping or navigation devices such as Waze do not provide the full information of the current traffic condition in real time, and our application seeks to remedy this issue.

This project will be considered complete when the application is being tested, reviewed, and approved by the Land Transport Authority. This project supports the government’s objective of harnessing publicly available data to help people make more informed decisions, contributing to the process of Singapore becoming a Smart Nation.

# Functional Requirements

1. Sign up page
   1. System must allow the user to create an account
      1. User must enter an email address and password to sign up for an account
      2. System must verify that the email address exists and is not registered under other users
      3. System must implement restrictions on the password complexity
         1. Passwords must have at least 8 characters, with at least 1 uppercase, 1 lowercase and 1 special character
2. Login page
   1. System must allow the user to log in to an existing account
      1. User must enter a valid email address and password
      2. System must verify that the email address and password entered are valid
   2. System must allow the user to reset the password if the user forgets the password.
      1. System must send an 8 digit OTP to the user via the registered email address to reset their password
      2. User must enter a valid OTP to reset password
      3. User must enter a new password that complies with the restrictions on the password complexity outlined in 1.1.3
3. Traffic Image page
   1. System must allow the user to view all real-time traffic images retrievable from the Traffic Image API
   2. System must allow the user to search and view real-time traffic images from specific traffic camera locations
      1. User must enter a valid location to search for a traffic image
   3. System must allow the user to view hourly and daily trends of the number of vehicles across all traffic camera locations and at specific traffic camera locations
4. Traffic Incident page
   1. System must allow the user to report incidents that occur on driving roads
      1. User must enter the incident type, incident time, incident and incident description to report an incident
         1. Incident type is restricted to accidents, roadworks, closures and slow traffic
      2. System must request to access and use the user’s current location as the incident location
   2. System must allow the user to view information of all the incidents reported in the past 24 hours
5. Traffic Map page
   1. System must allow the user to view real-time traffic congestion levels along driving roads, traffic camera locations and reported incident locations on google map
      1. System must assess real-time traffic congestion level by analysing real-time traffic images from the Traffic Image API
      2. System must allow the user to filter the map based on traffic camera types and incident types
         1. Traffic camera types include cameras at accident prone zone, city cameras and highway cameras
   2. System must allow the user to create driving routes
      1. User must enter a starting point and a destination to create driving routes
   3. System must allow the user to save their driving routes
   4. System must allow the user to view the number of traffic cameras and real-time congestion levels along a selected driving route on the google map

# Non-functional Requirements

1. Performance
   1. System must load results in 10 seconds.
   2. System must detect vehicles in traffic images for congestion analysis with a decent accuracy of above 70%
2. Scalability
   1. System must support simultaneous access for at least 100 users
3. Availability
   1. System must be available to users 99% of the time in a day
   2. System must not crash when the real-time Traffic Image API or google map API are unresponsive or unavailable
4. Usability
   1. System must use clear labels and prompts for easy navigation
5. Security
   1. System must not expose user’s password and data, such as saved routes, incident reports and search results
6. Compatibility
   1. System must be compatible with latest versions of web browsers such as chrome, firefox, safari, and edge

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## Data Dictionary

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| **Term** | **Definition** |
| User | A driver who utilises the application to gain real-time information on traffic congestion levels, trends of traffic congestion levels and locations of roadblocks to plan out their routes. |
| Account | An identity created for a user. Every user account has a unique email address and password. |
| Traffic congestion level | The level of vehicle occupancy in an area, which can span multiple roads. The system’s AI model will classify roads as high, moderate or low congestion. |
| Traffic camera | A camera currently operated to monitor vehicular traffic and its image data is retrievable from the Traffic Image API. |
| Traffic image | An image taken by a traffic camera that is retrievable from the Traffic Image API. |
| Driving road | A road that is mainly utilised by vehicles and which people are usually prohibited from travelling on except when crossing roads. |
| Accident | An incident that may result in injuries or damage that occurs on driving roads. |
| Roadwork | A driving road involved in construction works may be barricaded and barriers may be set up on the driving road. |
| Closure | A driving road closed by authorities cannot be used by the public. |
| Slow traffic | Traffic flow that is slower than what the user typically experiences. The speed of traffic flow is subjective to each user. |
| Real-time | Current time or not more than 20 seconds ago as the Traffic Image API retrieves images from traffic cameras every 20 seconds. |
| Driving route | A path on driving roads from a starting point to a destination. |

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