Hazard Analysis
Greenway

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Revision History

Date	Version	Notes
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Contents

1 Introduction

1.1 Background

1.1.1 Scope

The scope of the proposed software, Greenway, is a mapping software that not only gives fuel efficient directions to the intended destination but provides the user with fuel cost calculations. The intention is to calculate fuel costs using gas price data, car mileage information and terrain information to show how much money it will take to get to the intended destination using the most fuel efficient route.

1.1.2 Document Purpose

The purpose of this document is to identify potential hazardous components of Greenway and methods to mitigate these risks to an acceptable level. The following sections describe details of potential hazards in depth for each subsystem which also helps to understand how the system works as a whole to avoid these hazards.

1.2 Overview

1.2.1 Scope of Hazard Analysis

The scope of the this document covers all individual components that build up the entire system. These components include the "Car Selection System", the "Destination Selection System", the "Route Calculation System", the "Terrain Dat Collection System", the "Gas Price Collection System", and the "Fuel Cost Calculation System". The components mentioned each have their own safety considerations.

1.2.2 Definition of Hazard

Team Roadkill has defined their definition of hazard to be, " ".

2 Component Overview

Below describes each of the subsystems that make up the larger system.

2.1 Car Selection System

This component is responsible for allowing the user to input car data and collecting car information, such as mileage.

2.2 Destination Selection System

This component lets the user input the desired destination.

2.3 Route Calculation System

This component is responsible for calculating the most fuel efficient route to the destionation selected by the user.

2.4 Terrain Data Collection System

This component is responsible for collecting terrain data and providing it to the fuel cost calculation component.

2.5 Gas Price Collection System

This component is responsible for collecting gas price data from local gas stations.

2.6 Fuel Cost Calculation System

This component is responsible for calculating fuel cost taking into consideration fuel mileage data, terrain data, and gas price data.

3 Safety Considerations

3.1 Car Selection System

Issue 1: Incorrect input

Solution 1: The system will allow the user to change the selected car. And also allow the user to verify their pick before confirming it as there selected car.

Issue 2: Invalid input

Solution 2: The system will check if their car exists in the database. And let the user enter a new car if there current one isn't in the database.

Issue 3: Invalid data

Solution 3: The system will allow the user to verify if our estimate is sensible for their car. If it is not then the user can manually enter required data like mileage.

Issue 4: No internet connection

Solution 4: The system will prevent the user from using this system as that is required for the functionality of this system.

3.2 Destination Selection System

Issue 1: Incorrect input

Solution 1: The system will allow the user to change the selected destination. And also allow the user to verify their pick before confirming it as there selected destination.

Issue 2: Invalid input

Solution 2: The system will check if their destination is valid(reachable by car and exists on the map) before letting them set it as their desired destination.

Issue 3: No internet connection

Solution 3: The system will prevent the user from using this system as that is required for the functionality of this system.

3.3 Route Calculation System

Issue 1: Invalid output

Solution 1: The system will validate the output with estimation tools built into to it ensure that the route is a acceptable range.

Issue 2: No internet connection

Solution 2: The system will prevent the user from using this system as that is required for the functionality of this system.

Issue 3: Hidden Costs

Solution 3: The system will ensure that the user know only fuel efficiency is being used to calculate the given route and it does not necessarily ensure the cheapest route to take.

3.4 Terrain Data Collection System

Issue 1: Invalid output

Solution 1: The system will validate the output with external database to ensure that the data is in a acceptable range.

Issue 2: No internet connection

Solution 2: The system will prevent the user from using this system as that is required for the functionality of this system.

Issue 3: Extreme Weather

Solution 3: The system will ensure that the user knows weather situations can make a certain route undesirable to take and that they should do research before going on specific routes.

3.5 Fuel Cost Calculation System

Issue 1: Invalid output

Solution 1: The system will validate the output with external database to ensure that the data is in a acceptable range.

Issue 2: No internet connection

Solution 2: The system will prevent the user from using this system as that is required for the functionality of this system.

Issue 3: Fuel Cost changes

Solution 3: The system will ensure that the user knows when the application got the fuel prices and that there might be certain inaccuracies with the estimation considering that prices are changing constantly.

4 FMEA Worksheet

5 Conclusion

In summary, it is important to realize the potential hazards of each function to avoid potential risks and negative experiences for the user. The above document contents highlight important safety considerations along with risks/failures for each function. This will ensure the program is developed with expected behaviour.