**Traffic Monitoring Application**

**Team:**

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| **Name** | **Student ID** |
| Akhil Varupula | 025534780 |
| Jaya Krishna Kalavakuri | 026374853 |
| Kiran Kumar Reddy Panjam | 026642549 |
| Varun Lingabathini | 026626468 |

**Instructor:** Prof. Roman [Tankelevich](javascript://)

**Customer Requirements**

Today the advancement of technology has a positive impact on the traffic. There are many services which provide information about traffic like Google Maps, Apple Maps, Yahoo maps. According to the sources maximum number of users and also industries are using Google Maps services which is considered accurate than other services available in the market. Rather than using the previous traffic data and estimating the traffic, current days Maps use Satellite, GPS for giving the traffic updates to the users.

Our project attempt is to give more efficient information to user by making use of the modern techniques which include GPS tracking and satellite pictures. Taking traffic data in a particular route for many continuous days will give you more or less the idea about the traffic in any particular time, same idea can be used to study day light, weather, vision ability in the particular area. Giving these details to the user will ensure he makes the necessary arrangements in advance for those conditions. By these techniques we cannot update the traffic congestions, accidents that happen on the road because these cannot be estimated earlier. If a traffic congestion or an accident took place in the particular route, it should be intimated to the user as it happens and suggest him an alternate route if available for travelling to the destination. Giving live traffic updates to the user is the main focus in our project, which will ultimately help the traffic problems not only to the user but also to the others travelling in that route by reducing the congestion. These all factors should finally able to help the user to travel to his destination making the correct route choice.

Collection of data and producing the required output shouldn’t be a one time process but should keep on updating the information to get the latest update required, following this will enhance the end user experience in using this project. Our data collection is not limited to any area, we include all the routes where traffic is usually experienced by the people travelling along those routes. This will not only help the public but also the government officials and people involved in traffic management to take preventive steps in reducing the traffic congestion and accidents in those particular routes. In many places commuters use public transport as their means of transport on daily basis, for them we would provide the timings of the public transport by studying the previous data of those transport which include the time and usual early and late time on a particular route, so that the user would be able to save time by using this information. If traffic management people use this data wisely, they may be able to take eradicate traffic by employing new traffic rules or by expanding the lanes on the road to avoid traffic congestion.

A user is able to get the traffic details in the following way;

* + Select the region he would like view
  + Enter the Start point
  + Enter the destination
  + Enter the time during which he wanted to travel
  + Enter the mode of transport such as car/van/motorcycle/public transit

If the user is able to enter these details exactly, he can be able to view the possible routes to travel to his destination, also the traffic on the route and time to reach the destination. The user will also be given the weather update and visibility along the route he chooses to travel.

These features will be enabled for the user on the front end and at the back end, the data study like getting the possible routes and getting the weather and visibility updates from the previous data, it also processes the traffic updates on that route and gives them to the front end in the form of notifications. This application is also available as mobile application on Android and IOS platforms, this mobile application will make use of the GPS available on the device to get the source location and update the time accordingly, these details help in getting the data accurately and easily reducing the work of the user to enter those details explicitly.

In this application we also use a feature for the user to broadcast the information which he finds helpful for the others travelling along the same route. This will help in reducing the traffic congestions to a more extent by updating the fellow drivers about the traffic in that route.

**Casual Use case Description**

**Map Interface**:

A User-friendly interface which displays an animated satellite view of the locality should highlight the roads, user location, destination, and optimal route while casting down other unnecessary details. The map interface must give a pop-up report by accessing updated or reported traffic alerts.

**Directions**:

The application must request the user to answer a few questions about time, date, and the weather in their current location, and then should request for their destination. By comparing the data from other users and calculating optimal route the interface should provide the directions and other information’s like traffic jam and change of route to the destination.

**Estimated time**:

The application must provide user with estimated time to reach the destination by calculating the distance, traffic flow, and other information’s like weather, traffic history, and reports.

**Traffic data**:

The traffic data should be provided to the data base for using its information for recording and providing info to other users under traffic services. It is connected to the Administrator.

**Traffic history**:

Traffic history is noted in the database for future references and uses with date, time, and weather inputted by the user at the start of the application.

**Weather data**:

Same as Traffic data the weather data should be provided to the data base for using its information for recording and providing info to other users under weather services. It is connected to the Administrator.

**Traffic changes report**:

This allows the users to report the traffic data in their location if there are any changes or incidents in the traffic. This will be reported to the database which will update the routes of other users who are going through that location.

**Weather changes report**:

This allows the users to report the weather changes in their location. This will be reported to the database which will update the weather info to other users who are going through that location.

**Mobile report**:

Gives the user with updated reports in routes and weather in a location or area through mobile application.

**System Requirements**

**Functional requirements:**

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| **S. No.** | **Identifier** | **Requirement** |
| 1 | REQ1 | System should allow user to enter the "target zip code", "time", and "weather" to receive the desired traffic reports in a region. |
| 2 | REQ2 | System should allow user to enter "source & destination" as well as "time" to get desired traffic reports along a specific route. |
| 3 | REQ3 | The System uses weather collection and traffic collection services which are implemented using two different classes and are only accessible by the administrator but not users. |
| 4 | REQ4 | The "weather collection" service will help in retrieve data from weather forecasting service such as "Wunderground.com" |
| 5 | REQ5 | The "traffic collection" retrieves data from live traffic monitoring services, such as "511nj.org" or "traffic.com". |
| 6 | REQ6 | The system should allow user to warn the future drivers about the traffic intensity through a radio button to send the information to the database. |
| 7 | REQ7 | The system should allow users to share their current traffic status at any time. |
| 8 | REQ8 | In Addition to traffic monitoring service used in computers, there should be a mobile component for the traffic report system which allows users to use the system providing flexibility to the users. |
| 9 | REQ9 | Location services must be explicitly available on the smartphone to collect the location along with network connection. |

**Non-functional requirements:**

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| **S. No.** | **Identifier** | **Requirement** |
| 1 | REQ10 | The system shall provide a user-friendly, hassle free and easy to understand web page. |
| 2 | REQ11 | The system shall secure user private data such as locations while generating traffic reports. |
| 3 | REQ12 | The system shall have no downtime to produce accurate reports at any given time. |
| 4 | REQ13 | The system shall be able to handle multiple input and output operations while collecting data and generating reports. |
| 5 | REQ14 | The system shall allow admin to perform changes to database when needed to allow increase in usage. |
| 6 | REQ15 | The system shall be updated or upgraded when needed to provide efficient and accurate data. |