**2.1 Introduction**

Vehicle tracking system is used to track a vehicle using GPS and GSM and notice if it is being stolen, also to stop it if required. This system can also be used for Accident Detection Alert System, Soldier Tracking System and many more, by just making few changes in hardware and software. Tracking of vehicle is a process in which the vehicle location is extracted in form of Latitude and Longitude (GPS coordinates). GPS Coordinates are the value of a location. This kind of Vehicle theft detection system Project is widely used in tracking Cabs/Taxis, stolen vehicles, school/colleges buses etc.

**2.2 Purpose**

This Software Requirements Specification (SRS) specifies the requirements of vehicle theft detection system project which will be used in the required fields. The purpose of this document is to present a detailed description of the software and the hardware of this project. It will explain the purpose and features of the it, the importance of the code, what it will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for everyone.

**2.3 Document Conventions**

IEEE international conventions were followed while writing this document. Font used is **Times New Roman**. The size of the font used is 12 for all the headings, sub-headings and content.

**2.4 Intended Audience and Reading Suggestions**

This document is intended for, students, professors, and every other individual who needs it. This SRS contains the details of the Vehicle theft detection system and all the concepts and technologies used to build it.

* 1. **Project Scope**

Automobiles are necessary for the movement of goods and people from one location to another. Consumers may face several problems which may cause delays in the delivery of goods. This delay may be due to drivers choosing incorrect or longer routes when delivering. To avoid these challenges, the Global Positioning System (GPS) is increasingly being used for management of vehicle fleets, recovery of stolen vehicles, mapping and surveillance. This paper outlines the design and implementation of a real-time GPS tracker system using Arduino. When a user makes a call on the number that is registered on the GPS-GSM shield attached to Arduino, the user receives the location coordinates of the vehicle.

* 1. **Overall Description**

A Vehicle theft detection system is a device that is fitted in a vehicle, to enable the vehicle owner to identify the vehicle's location. This paper proposes the design of a vehicle theft detection system that utilizes GPS and GSM technology. This system built based on an embedded system, can be used for tracking and any car through GPS - Global Positioning System and GSM - Global System for Mobile Communication. This system will continuously monitor the location of a moving vehicle and report the status of the vehicle on demand

A remote monitoring system based on SMS and GSM was implemented, inclusive of the hardware and software designs. This project notes that the remote signals can be transmitted through the GSM network as shown in Fig 2.1 [1].

Fig 2.1: Vehicle Theft detection system

* + 1. **Project Perspective**

The GPS receiver and GSM modem utilizes Arduino UNO. The system is affixed to the vehicle. A GSM mobile phone can be used to send and receive the information. Therefore, the GPS system will send the longitudinal and latitudinal values corresponding to the position of vehicle to the GSM Modem. If for example, an individual forgets where their vehicle is parked, an SMS can be sent to the vehicle GPS, The SMS sent would be transmitted through the GSM service provider, thereby reaching the vehicle. The vehicle will have a GSM device installed, which includes a SIM card. Through the GMS modem, the SMS will be received and sent to the Arduino UNO in the vehicle. Upon receipt of the message, the Arduino will perform the request required by the owner by sending the longitude & latitude, showing the location of the vehicle

## Project Functions

This project, has several features which will allow users to use functionalities which have been explained above.

In this project, Arduino is used for controlling the whole process with a GPS Receiver and GSM module. GPS Receiver is used for detecting coordinates of the vehicle, GSM module is used for sending the coordinates to user by SMS. And an optional 16x2 LCD is also used for displaying status messages or coordinates. We have used GPS Module SKG13BL and GSM Module SIM900A.

## User Classes and Characteristics

There can be many user classes that will use this product, such as, companies or organizations and some individuals who'll use it to achieve their personal objectives. According to the usage, security related organizations may use this project mostly.

## Operating Environment

Operating environment for this project is as listed below.

• Operating system on phone: Any

• Vehicle and mobile in GSM network coverage area

• Constant power supply for the hardware

## Design and Implementation Constraints

## This project is dependent on the GSM and GPS module performance. If required hardware doesn't satisfies software specifications then it would act as a barrier in implementation. So, it must be made sure that the phone used with the project is in good network area. So that it can send receive messages.

# External Interface Requirements

This chapter is the outline of the various Inputs and Outputs of this project.

## User Interfaces

There isn’t much but a 16x2 LCD panel which will show the longitude and the latitude of the GPS module, just for the purpose of explanation. The rest of the working is done through phone’s default messaging app. The user will interact with the project with the help of registered mobile phone.

## Hardware Interfaces

As already been stated, the three major parts of this project are: Arduino UNO, GSM Module and the GPS Module. An LCD panel has also been installed for explanation purposes which show the longitude and the latitude of the GPS module.

* + 1. **Software Interfaces**

We have used the Proteus Software for the simulation if this project. Arduino IDE is used to program the Arduino UNO. There isn’t much more but the underlying code which interfaces all the modules with Arduino UNO and tells them what function to do.

* + 1. **Communications Interfaces**

As it has already been stated, Network connection for both the GSM, GPS modules in Arduino and Mobile phone is obviously necessary for a complete operation. The communication between the different parts of the system is important since they depend on each other. However, in what way the communication is achieved is not important for the system and is therefore handled by the underlying operating systems and different technological parts.

# Other Nonfunctional Requirements

Following are the requirements that specify the criteria that can be used to judge the operations of this system.

## Performance Requirements

It is mandatory to have a good network connection and to place the hardware properly and in safe condition so that it cannot be damaged easily. If it is not running properly, then it means that the system is not able to run i.e. system is not matching software needs. The accountability is also a vital feature and this could only be assured if the system is working in full capability.

## Safety Requirements

This project can’t be operated everywhere, so it should be taken care as a safety measure that it will run in specified specification only. If this safety is not considered then it can damage the project and maybe the whole system.

## Security Requirements

The security system is very critical path. Only the pre-registered mobile phone can receive the data of the location of the vehicle, else it can be used in bad ways.

## Software Quality Attributes

The source code of the project is going to be open. It will be free for further modifications and improvements.

**2.9 Summary**

In this chapter SRS of the system was discussed and the description of the software to be built was provided. The chapter laid out functional and non-functional requirements, and described a set of use cases that describe user interactions that the software must provide to the user for perfect interaction. This chapter held the key to stablish the basis for an agreement between the user and the system on how the project should function. Quality Attributes and safety requirements were noted out to let the user consider hazards and take precautions while interacting with the system.