**Device flowchart**

START VEHICLE

ARDUIONO TURNED ON, ALL VARIABLES SET

RPM ALERT

RECEIVED SMS

OPEN BONNET ALERT

EXTRACT CLIENT NUMBER & MSG

RPM > 70

SMS =‘FIND CAR LOCATION’

TURN GPS ON

END

COORDINATES   
FOUND?

APPEND THE COORDINATES   
TO A URL AND SEND AS SMS   
TO THE CLIENT NUMBER

YES

YES

SEND ALERT MESSAGE TO   
CLIENT NUMBER

BONNET  
OPPENED?

YES

NO

NO

YES

NO

RECEIVE LOCATION   
COORDINATE FROM SATELITE   
(LONGITUDE AND LATITUDE)

NO

SEND ALERT MESSAGE TO   
CLIENT NUMBER

DISPLAY COORDINATES ON SCREEN

***Program Pseudocode***

Function loop

check sms message  
if true  
next SendGPS  
check RPM  
if RPM > 70  
send speed red zone alert to client as an sms to client  
check vehicle bonnet  
if vehicle bonnet opened  
send bonnet opened alert as an sms to client  
end of loop

function SendGPS next

compare received message to ‘find vehicle location’  
if true   
turn gps on  
 receive location coordinates from satellite(longitude and latitude)  
if coordinates found  
append coordinates to a url and send as sms to the client  
display coordinates on lcd.

***Algorithm***

Step 1: Start  
Step 2: Declare variables state,timegps,latitude,longitude,message,phone  
 vehicle\_req, data, DEBUG, MESSAGE\_LENGTH, vehicle\_req,serial

Step3: Receive sms  
 message = received\_msg

Step4: if message = ‘find vehicle location’  
 serial = "AT+CSMP=17,167,0,0"  
 serial = "AT+CMGF=1\r"  
 serial = AT+CGNSPWR=1  
 serial = AT+CGNSSEQ=RMC  
 serial = "AT+CGNSINF"  
 serial = "AT+CMGS=\"  
 serial = phone  
 serial = <http://maps.google.com/maps?q=loc:>  
 serial = latitude  
 serial = longitude

Step5: stop

The main power supply for the gps device will mainly have its source from the vehicle 12v battery. The gsm module and the arduino will both have a separate channel for device powering since the datasheet for arduino on its power voltage tolerance is between 7v -12v but the 12v gets the on-board voltage regulator very hot and I would want to provide a decent ventilation and maybe an extra heat sink.

In stepping down the 12v power supply to 7v of the arduino board, I will be using a voltage divider of two resistors with resistor ratio (0.71:1). By using this ratio, I’m able to step down 12v to the desired 7v which is capable of powering the arduino board. However all other peripheral modules such as the bonet and the fuel sensor which are connected to the arduino will be supplied with 5v for powering.