# Idea/Approach Details

Technology Bucket : Software – Mobile App Development

Company Name : Min. Of Road Transport

Team Leader Name : Shrey Jasuja

Category : Software

Problem Code : MO5

College Code : U-0841

# Proposed Solution

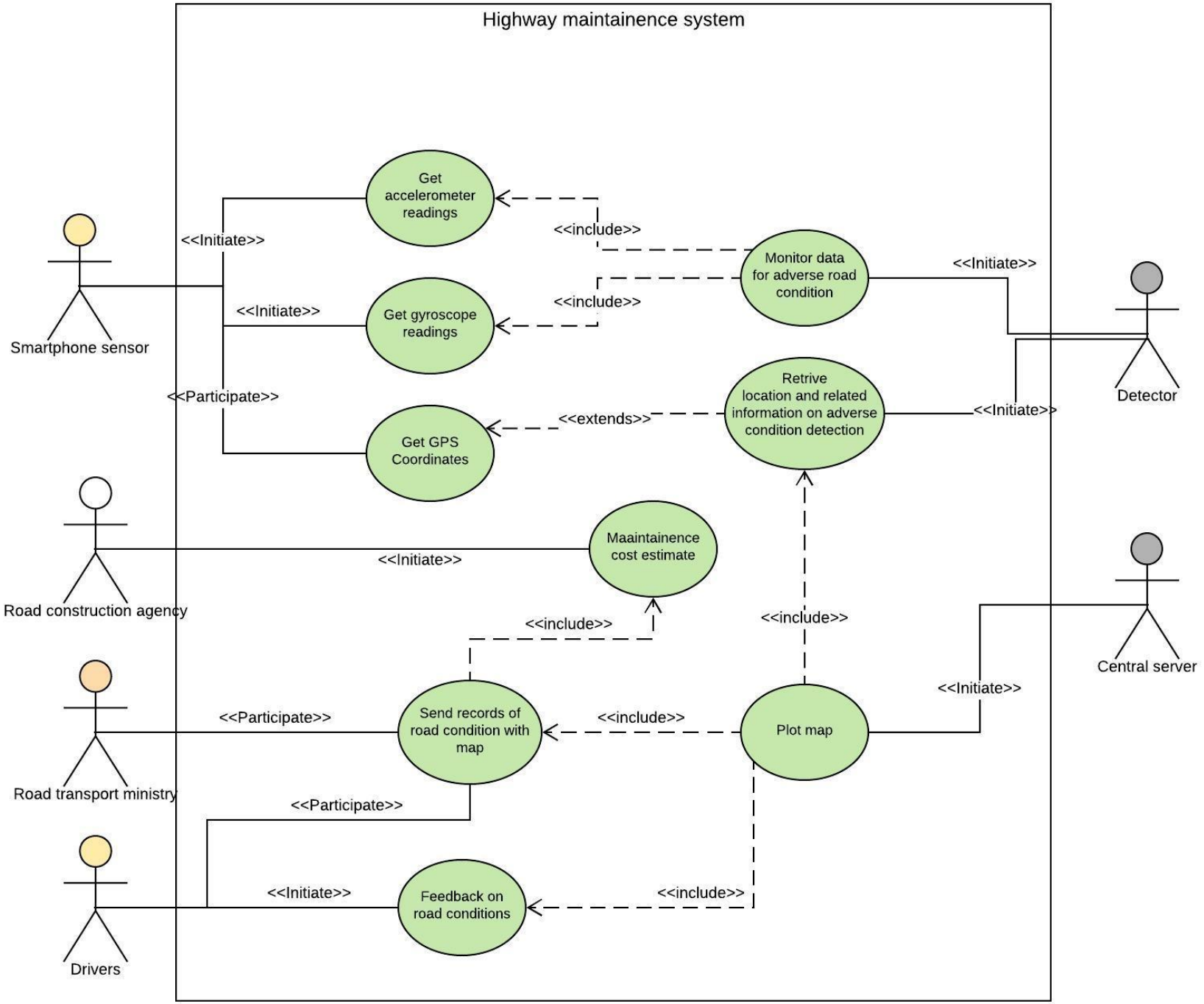
To realise the objective we suggest the following model:

- Using crowd-sourced data from smartphone sensors like accelerometers, gyroscope, and GPS to map potholes and rough road conditions.
- The above-mentioned sensors obtain outputs in form of graphical variations which can be analysed using machine learning / AI to detect whether it is a pothole or rough road conditions. We have gone through several research papers which support this implementation.
- Also the intensity of variations help in determining which kind of repair is needed i.e. The app can tell the exact road conditions and appropriate maintenance which is required.
- Whenever such findings are obtained they can be marked up using GPS coordinates of mobile phones. Mapping can be even more accurate by having a threshold that after a given no. of times a pothole or rough road conditions are reported in a given location it will be mapped.
- The details regarding road conditions will be made available to government agencies such as PWD, NHAI to carry out essential maintenance work and ensure safer roads.
- Since all locations will be mapped according to location coordinates this can help in determining the area of stretch on the road on which repair is needed. Thus using the available past trends of maintenance costs we can estimate the budget needed for repair and initiate tender allocation process automatically accordingly.

# Technology Stack:

- Android Studio ( for building an Android App)
- Google Maps API
- Cloud Server
- Python and some of its libraries;
    1. Pandas, NumPy
    2. Tensorflow, OpenCV
    3. Matplotlib
    4. Keras
    5. Scikit Learn

# Use Case Diagram



# Dependencies / Show Stopper

- Centralised Cloud Server.
- Smart Phone Sensors:
  - Accelerometer
  - Gyroscope Sensor
- Cost for repairing of road at different conditions which was done in past.
- Labelled data set of gyroscope and accelerometer readings which can be classified to tell the exact condition of the road.