Project Design Phase-I
Proposed Solution Template

Date	24 September 2022
Team ID	PNT2022TMID39434
Project Name	Project -Signs with Smart Connectivity for Better Road Safety
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Road traffic issues moreover has become the backbone for major injuries,deaths in recent times. The problem lies between negligence and the false approach towards the better analysis of traffic events.The liability of road accidents supposed to be varied due to various reasons such as drunken driver,natural cause (weather conditions),the lack of visibility pedestrian crossings,brake failure etc.,It is at ease to find remedy it factors could be analysed and act it to take right measures.To avoid road mishaps,it is not enough to just improve road conditions but also need to control the traffic accidents and congestion,the cause-and-effect regulations with the smart sign connectivity in traffic signals. Proposed solution: To avoid the traffic congestions and reduce the accidents and to save the lives we propose the three major solutions such as follows: 1)Density based traffic control systems with smart sign connectivity. 2)Smart pedestrian crossing connectivity with traffic signs. 3)Intelligent real time pothole detection and warning system for automobile application based on IOT.
2.	Idea / Solution description	**Changing Traffic signals According to the density of the vehicle in the lanes** To reduce the traffic congestion in a

		particular lane we introducing automatically changing traffic signals according to the density of the vehicle in the lane, for example: Consider a four lane Junction, where lane-A, B, C, D respectively. If lane A has 15 vehicles, B has 10 vehicles, C has 7 vehicles and D has 2 vehicles. Green signal should be prioritized to the higher density lane. Signal towards A should be change into green within 15 sec and last for 30 sec, signal towards B should be change into green within 25 sec and last for 20 sec, signal towards C should be change into green within 35 sec and last for 15sec and signal towards D should be change into green within 40 sec and last for 10sec. This helps to easily config the traffic signals. **SMART PEDESTRIAN CROSSING CONNECTIVITY WITH TRAFFIC SIGNS**: To reduce the number of traffic accidents that occur in many busy areas SMART Pedestrian crossings have been designed and by this way increase safety for pedestrians. This technical solution functions with a series of sensors which detect movement every time someone is crossing or about to cross. The light panels on the floor connected to these sensors immediately light up and help drivers see in an easier and quicker way that there is a pedestrian crossing. And also using the traffic signs automatically changing to red signal can make it even more clear and understandable to drivers that they must stop because someone is crossing the street. This solution mainly addresses the lack of visibility in pedestrian crossing situated in some busy zones of city. This solution is in the use of sensors to detect movement around pedestrian crossing. When movement is detected, this information is sent automatically to the smart sign connectivity in traffic light and ON the light and wait until the pedestrians cross the road. Near the both ends of pedestrian crossing a vertical light panel will glow until the pedestrians cross from one end to another end.

		<u>Updates regarding about the state of roads such as potholes and climate change</u> 3. The problem of this project is to potholes and climate change. So basic concept to solve this is that to detect the potholes and the change in climate and then convey the intermediate person to maintain the speed if the user is connected to internet and for the user who are not connected to the internet will receive the information by the digital board placed at a particular interval of distance. Step1: Detect the climate change through the open whether map Step 2: Indicate the user to maintain the speed levelthrough the MQTT protocol where the particular channel needed to be subscribed by all the user(connected to internet users) and even through the digital board of the high wavelength font colour for long distance view placed at equal intervals of distance (not connected to internet users).
3.	Novelty / Uniqueness	**1.** By this Idea the camera analyses the number of vehicles in the lane and decrease the red signal time and Increase the Green signal time. This majorly useful in developed cities where frequently more traffics are occurring. **2.** In current existing solutions for smart pedestrian crossings, it uses light panels and sensors for detection of pedestrians crossing the road Whereas in our idea, we use the sensors which detect the pedestrian crossing and also it will update info the connected devices and smart sign boards. It will also change the traffic signals accordingly. 3. The existing system just deals with the climate changes and inform the user. In our project we detect the climate change and convey about the safety measures to be followed users.
4.	Social Impact / Customer Satisfaction	1. The benefits of this idea is to clear the traffic as soon as possible. By this it first tries to clear the lane which has a greater number of vehicles. So there no more waiting time in the traffics. 2. The main benefits of implementing this solution are an improved and higher traffic safety, therefore a decrease in the number of accidents. This system of pedestrian crossing affects very **POSITIVELY.** Since it

		increases the visibility and reduce the accidents. In Spain, there are many cities already using this system, it can be adopted in major cities. Automated pedestrian detection provides more timely pedestrian indications and ensure that **visually impaired** pedestrians also have enough time to safely cross the road. 3. With the implementation of our project customers can travel peacefully at all type of climatic changes because of the earlier intimation.
5.	Business Model (Revenue Model)	1. It doesn't require more cost because in most of the junction already contains camera in the top of the signal towers, we just analyse the number of vehicles in the lane by a Python code and change the signals accordingly with the help of IOT. 2. This type of technical solution could be applied in any town or urban cities as it does not require a very high amount of money to be installed or to be maintained. It is believed that it will be adopted by the government in the upcoming years. The intelligent cost for this Intelligent Transport System (ITS) cost **1.20 lakh/set (INR)** approximately. Operating costs are approximately **3.25 lakh** per year. Adding smart sign with the existing pedestrian signal can range from (**5-8 lakh) INR** per crosswalk. 3. This technical solution can be easily implemented as it only have less installation cost, The operational cost for this smart pothole detection and warning it cost around 2-3lakh /set (approximately) also it will have more accuracy of about 85-90%, implementing this solution leads to the wide range of communication link and also internetwork system control which helps to update the informations with reduced cost. The installation of digital smart sign boards cost about (1.5lakh) approximately which helps to drastically reduce the accidents and vehicle collision
6.	Scalability of the Solution	1. Most of the people are struggling in the traffic signal by waiting for a long in the same lane. They can be cleared by this idea. 2. A pedestrian crossing in road is an essential infrastructure in the part of transportation which help to serve in the security and saving life of million people

		and possessions and helps flow in order of traffic in roads. This IOT based smart pedestrian crossing system has high scalability and integrity which helps in reducing unpredictability in determining the behaviour of the pedestrians while crossing the road. It will have high range of accuracy nearly 80% and it is cost effective of the current system. It is expected with this technical solution issues and hazards associated during road crossing will be eliminated. 3.This project highly feasible one as it's very easy to implement with low cost environment.