

Ideation

Date	07 November 2022
Team ID	PNT2022TMID07704
Project Name	Signs with Smart Conectivity for Better Road Safety
Maximum Marks	4 Marks

Idea 1:

Smart connected Signs for Improved Road Safety

In present Systems the road signs and the speed limits are Static. But the road signs can be changed in some cases. We can consider some cases when there are some road diversions due to heavy traffic or due to accidents then we can change the road signs accordingly if they are digitalized. This project proposes a system which has digital sign boards on which the signs can be changed dynamically. If there is rainfall then the roads will be slippery and the speed limit would be decreased. There is a web app through which you can enter the data of the road diversions, accident prone areas and the information sign boards can be entered through web app. This data is retrieved and displayed on the sign boards accordingly.

Technology for Road Safety

Speed Indication Display

Warning signs can be beneficial for road users. The speed indication displays – that serve as a warning sign – are digital speed boards which are installed on roads for identifying whether a vehicle crosses the speed limit or not. These devices are

installed along with a radar sensor, and can evaluate the speed of the vehicle, which is displayed on the LED displays, visible to all vehicles. Today, a wide range of speed indication display devices is available; while some display the vehicles which are driving under and over speed limits, others display the real-time speed of each vehicle. At times, the device captures and stores images of speeding vehicles. Speed Indication Displays have been implemented in Singapore and UK, and the Indian Government has already suggested the installation of these devices in its scheduled 'Integrated Traffic Management System'.

Variable message signs

Variable message signs are LED boards which display vital information to commuters. These signs are installed in Indian cities such as Bangalore and Hyderabad. Delhi is also planning to install the sign in the near future. As a result, it serves of value to road users as they are able to receive the latest updates on the road and traffic conditions, especially that of vehicle breakdowns and traffic congestion.

Idea 2:

Basic elements of an effective automated traffic enforcement PPP Model

- a. A study to identify the intersections or road sections that have a history of injuries or fatalities with the sole goal of improving road safety at these sites. The study should confirm that – besides safety cameras – a range of road safety countermeasures have been considered and thoroughly evaluated for effectiveness.
- b. A private party – either a supplier or a third party who is willing to supply the safety cameras for usage at no upfront charge to the public party, which could be a municipality, county, province, state, or nation, and provide a service to issue tickets and collect fines for traffic violations recorded by the safety cameras.
- c. A contractual arrangement between the public and private party, allowing the private party to recover its investment over time by receiving an agreed and capped share of the revenue generated by the safety cameras. This contractual cap should not prevent the private party from issuing further tickets, which means a reasonable per ticket fee to cover the private party's additional costs should continue once the cap is reached.
- d. No citations may be issued unless an authorized official has verified the offense after viewing the image or video of the incident.
- e. The end-to-end integrity of the enforcement system (from cameras to back office processes) must be guaranteed to ensure public trust and optimise efficacy and efficiency. An independent third party must be hired to formally approve and authorise usage, but also routinely inspect, verify and calibrate each camera to confirm the intended measurements and performances. An independent party should also monitor, inspect and verify that the

entire enforcement process from violation registration to fine collection takes place according to agreed-upon performance and integrity indicators.

f. A clearly publicized campaign that promises that the sole objective of the automated enforcement operation is road safety improvement, and that all revenue above the expenses incurred by private parties (camera supplier and operator as well as the third party hired to audit the cameras and enforcement processes) will be reinvested only in road safety related projects.

Idea 3:

Reinventing the Traffic Light

Automated three color traffic lights have been around since the 1920s. They are usually round in shape, since incandescent round bulbs were used at their center.

A recent technological improvement has been the switch from incandescent bulbs to LEDs. Although costlier in the short run, LED traffic lights have several advantages:

- More energy efficient (up to 98%).
- Low power consumption allows for battery backup in case of power outage. This improves safety and traffic flow during power outages.
- Very long life (5 to 10 years) as opposed to 1 year for incandescent. Maintenance cost savings.
- They do not just burn out, they slowly lose intensity. No down time due to burnt bulbs.
- No need for rear reflector. Eliminates the problem of false showing due to sunlight entering and being reflected back.
- Much brighter than incandescent, makes them easier to see in daylight and through rain and snow.
- The green light can be used for both left turn signal and straight through traffic (by selectively turning on some LEDs and then all of them). This allows for easy and cost-effective deployment of the left turn signal — a benefit for intersections that would otherwise not have justified the extra cost.

In-Vehicle Sensing

A possible setup for in-vehicle sensing comprises three elements: an OBD-II dongle, a dedicated sensor, and a smartphone. We evaluated two OBD-II interface alternatives: munic.box's Munic3 4G-cat4-WBT dongle and ScanTool's OBDLink MX Bluetooth. Both performed as desired on the tested vehicles. The dedicated sensor was Aaronia's GPS logger, which combines sensors for GPS localizations, compass, accelerometer, gyroscope, and altimeter with pressure sensor. The logger does not have wireless communication capabilities but can be connected to a PC through USB.