

ENHANCED SMART ROADS

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ABSTRACT:

Roads are the connecting paths. Road accidents are one major cause for loss of lives now days. Over speeding is one of the crucial reasons for road accidents among the others. We are here with a solution to control over speeding of vehicles technologically, to further minimize road accidents.

Design of roads with technology implementations mostly with interdependency with IOT is the role. The road construction is based on the smart road constructions which are prevailing these days. Friction is the main part here. Kinetic friction comes in contact when vehicles move, so that the static friction is nil or very less. So here, when vehicle over speed a certain speed limit, the kinetic friction is been changed to static slowly by making disturbances in the roads. These disturbances are like the moving plates, and not permanent disturbances like speed breakers. These disturbances arise from roads only when the vehicle crosses the specified speed limit (which is specified and controlled by using IOT indulged speed detectors and regulators).

The plates are designed in the way like folding and unfolding. So these are horizontal stepped plates. These horizontal steps fold and seem to be as a normal smooth road when vehicles speed is normal. Once the speed rises, the plates unfold and steep horizontally which brings in static friction and gradually decreases the speed of the vehicle. These horizontal steps act as temporary disturbances.

IOT designations for speed controlling in relation with this is the major part here. Arduino designations are done for speed detection of vehicles. These arduino are not only one to be used. An inter dependency of arduinos are done, with one linked to other and speed is detected and the specified speed limit is set during arduino coding.

Let's have an example here, if the average fixed speed is 60 kmph to 65 kmph,

Case 1: when the vehicle passes with speed 40 kmph, then there will not be any change.

Case 2: when the vehicles passes with speed 62 kmph, then there will an alarm from buzzer which will be connected to signal from arduino.

Case 3: when the vehicle speed exceeds 65 kmph, then the vehicle will automatically slow down due to the disturbance from unfolding of horizontally stepped plates.

Energy for the plates to fold and unfold is created from the interior by the process of Piezoelectric Effect. It is the ability of certain materials to generate an electric charge in response to applied mechanical stress. So here, the mechanical stress would be produced from movement of vehicles in the mode of vibration. So by this, piezoelectricity will be produced.

The road is laid in layers of these integrations. The 3D roads with integrated IOT concept with dimensions of,

- Speed detection and control
- Piezoelectricity production
- Horizontal stepped plates as temporary road disturbances.

If this technique is applied in smart roads , it would decrease over speeding of vehicles and minimize accidents caused due to over speeding.