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INTELLIGENT TRAFFIC DELINEATORS

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Technical task:
Traffic guidance posts use reflectors to indicate the course of the road at night. Intersections are marked with yellow reflectors.

Initial situation:
The course of the road and specially marked junctions are visible. No information about possible dangerous situations is passed on.

Solution:
Intelligent traffic guidance posts are introduced, which have an energy store, a transmitter and receiver, lighting and an energy supply in the form of a photovoltaic panel. The delineator can communicate with passing vehicles via the transmitter and receiver. The lighting can radiate different colours. The energy storage unit supplies the transmitting and receiving equipment as well as the lighting with energy and can be charged during the day with the aid of the photovoltaic panel.
A passing vehicle can exchange data with the reflector post. Based on this data, the lighting of the delineator can be activated.
If the driver detects pollution, game passes or other dangers for subsequent road users, he can manually communicate the information to the vehicle. The vehicle then passes this information on to the nearest reflector post. Subsequent vehicles are visually warned.
A rechargeable battery is installed in the base of the delineator to store energy. The photovoltaic cell is mounted at the top of the post and aligned in such a way that the maximum energy input is achieved. The receiving and transmitting equipment should be based on an energy-saving concept and be able to cover ranges of up to 100m in order to allow adequate time for data exchange with the vehicle. Examples of this would be
WLAN, or high quality Bluetooth (Class I) suitable technologies. The lighting can, for example, be realized by LEDS.

Advantages:
Especially on unintelligible routes, following drivers are effectively warned of dangers. Serious accidents can be avoided. Road safety at night is significantly increased. Especially motorcyclists who have problems with visibility at night on roads that are not clear can be protected in this way.

Possible application:
If the driver drives in darkness or other bad visibility conditions, he has the possibility to inform the vehicle of discovered dangers. The vehicle then begins to contact the nearest reflector post via its transmitter/receiver module. The type of danger is transmitted (or the colour to be emitted by the LED). The LED of the delineator is now activated. Following drivers are warned.

Various dangers could be quantified as follows:
Game change (red)
Pollution (Orange)
Aquaplaning (Blue)
Iced roadway (purple)

The delineator has a meaningful design with a facility for time recording. For example, a defined active time of the LED is linked to the type of danger.
For game passes, for example, a time of 30min or 60min can be set. For aquaplaning, for example, a period of 1h - 2h can be specified.
Dangers due to dirt or icing should, for example, be displayed up to one hour after sunrise. A reference value for the sunrise for example 5 o'clock, 6 o'clock or 7 o'clock must be deposited for this in the delineator. It would also be possible for the vehicle to transmit a light duration of 5 hours, for example, via the vehicle clock.
In another sensible arrangement, the intensity of the lighting decreases over the period of activation. Alternatively, the lighting can flash at a certain frequency. The frequency decreases with the duration of activation. This enables the following traffic to better assess how acute the warning is.
A brightness sensor would be useful for an energy-saving implementation of the concept. This sensor detects arriving vehicles and then activates the system. If there is no vehicle in the immediate vicinity, no energy is consumed.
For an economically sensible application, it would make sense, for example, to equip every third or every fourth reflector post with this technology. The warning should be displayed on each delineator in whose intermediate sector the hazard is located. This may require a connection between adjacent delineators. Depending on the available budget, it would also be possible to network all delineators with each other and control them from a central location.
The energy storage and the PV area must be dimensioned so that the system functions until sunrise (or possibly for two or more days without sun).

A road delineator as described above could look like this.