DEVICE FOR EXTENDING THE FUNCTIONALITY OF TRAFFIC SIGNS

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Technical task:
The task of this invention is to transmit traffic information to vehicles passing a traffic sign.

Initial situation:
Traffic signs today serve the sole purpose of providing information to the driver visually. Traffic signs are usually placed very close to the road. The tubular posts are usually round and closed at the top with a plastic plug. Today, information is already being sent to the backend cloud to provide information about traffic events and environmental conditions. The backend information comes from vehicles that have already passed the roadway. The dwell time and thus the measurement time at the respective location is very short and therefore inaccurate, depending on the speed. This means that some vehicles have to pass over an area with slippery road surfaces and their sensors must have detected slipperiness (which may not generate a hazard alarm if the driver drives conservatively) before the correct information about the road condition can be sent to the backend and stored in the cloud.

Solution:
One solution for this is a measuring module that can be inserted into the tubular post of the standard traffic sign with an autonomous power supply and environmental measuring technology. Sensors are attached to the traffic signs, which are already set up anyway, depending on requirements, for example to report the ambient temperature, the roadway temperature, the number of vehicles (traffic density). Radar or lidar sensors can be used for this purpose, for example to detect pedestrians or game passes, or a combination of required sensors. The batteries required for power supply can be installed in the tubular posts of the traffic sign. Photovoltaic elements can be installed above or on the sides of the measuring module protruding from the pipe to supply the batteries with power. The measuring module can be advantageously designed so that it covers the pipe post at the top. The transmitter module transmits the recorded data e.g. via the mobile phone network or communicates directly with vehicles in the vicinity.

Advantages:
Traffic signs are installed all over the country at traffic-relevant locations. If this infrastructure is used, there are no further investments apart from the measurement modules and only very low installation and maintenance costs are incurred (plug & play). Since the sensor technology is always on site, information can be generated with high quality even on less frequented roads. Changes can be recorded permanently and faster than with the car-2-car measurement principle. Tendency curves of the measured values can be calculated/extrapolated more precisely. Even before the first vehicle crosses the measuring range, the information can be sent to the backend. The quality of the measurements is better with stationary measurement than with mobile measurement by a vehicle. Due to the integration of the electronics, the batteries and, depending on the sensor principle, also the sensors in the pipe posts, they are well protected. The pipe posts are standardized with regard to their inner diameter, so that the modules can be installed easily and quickly instead of the protective caps. The idea could also be advantageously extended to include optical signal transmitters (flashing light) for modules that indicate a game crossing or pedestrian crossing, for example.

Possible application:
Figure 1

- Measuring module
- Photovoltaic cell
- Sensor area with transmitter module
- Signal transmitter
- Pipe insertion with battery and electronics
- Pipe posts