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Smart roads

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Smart highway and smart road are terms for a number of different proposals to incorporate technologies into roads for generating solar energy, for improving the operation of autonomous cars, for lighting, and for monitoring the condition of the road.

Despite many technological advances made to vehicles, mobile devices, and cars, we see little change to asphalt roads. There are many things we can do to roads that can help innovate and improve the driving experience, particularly when it comes to road safety. There are also ideas to use roads to store solar energy from the sun and to transfer that energy into electricity for homes [1].

As you know, road is essential part of our life. It help us travel with comfort, it will not let us get lost, wherever we were, so it is difficult to imagine a modern world without roads.

Types of smart roads:

Photovoltaic pavement

Form of pavement that generates electricity by collecting solar power with photovoltaics. Parking lots, foot paths, driveways, streets and highways are all candidate locations where this material could be used.

Solar Road is a system being developed by the Netherlands Organization for Applied Scientific Research (TNO), the Ooms Group, Imtech and the Netherlands province of North Holland.

Wireless vehicle charging

The university's stationary wireless charging technology uses magnetic resonance to create a field between a ground charging coil and a copper coil embedded in a vehicle through which electricity can pass.

The idea behind dynamic wireless charging is to create a series of embedded highway stations that can incrementally recharge electric vehicles carrying mobile receivers as the vehicles drive by.

Road markings

A 500 meter stretch of basic highway in the province of Noord-Brabant has been outfitted with Glowing Lines, which is the first step in Roosegaarde's master plan.

The painted lines on the side of the road and markings absorb light all day and then glow for up to eight hours at night, helping to guide motorists down the highway. The special paint was developed for the project.

Frost protection and melting snow

Snowmelt systems using electricity or hot water to heat roads and pavements have been installed in various locations.

Interactive Light

Interactive Light works in this sense: when a car approaches a particular stretch of a road, the motion sensors will light up only that section of the road. The lights will grow brighter as the car comes closer and will slowly dim away as it passes.

Interactive light is perfect for highways that are less-travelled or not always packed with cars. You can't afford to play dice with the safety of road users, for the sake of saving a penny or two, and Interactive lights help kill two birds with one stone, providing night visibility as and when required.

Wind-Powered Lights

It works by harnessing wind drafts from passing cars into electric. The electricity will use to light up the lights on the pinwheels, basically lighting up the road path [2].

Plastic road

A major advantage of plastic road is the hollow structure that can simply be installed on a surface of sand. It is also much easier to control the quality of the road. Recycled plastic is made into prefabricated road parts that can be installed in one piece. The prefabricated production and the lightweight design also make the construction of a Plastic Road into a much simpler task. Roads can be built in weeks instead of months.

Roads now no longer remain as a medium to travel from one place to another. We can now use it to charge electric cars and harness solar energy due to its large exposed surface area. There is also technology to keep portions of the roads well-lit with more energy-efficient and environment friendly technology and methods. Hopefully there will be more upcoming technology to make our roads smarter and safer to travel on.

References:

1. Mode of access: <http://veddro.com/2015/08/chego-zhdat-ot-umnyih-dorog-v-budushhem/>. – Date of access: 28.03.2017.
2. Mode of access: <https://www.opentown.org/news/3080>. – Date of access: 28.03.2017.