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Eternal Roads of the Future. Plastic Roads

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Everybody knows that the decomposition of plastics is at least 150 years.

However, the secondary use of plastic products in many countries is not well developed, which is extremely detrimental to the environment. And less waste plastic does not become.

At the same time, in our country asphalt *decomposes* in a matter of months, that adversely affects the suspension of cars and the size of the state budget allocated annually for the repair of the roadway.

And in some cases it affects accidents. After all, bad roads are the cause of serious accidents.

The production of asphalt pavement and components for it is not in itself environmentally friendly. According to experts, CO2 emissions from asphalt production are 1.6 million tons per year, equivalent to two percent of total carbon dioxide emissions from the automotive industry.

Scientists all over the world try to solve these problems, for the benefit of our humanity. The results of their work and creative thinking can be an innovation that, together with several technological solutions, can help solve several problems of our time.

So the largest road construction company KWS Infra from Holland and specialists from VolkerWessels are going to start the first project on the planet in the near future to create *timeless* automobile routes from special plastic modules [1].

Solar cells will be built into the modules for energy storage, and a unique luminescent paint applied from Acmelight Road, which accumulates solar energy in the daytime, and gives it away at night, in the form of a bright glow of up to 10-13 hours in pitch darkness, without electricity and even if it does not hit the headlights.

Developers argue that the roads of the future should be as smart as cars. According to their assurances, the road of the future will warn drivers about temperature changes and obstacles on the road. For example, if there is a danger of ice on the asphalt, a luminous snowflake will appear, and if the road is dry, the sun will appear [2].

The material for this road designer is planned to be harvested in the World Ocean, where for a long time, according to scientists, whole floating islands of plastic waste have grown, which are emitted annually into the oceans, seas and rivers [3].

The first plastic automobile road in Europe is planned to be built before the end of 2017, in the city of Rotterdam. As the developers Anne Kudstaal and Simon Yorritsma note, the contract, which is signed by the companies KWS, Wavin and Total, will contribute to the construction, combining their experience, technical capabilities, knowledge and resources for the implementation of this innovative project.

In general, these modules are able to withstand the same load as asphalt, but PlasticRoad has many advantages, compared to the usual road surface made of a mixture of stone, sand, asphalt and bitumen.

The main advantages of this technology include:

- Plastic road for its financial costs in production and assembling, will cost many times cheaper than conventional highways, which will save a lot of money.
- Due to their low weight, the modules are easy to transport and assemble, and the soil is much less prone to

subsidence. If necessary, the road can be easily dismantled and installed elsewhere.

- Mounting the slabs can be done on an aligned sand platform, and they are fit for laying down on almost any type of soil.
- In case of an unexpected damage to the module, it can simply be replaced with a new one in the designer.
- When the service life of the modules comes to an end, they can be recycled again to produce new modules.
- The construction of these plates provides space for various communications, in particular, electrical and telephone cables, sewage and water pipes, gas distribution networks, other pipelines, drainage for sewage, etc.
- In Europe, roads are calculated and built for 20-25 years. The lifetime of the road from plastic modules is 2-3 times greater than that of a road with a *classic road surface*.
- For manufacturing PlasticRoad, recycled plastic waste is used, which will reduce environmental pollution.
- These plastic modules are capable of withstanding temperatures from -40 to +80 °C, they are resistant to damage, wear, mechanical abrasion and corrosion. Withstanding temperature changes and stress, they will not show ruts and cracks from heavy transport, as it happens with our asphalt in hot weather. Plus plastic coating is not difficult to maintain in proper condition.
- Roads from the new material due to their convenient form in the form of a designer will be erected in a few weeks, not months compared to the *classical*, which is much faster.
- The proposed road design will lead to a significant reduction in emissions of carbon dioxide into the atmosphere, rather than in the production of asphalt.
- When the vehicle is traveling on a plastic roadway, the wheels will produce less sound. And due to the special pattern

of the upper part of the mold, it is possible to increase the coefficient of friction of the surface of plastic modules with vehicle tires. It is also possible to use special anti-skid coatings on the surface.

In the long term, this technological solution can help to find application for all those billions of tons of plastic debris, improve not only our roads, but also their erection, cutting costs. And also increase the safety and informative content on the roadways of communication [4].

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