



Tech Talk

Solar Roadways©

by Max Farrington and Pascal Grierson

Solar Roadways! This might well be the future; it's a technology that replaces the surface of all roads, parking lots, pavements, tarmacs and even outdoor recreation areas with... Solar panels. Not the basic ones on household roofs, but smaller, hexagonal and more technologically advanced panels. There are many advantages to this hexagonal glass plate. The main material that is used is glass, which is what the cars will actually drive on. These plates will have lighting inside them to avoid the need for road markings; furthermore, this lighting system will be able to change, so for instance if a parking lot has a lot of free handicapped spaces it will be very easy to change the parking space lighting to provide more standard parking spaces.

Then there is the environmental angle. These solar panels will generate electricity, enough to power the road system electronics and this, for all of America, according to its creators. This means a greener technology. For the northern countries, where there is a lot of snow, these panels could heat up and melt the snow away. This is an especially attractive feature as this will significantly reduce road blocks.

This all sounds pretty compelling, and that's why it raised \$2.1 million on Indiegogo, a crowdfunding website. On paper this is great stuff, but at this stage it remains merely a vision, as there are still many problems to resolve. And the project is almost entirely fictional for other reasons...

After a long 6 year period, there is only one prototype, located in a back garden. There have been no tests with cars or big trucks. As a matter of fact they have only tested a slow moving tractor, over a distance of 5 meters, in dry weather. Now imagine you live in Seattle, or anywhere in Britain where it rains quite often; the roads will become very slippery because they are made of... glass. And this is the second issue. It has not been proved that glass is a suitable material for roads; the traction is just not good enough. Asphalt for example is very good because its surface is ridged. And even if the glass can be adapted, it will quickly break with the amount of traction force.

Another point is the Hexagon roads, why don't we build roads with smaller fragments? The first problem is the bigger the tile, the faster and easier it will crack in the middle (much like pavements). These cracks will let water though into the ground and can slowly erode the foundation of the road, another area where Asphalt is far superior. In a matter of months or a few years, the tiles will also, over time, suffer differential loading, leading to the tiles slowly separating.

On the electric side of things it is not much better; they have made statements such as “this could power the whole of the united states”, yet there is no data. Furthermore, the LEDs will not be visible in daylight, and responding to this criticism, the creators have said that there are LEDs in traffic lights. However these are designed to be seen straight on as you are driving, they are not on the ground where the viewing angle is very different. Not to mention the lifetime and the pollution of the LEDs. And finally the costs will be huge, without even considering the manpower, the maintenance, the ultra-sophisticated electronics, the LEDs, or even the solar salt, the glass alone would cost \$20 trillion dollars for 25000m². That is 10 times the federal budget of the United States.

Their main claim is that the roads are always crumbling, and instead of fixing the crumbling roads why not just put the Solar panels in instead. It is a great idea, but it's just not the right time yet - as we don't have the money, the technology or the materials for the moment.