



Sweden Charging Electric Vehicles on the Move

One of the biggest and most costly barriers to electric vehicle adoption is the need to develop roadside charging infrastructure. However, the traditional model of charging stations along major roads may one day be obsolete. Sweden recently opened a small stretch of road that may change the way we think about electric vehicle charging going forward.

eRoadArlanda as it is being called, is a 1.2 mile stretch of road that actually charges electric vehicles as they drive over it. The best way to envision how it works is to think of the electric toy slot car tracks that were hugely popular in the second half of the twentieth century. As with the toy tracks; the Swedish road has electrified rails that run through the middle of the road. The car then has a retractable arm fitted to the underside of the vehicle that comes down and has contact with the rails in the road. There are also sensors fitted to the car, so when the driver needs to change lanes or overtake another vehicle the arm folds back up into the car. Having electrified rails in the middle of the road may sound inherently dangerous, but the technology used makes the rails safe to the touch. The conductors for the rails are buried deep beneath the surface to prevent any harm to animals or people. Weather also does not pose an issue for the electrified road since drainage systems have been put in place to allow the road to be used during rain and other inclement weather. The contact arm is also designed to push water, gravel, and other debris out of the way.

After years of testing on an enclosed track the project is now on a public road. Currently, only modified trucks can take advantage of the road; however, the Swedish Transportation Administration is planning a larger roll out. The main goal of the project is to eventually electrify the main highways and artery roads. If all goes as planned, there would be no need to electrify smaller roads because the vehicles can run off the stored battery power until they

reach another main highway. The hope is to reduce range anxiety and minimize the need for continued increase in battery sizes. According to the eRoadArland group, electrifying 12,000 miles of Swedish roads would cost about \$9.5 billion (USD), but that cost would be recouped within 3 years. Some of this cost will be recouped from drivers that take advantage of the electrified road in the form of billing. Drivers will be charged for the amount of electricity their car takes from the road. This billing system is still in development and will require the efforts of both the Swedish Transportation Administration and eRoadArlanda.

As electric vehicle penetration grows, the need to address the infrastructure that goes along with it will become a major focus. Innovation and emerging technology will play a crucial role in solving some of the issues and barriers associated with EVs. Following home charging and targeted charging stations, electrified roads may be the future of electric vehicle charging.

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