

# Developing roads that can generate power from passing traffic

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Researchers are looking at advanced materials for roads and pavements that could generate electricity from passing traffic.

Engineers from Lancaster University are working on [smart materials](#) such as 'piezoelectric' ceramics that when embedded in road surfaces would be able to harvest and convert vehicle vibration into [electrical energy](#).

The research project, led by Professor Mohamed Saafi, will design and optimise energy recovery of around one to two Megawatts per kilometre under 'normal' [traffic](#) volumes—which is around 2,000 to 3,000 cars an hour.

This amount of energy, when stored, is the amount needed to power between 2,000 and 4,000 street lamps. As well as providing environmental benefits, this would also deliver significant costs savings for taxpayers.

It currently costs around 15p a kilowatt hour to power a street lamp. Therefore 2,000 to 4,000 lights can cost operators—which in the UK tend to be local authorities, or the Highways Agency for motorways and trunk roads—approximately between £1,800 and £3,600 per day. Researchers say the cost of installing and operating new road energy harvesting technology would be around 20 per cent of this cost.

Professor Saafi said: "This research is about helping to produce the next

generation of smart road surfaces.

"We will be developing new materials to take advantage of the piezoelectric effect where passing vehicles cause stress on the road surface, producing voltage. The materials will need to withstand high strengths, and provide a good balance between cost and the energy they produce.

"The system we develop will then convert this mechanical energy into electric energy to power things such as street lamps, traffic lights and electric car charging points. It could also be used to provide other smart [street](#) benefits, such as real-time traffic volume monitoring."

When the technology has been developed it will undergo field trials in the UK and other areas of the EU.

Provided by Lancaster University

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