

# DynoTRAIN railway researchers complete new virtual testing project

August 7 2013

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A PROJECT that could enable manufacturers of rail vehicles to use virtual testing of trains in order to ensure safety standards throughout Europe while making huge savings on development costs has relied on a key contribution from a research team based at the University of Huddersfield.

Named [DynoTRAIN](#), with a total [budget](#) over €5.5 million euros, the four-year project, now nearing completion, has received funding from the European Commission under the 7th Framework Programme and among the partners – alongside manufacturers and rail infrastructure

bodies in seven European nations – is the Institute for Railway Research (IRR), which occupies a purpose-built suite of labs at the University of Huddersfield.

The IRR's Head of Research is Dr Yann Bezin (pictured below), who explained that an overall aim of DynoTRAIN was to speed up the process of certifying rail vehicles so that they can run safely on tracks throughout Europe.

"Before you are allowed to run a vehicle in a country you need to make sure it is safe and that implies a lot of physical testing," said Dr Bezin. "So you build a prototype of the train and it is tested through an intensive and long programme of physical testing."

This is costly as well as time-consuming.

"If you build a fleet of vehicles to sell, the cost of a full train would be spent on certification. That is quite a large proportion, because you don't sell hundreds of [trains](#)," said Dr Bezin.



A speciality of the IRR is in the development of modelling software that can simulate the dynamic behaviour of railway vehicles, leading to estimate the safe operation of a train in differing conditions.

"One of our tasks as part of DynoTRAIN has been to build [mathematical tools](#) that take data collected from different countries about the track and synthesise that data into a representative track that you would use in a [virtual test](#) environment," explained Dr Bezin.

Manufacturers would be able to use virtual test tracks to make adjustments to vehicles according to the conditions in which they would be used. It is hoped that the findings of DynoTRAIN, including the IRR's contribution, will help to establish virtual testing as a valid route to certification.

But it relies on a massive database of information about real tracks and real railway systems and this was gathered as part of DynoTRAIN by assembling a special train – locomotives, passenger carriages and freight wagons – fitted out with a battery of testing equipment, such as a laser system that captured the shape of the rail every 25 cms over thousands of kilometres.

?This train ran in Germany, France, Italy and Switzerland, capturing the characteristics of different tracks in different countries, including high speed lines and slower, local services.

This furnished a huge amount of information that could be used in order to help validate vehicle models and build virtual test tracks.

"DynoTRAIN has been a very useful project, involving all the key players in the industry," said Dr Bezin. The Institute had developed a tool that was of interest to railway manufacturers and could be used to build a database of virtual tracks to aid the safety certification process.

Meanwhile, the University of Huddersfield's Institute for Railway Research is also involved in other projects that have received substantial EU funding, such as SUSTRAIL, which aims to boost sustainable and efficient rail freight transport in Europe.

Provided by University of Huddersfield

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