

# Research leads to better asphalt roads

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In cooperation with eleven road construction companies, the University of Twente is working on improving asphalt roads in the Netherlands. By using new technology during the asphalt paving process, the resulting road quality is 10 to 30 per cent higher. The improved life span of the road in turn naturally means less maintenance and, therefore, less nuisance. What's more, it becomes easier to plan road maintenance work, leading to decreased traffic congestion. The UT findings have by now been put to use during more than 50 asphalt paving projects in the

Netherlands.

Up till now, very little was known about the [asphalt](#) paving process, as it was never systematically and routinely put to writing. The knowledge and experience of the asphalt paving workers formed the prime source of information. The adoption of [new technology](#) in the construction sector is a slow and laborious process. Moreover, there was little relation between lab design and actual on-site implementation.

## **Road rolling: high-tech skill and expertise**

"Road rolling requires much more than just driving your roller up and down a stretch of [road](#)," UT doctoral candidate Frank Bijleveld says. He conducts research on the professional development of the asphalt paving process.

"Driving a road roller is rather easy, but proper asphalt paving requires professional skill and expertise. On arrival to the [construction site](#), the asphalt has a temperature of some 150 degrees Celsius. Asphalt compaction is to take place within a specific range of temperatures, but in practice determining whether the asphalt is at the right temperature is often based on the workers' own gut feelings. Things get more complicated when considering there are many types of asphalt. And, naturally, the asphalt cools down more quickly in winter than in summer. So, road rolling requires a great deal of professional skill and experience. What's the ideal driving speed? What's the asphalt's current temperature? What has my colleague driver done already? Should I have the roller start vibrating now? One error of judgement, and you would immediately damage the new road."

## **New technology**

The University of Twente and the eleven road construction companies have deployed new technologies providing the roller driver with more information about the process, allowing them to better make use of their expertise. Such technologies include the use of GPS, laser and infrared for monitoring the installation process at the construction site. Furthermore, asphalt crew feedback sessions have been organized, allowing the workers to become aware of, and make use of, the experience and expertise of their colleagues, thereby improving the process. During lab experiments, the strategies as monitored on the construction site were simulated so as to determine their effects on the quality of the asphalt layer.

## **More than 50 asphalt paving projects in the Netherlands**

More than 50 asphalt paving projects were systematically monitored and recorded for the purpose of this research. New technologies allowed for the monitoring of all material movements on the construction site, including asphalt temperature during laydown, asphalt compaction and the weather conditions.

Measurements were recorded 24/7 for two weeks during work on the A50. A learning model was tested at the A15 work site between Maasvlakte and Vaanplein. Feedback could be provided to an asphalt crew working on the A4 within a single day. And low temperature asphalt was monitored at a Rotterdam location.

Provided by University of Twente

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