

OSU professor Kelvin Wang shows members of the research team for the College of Engineering, Architecture and Technology the pavement images his technology collects. Engineers can use the information to prioritize repairing and even replacing roads.

Paving the way for improvements

OSU professor's technology cuts highway maintenance costs

As aging takes its toll on America's infrastructure, the cost and maintenance of roads, bridges and other public structures have become key issues.

KELVIN WANG, an OSU professor who holds the Gilbert, Cooper, W&W Steel Chair in civil engineering, has a highway data collection technology that is becoming even more beneficial to society through his research at Oklahoma State University.


The sensor hardware and Automated Distress Analyzer (ADA) software developed by Wang's team can measure the pavement beneath a vehicle moving at 60 miles an hour at a resolution of 1mm — the equivalent of taking 30,000 photographs of the highway surface in one second. The combined profiles are presented as a 3-D visual, offering a way to analyze the pavement for roughness, rutting, cracking and other problems. The technology can even measure vertical variations of pavement at 0.3mm resolution at 60 miles per hour.

Wang's roadway analysis technology was theorized by his company, WayLink Systems Corp., then developed by Wang and his students while he was at the University of Arkansas. Wang's company is now affiliated with OSU, and several OSU projects rely on his sensor technology. His sensor holds the world speed record and is up to four times faster than any competing technology. The Arkansas and Oklahoma departments of transportation have contracted with OSU to use his latest technology for pavement survey. The Federal Aviation Administration and Federal Highway Administration are also supporting Wang's team on implementing the 3-D pavement survey technology.

Wang's product already offers excellent data collection and analysis capabilities, so his focus now is on developing software that will process and extract the data to provide pavement engineers with information they need for making their

decisions. After all, pavement engineers can't manually analyze as many images as would be needed to cover a large network of highways in a state.

According to Wang, highways are designed to last up to 30 years, but many of them fail before reaching even 20 years. A highway deteriorates as it ages. The sooner a road problem is diagnosed, the easier and cheaper it is to repair. Highway engineers, like doctors, need good data to diagnose problems.

Highway maintenance is a huge public investment of more than \$40 billion each year in the United States. Wang's research will help highway engineers diagnose problems more quickly and efficiently, lessening the cost of highway maintenance. 

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