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PLYMOUTH, Minn. - We all know what a great tool microwaves have been for filling our stomachs. But a public-private partnership is using the same technology to fill potholes.

"This particular machine is a 50,000 watt microwave," says a proud Krik Kjellberg, pointing to the contraption he's built on the back of a flatbed truck.

In his hands Kjellberg holds ground asphalt from an old road, mixed with a small amount of magnetite - a substance produced in abundance in Minnesota's iron mines.

"Of the natural materials, it's probably the best microwave absorber there is," said David Hopstock who began thinking about the possibilities for magnetite years ago while he worked for the U.S. Bureau of Mines.

What if a mix of asphalt and magnetite were microwaved in a pothole? Hopstock eventually took his idea to Larry Zanko of the Natural Resources Research Institute at University of Minnesota Duluth.

After running tests with kitchen-size microwaves, Zanko connected with Kjellberg's company which had already patented microwave technology for thawing frozen ground. The pothole project hit its stride.

In a demonstration, an arm at the end of the Microwave Utilities truck lowers a bottomless metal box over a pothole filled with the asphalt magnetite mix. During a ten minute microwave cycle, the temperature of the mix under the box rises to nearly 300 degrees. Steam flows through tiny holes in the box.

Not only is the temperature of the patch rising, but so is the existing pavement around it. Kjellberg says that's key because the patch and existing pavement bond together. "You put something warm into a cold hole, it has a hard time sticking to it, so what we do is heat up the base and the material at the same time."

Zanko believes the technique could be used widely around the world. "It's a matter of doing the repair once and being done with it. In my estimation I believe it's a superior repair."

Kjellberg says the new patch is stronger than the old pavement. "Eventually the pavement around it will give up before the patch does, and I have instances where we've shown that to be true," he says.

A spokesman for the Minnesota Department of Transportation said the agency is aware of the microwave technology and is watching its development with interest.

Unlike last night's dinner, these microwave fixins are built to last.

"It's just the magic of microwaves," says Kjellberg. "That's all I can say."