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Infrastructure: Filling a hole in the market



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Industry Watch

An innovative startup offers quick and easy road repair, even in the dead of winter

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 [mui1.jpg](#)

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Photo By: Amanda Gahler

It's often said that in Minnesota there are only two seasons: winter and road repair. If it isn't snow making one's commute a challenge, then it's the repair crews fixing the pavement. Thanks to a small company called Microwave Utilities Inc. (MUI) those two seasons might start to blur a bit. It's devised a way to quickly warm frozen earth and asphalt, making it easier to repair potholes and access underground utilities. Based in Monticello, the five-person venture has been researching and testing its patent-pending methods since it was founded in 2004. As of November 2012, it's slowly begun to offer some of its services commercially.

The MUI approach employs large microwave heating technology to thaw the frozen ground or asphalt in the winter. This approach allows for quick and efficient work, whether it involves a pothole or buried infrastructure — gas, electric, fiber optics — that need a repair or add-on.

It's hardly sexy work, but "MUI is a first-in-the-world situation," says Kirk Kjellberg, the company's head of sales and marketing.

Quick fix

Today, a common way to access underground utilities in the winter is to turn large gas-powered grills upside down on the roads and leave them there for three or four days to warm the frozen earth. But this approach is expensive and time-consuming compared to MUI's method, which channels 50,000 watts of microwave energy into the earth and takes about an hour. "We developed a process to speed things up, like in the kitchen, where instead of warming something up on the stove, you use a microwave," says Kjellberg. "We took that idea and introduced it to the industry."

In winter, the MUI approach can come in handy for power and gas giants, especially during an emergency when part of a buried utility needs to be accessed quickly.



As for fixing potholes, one of the company's best potential partners is the Minnesota Department of Transportation. But MUI thinks it can also fill a hole in the market (so to speak) when it comes to repairing potholes in small numbers, like one to five. Places such as convenience stores and strip-mall parking lots promise to offer a steady customer base.

Kjellberg says he called several asphalt contractors to see if they would repair one pothole in a cafe's parking lot. Most declined. "Hot mix only stays hot in large quantities or in a heated vehicle and is prone to a lot of waste," he notes. "Large asphalt companies do not want this market, as they are set up for large jobs." Some of those he called offered to send a crew for a minimum of \$500 to \$700.

MUI, by contrast, will do the job for \$450 and give a one-year warranty. "We come out one

machine and one guy," says Kjellberg. "We can do small patches much more economically than a big company." MUI's midsize trucks (five so far, all assembled and finessed in Minnesota) have the microwave system installed directly on them. The heat is dispersed evenly through the asphalt horn to the area being patched. The microwave energy quickly heats both the mix for the new patch and the surrounding asphalt, allowing the patch to fuse to the existing roadway and form a durable repair. The whole process takes about 24 minutes.

With a traditional infrared heat approach, a fix can take two and a half hours. "They [have] a semi-truck, a Bobcat, and all kinds of heavy equipment, versus ours where [it's] just a truck and one person," says Kjellberg, who adds that MUI's setup also causes less traffic obstruction. For now the company has been fixing potholes on its own, but as we go to press it is negotiating with a contractor to implement the service on its behalf. "We don't offer franchises per se, but that is our model," notes Kjellberg.

Slow build

MUI has taken a slow, careful approach to research and build-out. Says Kjellberg: "We are a very conservative company in the sense that we did multiple levels of research to make sure that we indeed have the technology that we are banking our business structure upon. We have no debt. We work slowly."

Much of the company's initial research has involved testing the safety of the approach, which involves high-wattage electricity and microwave energy. "We needed to be very certain we would not in any way impact the very utilities we were helping to access," notes Kjellberg.

MUI has a number of patents pending. Early on it retained Patterson Thuent Christensen Pedersen, an IP law firm in Minneapolis, as counsel. Tye Biasco, a partner at the firm, notes that “in dealing with MUI’s patent applications regarding this technology, I have not only seen the early prototype, but also witnessed MUI’s improvement of the technology and product development.”

The company has also worked with the National Resource Research Institute at the University of Minnesota Duluth. Larry Zanko, a senior research fellow there, worked with MUI on pothole repair. “Based on that experience, I can say that MUI has demonstrated the safety, efficiency, and effectiveness of the microwave technology,” he says. “I believe the more that people see the technology in use, especially for cold weather repairs, the more rapidly and broadly the technology will be adopted.”

Submitted by tom.johnson on Monday, February 25

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