

CHRIS BALL | THURSDAY, OCTOBER 24, 2019

Cleveland Heights car mechanic finds a much cheaper way to paint lines on streets

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Wyatt Newman, who has training in robotics, mechanical engineering and electrical engineering, sets up the software runs the robotic arm during a recent test.

Workers painting lines on resurfaced roads must wait at least 40 minutes for the paint to dry before moving on. Sam Bell knows a better way.

The Cleveland Heights car mechanic closed his Lusty Wrench repair shop in April after 40 years to devote himself full time to his new enterprise, RoadPrintz Inc. Using modern technology, he figures he can restripe roads for less than a third of the going rate.

Bell, 69, has won awards for his “eco-conscious” car repair methods. Loyal customers cried when he suddenly shut his shop, across Lee Road from his alma mater, Cleveland Heights High School.

Despite his automotive expertise, his love of cycling led him to shift gears. Bell supports efforts to make streets more accessible to cyclists and pedestrians with new bike lanes and street markings. He is co-chairman of the Cleveland Heights Transportation Advisory Committee. At a meeting, he heard a startling figure.

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Sam Bell operates the special truck they developed with a robotic arm to paint street markings.

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It costs \$15,000 per mile for crews to paint road markings. Why so much, Bell wondered. “Are they hiring Picassos with paint brushes?” No, the reason workers have to literally stand around and wait so long for the paint to dry is that if they lift the stencils too soon, the paint will smear.

That’s silly, Bell thought. So he is developing a special truck equipped with a robotic arm that won’t be scalded by using hot paint that dries in less than a minute. Instead of stencils, it uses GPS measurements guided by a computer.

Bell figures his system can do the work for \$5,000 per mile. Or even less. Straight lines are the easy part. “Anything that is done parallel to the curb is already being done at a pretty reasonable cost,” he says. “Where we can bring it down is the transverse markings, the diagonals, the bike symbols, the school zone markings, the turn arrows, that kind of thing.”

Cleveland Heights spends \$80,000 a year on restriping roads. Bell isn’t ready to say how much he can reduce that by, but he’s getting there. He is six months away from product

launch, he estimates.

Another major factor is safety. Workers painting roads are getting hit and killed too often these days by drivers who aren't paying attention. With Roadprintz's system, workers don't need to leave the truck.

For now, when Bell isn't applying for grants, he's customizing a proof-of-concept 2018 Ford F-550 truck. He wants to build a fleet of six trucks to lease. That's for starters.

Bell's business partner and cycling buddy, Wyatt Newman, also has gone all in. He's taking a one-year sabbatical from his position as a professor of electrical engineering and computer science at Case Western Reserve University. They have formed a strategic partnership with QT Equipment Co. of Akron to customize the truck.

"I'm a robot guy," says Newman, 63. "I've been doing robots for 35 years. So when Sam said, 'Where's the truck that paints these things?' we both looked around, and there doesn't seem to be a machine in box, we decided we should make a machine."

They've installed a custom suspension system on the truck to cushion the large controller mounted behind the cab from Cleveland potholes. But much more remains to be done.

"It has put together a lot of things that I do," says Newman, who lives near Shaker Square. He has formal theoretical training in robotics, mechanical engineering and electrical engineering. Bell knows how to build and fix things in a shop. "So it's a good team," Newman says.

On Oct. 19, the team puts their robotic arm through the paces on an unused patch of pavement in Cleveland Heights that they have permission to decorate with paint. They're still in the proof-of-concept stage, one step before the prototype stage.

Wyatt Newman sets up the software that runs the robotic arm during a test Oct. 19.

"Ready to enable," Bell calls out from the back of the truck, prepared to hit a big red STOP button on a control pad if necessary. "Enable 3, 2, 1," Newman counts down from the truck cab while watching a monitor. The general-purpose robot, dubbed Lester, jerks

into motion. It sweeps down just above the ground and sprays white paint in the form of an arrow with a few quick, tight strokes.

The goal is to bring the paint head at the end of the 1,000-pound robot arm right next to the ground without hitting it. They've hit the ground three times so far, causing minor damage.

Most GPS devices use military technology. If a missile or a mortar comes within 10 feet, it's considered a direct hit, Bell says. But not for painting on uneven pavement. RoadPrintz uses a much more precise system. How precise? The odometer on their computer reads in eighths of an inch.

The scale of their venture is harder to measure. Interest could come not just from across the country but around the world.

"In fact, a lot of countries do a lot more road painting than we do, such as Japan," Newman says. "They put a lot of paint on their pavement."

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The Roadprintz team put their robotic arm through the paces Oct. 19 on an unused patch of pavement in Cleveland Heights.

The Technology Transfer Office at CWRU has provided a lot of help, both financially and with paperwork and advice on starting a business, in exchange for less than 10% of the equity and royalties. "But hopefully it will make them a lot of money over time," Bell says.

How much? Nationwide, Bell estimates a billion and a half is spent on restriping public roads. "There's another few hundred million dollars spent on airports," he says. "And there's a ton of money spent on parking lots and private areas."

The exact amount is a little hard to fathom. "Five years out or so, it's maybe \$20 million a year in sales for us of equipment," Bell says. "You buy our software, it comes with a truck and a painting system." After support and service costs, it leaves a net operating margin of 20 to 30%, which Bell says is pretty typical for large equipment.

"My understanding of how this works is venture capitalists come and take it all," Newman says with a laugh.

“We think we have something that’s really uniquely different,” Bell says.

Cleveland Heights car mechanic Sam Bell closed his Lusty Wrench repair shop in April after 40 years to concentrate full time on his new enterprise, RoadPrintz.

“Our intent is to team with a road painter in the next painting season,” Newman says. “So by spring, we’ll have our prototype, the next generation of this, out on the road painting with real road painters so that we get their feedback, what they like, what they don’t like, so we have time to iterate before we go into limited production.”

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Meanwhile, they have a lot of tinkering to do. “There’s a lot of bugs, which we expected,” Bell says. “Things like getting the spray head timing coordinated so you wind up with even ends to your lines, instead of one of them being offset in one direction or the other. So they wind up matching if you’re putting two lines next to each other to make a wider line. It’s mostly little stuff. Instead of them coming out raggedy or staggered. Little buggy detail kind of things, but we’re getting better and better at it.”

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It’s an ambitious project that they know will run into bumps in the road. Whatever happens, it’s bound to be more fun than standing around and watching paint dry.

Read more articles by Chris Ball.

Chris Ball became managing editor of FreshWater Cleveland in August 2019 after more than 20 years of editing and writing for The Plain Dealer. A graduate of Hawken School and Oberlin College, he previously worked for Crain Communications, the Lorain Morning Journal, The Free Times and The Cleveland Edition. A lover of Frisbee and film, Ball wrote a DVD review column for The PD for 15 years. He won the Press Club of Cleveland award in 2018 for Best Headline Writer in Ohio.

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