

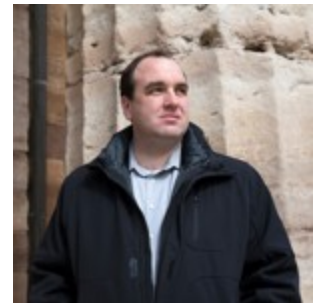
Rough ride? Data bikes chart the condition of bike paths in more cities

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The tools that transportation agencies use to record the condition of pavement on roadways don't work for biking and walking paths, so several communities are rolling out bikes that can get the job done.

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How bumpy is your ride home? If you're driving a car, your local transportation department could easily find out with devices that attach to trucks to measure the smoothness of pavement along a route.

In most places, though, transportation planners have far less information about the pavement along bike trails. Vehicles with pavement monitors don't always fit on bike paths, and they need to travel at speeds that are too high for bike and foot traffic.

But that's changing, as many communities have started using "data bikes" to monitor the quality of their local bike network. Local planning organizations have deployed them in Idaho, Iowa, Massachusetts and Minnesota. Alaska might be next, if it can secure a federal grant to purchase the specially outfitted bicycles, which are connected to an iPhone with an app that monitors the smoothness of the pavement. The cargo bikes are also outfitted with a GoPro camera in the front and a 360-degree camera on a pole overhead to collect images for sites like Google Maps.

"Things change throughout the years. Droughts can happen. Floods can happen—as we're experiencing now. But everything does something different to the pavement, so it's important that we monitor the pavement annually," said Carl Saxon, a senior planner for the Des Moines Area Metropolitan Planning Organization, which came up with the concept in 2016.

The Des Moines area agency produces heat maps of where distressed pavement is located, which helps local governments identify the problem areas quickly. Researchers from Iowa State University are also working with the organization to use AI to identify the severity of cracks in the pavement which can indicate the reason for the problem.

With more data on the condition of bike paths in the region, local governments have been building trails to last longer, even if the upfront costs are higher, Saxon said.

The metropolitan planning organization in the Boise, Idaho, region secured their data bike with a \$6,000 federal grant in 2018, because one of its employees had seen the device being used in Iowa. After a test phase, the agency put out its first annual report on trails in Ada and Canyon Counties in February. It collected data on 54 miles out of the 86 miles of local, off-street pathways.

The bike found that 42% of the trails it covered were in good condition and 5% rated as excellent. But 33% of the paths were in fair condition, 12% were in poor condition and 9% were in very poor shape.

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"When you're looking at the roadway network, we have a lot of ways of measuring the condition and maintenance needs on roads. For pathways, it was basically just anecdotal," said Amy Luft, the communications coordinator for the Community Planning Association of Southwest Idaho, known as Compass. Adding the bike, she said, gives local governments data that can help them prioritize maintenance, develop maintenance plans and apply for grants.

The goal, said Tori Cale, the technician who runs the program, is to collect data on at least half of the region's pathways every year, so the entire region can be covered every two years. That is somewhat of a moving target, though, as more localities continue to add multiuse trails every year to meet an increase in demand for biking and other modes of active transportation.

Cale has to ride over every segment of path four times to get complete results. The fact that it is an e-bike helps keep the speed of the bike consistent while it collects information. The sensors work on regular pavement, but they don't work well when the path is made of stone pavers, wood bridges or gravel. The devices on board also don't record debris or the slope of the paths, which would also be helpful for devising maintenance plans. And they don't capture branches growing over the path or other obstacles that could prevent cyclists from using the trail.

Although the task is pretty straightforward, it does take some getting used to, Cale said. "I didn't realize how much I avoided bumps when I ride, but when I'm on the data bike, we just go right over them. So it's not the most comfortable ride. And it does have all the sensors, so I've got to avoid branches."

But all the gadgets do attract interest from other cyclists, she added. "Lots of people want to know what I'm doing, and kids love it."

Saxon said groups from as far away as Hawaii and Massachusetts have asked the Des Moines agency about deploying the data bike, and the concept has even generated interest overseas. He has shared some details about which kinds of bikes work best and other considerations, but he said the bikes are easy to assemble.

"Anyone can start one of these programs. There's nothing proprietary about it," he says. "We literally use an iPhone 6 and two GoPro cameras. So it's all consumer-grade electronics."

Daniel C. Vock is a senior reporter for Route Fifty based in Washington, D.C.