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# UW students designed a rover to inspect culvert conditions to help fish

**Sarah McQuate**

UW News

B-roll: UW HydroCUB in action



Now that the rainy season is here, culverts across the city are giving stormwater and streams a clear path away from streets and roads.

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### For journalists

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Before the rains come, the Washington Department of Transportation inspects these concrete or metal tunnels for any damage that could prevent fish from using them during migration. But there are a lot of spaces to inspect, and these spaces are often small and inaccessible for people.

So University of Washington students created a rover, called the HydroCUB, that can enter sewer pipes, culverts or other tiny areas and send back video status reports back.

The team worked on the rover throughout the pandemic.

“The pandemic was challenging because I was separated from my family and my friends,” said lead researcher [Qishi Zhou](#), a UW master’s student in the electrical and computer engineering department. “It was also challenging because I was in Minnesota and my teammate was in Seattle, so we had to ship things back and forth. In addition, issues with the supply chain meant that many of the parts were unavailable and we had to do extensive searching to find them. But knowing this project would solve a real-world issue made me feel uplifted.”

The goal is for WSDOT, which proposed the idea, to use the tool to look for vegetation, cracks, debris and other potential “fish-barriers” in culverts. HydroCUB is designed to operate from a distance through a 300-foot-long cable that supplies power to the rover and transmits video back to the operator.

This rover was designed as part of a two-quarter UW industry capstone program where students work with clients to design solutions to real-world problems. In this case, WSDOT asked the UW team to build a cheap but robust device to monitor culverts. The organization has been working with the UW team throughout the process to review its design and make suggestions. This capstone program is sponsored by the UW departments of civil and environmental engineering and of electrical and computer engineering.

“It is a thrill to work on something that is going to solve many issues,” Zhou said. “HydroCUB is one-of-a-kind that is both reliable and low-cost. It also provides a platform for future students to do more improvement or testing.”

For more information, contact Zhou at [qishiz@uw.edu](mailto:qishiz@uw.edu) and lead UW faculty [Faisal Hossain](#), professor of civil and environmental engineering, at [fhossain@uw.edu](mailto:fhossain@uw.edu).

To talk to someone at WSDOT about this project, contact [Cameron Kukes](#), who has been working with the team, at [KukesC@wsdot.wa.gov](mailto:KukesC@wsdot.wa.gov).

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