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Specifications

- Waterproof
- Wi-Fi transmission
- 4x4 drive
- \$1,200 vehicle/camera
- \$300 tablet
- Transported in 11"x17" box

Observed Range

- 24-inch diameter ≈ 250 feet
- 18-inch diameter ≈ 150 feet
- 12-inch diameter ≈ 50 feet

2016 Winner of Governor's Better Government Award



MnDOT employees received a Governor's Better Government Award Jan. 30. Lt. Gov. Tina Smith and Department of Administration Commissioner Matt Massman (far right) presented the award to Mark Hill, Rob Coughlin, Kris Langlie and Chade Trupe. (Photo by Mike Dougherty)

Hydraulics Inspection Vehicle Explorer (HIVE)



What Is It?

The Hydraulic Inspection Vehicle Explorer (HIVE) is an enhanced radio-operated car, which allows MnDOT to inspect culverts and pipes to determine if any repairs or replacement is needed. Often the culverts and pipes are too small or difficult for a person to enter to visually inspect it, so the vehicle is operated via radio control with a camera and lights to record and view conditions with just one specialist at the site. It has discovered damage in culverts underneath roads long before the problem becomes an emergency. The device was modified by Rochester MnDOT workers in the inventory department, who are experienced radio-operated car hobbyists. They are building similar devices for other MnDOT districts and creating an online guide for parts, repairs and operation to allow all MnDOT users to access the information when issues arise.

Better Inspections, Better Data, Better Decisions

By using the HIVE unit, eight culverts changed from no work needed to repair needed, because large joint separations or broken flanges with exposed soil visible were detected by video far into the pipe.

In one case study, an end-of-pipe inspection showed significant pipe damage that would typically result in a full replacement costing about \$45,000. However, HIVE video footage showed that the damage was limited to just 12 feet of the pipe near the end. Instead of replacing the entire pipe, a \$1,000 repair was implemented resulting in \$44,000 savings.



End of pipe inspection



HIVE video 55 feet into pipe

What's Next?

A Best Practices Manual for Enhanced Culvert Inspections, funded through the MnDOT research program, is due out in Summer 2017. One of the technologies covered in the manual will be the Hydraulic Inspection Vehicle Explorer.