



Hydraulics Inspection Vehicle Explorer (HIVE)

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Your Destination...Our Priority





Better inspections result in better data which lead to better decisions.



End of Pipe Inspection





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Right Tool for the Job?

- **Commercially Available Inspection Unit**
 - \$80,000 to \$100,000 Capital Cost + Transport Van
 - Two Operators Required
 - Extensive Range in Small Storm Sewer Applications

- **Normal Field Inspection Needs**
 - 50 to 100ft Range
 - One Person Operation
 - Small to Transport
 - Durable and Low Cost



Right Tool for the Job?

➤ Ineffective Solutions for Culverts

- Cable Camera
- Pole Camera
- End of Pipe Inspection

➤ Development

- Idea and Field Experience
- Wi-Fi Connectivity in Cameras
- Remote Control Car Hobbyist





➤ HIVE – Hydraulics Vehicle Inspection Explorer

- Waterproof; Wi-Fi transmission; 4x4 drive
- \$1200 vehicle/camera + \$300 tablet
- Transported in 11"x17" Box



I-90 Dakota HIVE Video – 24” CMP

End of Pipe Inspection



HIVE Video – 55ft from Pipe End



MN26 Maintenance Repair Case Study – 24” CMP

End of Pipe Inspection



Repair: Replacement (\$45k)

HIVE Video – Rest of Pipe “Good”



Repair: 12ft of Paved Invert (\$1k)





US52 Maneuverability/Waterproof HIVE Video – 24” RCP



- 8 Culverts Changed from No Work Needed to Repair Needed
 - Large joint separations or broken flanges with exposed soil visible





MN44 Hokah HIVE Video – 15” CMP Storm Sewer at 60ft



DEMONSTRATION AND QUESTIONS



HIVE – Hyd Insp Vehc Explr

- Waterproof; 4x4 Drive
- Wi-Fi transmission
- \$1200 vehicle/camera + \$300 tablet
- Transported in 11"x17" Box
- 1/32" SS Recovery Cable

Observed Range

- 24" Diameter = ~250ft
- 18" Diameter = ~150ft
- 12" Diameter = ~50ft

