What was the challenge you set out to solve?

Our problem was how to inspect the inside of cross road culverts that were too small in diameter for a person to crawl through to check the condition of a pipe safely. We wanted to see if there were any issues with the pipe before we determine a “fix solution” so we could find a cost-effective way to resolve the problem.

How did you develop and implement your solution?

We have a small camera attached to a cord for small diameter pipes such as 4” tile, but that was not working with bigger diameter pipes because the camera would end up in the water if there was any in the pipe. We needed a way to get the camera up out of the water and was not limited by a cord length. We came up with a remote control car of some sort with a Go-Pro camera. As we looked at RC cars, we wanted something that could stand up to some water and be able to attach a camera easily. When beginning this process, we were not sure what to expect, so to be cost effective we went to Wal Mart and found something that we thought would work just to try it out. (It is the current one that we are still using.) After we figured how to attach the camera, we gave it its first test run and found out that once we got into the pipe we needed light, so we added a flashlight to the car. We have not changed a thing after that initial test run and have videoed several pipes with it.

What did it take to make this solution a reality?

We purchased a Go-Pro that links to a phone through an app, this way you can see and steer the car as it is in the pipe. We bought some Go-Pro accessories that included a waterproof case. We ended up using zip ties to attach the Go-Pro to the car. The flash light we got was purchased to make sure it fit through the cab of the car and is held in place by duct tape. Then we thought, what happens if the car broke – how would we get it out? So we purchased 150 feet of rope and an electrical cord reel for the rope, and tied the rope to the car to be able to pull it back out of the pipe if something were to happen.

What was the cost of implementation?

RC = $75 Go-Pro = $310 Accessories = $35 Rope/Zip ties/Duct tape/Reel=$30 Total=$450 Labor= 2hr= $60 (hour at the store purchasing items and an hour figuring how to tie it all down)
What was the impact and results of your efforts?
Since January 2021 this has been a game changer for us. We can effectively get a good visual on the condition of our pipe, where before we didn’t have the greatest access. We inspect our pipes during preliminary design stage to see if we truly need to replace a culvert or not. We have used it for maintenance side, where a pipe was causing a sink hole, and instead of replacing the entire pipe that was in good shape, it was shown to be a bad connection where it was just needing to be fixed. We have run it through some small box culverts and corrugated metal pipes from 18” diameter to 48”diameter.