

West Boise Sewer District's Journey with DragonflySM

Background

Similarly, to most sewer utilities, West Boise Sewer District (WBSD) faces challenges to improve their sewer inspection operations in terms of accuracy and efficiency. With limited resources and aggressive schedules, WBSD embarked on a journey to test artificial intelligence (AI) technology as a way to more efficiently process copious amounts of sewer inspection data collected annually.

Skepticism of AI's Potential

While assisting with ongoing operations, Jacobs introduced WBSD to DragonflySM, a cloud-based AI defect coding solution built by Jacobs in partnership with Hitachi for sewer system assessment and guidance. Dragonfly expedites the coding process resulting in highly accurate inspections at a low cost and includes an interactive asset management module. Streamlining inspection data management especially regarding pipe ratings was a key goal for WBSD. They were evaluating whether to utilize a local contractor to manually process the data or leverage AI. They were interested in determining if Dragonfly could simplify WBSD's complex process and free up valuable resources (refer to the insert for details on WBSD's current sewer inspection process and challenges).

*With AI being new technology in this domain, it was important to answer the question: **Could Dragonfly enhance the efficiency of the inspection process and streamline the management of inspection data?***

Although maintenance and office supervisors were eager to embrace the new technology, others were cautious and somewhat skeptical of this technological innovation. Therefore, Jacobs performed a pilot study to measure, evaluate and illustrate (to WBSD leadership) Dragonfly's viability, cost-efficient alternative that does not compromise quality or accuracy prior to implementing at full scale.

The Pilot

Dragonfly processed 25,000 linear feet of CCTV videos as part of the pilot. Within a few days, Dragonfly identified a significant defect regarding a pipe deformity that had been missed by previous human inspection. This defect was captured, cataloged, and identified for repair by Dragonfly. WBSD was initially skeptical about the finding, so they manually reviewed several photo snapshots (like Figure 1), and the deformity became instantly visible. This finding built WBSD's confidence in the AI's ability to accurately capture defects and highlighted how defects sometimes get overlooked in human inspection.

WBSD's current sewer inspection process:

- *Two field staff members visually inspect pipes using a truck-based closed-circuit television (CCTV) camera.*
- *An office-based employee methodically catalogs defects from the footage.*

WBSD's Challenges

- *While effective, this method took up a lot of time and resources, limiting the completion of other tasks.*
- *WBSD struggles to fill essential operator positions for pipe inspections due to the specialized skillset required.*
- *Losing their top operator only added to their challenges.*

Dragonfly finished the pilot in a few weeks and WBSD shared the detailed results with their engineering team. The team found that no human-coded defects were missed by Dragonfly, and some major defects misclassified by humans were correctly classified by Dragonfly.

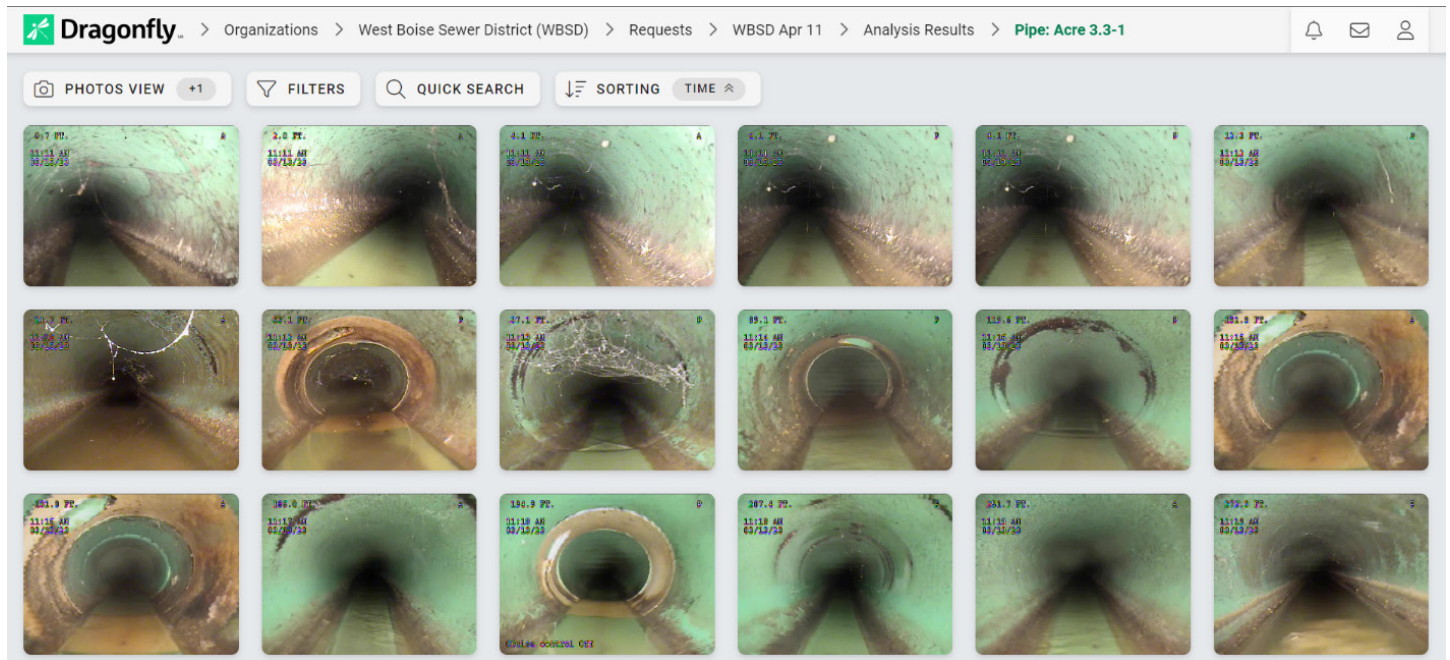


Figure 1. Defect Snapshots from Dragonfly

The pilot program also introduced WBSD to the integrated asset management module within Dragonfly powered by Argon (formerly known as SCREAM). The Argon summary efficiently catalogs inspection data ratings of all collection system pipes (Figure 2A). The report also provides cleaning and reinspection plans (Figure 2B) and prioritized assets for rehabilitation and replacement. This was recognized by WBSD as a significant value-add to Dragonfly's AI inspection capabilities as it automated a previously cumbersome task of taking the inspection results and developing actionable plans.

Benefits identified by WBSD using the consolidated Argon Report:

- Detailed Insights and Advanced Visualizations
- Efficient Maintenance Scheduling and Planning
- Easily Accessible Pipe Inventory

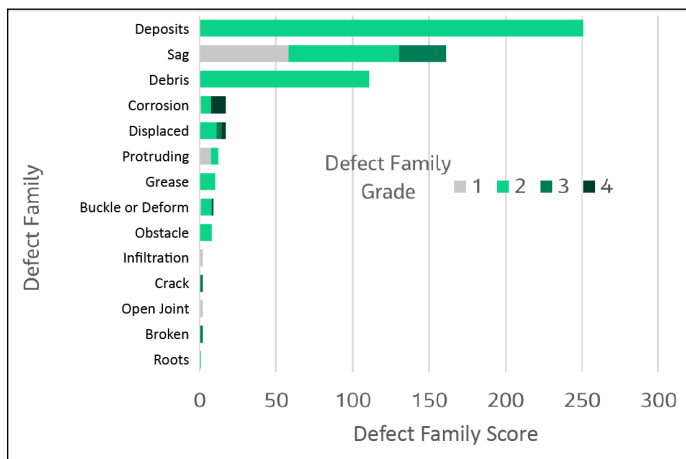


Figure 2A. Dragonfly Defect Family Score

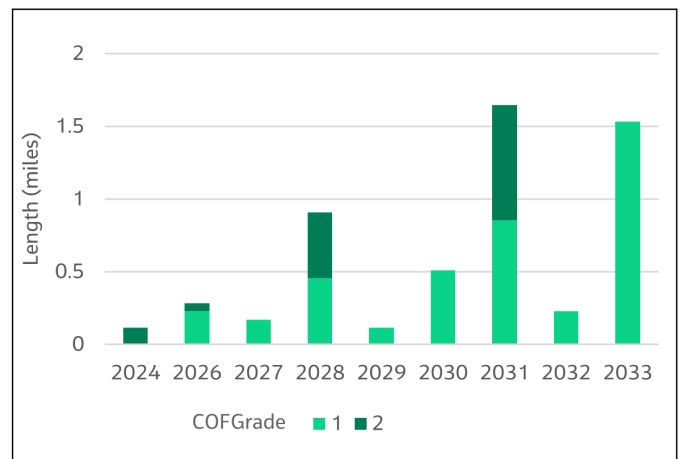


Figure 2B. Dragonfly Pipes Needing Reinspection

Path Forward

From quality pipe coding to actionable plans, all provided in a timely manner, the Dragonfly tool provided value to WBSD's pipe inspection program. The accuracy of the AI tool proved to exceed expectations and WBSD was further reassured when they learned Dragonfly's AI results undergo a rigorous 100% quality control review by NASSCO-certified technicians.

Argon provides the District with an overall snapshot of the 'health' of their system at any time.

After the successful pilot, WBSD was ready to expand the use of Dragonfly to their entire 65-mile sewer network. WBSD recognized that in addition to the value from accurate AI defect inspection and data management and insights/analysis, they could also capture value from cost savings, convenience, and improved/flexible processes. **WBSD secured an ongoing annual services contract for Dragonfly to process their entire sewer network at an estimated cost of 75% less than their initial budget.**

Takeaways/Lessons Learned

Dragonfly was able to demonstrate significant value to WBSD in terms of accuracy, cost, and resource savings. Beginning with a pilot project is a low-risk way to learn and gain confidence in the effectiveness and value of new technology. Utilities facing similar challenges in sewer asset and operations management could benefit from learning about WBSD's journey. WBSD was able to uncover hidden defects, streamline operations, and address staffing challenges. WBSD can have confidence that they are saving time and money with this innovative solution. Jacobs is pleased to continue to support WBSD as a trusted and innovative solutions provider committed to delivering efficient, precise, informed sewer management to West Boise and their customers.

"Dragonfly's CCTV Inspection System has been a game-changer for us! It saves time, frees up staff, and its accuracy is unmatched. The Argon dashboard impresses, helping us prioritize maintenance and plan for the future. We highly recommend Dragonfly to any organization seeking efficient and precise sewer inspection solutions." - WBSD

Key Takeaways:

- **Cost Predictability:** A flat-rate cost structure simplified budgeting and minimized the risk of unexpected cost escalations.
- **Web-Based Convenience:** Dragonfly's web-based platform, free from licensing fees or additional software installations, was ideal as it required less budget and allowed data access anytime.
- **Flexible Video Uploads:** The flexibility to upload videos anytime and in any quantity allowed the Maintenance Supervisor to adapt to changing priorities without constraints.
- **Quality Assurance:** Results from the advanced AI technology are fully reviewed by certified technicians ensuring accurate results.
- **Support:** The ability to contact Dragonfly representatives at Jacobs without incurring additional fees, proved to be valuable.
- **Comprehensive Information:** The Argon Report maintained a complete pipe inventory with ratings and displayed data efficiently, aiding decision-making.
- **Advanced Data Analysis:** Argon's multiple analysis tabs provided insights into rehabilitation, repair, reinspection, defects, next steps, and cost estimates.

Learn more:  dragonfly-info@jacobs.com  <https://www.jacobs.com/technology/dragonfly>