

CASE STUDY

MaxPredict Helps Vermont Gas Prioritize Cross Bore Mitigation Efforts



Case Details



Client:
Vermont Gas



Type of Service:
Cross Bore
Prioritization Model



Location & Size:
NW Vermont,
50k+ Services



Date
2020 - 2021

Project Need

As part of their mission to deliver safe energy, Hydromax USA strategized with Vermont Gas to develop a cross bore mitigation program that would leverage HUSA's MaxPredict Cross Bore Risk Reduction Prioritization Software. MaxPredict software would need to identify likely high-risk priority locations and assist Vermont Gas in establishing a well-informed, priority-based schedule to conduct cross bore inspections most effectively and efficiently over a distribution area of 50,000+ services. Utilizing this software, Hydromax USA was able to leverage both robust historical cross bore program knowledge from around the country in addition to Vermont Gas's own program data within the same framework. The desired result was an informed, prioritized, and targeted program road map for work area creation and implementation.



Project Hurdles

All available asset information would need to be identified and collected for processing by the prioritization model and a clear plan to utilize the predictive output for work area creation would need to be established. Once implemented, a solution would be outlined for ongoing risk model assessment as new data was collected.

Implementation Requirements

All data had to be defined, collected, and transferred before the plan could be implemented, and parameters were needed in order to standardize the work area creation process.

Project Approach

The first step would involve working with the Vermont Gas team to identify all historical cross bore data and asset information required for input. Within the development unit of HUSA, data preparation would ensure all necessary data was evaluated and formatted for import into the risk model. The model would then perform statistical and machine learning analysis on data to produce probability fields and contours. Final work area generation would involve HUSA scoping analysts utilizing sewer data and further parameters developed in collaboration with Vermont Gas. Subsequent risk model runs containing updated cross bore data would allow for continual revision and identification of high-risk work areas.

The Software

Hydromax USA's Risk Prioritization Modeling Software MaxPredict empowers utilities to quickly assess and prioritize their inspection plan utilizing their existing cross bore and claims records. MaxPredict pinpoints and prioritizes at risk facilities so you can prioritize inspections to the highest potential risk while simultaneously categorizing areas of medium and lower risk values resulting in a heat map visualization of priority. By leveraging Hydromax USA's direct experience managing cross bore projects as well as our deep expertise in data analytics and testing, utilities can make efficient use of limited budgets and capital resources. This accelerates the prioritization of potential risks and remediation all while improving public safety.

Our novel approach utilizes proprietary spatial relational tools based upon GIS data combined with powerful machine learning algorithms to create risk prioritization models with rich depth. The results drive the decisions to provide the highest reduction in risk with economic evaluation, sorting through all the available attribute data and teasing out correlated features instead of relying on human intuition and experience, both of which can carry unintentional bias. The result is an output for the likelihood of an event that has much better statistical significance and predictive power than any traditional approach.

Project Solution

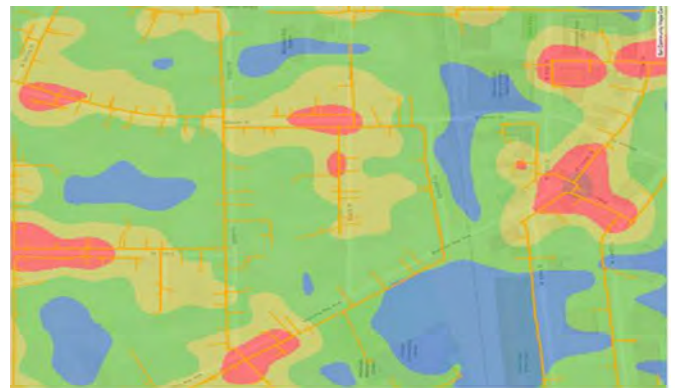
Following the outlined project plan, all necessary data was imported for the inaugural VGS risk prioritization efforts. Reviewing the aggregated data in the risk model map allowed the team to review the spatial density of the distribution network and fine tune the probability field parameters. Utilizing the risk field contours to delineate work areas, pre-set parameters were then followed in the scoping process to finalize work areas for field production to commence. Work area layers and naming conventions were developed to allow for subsequent risk model runs to track the progress and revision of future work areas.

Project Results

Utilizing HUSAs risk prioritization output data, scoping analysts identified 34 work areas for field inspections throughout the City of Burlington and Essex, VT. HUSA field crews inspected approximately 17.3 miles of mainline and 24.26 miles of service laterals over a cumulative period of 10 months in 2019 and 2020 during which 5 cross bores were identified at approx. \$139,330.00 per cross bore, while 34 percent of all footage inspected has been verified and cleared from risk. Moving into Spring, 2021, additional high risk work areas in Middlebury and Vergennes, VT are scheduled for inspection with geographic expansion expected to further refine the prioritization output.

"Hydromax gives us thorough data and confidence that we are doing what we can to find and address sewers which we might have unwillingly cross bored."

— Diana Camaiani
Distribution Engineer, Vermont Gas



THE VALUE OF A PRIORITIZATION MODEL

In developing a cross bore program for a 50,000+ service distribution area, the value in prioritization includes high risk identification and damage mitigation while maintaining cost efficiency. Utilization of MaxPredict allowed us to mitigate additional costs and low confidence issues from externally sourced data. Our machine learning framework and internal scoping unit provided specific advantages in the development of high-risk work areas:

- Spatial Distribution of Associated Risk
- Statistically Validated from Real Gas Data
- Client Collaboration for Meaningful Parameter Development
- Continual Risk Model Input for Updated Risk Area Output
- Room for Future Enhancements

