Identifying Costly Non-Surfacing Leaks

The City of Waterloo, Ontario, Canada is responsible for the distribution of water to over 137,000 customers within the Regional Municipality of Waterloo. The distribution system is divided into 7 areas, with over 441km (275mi) of watermains. Non-surfacing leaks can add up to big money very quickly.

SAVINGS OPPORTUNITY
$85,000

$34,000

$18,000

$33,000

The Savings with hydrant.AI

The City estimated that they would have saved a minimum of $85,000, if a leak identified and localized by the hydrant.AI solution had been repaired within 30 days of discovery. The cost associated with the leak is directly related to the leak flow rate, which as can be seen in the figure below continued to grow over the duration of the leak event. The leak evolved twice after the initial leak developed, resulting in the three periods identified, along with their associated costs.
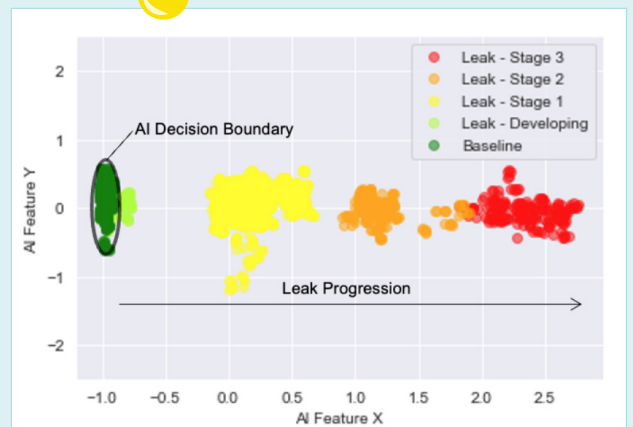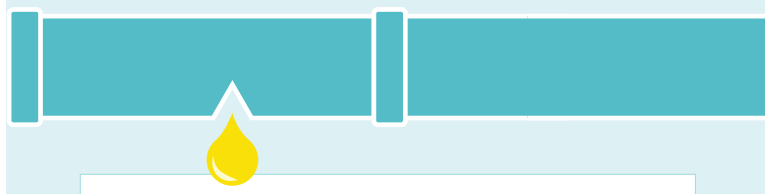
Detection of Subsurface Leaks

Utilizing the 42 hydrant.AI devices deployed within the distribution system the City is able to proactively identify leaks as they occur and more efficiently plan their repair work. The City has identified key areas for monitoring as part of the project and have increased the distance between the units to cover a greater range thus further reducing water losses through early identification of non-surfacing leaks.

In this example the Digital Water team identified a leak within the City distribution system. The leak did not immediately surface and the City determined that, as part of the project, it was beneficial to allow the leak to continue to flow for a period of time to assess the capability of the hydrant.AI solution to identify and localize non-surfacing leaks, to quantify the cost of a non-surfacing leak, and to see how the system responded as the leak increased in size over time.

Visualization of the hydrant.AI Leak Detection results over progression of the leak. Points outside of the AI Decision Boundary are classified as leaks. Distance from the boundary is indicative of leak severity.
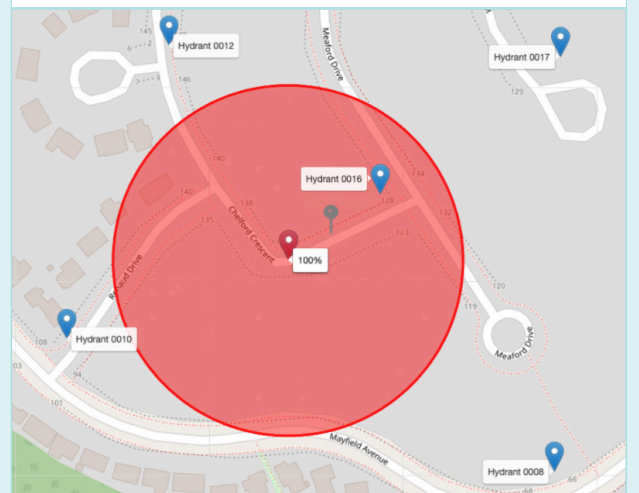
Leak Localization

At the end of the period the hydrant.AI Platform was able to identify and localize the leak, allowing the City to direct their crews to the proper location. Despite the leak never actually surfacing the City was able to repair the watermain, identify the approximate flow rate of the leak and the cost savings had the repair been effected within 30 days of the leak being identified, rather than allowing the leak to continue running as part of the technology assessment.

Hydrant.AI Leak Location – (100% detection confidence). Circle indicates the probable location of the leak, with the marker at the center representing the most probable location. Grey marker next to AI Leak location marker indicates the actual leak location.

The City recognizes that there are a number of small leaks that never surface within their water network, and the 40-50 water main breaks that occur each year are only representative of a fraction of the total leaks within the system.