

City of South Bend, Indiana

INTELLIGENT URBAN WATERSHED™ TECHNOLOGY REDUCES COMBINED SEWER OVERFLOW (CSO) VOLUME BY OVER 70% AND SAVES SOUTH BEND ESTIMATED \$500 MILLION IN CAPITAL PROJECT WORK

The Saint Joseph River has long shaped South Bend's economy, especially during the mid-20th century, when the river was the conduit to heavy industrial development such as Studebaker and the Singer Sewing Company. Despite the demise of heavy industry in the 1960s, the City is still the economic and cultural hub of Northern Indiana, and The Saint Joseph River is still the central downtown attraction. Under the development efforts of Mayor Pete Buttigieg, the City's population has started to grow for the first time in 50 years, and the old Studebaker plant and surrounding area is being re-ignited as a technology center to attract new business.

To reduce the 1-2 billion gallons of polluted water dumped in the Saint Joseph River annually, and the huge environmental, social, and economic costs associated with the ongoing issue, the City embraced a way to harness intelligent watershed technology to optimize its existing sewer system, without the need to build costly new grey infrastructure.

Challenge

Prior to 2008, virtually every time it rained heavily, the City of South Bend faced sewer overflows into the landmark Saint Joseph River because the City's aging sewer system could not handle the excess discharge, an average of some 1-2 billion gallons annually.

In 2011, the City – under the leadership of Public Works Director Eric Horvath – entered into a consent decree, agreeing to a long-term control plan (LTCP) of their sewer overflow estimated at more than \$860 million. For South Bend, with a population of just over 100,000, this equated to a burden of nearly \$10,000 per citizen, which is economically unfeasible given that the average annual household income is around \$32,000.

Solution

South Bend turned to Xylem for help to solve the overflow problem. In 2008, the City installed and commissioned a real-time monitoring system of more than 120 sensors located throughout the City's urban watershed. After a thorough data review in 2012 by the City and Xylem, the engineering firm Greeley and Hanson and local



Program Highlights

- Elimination of dry weather overflows
- Over 70% reduction in combined sewer overflow volumes (roughly 1 billion gallons per year)
- Over 50% drop in E. coli concentration (from sewer system) in the Saint Joseph River
- \$1.5 million per year in operations and maintenance cost-savings
- Estimated \$500 million in capital work savings

SERVICES PROVIDED:

- BLU-X real-time decision support system (RT-DSS) for optimizing sewer infrastructure
- 165 networked sensors and software agents optimally operating 13 gates and valves city-wide
- All sensor data presented on one unified platform
- Integration into South Bend's existing IT networks
- Real-time alert system to identify grit, FOG, sewer collapse & blockages

construction firms installed and commissioned BLU-X, a distributed real-time decision support system (RT-DSS) consisting of smart sensors and actuators that trade available conveyance capacity in real time, like an underground stock market, to avoid flooding.

The BLU-X RT-DSS serves overflow information via SCADA screens to operators, via smartphones and tablets to field staff, and through Web portals jointly developed with the City's engineering staff. A key benefit is that operators have the ability to override the system at any time and take control.

“We spent 500 million dollars less than originally estimated, achieving the same environmental benefit and level of service, just by optimizing the existing system in the ground.”

Eric Horvath, Director of Public Works, City of South Bend

Since 2012, the monitoring sites (currently 152) and 13 automated gates and valves have eliminated dry weather overflows and reduced combined sewer overflow (CSO) into the Saint Joseph River by more than 70 percent.

Eric Horvath believes in the benefits of the real-time decision support system approach. In 2014, he rewrote the LTCP on the basis that the City no longer needed half of the capital assets previously earmarked to achieve the same level of control and environmental benefit. If successful, the City will reduce the capital expense by as much as \$500 million.

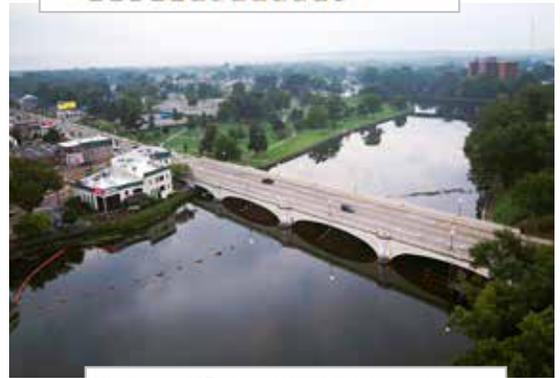
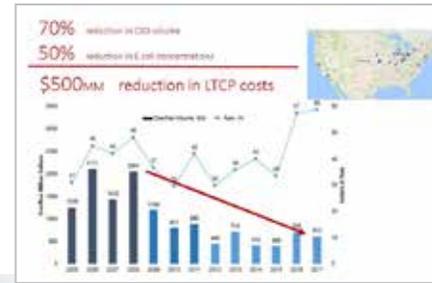
Outcome

Since implementing its Smart Sewer program, South Bend has enjoyed approximately \$1.5 million in annual operating and maintenance cost savings. By optimizing the system, the City has saved approximately \$500 million in capital work savings.

Dry weather overflows have been eliminated and **combined sewer overflow volumes reduced by more than 70 percent, or roughly one billion gallons per year**. E.coli concentrations in the Saint Joseph River have dropped by more than 50 percent on average, improving the water quality.

Overall, this intelligent program allowed South Bend to reduce costly traditional gray infrastructure, while improving system performance and capacity utilization, delivering environmental gains 10 to 15 years ahead of schedule.

That's the power of decision intelligence.



As proof of the environmental gains, residents and tourists are again now fishing for salmon and steelhead in the Saint Joseph River without trepidation. Photo: Kieran Fahey, Long Term Control Plan Manager, City of South Bend