

### THE STATE OF MICHIGAN IS GETTING VERY SERIOUS ABOUT WATER INFRASTRUCTURE, RESTORING PUBLIC TRUST & PROTECTING RATEPAYERS



A shockwave occurred in the U.S. water industry as the toxic lead findings sent a media mushroom cloud over Flint Michigan.

Every water utility in America convened fact finding meetings to assess their own water system testing and water quality risks. Still reeling from the shock and gripped by the fear of their aging and failing underground pipe infrastructure, more revelations emerged from Virginia Tech scientists — high iron corrosion removed chlorine disinfectant leading to Legionella deaths. Iron corrosion is a food source for water-borne pathogens. It can combine with lead and be deposited in galvanized pipes and could be disturbed later even when lead service lines are removed.

Now, nearly numb from looking down the abyss of potential risks, the water industry takes another blow as a survey of green building water systems reveals elevated water age and water quality concerns. Almost in disbelief, experts learn that water conservation methods to combat drought and water scarcity now has the potential to increase water age and extend stagnation which can cause chlorine and chloramine residuals to be absent, decaying up to 144 times faster and spiking the Legionella risk by four times.

Protecting water quality and public health does not just start at the water source point and end with the treatment plant. It extends through the entire water distribution system connecting to the household service lines and pouring out of the faucets for thirsty ratepayers.

The Trump administration may not have its infrastructure plan in place yet, but the State of Michigan is pulling out all the stops to figure out how to repair, replace and redesign their water and wastewater systems as sustainable infrastructure systems while balancing the economic, societal and environmental costs and risks to citizens.

Michigan's 21st Century Infrastructure Commission, created by Gov. Rick Snyder, presents recommendations to improve the state's infrastructure systems and enhance the quality of life for all Michiganders. The Commission was created through Executive Order 2016-5 after the governor's State of the State address in January 2017.

"Our state's infrastructure challenges are serious and wide-ranging, and we need to act with urgency to improve our infrastructure systems and make Michigan an even better place to live," Snyder said. "Safe and reliable infrastructure is critically important to the health and well-being of the people of Michigan and will help support our growing economy in the future. Our state is poised to be a global leader in emerging technologies as we move forward in the 21st century, so it is essential that we have the infrastructure to match our goals."

Michigan is the first state in the nation to develop a list of comprehensive infrastructure recommendations. The Commission's report includes recommendations for all types of infrastructure systems, including transportation, water, stormwater, wastewater treatment, drainage, energy and communications infrastructure.

A first key issue identified in developing a 21st century infrastructure system for Michigan is determining how to get more value out of its assets over their entire service life. The Commission states that the best way to accomplish this is through asset management — the practice of identifying and managing infrastructure in a cost-effective and efficient manner based on continuous collection and review of data. The second key issue deals with the coordination of the way the state plans for and manages infrastructure across and among levels of government and with private sector entities that build and manage infrastructure.

The governor reached out to water infrastructure experts across the nation to present on new technologies and innovations involved in the operation, maintenance, design, management or administration of aging water infrastructure.

On March 7-9, Snyder and the Department of Environmental Quality (DEQ) convened the Water Infrastructure Conference: A National Conversation in Flint. Topics included right-sized and flexible water infrastructure to meet the changing needs of communities, as well as incorporating innovative and emerging technologies to solve complex infrastructure issues nationally. Doing the same things in the same way was not going to bring innovation, sustainability and affordability. Asset management was a core discussion at the conference as well as the use of sustainable materials and processes. Attendees learned about the importance of knowing what assets they have, and understanding the life cycle of the assets including the increasing costs as the condition score of an asset deteriorates.



Presentations offered solutions on collecting and valuing asset data by using computerized maintenance management systems on a Web GIS-centric platform for criticality and geo-spatial analysis while also reviewing multiple layers of water, sewer and road critical assets contained within a single ArcGIS geodatabase as part of an integrated multi-sector decision making approach. Part of the desired outcome of the conference was to help identify infrastructure solutions that may be applied to address the broad initiatives of the governor's 21st Century Infrastructure Commission.

On March 9, the American Society of Civil Engineers (ASCE) released the 2017 Infrastructure Report Card. While the nation's drinking water infrastructure earned a "D," the report estimated that Michigan faces drinking water infrastructure challenges totally roughly \$13.8 billion.

Many of the report card's recommendations to improve the infrastructure grade for drinking water coincides with Snyder's 21st Century Infrastructure Commission's recommendations and further supports asset management elements to ensure the lowest life-cycle costs. This can be accomplished through comparative analysis of alternative sustainable pipe materials and innovative processes to design and build better water systems which also take into consideration environmental, water quality and affordability concerns of the public.

These elements can also be found as part of the Effective Utility Management (EUM) initiative with collaborating organizations like the U.S. Environmental Protection Agency (EPA), the Association of State Drinking Water Administrators, the American Public Works Association, the American Water Works Association, the National Association of Water Companies, the Water Environment Federation and others.

The 2017 EUM primer explains that water sector utilities face a broad range of complex challenges, including rising costs and affordability, aging water infrastructure, ongoing regulatory requirements, enhanced customer expectations and rapidly evolving technology. As part of the 10 attributes of an effectively managed water and wastewater utility, financial viability addresses the need for understanding and planning for the full life cycle costs of operations and the attribute of Infrastructure Strategy and Performance identifies the need to achieve "the lowest possible life cycle cost."

State and local governments and their various associations continue to press for more federal funding and legislation. This includes the following requests which align with ASCE's recommendations to fix infrastructure and improve the report card grade:

- Reinvalidate the State Revolving Loan Fund (SRF) program under the Safe Drinking Water Act through permanent reauthorization and tripling the amount of annual appropriations;
- Fully fund the Water Infrastructure Finance and Innovation Act (WIFIA) at its authorized level;
- Preserve tax exempt municipal bond financing;
- Establish a federal Water Infrastructure Trust Fund to finance the national shortfall in funding of infrastructure systems under the Clean Water Act;
- Eliminate the state cap on private activity bonds for water infrastructure projects to bring an estimated \$6 to \$7 billion annually in new private financing;
- Increase federal support and funding for green infrastructure, watershed permitting, and other programs that promote the concept of "one water" to protect source watersheds;
- Incentivizing municipalities and utilities to undertake asset management programs and develop asset management plans; and
- Increase federal and local support for vocational training in the drinking water sector as engineers, operators, and maintenance staff begin to retire in large numbers.

As all interests turn to Washington waiting with bated breath for the release President Donald Trump's federal budget reduction recommendations, tax reforms and the "Make America Great Again" Infrastructure Plan, Michigan is pushing forward with Snyder's plan of "Reinventing Michigan — Getting It Right and Getting It Done."

On March 15, the Senate Committee on Michigan Competitiveness heard testimony on SB 157, a legislation sponsored by Sen. Rick Jones (R-Grand Ledge) that would require open competition for water and sewer underground infrastructure projects at the local level when state funding is requested. The Senate Committee Chair Mike Shirkey (R-16th District) and his colleagues, Vice Chair Jim Stamas (R-36th District), David Robertson (R-14th District), John Proos (R-21st District) and Minority Vice Chair Rebekah Warren (D-18th District) are very serious about the trend of increasing water and sewer rates on their citizens and the lack of sustainable and innovative solutions that are being recommended to address the complex infrastructure and environmental challenges the state is facing.

The U.S. Conference of Mayors warned elected officials in a publication on “Municipal Procurement: Procurement Process Improvements Yield Cost-Effective Public Benefits” that outdated procurement practices and policies is a key stumbling block to doing comparative analysis of current water infrastructure repair and replacement practices, and that outdated technology and material specifications are significantly limiting competition which only drives up the cost passed on to taxpayers. Many times, even developers and home building associations striving to increase economic development are restricted to high cost materials through outdated procurement practices set in place by local ordinances.

The Government Finance Officers Association directs an 18,000-professional membership to the National Institute of Governmental Purchasing (NIGP) and the Values and Guiding Principles of Public Procurement which are grounded in the key values of transparency, accountability, ethics, impartiality, service and professionalism. Government finance officers know that in a competitive process, the public can find cost savings. Combined with a total cost of ownership comparative analysis, the long-term financial perspective of finding the lowest life-cycle cost can be achieved. The Institute for Public Procurement in the Principles and Practices of Public Procurement states that specifications are “written with an intent to maximize competition.”

As an example for the water sector to follow, the Michigan Department of Transportation (MDOT), in its procedure guidelines for grantees receiving federal transportation funding via MDOT, defines “competition” as the primary purpose of any procurement to obtain optimal quality and service at minimum cost through free and open competition. The second purpose is to guide against favoritism at the public’s expense and to provide equal opportunity to every potential vendor to ensure that all qualified vendors have a fair opportunity to benefit from public funds.

Unlike other water industry legislation, Michigan’s SB 157 seeks to remove the obstacles of decades old and outdated procurement practices that prevent professional water and sewer engineers from recommending innovative and sustainable solutions to local governments and their utilities. Most ratepayers and even elected officials have not known that their water infrastructure decision making process did not include asset management best practices of life-cycle costing and business case evaluations, presenting a comparative analysis of alternative underground infrastructure repair and replacement activities. If a decision was made with a lack of data, knowledge or comparative analysis, ratepayers may be paying for assets with a higher life-cycle cost or total cost of ownership (initial cost, operations and maintenance, repair and rehab and disposal) over a 100-year sustainable performance life. These higher-cost decisions roll into asset management funding plans, capital budgets and operation and maintenance budgets which all directly impact water and sewer rates, utility cash reserves and ability the to acquire debt financing.

Considering a tenant of Trump’s infrastructure plan during his presidential campaign — which called for greater use of and leveraging of private capital and public-private partnerships — SB 157 seems to remove the initial and most basic obstacles needed to start to understand the real costs of innovated solutions for our water and sewer infrastructure.

Michigan understands that only through communicating the true value and costs of public assets can private capital partnerships be formed. The key ingredients of such a partnership includes trust (trust between the public and all levels of government officials then with private parties) and the ability to identify and quantify the cost of carrying risk. Right now, tens of thousands of utilities and municipalities across the nation are carrying a severe level of unknown and undisclosed risk associated with their drinking water and sewer systems. This liability can be several times larger than even pension funding gaps. Open competition, innovative engineering solutions and the proper application of asset management practices can provide a framework to address both fiscal and infrastructure sustainability issues.

Open procurement drives competition, competition drives innovation, innovation drives sustainability, and sustainability drives affordability. An asset management program’s focus should be on achieving the “lowest life cycle cost” of an asset while meeting community service levels through a continuous improvement process. A defined process values one’s asset cost and condition data and entails measurement. When there is no true measurement, there can be no control process and thus no continuous improvement.

The first step in developing the Trump Infrastructure Plan should include embracing the Michigan’s efforts and progress of the 21st Century Infrastructure Commission and the second step should include protecting the public funds with a standard of transparency, because the government’s only real currency is the public trust.



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