Top Trends in Infrastructure Management

Demo Theater 1, Wednesday, July 12, 09:30 am

David Totman | Industry Manager | Global Water Practice
Reported water main break... City of Cleveland, July 7, 2017

...Found it!
Sources

- ASCE - America Society of Civil Engineers
- APWA - American Public Works Association
- AWWA - American Water Works Association
- NRWA - National Rural Water Association
- WEF - Water Environment Federation
Top trends in infrastructure management

- Condition of water/wastewater infrastructure – The American Society of Civil Engineers (ASCE) gave America’s infrastructure a “D” grade.
- Lack of public appreciation for the value of water
- Funding for capital improvement projects – More than 40 percent of non-utility respondents believe the water industry is not prepared to meet financial needs.
- Water scarcity/supply
- Replacing a retiring workforce
- Drought potential – Ten percent of respondents believe their home water service is not prepared for a drought of more than three years.
- Customer/community relations – Outreach is needed to communicate the challenges of water stewardship and develop public support.
Water Systems: > 100,000 served
Water Systems: > 10,000 served
Water Systems: \( \leq 10,000 \) served
The Challenge
Top trends in infrastructure management

- Condition of water/wastewater infrastructure – The American Society of Civil Engineers (ASCE) gave America’s infrastructure a “D” grade.
- Lack of public appreciation for the value of water
- Funding for capital improvement projects – More than 40 percent of non-utility respondents believe the water industry is not prepared to meet financial needs.
- Water scarcity/supply
- Replacing a retiring workforce
- Drought potential – Ten percent of respondents believe their home water service is not prepared for a drought of more than three years.
- Customer/community relations – Outreach is needed to communicate the challenges of water stewardship and develop public support.
Top trends in infrastructure management

- Recovering costs for service/investment – Eighty percent of utilities (water, wastewater, and combined systems) said they were not able to recover the full cost for providing service.
- Government regulations – Utility personnel ranked disinfection byproducts (DBPs) as the top regulatory concern, followed by pharmaceuticals and personal care products (PPCPs).
- Emergency planning and response
- Energy usage/cost
- Climate change – Only 20 percent of non-utility respondents feel the water industry is prepared for climate issues such as risk and resiliency.
- Utility security – Worries include intentional water contamination and cybersecurity.
Buried No Longer Findings

• The needs are large.
• Household water bills will go up.
• There are important regional differences.
• There are important differences based on system size.
• The costs keep coming.

• *Postponing the investment only makes things worse.*
Applying the platform
Applying the platform

- Infrastructure data management
- Public engagement
- Capital Improvement Projects
- Water resource management
- Workforce optimization
- O&M optimization
- Regulatory and policy impact
- Emergency planning and response
- Natural resource management
- FISMA, FedRAMP, USGCB compliance

ArcGIS
Dave’s top 5…

- Lead service lines
- Infrastructure open data
- High-accuracy mobile
- Infrastructure story maps
- Drones, drones, drones…
Lead Service Lines
Lead Service Map

Prior to 1950, lead was commonly used in the manufacture and installation of water service pipes and some private water service lines are made of lead. If too much lead enters your body, it can pose significant health risks, especially to children. For more information, refer to our Sources of Lead page.

The following map indicates, in yellow, properties within the City of Boston that have private lead service pipes. If your property has a lead service pipe, consider the following:

- Owners of properties with lead service pipes can call the BWSC Lead Hotline at (617) 989-7888.
- One, two and three family homes may be eligible for BWSC's Lead Replacement Incentive Program.
- Tenants, whose building has a lead water service should contact their landlord or building manager.

Instructions
1. Begin entering an address in the search box, then select an address from the dropdown.
DC Water - Water Service Information

To see service line information, enter an address in the search box or zoom in on the map. Click the circle located within the property boundaries to view the property’s service line information. The information provided through this map is limited to the best available data in DC Water’s possession at this time. It may not be accurate.

Visit Service Lines - Fact Sheet for more information.

DISCLAIMER: The maps provided by the District of Columbia Water and Sewer Authority ("D.C. Water") are based on historical data, information directly provided by customers, and in some cases, information acquired during physical inspections. DC Water does not guarantee the accuracy of these records and maps, which shall be used for the sole purpose of providing property owners and residents with DC Water’s best available data regarding their private water services, and not for any commercial, legal or other use. These records will be updated constantly as D.C. Water gathers additional information. D.C. Water requests that customers provide to it records of any service line replacements performed by property owners. D.C. Water reserves the right to alter, amend or terminate at any time the display of these maps and records.

I understand
Infrastructure open data
High-accuracy mobile
Rural Water District Gains
High Accuracy on a Budget

By Travis Anderson, District Engineer, Le-Au Water District

When I came to work at La-Au Water District in the fall of 2016, staff had just finished gathering GPS points on all the aboveground assets. With Ohio University’s Institute of Local Government Administration and Rural Development (ILGARD) providing technical resources, Le-Au had finally put together all the pieces and had a functioning geographic information system (GIS). From that point on, it was the district’s responsibility to maintain it.

The continued task of gathering GPS points was assigned to the maintenance crew. Since they were responsible for installing, moving, and replacing meters and valves, it made the most sense for them to collect the asset locations. Periodically, I would take the handheld GPS unit from the staff and put the new points into ArcMap. The workflow seemed pretty straightforward, but it became apparent fairly quickly that this transition to the district’s maintaining the GIS unit would not be an easy one.

The two main problems that came to light were the staff’s limited technical knowledge of the equipment itself, and the amount of time the handheld unit needed to acquire accuracy. The first problem was corrected by creating cheat sheets for the staff. If the cheat sheet couldn’t answer questions or reflect the memory, a phone call generally would solve the problem. The second problem became a much more contentious issue. As the crew would be ready to begin data collection, the person responsible for gathering the points would be waiting on the handheld GPS unit to achieve accuracy. Sometimes it would take 30 seconds or more, which was frustrating for everyone.

In 2018, Travis Anderson, District Engineer, Le-Au Water District
Infrastructure story maps
Hayward 2016 Pavement Improvement Project
317 streets will receive a treatment. Each color represents a different treatment type. Continue scrolling to view the different types of treatment used.
replacement of the structure, and is typically done when there is only minor to modest damage to the existing pavement structure.

Here is how a mill and overlay procedure works.
In urban areas, much of the water that comes from rain and snow can't soak into the ground. Instead, it runs off of hard surfaces and enters a network of underground pipes. These pipes carry the runoff directly into nearby rivers, lakes or wetlands.

Because of the pollutants found on our urban streets and lands, the stormwater runoff that runs through these pipes is a major source of water pollution. In Minnesota, special local government units called watershed management organizations work to protect water quality by capturing and treating polluted runoff.

The Mississippi Watershed Management Organization manages an urban area that includes much of Minneapolis and portions of several neighboring communities. The water that falls in this area drains directly into the Mississippi River. Use this StoryMap to explore one portion of the MWMO and see how runoff from this area impacts the river.
Drones, drones, drones
Drone2Map for ArcGIS

What Will Your Drone Do For You?

Turn Your Drone Into an Enterprise GIS Productivity Tool

Create orthomosaics, 3D meshes, and more in ArcGIS from your drone-captured still imagery — in minutes, not days.
DJI - Phantom 4 Pro Quadcopter - White

Model: PHANTOM4 PRO (NA)  SKU: 5710367  4.8 (255)  18 Questions, 95 Answers

$1,499.99

Included Free: 1 Item

FREE 2-DAY SHIPPING on orders $33 and up

Build A Bundle

Color: White

Product Set:
- Advanced
- Base
- Pro
- Pro+ (remote w/ 1080p display)

Shipping: FREE Two Day
Ct ll by 7/14/23 for 8/1/23
What have I learned…

• You don’t have the luxury of saying No
• Nearly every issue tied to a lack of education
• There is a lot of noise out there
• Seeing these issues laid out on a map is key to understanding
• ArcGIS is better than ever