CONGRATULATIONS

EEI would like to recognize the following employees for their milestone anniversaries with the company and awards received in 2023.

10 Years:
Chris Walton

Crain's Chicago Notable Women in STEM
Michele Piotrowski

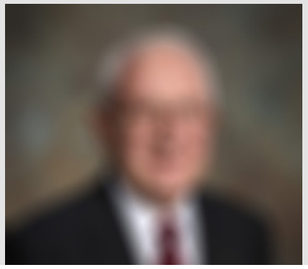
DID YOU KNOW?

Thanks to the dedication and hard work of our employees, EEI has earned the impressive ranking of 21 out of the top 100 in Crain's 2023 Best Places to Work in Chicago. We are grateful to have such a talented and committed team. Read the full article below.

ENTERPRISES TRIVIA CHALLENGE

Q: EEI is celebrating 50 years this upcoming Spring. Who founded EEI?

Submit answers to eei@eeiweb.com by 1/12 to be entered into a drawing for a $50 gift card!



Engineering Enterprises, Inc. (EEI), founded in 1974, is an award winning consulting engineering firm providing services to public agencies and private entities throughout northern Illinois. Our expertise includes water, wastewater, transportation, stormwater, construction management, land surveying, GIS and municipal consulting.

Now with three locations to better serve you:
Sugar Grove // Rockford // Itasca

For more information, visit us online: www.eeiweb.com

Engineering Enterprises, Inc.

OUTSTANDING SERVICE · EVERY CLIENT · EVERY DAY

WATER MAIN REPLACEMENT PLANNING

A community's infrastructure provides the foundation for mobility and water and wastewater management. Therefore, infrastructure maintenance and rehabilitation are imperative for a community to continue to prosper. Underground infrastructure maintenance and rehabilitation can be especially challenging because it is out of sight. However, it cannot be out of mind, because it has a service life just as all infrastructure components do.

A community's water distribution system, comprised primarily of water main, valves, fire hydrants, water services and other appurtenances needs to be maintained and rehabilitated in order to maintain reliable, efficient and high quality water service to the community. While water distribution system components can have service lives in excess of 50 years, much of our community's water distribution system components have been in service for 50+ years and in some cases over 100 years. Service leaks, water main breaks and service disruptions become more commonplace. In addition, as water distribution systems leak and water mains break, water produced or purchased that does not make it to the customer's tap becomes nonrevenue water that leaks into the ground.

IN THIS EDITION

FALL/WINTER 2023

52 Wheeler Road ▪ Sugar Grove, IL 60554 ▪ Tel: 630.466.6700 ▪ Fax: 630.466.6701

Presorted
Standard
U.S. Postage
PAID
Permit No. XXX
Fox Valley, IL

Engineering Enterprises, Inc.
52 Wheeler Road
Sugar Grove, IL 60554

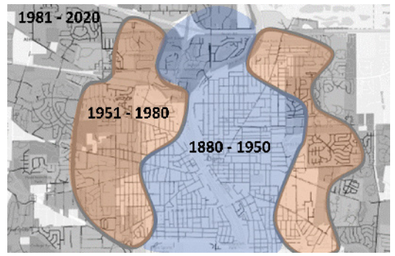
WATER MAIN REPLACEMENT PLANNING

Meanwhile, covering the costs to maintain and rehabilitate water distribution systems is an ongoing challenge as infrastructure funding dollars continue to be stretched. In order to maintain high quality water service with limited financial resources, communities must optimize water distribution system rehabilitation. Optimal water distribution system rehabilitation can be achieved with a well thought out water main replacement.

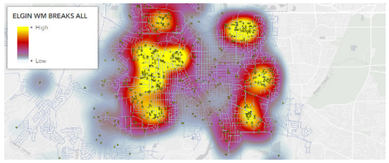
Planning for the replacement of distribution system components is critical. It requires a concerted effort to collect, process, and interpret the information required to develop a water distribution system replacement plan. The most effective replacement plans prioritize replacements utilizing the best available information. Age, life expectancy, condition, criticality, and level of service are the fundamental data required for a priority-based replacement plan. Replacement planning involves several factors which are beyond the scope of this article. However, the essence of prioritizing the replacement of water distribution system components employs risk scoring based on condition and criticality. Multiple factors are used to derive a condition score, such as good, fair, or poor, for ranking the condition. Criticality is primarily judgment-based and is typically high, medium, and low. Once condition and criticality rankings for all components are assigned, risk is assigned based on the combination of condition and criticality.

In addition to evaluating metrics specific to the water distribution system, it is important for a community to consider other infrastructure throughout the community. Lead service line replacement plans, storm and sanitary sewer improvements, along with road rehabilitation projects should be considered to identify appropriately sequenced rehabilitation timelines. After taking into account as much information as is available, prioritized water main replacement programs can then be developed.

The City of Elgin's Comprehensive Water and Sewer Master Plan includes a water main replacement program that establishes a prioritization hierarchy and is integrated within the City's lead service line replacement strategy, sewer separation plan and planned transportation improvements. In order to develop the plan, the age of water mains was estimated based on the age of homes adjacent to the mains using GIS tools. A GIS layer of water main age was created showing the age of pipes color-coded by decade constructed. Annexation maps were used to quality control the inferred water main age.

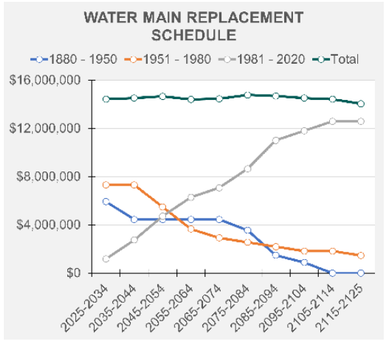


Next, water main break records were gathered, and the locations of the breaks mapped. GIS was used to create a heat map to visualize the density of breaks. The highest density of main breaks occurs in cast iron pipes located at the edge of the urban core, creating a donut shape around the core. The heat map was overlain onto the water main age map to investigate the possibility of a relationship between age and breaks.



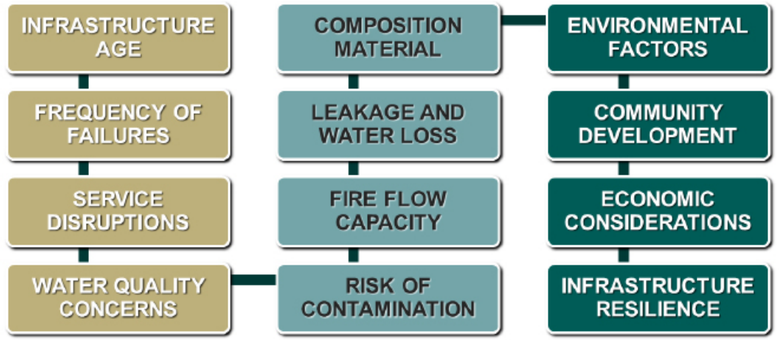
In the Elgin case, the highest density of main breaks occurs in water mains constructed during the 1950s through 1970s. This was a bit of a surprise because the oldest water mains located throughout the urban core are well over 100 years old. Further investigation revealed that in many areas of the country the quality of iron used in cast iron piping was inferior during the World War era and the years following.

As a result of analyzing water main age and main break history, the City's water main replacement schedule considers three different categories of water mains: 1) Pre-1950 mains, 2) Mains between 1950 and 1980, and 3) Post-1980 mains. For the next 10 years or so, funding will be divided between category 1 and 2 with approximately 50% going to both. After this initial phase, a small percentage will be set aside for replacing water main in category 3. Over time, as categories 1 and 2 replacements are completed, funding for category 3 mains will increase. In the end, all water mains will be replaced in approximately 100 years.



For most communities, continued water distribution system maintenance and rehabilitation will be needed to maintain high quality water service. Thus, data-driven prioritization of water main replacements will continue to grow in importance as many water distribution system components reach the end of their service lives.

For more information, contact Tim Holdeman at tholdeman@eeiweb.com or 630-466-6700



L² LEADERSHIP LOOKOUT

Bradley Sanderson, PE, COO / President

CAPITAL IMPROVEMENT PLANNING FOR PUBLIC WORKS

Capital Improvement Planning (CIP) plays a crucial role in the shaping of future public works projects in a time of rapid urbanization, technological advancements, and an ever-growing demand for better living. It is essential to adopt a strategic approach to planning in order to ensure the long-term success and stability of our communities.

Capital Improvement Planning is an all-encompassing process that lays out the financing, location, and timing for projects over several years and requires collaboration between several departments including planning, finance, public works and potentially others. The creation of a CIP is important as it is one of the major responsibilities of government. Having a plan allows you to maintain infrastructure proactively, increase buy in from elected officials and residents, aid in project financing and assist in seeking grant opportunities. The following are a handful of strategies to consider in preparing a plan:

1. Collection and Analysis of Data: This includes information on the current infrastructure condition, demographics, and growth projections for the future. Investing in data collection tools and techniques, such as GIS (Geographic Information Systems) and asset management software to monitor the condition and performance of existing assets. Master planning for critical water, wastewater and transportation infrastructure helps identify long-term needs.

2. Engagement of Stakeholders and Public Participation: It is essential to engage with stakeholders, such as the elected officials, public, local businesses, and government agencies. Seek their opinions and concerns. Public participation ensures that infrastructure projects reflect the community's needs and preferences and effective communication can garner support for funding.

3. Long-Term Vision and Objective Setting: Define a clear and compelling long-term vision for the infrastructure of the community. What are the sustainability, resilience, and quality of life objectives? A clear vision and objectives help prioritize projects and allocate resources.

4. Risk Evaluation and Mitigation: Conduct a thorough risk assessment to identify potential infrastructure threats, such as natural disasters, climate change, and economic uncertainty. Develop risk mitigation strategies. Resilience planning ensures infrastructure can withstand and recover from adverse events.

5. Budgeting and Funding Strategies: CIP infrastructure projects require adequate funding. Create multi-year budgets consistent with the long-term goals. Explore grants, bonds, and user fees. Diversifying funding sources reduces risk and ensures projects are adequately funded.

CIP is a dynamic process that must be reviewed and revised as conditions change. Communities can better prepare for their long-term infrastructure needs and meet future challenges by implementing a few of these strategies.