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The University of Delaware Water Resources Center partnered with the City of Wilmington to inventory the city's water infrastructure, aiming to identify and remove lead service lines that can contaminate drinking water.

PROTECTING WILMINGTON'S DRINKING WATER

Article by Sophonie Milord | Photo by iStock | January 29, 2025

UD Water Resources Center and the City of Wilmington partner on water service line inventory

While the use of lead pipes in new construction was banned in the United States in 1986, many older homes still receive water through lead pipes, which are considered a significant public health concern due to the potential for lead contamination in drinking water.

Last fall, the Environmental Protection Agency (EPA) released the Lead and Copper Improvements Rule, which requires that nearly every lead water pipe in the country be removed by 2037.

In Wilmington, Delaware, there are roughly 74,000 service lines, and excavating and replacing all of them would be costly and time-intensive.

The [University of Delaware Water Resources Center](https://www.udel.edu/academics/colleges/biden-school/research-public-service/ipa/public-service/water/)

(<https://www.udel.edu/academics/colleges/biden-school/research-public-service/ipa/public-service/water/>), (UDWRC), the City of Wilmington and Jacobs, a private engineering firm, partnered to create a first-of-its-kind lead pipe inventory for all city-owned water lines. So instead of replacing all 74,000 lines, the city will be able to focus its resources on fewer than 2,000.

Findings from the analysis proved that 75% of the system is not lead. Fewer than 2,000 – less than 3% – were found to be made of lead, and fewer than 1,000 lines were found to be made of galvanized material.

The development of this inventory has substantial public health and economic benefits for Wilmington residents. Identifying the materials of drinking water service lines and determining the areas where lead and pipe replacement must occur has reduced the uncertainty while decreasing the estimated cost of replacing lead lines in the city's historical system.

“This partnership not only ensures compliance with federal regulations but also serves as a model for cities nationwide,” said Kelly Williams, public works commissioner for the City of Wilmington.

“We're proud to set an example of what collaboration between municipalities and academic institutions can achieve.”

Martha Narvaez, UDWRC's associate director, and Andrew Homsey, Geographic Information Systems (GIS) manager, led the initiative, which has been ongoing for the past two years. Narvaez and Homsey supervised a team of UD students – spanning four colleges and eight majors – who reviewed more than 70,000 historical work orders dating back to 1916 to inventory the public side of Wilmington's water supply system.

The team evaluated service line data from the city's as-built plans, asset management system, meter shop, licensing and inspection, and insurance records. The students searched through handwritten work orders from the early 1900s and updated GIS mapping layers to identify critical information such as service materials, size, location and installation date. Jacobs further processed the data using AI techniques to help in the quality control process.

“The dedication and hard work of the students have been remarkable,” Williams said. “Their ability to meticulously review over a century of data to develop our Service Line Inventory Map has been nothing short of extraordinary.”

The inventory will help the City of Wilmington meet the EPA's Lead and Copper Rule Revision deadline, according to Cheryl Townsend-Braun, a business analyst/asset management professional at Jacobs.

“The students' meticulous review of historic work orders not only provided the foundation for the city's water service line inventory but has also delivered immediate and tangible benefits to our community,” she said.

By leveraging this data during water main replacement projects, the city has already saved thousands of dollars by utilizing grant funding instead of capital improvement funds to replace lead water services, Townsend-Braun said.

“We are immensely grateful for the hard work and dedication of the students, whose efforts have made a lasting impact on both public health and the city's financial stewardship,” she said.

Three student researchers – Aaron Balmer, Cooper Feeny and Dmitriy Rybin – presented their findings at the UDWRC's annual advisory panel meeting last May. The advisory panel includes representatives from the University of Delaware, Delaware State University, government agencies and nonprofits in the water resources field in Delaware.

“This project has been immensely rewarding on both a personal and professional level,” said Feeny, a senior economics and public policy major. “Contributing to such a significant aspect of EPA regulatory compliance while having the opportunity to present my findings and inform other researchers and professionals about its importance has been a pivotal experience in my early career in water resources research and policy.”

Other student researchers included Lydia Franks, Alex Makowski, Elizabeth Shields, Megan Wassil and Michele Wassil.

UDWRC will continue to work with students, the City of Wilmington and Jacobs to inventory the approximately 18,000 city lines that haven't yet been identified.

“This partnership serves as a state and national model for other cities and towns that must comply with the EPA's Safe Drinking Water Act standards to provide the public with clean and healthy drinking water,” Narvaez said.

Results from the initial inventory are available through the city's website on the [Wilmington Water Lead Reduction Program page](https://www.wilmingtondewater.gov/204/Lead-Reduction-Program) (<https://www.wilmingtondewater.gov/204/Lead-Reduction-Program>). Wilmington seeks customer assistance in identifying their private service lines and encourages residents to participate in the [water service line survey](https://survey123.arcgis.com/share/c807894a91214a668b1cdcb45920042e). (<https://survey123.arcgis.com/share/c807894a91214a668b1cdcb45920042e>).

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