

Lead Service Line (LSL) Replacement

Examples from Other States and Cities

This document identifies lead service line replacement policies, actions, and investments in other states and cities. Together, these examples provide a broad sense of how others have addressed this problem, the policy innovations they pursued, the time required, and the known or projected cost.

State Examples:

Excerpted from the Lead Service Line Replacement Collaborative:

<https://www.lslr-collaborative.org/requiring-lsl-replacement.html>

California

In 2016, [California enacted SB-1398](#) that requires public water systems to provide the following information to the state water board:

- By July 2018, an inventory of known LSLs in use in its distribution system, a timeline to replace these lines, and identified areas that may have LSLs in use.
- By July 2020, for those areas that may have LSLs, a determination of the existence or absence of LSLs in the distribution system and a timeline to replace service lines whose content cannot be determined.

The California Water Board must approve or deny the utility's timeline within 30 days of receipt. If it misses the deadline, the timeline is approved. If denied, the Board and the utility must develop a compromise timeline within 30 days. The requirements only apply to a "[user service line](#)" which connects the water main to an individual water meter or service connection. Based on preliminary interpretation, this term does not appear to include the portion of the LSL on private property.

Washington

In 2016, the [Governor of Washington issued a directive](#) to the state department of health ordering it to prioritize the removal of LSLs and other lead components in water distribution systems when considering a funding proposed through the Drinking Water State Revolving Fund.

Michigan

In June 2018, **Michigan** filed rules [overhauling the state's Lead and Copper Rule](#) to accelerate LSL replacement. The rules require full LSL replacement in addition to replacement of galvanized steel lines downstream of a lead pipe, with special provisions for emergency repairs. Community Water Systems must achieve replacement on a schedule averaging 5% per year starting in 2021 totaling not more than 20 years for replacement of all LSLs, unless the system has an alternative plan approved by the state.

City Examples:

Cincinnati, OH

In 2017, Cincinnati enacted three laws that created an innovative legal framework for LSL replacement. Most importantly, LSLs were outlawed and property owners were required to remove their portion of the pipe when Greater Cincinnati Water Works (GCWW) provides notification of pending work on its water mains. (The city also required landlords to disclose the presence of LSLs to prospective tenants and established a fund for donations to assist low income residents in paying the unsubsidized portion of the work.) If the property owner uses GCWW's contractor, the city subsidizes 40% to 50% of the cost of removing privately-owned LSLs (up to \$1,500) and the remaining cost may be paid over 5 to 10 years as an assessment on the property tax bill. The goal is to replace all LSLs over 15 years.

For planned LSL replacements, the GCWW considers the following criteria to determine which Cincinnati neighborhoods should be prioritized:

- Children aged six or younger, using U.S. Census Bureau data;
- High blood lead levels in the neighborhood based on Ohio Department of Health data;
- Houses with lead in water test results above the action level of 15 parts per billion;
- Lead branch density per 100 feet of water main;
- Coordinate with other public agency projects, such as road construction.

Denver, CO

In August, 2019, Denver Water proposed to remove all lead service pipes from homes across its metro area, a rare action that could cost between \$250 million and \$400 million over 15 years for the 50,000 to 90,000 homes that may be affected. (The planning assumption is that a total of 75,000 lead service lines will be replaced.) The effort will be one of the largest lead-removal programs ever implemented, and the pace is far faster than the current rate of replacement, which would have taken over 50 years to complete.

In Denver, LSLs are concentrated in homes built before 1951, and the lines are owned by water customers, not the utility. Nonetheless, Denver Water will pay the full cost of the replacements at an estimated average cost of \$5,000 per line. The utility plans to increase water rates to support the work. In recent years, rates have increased by an annual average of 3 percent, but the LSL program may require increases averaging 4% to 5% as the average annual number of LSLs removed rises from approximately 1,200 to a projected 5,000.

The utility will aggressively construct an accurate LSL inventory by examining historical records and through field investigations, including visual inspections in the home or through potholing, water testing, and feedback from an outreach effort to customers. It will also build a predictive model based on its knowledge of the pipe materials that were used in certain time periods. The results will be shared with the public through an online map. Residents that have known or suspected LSLs will be provided with filters certified to remove lead until six months after the utility replaces the pipe. Existing corrosion control treatment will be enhanced by increasing the

current pH of the water and maintaining a steady alkalinity level. The utility will pay the capital cost from water rates, bonds, and the sale of new water system connections.

Denver Water plans to schedule LSL replacements based on a number of risk-based factors to address health equity, including:

- Public health considerations (e.g., odds ratio for childhood lead poisoning);
- Areas where filter adoption (the rate at which customers properly install filters) is low;
- Critical, “lead sensitive” customers (e.g., child care, primary schools, nursing facilities);
- Age-related considerations (e.g., probability of children under 5 years, adults over 70 years, or women of childbearing age); and
- Social economic factors (e.g., under federal poverty level).

The city presented this plan as an alternative to the Colorado Department of Public Health and Environment’s original order in 2018 which would have required Denver Water to add orthophosphate to its drinking water to improve corrosion control and reduce lead leaching. Because orthophosphate is a fertilizer nutrient, that action could have exacerbated existing water quality problems that affect the greater Denver region, including algae blooms. (I.e., Denver Water would have paid to add orthophosphates to control lead in drinking water and surrounding wastewater plants subsequently would have paid to remove it from the effluent.)

Federal and state regulatory agencies must approve the plan.

<https://denverwatertap.org/2019/07/01/denver-water-state-and-federal-agencies-consider-next-steps-on-lead/>

Madison, WI

In 2000, Madison became the first city in the country to adopt a policy supporting full replacement of both the utility and privately-owned LSLs. By 2012, it became the first city in the country to fully eliminate its lead service lines.

While the city finished slightly past its initial goal of replacing all lead service lines in 10 years, it had a strong beginning, replacing 80% of its 8,000 existing lead service lines by 2006. The total cost was \$15.5m, excluding the customer cost share. Of the 8,000 LSLs, only 5,600 (70%) involved replacement of LSLs located under private property, as many residents had replaced their lines by the time the program began.

The city’s initial application for a rate increase was rejected by the Wisconsin Public Service Commission on the grounds that it would be “...unreasonably and unjustly discriminatory if public program dollars generated through utility rates were to be authorized as a subsidy to furnish a direct benefit to an exclusive group of private property owners.” In response, the city substituted municipal revenue (i.e., fees charged to cell phone companies for renting space on city-owned water towers). By 2012, all 8,000 existing LSLs had been replaced at a cost to the

city of \$15.5m (excluding the customer cost share). (Of the 8,000, only 5,600 involved replacement of customer-owned LSLs, and many residents had replaced their lines by the time the program began.) Under the program, the city reimbursed half of the cost of replacing privately-owned LSLs up to a maximum of \$1,500 per installation, and recalcitrants were subjected to fines ranging from \$50 to \$1000 per day.

In 2018, state legislation (Act 137) authorized water utilities to provide financial assistance to property owners for removal of privately-owned LSLs. The municipality were required to enact an ordinance that supports that action and mandates the elimination of the privately-owned LSL. The law also required the water utility to ensure that its portion of the line was either simultaneously removed or verified as lead-free. It was also required to obtain approval from the Commission that its proposed plan is not unjust, unreasonable or unfairly discriminatory.

Green Bay, WI

Since 1990, the Green Bay Water Utility has been replacing lead service lines as its budget allowed. However, in the summer of 2016, the city passed an ordinance accelerating the replacement program. The ordinance set a goal of 10 years for full LSL replacement, but Green Bay Water Utility has a stated goal of removing all LSLs by the end of 2020.

The city had a total of 35,700 LSLs when it started the program in 1990. As of June, 2019, less than 2 percent of its water customers were still served by an LSL. Since pace was accelerated beginning in 2016, the number of utility-owned LSLs was reduced from nearly 1,800 to 445 and the number of LSLs located under private property was reduced to only 22.

The program cost was largely funded through \$800,000 in principal forgiveness from the state's two-year LSL replacement program plus revenue from the city's stadium agreement.

Lansing, MI

At the end of a 12 year campaign, the City of Lansing removed the last of its estimated 12,000 LSLs from the ground at the end of 2016. At that time, it joined Madison, WI as the only two cities in the country to accomplish this feat.

In an important distinction, Lansing owns the entire service line, enabling it to replace the entire LSL without charging the customer. The total estimated cost of \$44.5 million reflected savings from an innovative "trenchless" excavation method that accelerated the pace of construction. (Workers cut two squares in the ground at either end of the line, one to expose the water main and service connection and one to access the service box. The lead pipe is then threaded out and a new pipe is slipped in.) While traditional excavation initially cost the city \$9,000 for each pipe the new method cost only \$3,600 per line.

Over time, the city set aside funds within its base budget for the Board of Water and Light to support the work.

Washington D.C.

The Lead Water Service Line Replacement and Disclosure Amendment Act of 2018 (D.C. Law 22-241) amends the Lead Service Line Priority Replacement Assistance Act of 2004 to require District of Columbia Water and Sewer Authority to:

- Replace lead water service lines on private property, with the consent of the property owner, whenever it is replacing lead water service lines or the nearby water main on public property,
- Establish a payment assistance program for income-eligible residents to assist in paying for the replacement of lead water service lines located on private property if the portion of the water service line on public property is not a lead water service line, and
- Require the District of Columbia Water and Sewer Authority to provide public education about the risks of lead water service lines and, upon request, annual free lead test kits to property owners and lessees of commercial and residential building; and
- Amend the Residential Real Property Seller Disclosure, Funeral Services Date Change, and Public Service Commission Independent Procurement Authority Act of 1998 to require that homeowners disclose if there is lead plumbing on the property or evidence of lead in the water to potential buyers prior to sale.

<https://www.nrdc.org/experts/valerie-baron/getting-lead-out-dc-drinking-water> - summarizes the new law and its funding:

Pittsburgh, PA

The Pittsburgh Water and Sewer Authority (PWSA) aims to replace all of its remaining lead service lines by 2026. Since July 2016, the utility has replaced 2,800 utility-owned lead lines and nearly 1,400 lead lines located under private property, with approximately 2,000 utility-owned and 1,300 private-related LSL replacements occurring in 2018 alone. PWSA increased its goal for 2019, planning to replace up to 3,400 more lead lines by the end of the year. As of May 2019, PWSA has stated its intent to complete 3,700 utility-owned replacements and 3,100 replacements under private property by June 2020. With this replacement schedule, the utility is well on track to remove the estimated 10,000 remaining LSLs by 2026.

Pittsburgh stopped partial LSL replacements in May 2017, only replacing LSLs for emergency repairs and when the result is a full service line replacement. Pittsburgh offers replacements of the lines located under private property at no cost, and its lead replacement program is supported by grants and loans from the Pennsylvania Infrastructure Authority. PWSA's targets areas with many children under age 6, areas with elevated blood lead levels, and areas with high known amounts of LSLs for LSL replacement.

<https://www.post-gazette.com/local/city/2019/01/28/PWSA-Pittsburgh-accelerate-lead-line-replacements-water-health/stories/201901270183>

https://apps.pittsburghpa.gov/redtail/images/4758_PWSACurrentsNewsletterJanuary2019-FINAL.pdf

<http://lead.pgh2o.com/pwsa-releases-june-2017-lead-compliance-test-results/>

<https://triblive.com/local/pittsburgh-allegheny/pwsa-steps-up-lead-water-line-replacement-program-in-pittsburgh/>

For additional examples of state and community initiatives:

Environmental Defense Fund: [Recognition of community and state LSL replacement programs](#)