

# Case Study Brief: Cincinnati Enhanced Lead Program to Replace Lead Service Lines



**HARVARD**  
**T.H. CHAN**  
**SCHOOL OF PUBLIC HEALTH**  
Prevention Research Center  
on Nutrition and Physical Activity





# INTRODUCTION

In 2016 and 2017, the Cincinnati City Council enacted ordinances to replace an estimated 39,000 privately-owned lead service lines (LSLs)<sup>1</sup> in the City's water delivery infrastructure over a 15-year period. Greater Cincinnati Water Works (GCWW), the local water utility, began its Enhanced Lead Program in 2016 to carry out the ordinances. Service lines are the pipes that bring water from a water main in a public street to private homes. Cincinnati's approach to phasing out all LSLs has begun by including private LSL replacement as part of routine water main replacement work. This case study will focus on the elements of the Enhanced Lead Program that apply to residences (as opposed to businesses, schools or childcare centers). To reduce the cost of private LSL replacement, the water utility began by providing subsidies and interest-free

financing to property owners, and additional subsidies for property owners with low incomes, and it now pays 100 percent of the cost of private LSL replacement. Policies and programs to address LSLs are an important strategy to improve the built environment. In general, homes with a LSL are more likely to report higher water lead levels at the tap and LSLs are estimated to contribute between half and three-quarters of the total mass of lead in drinking water.<sup>2</sup> Households with pregnant women and children under six years old are most at risk for adverse health and developmental outcomes from exposure to lead in drinking water.<sup>3</sup> The lessons learned from GCWW's Enhanced Lead Program may inform the actions of other water utilities and state and local elected officials that undertake similar programs.

*This case study is part of a series of six descriptive case studies of state and local safe home water access policies and programs. The research team collected and reviewed available background materials for each case and conducted semi-structured interviews with key informants about relevant community context and policies, program design, program implementation, and lessons learned. All six case studies and a summary report are available at: <https://www.hsph.harvard.edu/prc/projects/safe-home-water>*

*The research team also developed and compared estimates of the population reach and costs for widespread implementation of each case study policy or program based upon the prevalence of families with children 0-5 experiencing low income with concerns about tap water and/or lack of access to safe home tap water.*

## POLICY RATIONALE

The Cincinnati City Council crafted its local ordinances to achieve full LSL replacement “to the extent practically possible.”<sup>4</sup> Lead service lines are jointly owned by public utilities and private homeowners. Evidence shows that replacing the entire LSL is the most effective way to reduce exposure to lead at the tap.<sup>2</sup> Replacing both sides of a LSL can be challenging because the utility or a private contractor needs consent to enter private property to make the replacement, and, typically, private property owners have been responsible for the cost of private LSL replacement.<sup>2</sup>

## COMMUNITY PARTNERS

Greater Cincinnati Water Works is a public water utility serving the City of Cincinnati and surrounding areas. Utility leadership were interested in doing more to accelerate full LSL replacement, and advocated for municipal policy changes in Cincinnati to authorize a new program that would phase out all LSLs.





## PROGRAM FINANCING

The cost of the Enhanced Lead Program was originally estimated at \$145.5 million (\$9.7 million per year over 15 years).<sup>5</sup> An economic analysis conducted by the City found that GCWW could fully fund the program through new revenue from annual rate increases of 3.75 percent, refinancing existing debt, and issuing new debt at favorable rates.<sup>5,6</sup> GCWW initially funded the Enhanced Lead Program primarily through existing funding from its capital improvement program funds. For example, in 2021 the City appropriated \$4.2 million from the City's Water Works Fund 101 for private LSL replacement.<sup>7(p15)</sup>

In 2020, the City appropriated one-third of future lease revenue from a cellular telephone company (\$3,325) for the Help Eliminate Lead Pipes (HELP) program to provide subsidies to families with low incomes.<sup>8</sup> Beginning in 2022, GCWW has been authorized to provide 100 percent subsidies for private LSL replacement to property owners regardless of income.<sup>9</sup> Replacements will be primarily financed through a water rate increase.<sup>10</sup>



## KEY POLICY ELEMENTS AND PROGRAM ACTIVITIES

The Cincinnati City Council directed GCWW to undertake an inventory of LSLs,<sup>5,11</sup> and passed a trio of local ordinances that:

1. Established the Enhanced Lead Program;<sup>12</sup>
2. Prohibited existing LSLs by authorizing GCWW to serve property owners with a notice ordering the removal and replacement of a LSL within a certain period of time;<sup>12</sup>
3. Required landlords to inform tenants of the presence of a LSL prior to executing a lease agreement;<sup>12</sup>
4. Provided subsidies and established a property tax assessment program to provide financing to homeowners for private LSL replacements;<sup>13</sup>
5. Established the Help Eliminate Lead Pipes (HELP) program to provide additional subsidies to low-income residents for LSL removal and replacement.<sup>14</sup>

GCWW's Enhanced Lead Program coordinates and conducts partial or full LSL replacement and provides post-construction notices and water filter kits for use immediately after LSL replacement.

The ordinance prohibiting LSLs phases in removal by providing a grace period for removal until a property owner is provided with written notice from GCWW of the need for replacement. GCWW originally provided a subsidy for 40 percent of the cost (up to \$1,500) of private LSL

replacement.<sup>15</sup> GCWW customers could pay right away or through a 5 or 10-year interest-free property tax assessment. GCWW also administered the HELP program to provide additional subsidies for LSL replacement to property owners with a household income that was 80 percent of HUD-defined Area Median Income (e.g. \$68,300 or less for a family of four).<sup>16</sup> Beginning in 2022, GCWW will provide 100 percent subsidies for private LSL replacement to property owners regardless of income, and aims to replace 1,200 private LSL annually.<sup>9,10</sup>

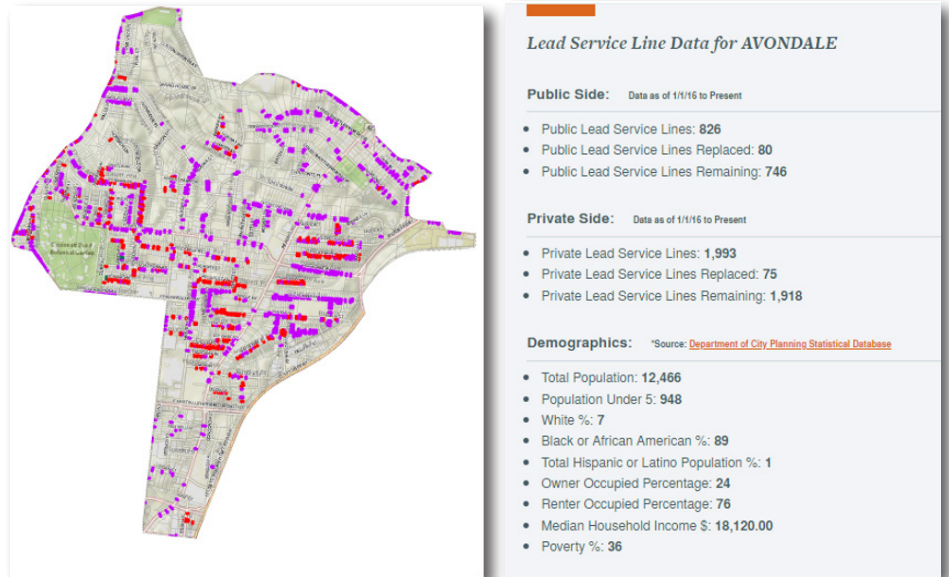
## STRATEGIES USED TO REACH FAMILIES WITH CHILDREN 0-5 WHO EXPERIENCE LOW INCOME

By local ordinance, GCWW has the discretion to prioritize replacement of LSLs "based on public health risk and economic considerations."<sup>17</sup> In 2017, GCWW stated that it would consider the following factors when determining where to conduct LSL replacement: the presence of children six years and under; state health department data about high blood lead levels in children; water infrastructure projects with more than 100 public LSLs in need of removal; timing LSL removal to coincide with road improvement projects; the presence of properties with water test results above the action level for lead; and other criteria "as indicated and related to children exposed to lead."<sup>18</sup>



More recently, utility leadership have stated that work will be prioritized for neighborhoods with a high density of remaining LSLs.<sup>19</sup> GCWW is in the process of providing on its website neighborhood profiles with demographic data and data about existing LSLs and public and private LSL replacements (Figure 1).<sup>20</sup>

**Figure 1: Enhanced Lead Program Neighborhood Profiles**



Courtesy of Greater Cincinnati Water Works' "See Progress in Your Neighborhood"; <https://la.mygcww.org/neighborhoods>

## CURRENT POLICY IMPLEMENTATION APPROACH

The ordinances enacted by the Cincinnati City Council provided for a variety of paths forward to address LSLs in the City. Table 1 summarizes the policy implementation approaches taken by GCWW.

### LSL Replacements

The 15-year Enhanced Lead Program began in 2016, and the first LSL replacements conducted under the program were in 2018.<sup>19</sup> GCWW

estimated that there were approximately 39,000 private lead service lines within the City of Cincinnati when the program began. According to GCWW, between February 2018 and April 2021 a total of 1,164 private LSL replacements have been completed as part of the Enhanced Lead Program.<sup>21(p15)</sup>

There were 716 completed with funding from a 5 or 10-year zero interest property tax assessment and 448 were paid for in full by the property owner.<sup>21(p15)</sup> GCWW has been replacing private LSLs during routine water main replacements, at the request of a property owner, or when there is a leak in a service line.<sup>21(p15)</sup> If a water main is connected to a private LSL, GCWW “strongly advises” that the private LSL be replaced.<sup>15</sup> The utility is authorized by a local ordinance prohibiting LSLs to compel private side replacement by serving a notice to the homeowner ordering private LSL replacement. Under the more voluntary implementation approach of “strongly” advising private LSL replacement, full LSL replacements, meaning both the public and private sides of a LSL are replaced, occurred about 30-40 percent of the time on water main projects with high concentrations of LSLs.

### Cost of LSL Replacements

According to GCWW, the costs of private LSL replacement had been declining until supply chain disruptions and inflation in late 2021 impacted costs. In fiscal year 2020 the average total cost of private LSL replacement to the property owner before receiving any subsidies from GCWW or the HELP program was \$3,247, and in 2021 the average cost was reduced to \$2,400.<sup>22, 21(p15)</sup> In 2021, for property owners receiving the standard 40 percent subsidy from GCWW, the average cost of LSL replacement after receiving the subsidy was \$1,440.<sup>21(p15)</sup> Beginning in 2022, the utility will provide a 100 percent subsidy for all private LSL replacements, and the utility estimates that the average cost will be approximately \$3,000.

### HELP Program

According to GCWW, as of January 2022, the HELP program to assist families with low incomes with the cost of LSL replacement had provided \$376,150 in subsidies benefiting over 178 eligible homeowners.<sup>20(p15)</sup> Prior to 2021, the HELP program provided a subsidy of 30 percent of the cost of private LSL replacement in addition to the 40 percent subsidy available to all property owners. In 2022, all property owners, regardless of income, with a private LSL can receive a 100 percent subsidy.<sup>9</sup>

### Tenant Notification

Since July of 2017, landlords in the City of Cincinnati have been required to notify tenants in writing and before executing a lease if a rental unit receives its water through a LSL.<sup>12</sup> While this notification is required, the ordinance establishing the requirement does not contain any enforcement mechanisms or reporting requirements. As a result, it is not known to what extent prospective tenants are being notified of LSLs.



**Table 1: Policy Implementation Approaches  
for Private LSL Removal Taken by the Enhanced Lead Program**

| Policy Elements for Private LSLs   | Implementation Approaches Used  |
|--|---|
| Remove and replace all private LSLs by 2033 (~6.6 percent per year)*   | <ul style="list-style-type: none"> <li>• 1 percent per year on average (2018–2020)**</li> <li>• 3 percent per year on average projected (2022–until completion)</li> </ul>  |
| Private LSLs can be replaced by GCWW: during water main replacement, as targeted neighborhood replacements without water main replacement, or as individual LSL replacements <sup>23</sup> | <ul style="list-style-type: none"> <li>• Property owners are provided with the option to replace private LSL during water main replacement<sup>15</sup></li> <li>• LSLs are replaced at the request of an individual property owner<sup>21</sup></li> <li>• LSLs are replaced when there is a leak in a private LSL<sup>21</sup></li> </ul> |
| Existing LSLs are prohibited. Prior to enforcement, property owner must be served with at least thirty days written notice of the need to replace a LSL <sup>24</sup>                      | <ul style="list-style-type: none"> <li>• Enforcement is being phased in over time</li> <li>• In 2020, 60 – 70 percent of LSL replacements on water main projects were partial LSL replacements where only the public side of the LSL was replaced</li> </ul>  |
| Property owners shall be responsible for the cost of replacement of the portion of the LSL on private property <sup>25</sup>   | <ul style="list-style-type: none"> <li>• GCWW provided a subsidy of 40 percent (up to \$1,500) of the cost of private LSL replacement (2018–2021)<sup>15</sup></li> <li>• Beginning in January 2022, GCWW will provide a 100 percent subsidy for a projected 1,200 private LSLs annually<sup>9,10</sup></li> </ul>                          |
| Property owners can pay for private LSL replacement in full or through a property tax assessment (no interest rate specified) <sup>26</sup>  | <ul style="list-style-type: none"> <li>• From 2018–2021, a zero percent interest special assessment payable over a period of 5 or 10 years was available to property owners that had GCWW coordinate their LSL work</li> </ul>  |
| HELP program fund was established to provide subsidies to property owners with low incomes <sup>14</sup>   | <ul style="list-style-type: none"> <li>• From 2018–2021, GCWW provided subsidies of 30 percent of the cost of private LSL replacement in addition to the 40 percent subsidy available to all property owners</li> <li>• Beginning in January 2022, GCWW will provide a 100 percent subsidy, regardless of income<sup>9</sup></li> </ul>     |

\*39,000 (total private-side LSLs) / 15 (years to replace) = 2,600 private-side LSL replacements per year (6.7 percent per year)

\*\* 1,164 completed private-side LSL replacements over approx. 3 years = an average annual replacement rate of 1 percent ((388/39,000) x 100 = .99)



## POLICY AND PROGRAM IMPLICATIONS

The City of Cincinnati established the Enhanced Lead Program to improve the water supply infrastructure by removing LSLs. The intent of the original ordinances that established the program was to remove all LSLs from the City's water distribution system by 2033. The ordinances establishing the program provide GCWW with the authority needed to complete private LSL removal and funding mechanisms to provide subsidies to property owners. The policy foundation established by the City Council could also facilitate GCWW's transition from "strongly advising" property owners to replace the private side of a LSL during water main replacement to requiring that all private LSLs encountered during water main replacement are removed and replaced. Since the program began replacing private LSLs in 2018, GCWW has increased

financial assistance for property owners, and increased the number of full LSL replacements each year.



### SUGGESTED CITATION

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### AUTHORS

Prepared by Cara Wilking, JD, independent legal consultant, Barnstable, Massachusetts; Emily Nink, MS, CPH, Prevention Research Center on Nutrition and Physical Activity, Department of Social and Behavioral Sciences at the Harvard T.H. Chan School of Public Health; and Angie Cradock, ScD, MPE, Prevention Research Center on Nutrition and Physical Activity, Department of Social and Behavioral Sciences at the Harvard T.H. Chan School of Public Health.

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