

Plan Development

Elements of a full lead service line replacement plan to consider:

- [How many LSLs exist in our community, and where are they located?](#)
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- [Will participation be mandatory or voluntary?](#)
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How many LSLs exist in our community, and where are they located?

The number of LSLs and their geographic distribution within the community affects the scale of the task, budget implications and the impacted population. The initiative must include plans intended to meet the needs of low-income and minority communities, target replacement efforts and coordinate with other infrastructure projects. The availability of information about the number of LSLs may differ considerably among utilities, particularly for older systems or where systems were acquired and complete records were not transferred.

There are many possible sources of information to [help determine where lead service lines are located](#), including:

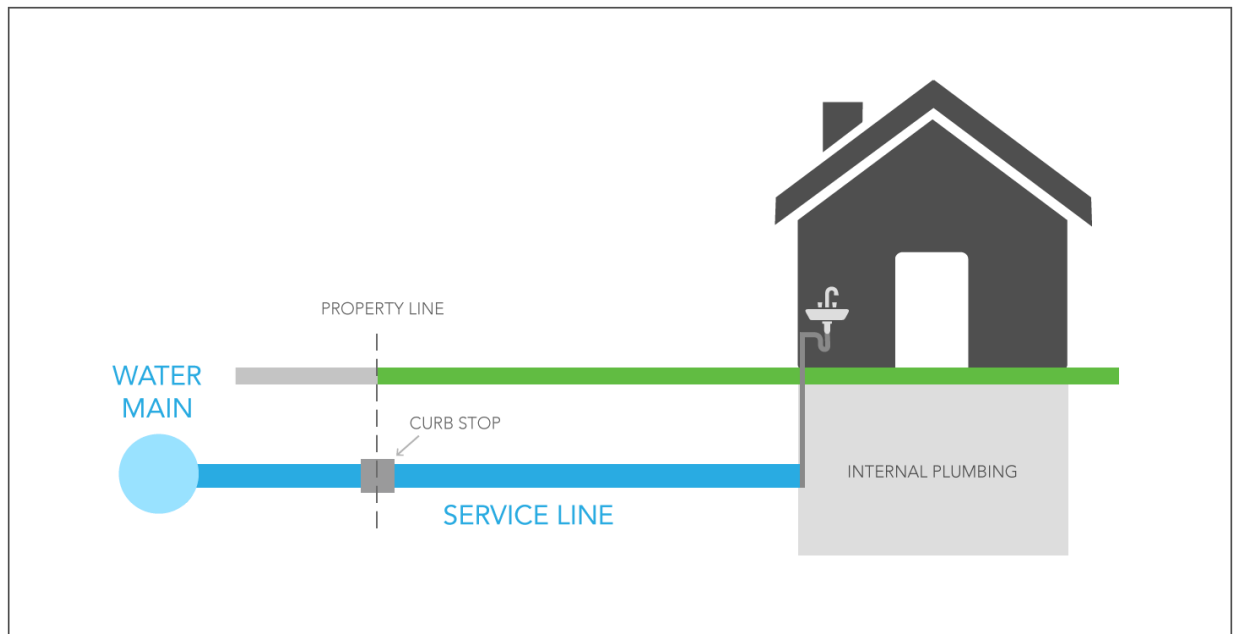
- Tap cards from initial service installation indicating date, location and possibly pipe material installed;
- Plans from water main installation, rehabilitation, and replacement illustrating service line locations and pipe materials;
- Historic water utility records, plumbing codes, and ordinances specifying materials and construction standards for service lines;
- Tax records indicating when a building was constructed;

- Plumbing permits for when existing structures were renovated and service line was replaced; and
- Visual confirmation of pipe material by plumbers or utility crews during routine maintenance and renewal activities, like meter or valve replacement and leak repairs.

Read more detailed information about [replacement practices](#) or [introductory information about LSLs](#).

How do we define full LSL replacement?

Full LSL replacement is the elimination of lead pipe from a water main up to the interior plumbing of an individual home.



Read more information about [full lead service line replacement](#) and [approaches to replacement](#).

Will participation be mandatory or voluntary?

Most LSLs extend under both public and private property. Additionally, properties with LSLs may be occupied by a tenant instead of the property owner. Thus, full LSL replacement will involve shared responsibilities amongst the water utility, property owner, and consumers. Choices concerning shared responsibility could include: requirements to participate, who bears the replacement costs for the portion of the LSL on private property, liability for damage to

landscaping or special features of their property in the path of the LSL replacement, property restoration after replacement, implementing instructions for use of filters, and [flushing at the home](#).

Decisions about shared responsibility lead to four related questions for any plan:

- How will the utility respond to requests from property owners who wish to replace the entire LSL?
- Will property owners be required to participate in LSL replacement initiated by the local government or water utility?
- Can the efforts be mandatory in high-risk areas and voluntary in others? How will high risk be decided?
- Will partial replacements be allowed as part of the proactive LSL replacement initiative?

Factors to consider if the water utility is required to replace the portion of the LSL in the public right of way at the request of the property owner:

- What steps can the utility take to be responsive to property owners/residents' concerns about lead exposure?
- What criteria are appropriate when prioritizing LSLs for replacement (i.e. Which LSLs are replaced first?)?
- What is availability of public funds for full replacement (or does the property owner pay for some or all of the costs of full replacement?)
- Who implements the replacement (the utility, the property owner, a coordinated approach)?
- What are the implications for street repairs and repaving?
- What is the timeline for replacements to occur (i.e. How might an individual request be coordinated with planned replacements for that neighborhood or section of the municipality to reduce costs and address any needed street repairs?)?

Factors to consider when replacing LSLs on private property:

- Are affected property owners aware of public health benefits of full LSL replacement over partial replacements?
- Is there legal authority for the local government mandating replacement and access to private property?
- What are available sources of funding for LSL replacement? (Will public funds pay for full replacement? If not, are funds available to help pay for the costs of replacement on private property?)
- What penalties are applied and to whom are they applied when full LSL replacement is not achieved at a particular building?

- Is the LSL replacement tied to specific occurrences, such as redevelopment, change of property ownership or infrastructure improvements where utility section is being replaced?
- Are there criteria or exemptions? (i.e. What if the cost of replacement is greater than the property value? What if property taxes or utility bills are delinquent?)
- Who replaces the portion of the line on private property (property-owner hired contractor versus utility-hired contractor)?
- What is timeframe and steps for coordinating full LSL replacement?
- What steps can be taken to address concerns and burdens for buildings with multiple housing units or rental properties?

Factors to consider if participation by the property owner is voluntary:

- What information can the initiative provide property owners about the increased public health risk of partial LSL replacements over full replacements?
- What steps can be taken to identify and reduce the potential for disproportionate impacts?
- What steps can be taken to encourage replacement in a way that gains greater economies of scale?
- Will/how will a future property owner have the option to complete a full replacement?
- What is local government or utility liability associated with increased public health risk of partial LSL replacement over full replacement and what steps will be taken to reduce that liability?
- If LSLs are within a property association, is the determination to replace LSLs an individual or collective decision?

Additional information regarding initiatives for LSL replacement:

- [Strategies to Obtain Customer Acceptance of Complete Lead Service Line Replacement](#)
- [SAB Evaluation of the Effectiveness of Partial Lead Service Replacements](#)

Additional information regarding mandatory service line replacement:

- [Green Bay, WI: Chapter 21 - Utilities](#)
- [Madison, WI: Lead Water Service Line Replacement](#)

How will we prioritize and sequence LSL replacements?

LSL replacements could be prioritized based on vulnerable populations, cost-effectiveness, or a combination of both.

The local Health Department may be a resource for how to reach vulnerable populations. Facilities interacting with young children, such as childcare centers or elementary schools could be prioritized for “spot” replacements. Within those subsets, priority could be given to facilities in areas defined by zip code or census tract where lead has already been identified as a significant concern. This could include areas where children have elevated blood-lead levels, testing shows high levels of lead in the water and lead abatement of properties is underway.

Cost-effectiveness is most likely achieved when the LSL replacement is accomplished in conjunction with other infrastructure improvements. Planned projects such as water main replacements, sewer main replacements and street reconstruction projects provide opportunities to reduce the unit cost of individual LSL replacements through “volume discounts” and reduced mobilization costs. In some situations, the cost of restoration of the public way may be covered by the infrastructure project rather than attributed to the LSL work, further reducing the total cost of the individual LSL replacement work.

Plans should consider timing and method of notification for owners and residents of buildings with LSLs. The earlier such notification is provided, the more time property owners will have to understand the importance of participation and to plan their participation.

Non-planned (emergency) work may also provide opportunities to replace the public portion of impacted LSLs. These situations can include leaks on LSLs, the accidental severing of an LSL during water or non-water related construction work, and water main breaks that may damage LSLs. The property owner’s cost may decrease if the replacement of the private portion of the LSL is offered at the same time as the public portion. However, the unit cost for “spot” replacements is generally higher than for planned LSL replacement projects.

Read more about [Approaches to LSL Replacement](#).

How can we identify households at risk of disproportionate impact?

Implementing an LSL replacement effort requires:

1. Communicating effectively to households and businesses most likely to be effected and
2. Developing and taking steps that will work for those households and businesses.

Understanding the affected community is as important as understanding the physical location of the LSLs. Knowing the following in relation to where LSLs are located can guide the approach taken:

1. Income levels of households where LSLs are most prevalent,

2. Locations of concentrated areas of buildings that house multiple families and rentals, where LSLs are prevalent,
3. Ethnic make-up of affected neighborhoods,
4. Locations of child-care facilities, churches, and other facilities where there are large numbers of young children,
5. Neighborhood, block-level, and more detailed information may be available through local government planning offices. In major metropolitan areas, detailed data can be acquired through the U.S. Census.

Some analyses to consider when developing an LSL replacement effort:

1. Number of properties with LSLs by use (i.e., residential, commercial, condominiums, apartments, tax-exempt),
2. Number of properties with LSLs by neighborhood,
3. Number of vacant properties with LSLs,
4. Number of properties with LSLs with respect to assessed value of structure,
5. Number of properties with LSLs with respect to median household income of census tract (if data is available and tract data is adequately representative).

By considering the above factors, an LSL replacement initiative can:

1. Incorporate prioritization of sensitive groups,
2. Include consideration of financial assistance measures that will work for the households most likely to be affected,
3. Utilize outreach materials appropriate to the impacted neighborhoods,
4. Communicate to the community as a whole about how equity is being addressed in design of the replacement effort,
5. Utilize cost effective implementation.

Read more information about environmental justice and [equity in lead service line replacement](#).

What are the roles and responsibilities for a variety of organizations?

What is the role of the state environmental regulatory agency and/or the state PUC?

It will be important to consult with regulatory agencies as plans for LSL removal are developed. A state PUC may have prohibitions on what types of work utility (ratepayer) funds may be used for. State water regulatory agencies will specify rules for construction practices and water quality and may have or develop requirements related to advance notice to

consumers and property owners, where these are not the same. State and local health agencies can assist with risk messaging and other communication tailored to vulnerable populations.

What role could local or regional environmental, public health, or other civic organizations play?

Engaging public health, business and other civic partners can increase awareness, which in turn may lead to more comprehensive and integrated “healthy housing” programs that include drinking water.

How will regulations affect LSL replacement?

Local ordinances can affect an LSL replacement initiative in positive ways or can create challenges. One of the reasons to enlist the participation of multiple local and state agencies and community groups is that each can help identify both opportunities and challenges. Examples might include plumbing codes, notice requirements on sale of property, limitations on the ability of the public water system to engage in work on private property, public health programs or other local programs where outreach to households with young children or to homeowners might be appropriate. Conversations about local barriers, resources and incentives might also lead to ideas for new policies.

Read more information about [legal factors](#) and [policies to consider](#).

How can we ensure public health protection throughout the replacement process?

As part of an overall LSL replacement initiative, residents and owners of properties with LSLs also should be regularly informed of best practices for reducing risks of lead exposure in drinking water under typical (non-construction) conditions. Key messages include:

- Flushing plumbing after water has been unused for several hours;
- Using only water from the cold water tap for cooking and drinking;
- Regularly removing and cleaning faucet aerators and screens; and
- Filtering cold water tap for drinking using a certified filter that meets [NSF Standard 53](#) for lead removal and routinely replacing filter cartridges according to the manufacturer’s instructions

Outreach messages should include a variety of visual, verbal and written formats in multiple forms of media to reach all ranges of literacy and cultural diversity in the community. Outreach should also be emphasized at locations visited by vulnerable populations, such as offices of pediatricians and obstetricians, community health centers, vaccination centers and schools. Additionally, involving plumbers, realtors, home inspectors, rental agencies, landlord

organizations, and others can increase the impact of the initiative.

Consider including the following aspects in written protocol to ensure consistent practice for both utilities and private contractors:

- Information and risk messaging to residents/owners, tailored to presence of vulnerable populations. Prepare a script so that the message will be accurately presented. Provide a form for employees to document the interaction with the resident.
- Coordinate knowledge about the presence of vulnerable populations with local health authority.
- Offer alternate water supply for drinking and cooking, such as a filter certified to remove lead, cases of bottled water, or office-type large jugs and dispenser, during and for some period of time after the construction. The state of knowledge at the time of the work as regards to physical and hydraulic LSL disturbances and its impact on lead at the tap can inform this consideration.
- Consider special precautions for locations with a focus on children (e.g., child care facility or school).
- Consider whether or not to offer or encourage [water testing for lead](#) before and/or after the LSL replacement.
- Emphasize the importance of [aggressive flushing of their plumbing](#) to residents after LSLs have been replacement. Procedures for “whole house flushing” have been developed and will be improved as more is learned. The utility can consider not charging the customer for this period of time or volume of water to effectuate higher flushing velocities and overcome residents concerns for the cost of the flushed water. In areas of drought, the public health aspects of the flushing will have to be balanced against the need to conserve water. Read additional information about [replacement practices](#).

Situations where LSLs may be physically or hydraulically disturbed should be identified and appropriate messaging should be considered for those situations. Examples include plumbing work on internal building plumbing where lead from the LSL may have seeded internal pipes, buildings with LSLs where water system depressurization (such as within the limits of a water main shutoff) may create flow reversals that release lead particles from within building plumbing or significant street excavation near the property.

- [Communicating about lead service lines: a guide for water systems addressing service line repair and replacement](#)

What is our timetable?

Generally, a replacement initiative will set a timetable to accomplish full LSL replacement. The cost to the water system and property owners are major considerations when developing a timetable. Property owners may bear costs directly (by paying for the work on their property) or indirectly (if property tax levy funds are used to subsidize or pay for LSL replacement).

What are our metrics of success?

Any plan benefits from clarity about how success will be measured. A water utility may want to track additional information for the purposes of plan implementation.

Success measures may include replacement progress against inventory and improving knowledge about the inventory. Other tracking information might include: progress against budget, implementation measures, communication efforts, and the demographics of who has had their LSL replaced.

Communities may want to consider selecting from [case examples](#) taken from communities with existing LSL replacement initiatives and/or developing additional ideas that reflect what is important locally.