NEW YORK STATE | Department of Health

8/16/19

A Statewide Plan for Lead Service Line Replacement

Executive Summary

Lead can enter drinking water when service pipes that contain lead corrode, especially if the water has characteristics that corrode pipes and fixtures, such as high acidity or low mineral content. Corrosion is found to occur often in brass or chrome-plated brass faucets and fixtures with lead solder, from which significant amounts of lead can leach into the water, especially hot water. The U.S. Environmental Protection Agency (EPA) estimates that drinking water contaminated with lead can contribute up to 20 percent or more of a person's total exposure to lead. Infants who consume mostly mixed formula can receive 40 percent to 60 percent of their total exposure to lead from drinking water.

New York's Clean Water Infrastructure Act of 2017 (Act) amended the Public Health Law (PHL) by creating § 1114 to require the Department of Health (Department) to implement a Lead Service Line Replacement Program (LSLRP), which would provide municipalities with grant funds to replace lead drinking water service lines.

As part of the SFY 2018-19 Enacted Budget, the Department was tasked with preparing a statewide plan for lead service line (LSL) replacement. This report details the implementation of the LSLRP, resources and techniques for identifying LSLs throughout the state, the estimated cost of replacing LSLs, and provides recommendations on methods for evaluating the status of LSLs present and guidance on replacement.

Implementation of the Lead Service Line Replacement Program

I. Eligible Municipalities

The LSLRP provided grant funds to municipalities (city, village, town or consolidated health district) as defined in PHL § 2(1)(i). Municipal eligibility was predetermined by the Department based on criteria contained in PHL § 1114: "*Within each region, the department shall give priority to municipalities that have a high percentage of elevated childhood blood lead levels, based on the most recent available data. In distributing the awards allocated for each region to such priority municipalities, the department shall also consider whether the community is low income and the number of lead service lines in need of replacement.*"

To comply with the statute, the following three data categories were chosen to evaluate potentially eligible municipalities: number of children with elevated blood lead levels (BLL), median household income (MHI), and the number of houses built before 1939 (<1939). Municipalities that met thresholds for each data category were deemed eligible to receive LSLRP funding. The threshold values of each variable, see below for additional detail, were chosen based on Department review of available data.

Blood Lead Level: Childhood BLL data presents the number of children with a BLL of 5.0 µg/dL or higher. Data from 2011 to 2015 were utilized to calculate the percentage of a municipality's children up to 6 years old, which represents the best data source available. Municipalities were included if they had a minimum of 0.5 percent or greater of their children with an elevated BLL.

Median Household Income: Median Household Income data are available for every municipality across New York State. Statewide MHI values range from $30,000 per year to over $230,000 per year. To account for this wide variability, which is often geographic, a MHI threshold was chosen based on regional average MHI. This way, neighboring municipalities are compared to others in their region rather than statewide. To be eligible for the LSLRP, municipalities must have a MHI below 150 percent of their region's average MHI.

Houses Built Before 1939: Due to the evolution of regulations and construction practices, the use of lead in water service lines for residential homes began decreasing in the 1930s. Data showing the number of LSLs per municipality is not available, so the LSLRP is utilizing housing data (specifically the number of homes constructed before 1939) as a proxy for the presence of LSLs. In reviewing these data, the number of residential houses built before 1939 ranged from 0 to over 400,000 per municipality. Municipalities with a minimum of 500 or more homes constructed before 1939 were included.

A list of municipalities that met all three of the LSLRP eligibility criteria is presented in Appendix A.

II. Funding Methodology

In creating the LSLRP, PHL § 1114 states that "*the department shall allocate appropriated funds equitably among regions of the state.*" In 2011, Governor Cuomo established 10 Regional Economic Development Councils (REDC) to provide a local focus for state investment. The LSLRP utilized these 10 REDC boundaries for the purpose of allocating funds. The Regions, with the counties included, are listed below in Table 1.

TABLE 1

Region	Counties
Capital Region	Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, Washington
Central NY	Cayuga, Cortland, Madison, Onondaga, Oswego
Finger Lakes	Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, Yates
Long Island	Nassau, Suffolk
Mid-Hudson	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester
Mohawk Valley	Fulton, Herkimer, Montgomery, Oneida, Otsego, Schoharie
New York City	Bronx, Kings, New York, Queens, Richmond
North Country	Clinton, Essex, Franklin, Hamilton, Jefferson, Lewis, St. Lawrence
Southern Tier	Broome, Chemung, Chenango, Delaware, Schuyler, Steuben, Tioga, Tompkins
Western NY	Allegany, Cattaraugus, Chautauqua, Erie, Niagara

The New York State FY17 Enacted Budget included a $20 million sub-allocation for the Department from the Department of Environmental Conservation's Capital Projects Fund to capitalize the LSLRP. Based on the legislative requirement to equitably distribute available funds, the LSLRP utilized the 10 REDC boundaries to provide funding of at least $500,000 to at least two municipalities per

region (the exception being the New York City Region, which contains one municipality). With each region guaranteed a minimum allocation of $1 million, the remaining funds were then distributed across the 10 REDC Regions based on the regional population as a percentage of the total state population, utilizing 2016 U.S. Census data.

Regional Allocation = Minimum Allocation + (% of NY Population) * (Remaining Funds)

To secure municipal participation and interest in the LSLRP, provide sufficient funds per region and account for the regional differences in construction costs, a maximum municipal award of $700,000 was used. Dividing the Final Regional Allocation by the maximum municipal award yielded the number of municipalities that would be offered an award. To eliminate partial awards, the number of municipalities per region was rounded up to a whole number. Dividing the Final Regional Allocation by the rounded number of municipalities allowed the Department to calculate the Regional Municipal Awards. The New York City Region, which only contains one municipality, is the exception to the above methodology.

The following table (Table 2) lists the 2017 Regional allocations, based on the above methodology.

TABLE 2

Total LSLRP Allocation = $20,000,000

Minimum Regional Allocation = $1,000,000

Remaining Allocation to be Divided = $10,000,000

REDC Region	Region Population	% of NY Population	Minimum Regional Allocation	Additional Allocation by Percentage	Final Regional Allocation	Regional Municipal Award
Capital Region	1,085,386	5.50	$1,000,000	$549,694	$1,549,694	$516,565
Central NY	782,441	3.96	$1,000,000	$396,267	$1,396,267	$698,134
Finger Lakes	1,212,929	6.14	$1,000,000	$614,288	$1,614,288	$538,096
Long Island	2,854,083	14.45	$1,000,000	$1,445,450	$2,445,450	$611,363
Mid-Hudson	2,327,931	11.79	$1,000,000	$1,178,980	$2,178,980	$544,745
Mohawk Valley	488,321	2.47	$1,000,000	$247,310	$1,247,310	$623,655
New York City	8,537,673	43.24	$1,000,000	$4,323,904	$5,323,904	$5,323,904
North Country	425,035	2.15	$1,000,000	$215,259	$1,215,259	$607,629
Southern Tier	644,428	3.26	$1,000,000	$326,371	$1,326,371	$663,185
Western NY	1,387,062	7.02	$1,000,000	$702,477	$1,702,477	$567,492
NY State	19,745,289			**Total**	$20,000,000	

On November 27, 2017 the LSLRP awarded grant funds to 26 municipalities (Table 3).

TABLE 3		
REDC Region	**% of NY Population**	**Awarded Municipalities**
Capital Region	5.50	(C) Schenectady, (C) Troy, (C) Albany
Central NY	3.96	(C) Syracuse, (C) Auburn
Finger Lakes	6.14	(C) Rochester, (C) Geneva, (T) Lyons
Long Island	14.45	(T) Southold, (T) Hempstead, (T) N. Hempstead, (C) Long Beach
Mid-Hudson	11.79	(C) Poughkeepsie, (C)Newburgh, (C)Kingston, (C) Middletown
Mohawk Valley	2.47	(C) Utica, (C) Gloversville
New York City	43.24	New York City
North Country	2.15	(C) Watertown, (T) Gouverneur
Southern Tier	3.26	(C) Binghamton, (C) Elmira
Western NY	7.02	(C) Buffalo, (C) Niagara Falls, (C) Jamestown

The New York State FY18 Enacted Budget included an additional $10 million sub-allocation for the Department from DEC's Capital Projects Fund to further capitalize the program. The allocation methodology for these funds was the same as the initial $20 million, with the exception being municipalities that received 2017 LSLRP awards were not eligible to receive an award in 2018. As such, the New York City region, and its population, was excluded from the 2018 calculations.

Based on the legislative requirement to equitably distribute available funds, the LSLRP offered grant funding of at least $500,000 to at least two municipalities per REDC region. With each region guaranteed a minimum allocation of $1 million, the remaining funds were then distributed across the 9 REDC Regions based on the regional population as a percentage of the total state population, utilizing 2016 U.S. Census data.

Regional Allocation = Minimum Allocation + (% of NY Population) * (Remaining Funds)

To secure municipal participation and interest in the LSLRP, provide sufficient funds per region and account for the regional differences in construction costs, a maximum municipal award of $700,000 was used. Dividing the Final Regional Allocation by the maximum municipal award yielded the number of municipalities that would be offered an award. To eliminate partial awards, the number of municipalities per region was rounded up to a whole number. Dividing the Final Regional Allocation by the rounded number of municipalities allowed the Department to calculate the Regional Municipal Awards.

The following table (Table 4) lists the 2018 Regional allocations, based on the above methodology.

TABLE 4						
Total LSLRP Allocation = $10,000,000						
Minimum Regional Allocation = $1,000,000						
Remaining Allocation to be Divided = $1,000,000						
REDC Region	**Region Population**	**% of NY Population**	**Minimum Regional Allocation**	**Additional Allocation by Percentage**	**Final Regional Allocation**	**Regional Municipal Award**
Capital Region	1,085,386	9.68	$1,000,000	$96,844	$1,096,844	$548,422
Central NY	782,441	6.98	$1,000,000	$69,813	$1,069,814	$534,907
Finger Lakes	1,212,929	10.82	$1,000,000	$108,224	$1,108,224	$554,112
Long Island	2,854,083	25.47	$1,000,000	$254,656	$1,254,654	$627,327
Mid-Hudson	2,327,931	20.77	$1,000,000	$207,710	$1,207,710	$603,855
Mohawk Valley	488,321	4.36	$1,000,000	$43,570	$1,043,570	$521,785
New York City	0	0.00	0	0	0	$0
North Country	425,035	3.79	$1,000,000	$37,924	$1,037,924	$518,962
Southern Tier	644,428	5.75	$1,000,000	$57,499	$1,057,500	$528,750
Western NY	1,387,062	12.38	$1,000,000	$123,761	$1,123,760	$561,880
NY State	11,207,616			**Total**	$10,000,000	

On July 26, 2019 the LSLRP awarded grant funds to 18 municipalities (Table 5).

TABLE 5		
REDC Region	**% of NY Population**	**Awarded Municipalities**
Capital Region	9.68	(C) Hudson, (C) Watervliet
Central NY	6.98	(C) Cortland, (C) Oswego
Finger Lakes	10.82	(C) Batavia, (V) Perry
Long Island	25.47	(C) Glen Cove, (T) Riverhead
Mid-Hudson	20.77	(C) Port Jervis, (C) Yonkers
Mohawk Valley	4.36	(C) Amsterdam, (C) Johnstown
North Country	3.79	(C) Plattsburgh, (T) Ticonderoga
Southern Tier	5.75	(C) Hornell, (C) Norwich
Western NY	12.38	(C) Dunkirk, (T) Ellicott

III. Eligible Expenses

LSLRP grant funds can be used to replace the entire length of residential LSLs, from the municipal water main to the residence. However, many service lines only contain lead in one portion of the line (either from the water main to the shut-off valve or from the shut-off valve to the residence - see Figure 1), resulting in a sectional replacement.

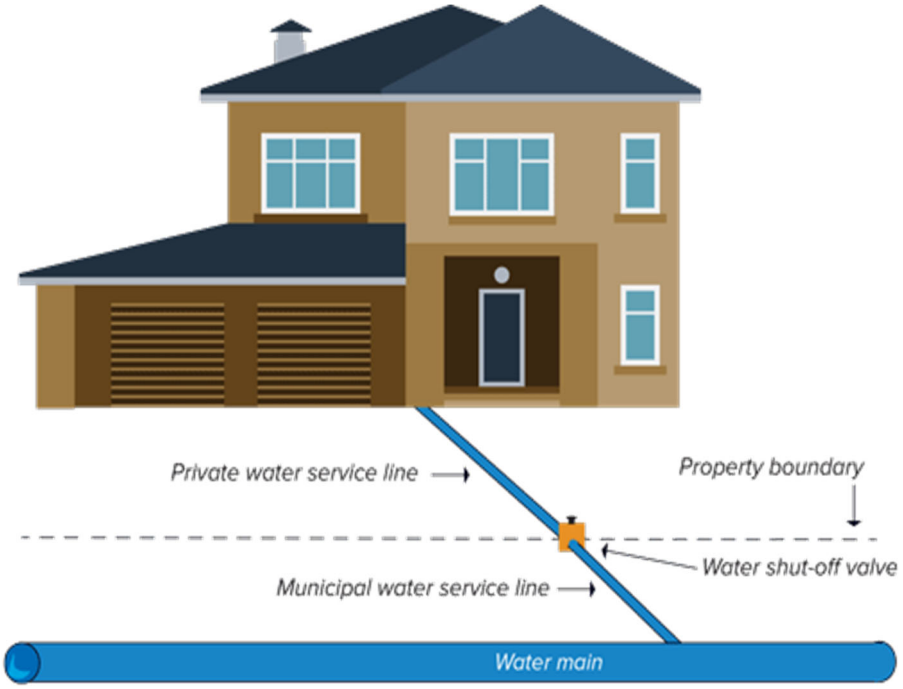


Figure 1

In addition, in most cases the portion of the service line from the water main to the shut-off valve is owned by the municipality while the portion from the shut-off valve to the residence is owned by the property owner. Regardless of ownership, replacement of both portions is eligible under the LSLRP. Eligible costs include, but are not limited to:

- Engineering fees (planning, design and construction)
- Legal fees
- Municipal administration fees
- Construction (materials, equipment, workforce)
- Site/property restoration

IV. Guidance and Outreach

The Department held several conference calls with the LSLRP awarded municipalities to assist them in the development and administration of their grant funding. During these calls, municipalities were encouraged to ask questions, share success stories and raise any issues they were having. The summaries of these conference calls, including the questions and answers, were made available to all LSLRP awarded municipalities.

In addition to the conference calls, a public LSLRP website was created to provide general program information as well as Frequently Asked Questions. The LSLRP website can be reached at: https://health.ny.gov/LSLRP.

The Department created sample outreach documentation the LSLRP awarded municipalities could use when making their residents aware of the program. The Department also provided the LSLRP awarded municipalities with a post-LSL replacement flushing guidance document, which they are required to give to every address where a LSL is replaced. This document was made available in English, Spanish, Chinese, Haitian Creole, Italian, Korean, Russian and Farsi. A copy of this document is included in Appendix B and its use can be seen in Figure 2.

Figure 2

V. Municipal Lead Service Line Replacement

Beginning in the spring of 2018, LSLRP awarded municipalities (including the cities of Syracuse, Watertown, Niagara Falls, Jamestown, Geneva and Auburn) began replacing LSLs. To date, approximately 200 lead service lines have been replaced using LSLRP funds.

Resources and Techniques for Identifying Lead Service Lines

Before construction activities can begin, LSLs need to be located. It also needs to be determined which portions of the service line contain lead: entire length, municipally owned "gooseneck" from the public main to the curb stop or the privately-owned line from the curb stop to the home. Utilizing the following methods, municipalities and property owners can work together to identify LSLs.

I. Historical Records, Local Municipal Knowledge & Housing Inventory

Many municipalities maintain records of service line location, size, year of installation/replacement and material. Searching these records for LSLs can provide an inventory of

lines needing replacement. If historical records are not available, it is not uncommon for municipal construction personnel to have local knowledge of previously replaced LSLs. This knowledge can be used to identify geographic areas with a higher potential of containing LSLs. Due to regulatory changes and revised construction practices, homes constructed before 1940 have a higher probability of containing LSLs. Using this information as a guide, municipal housing inventories can identify areas with older homes that may contain LSLs. Once a geographical location of potential LSL locations has been established, a physical examination of the services in question can begin.

II. Scratch Test

Using a simple "scratch test," homeowners can easily check their incoming service line to determine if it is made of lead. After locating the water service entering their home, the homeowner will utilize the flat edge of a screwdriver to scratch their service line, in an area before any valves or meters (see Figure 3).

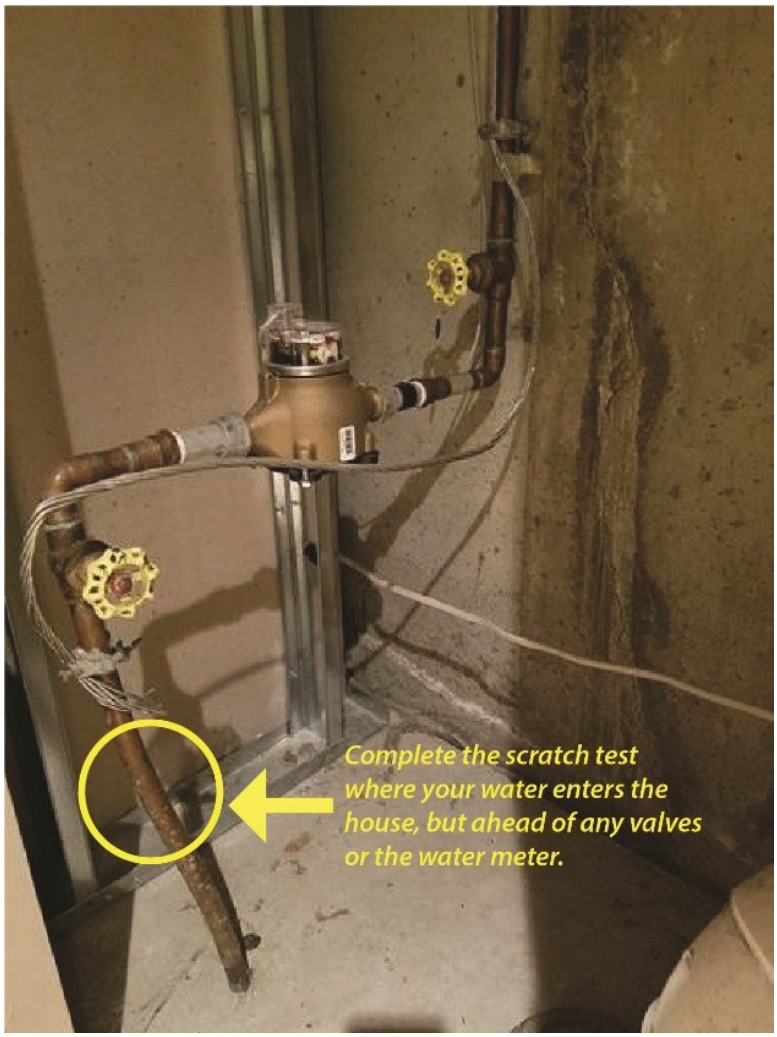


Figure 3

Per the following images, a visual inspection of the scratched area will provide a good indication of the pipe material:

If the scratched area is copper in color, like a penny, the service line is made of copper.

If the scratched area remains a dull gray color, the service line is made of galvanized steel. A strong magnet will also stick to galvanized steel pipe.

If the scratched area is shiny and silver, the service line is made of lead. Lead pipes are also softer and easier to scratch than copper or galvanized steel.

III. Service Line Excavation

The results of a "scratch test" are a good indicator of the service line material from the water shut-off valve to the home. Unless other records exist, determining the service line material from the public water main to the shut-off valve will require visual inspection.

Excavating a portion of the service line to physically inspect it for the presence of lead pipe is more accurate than other methods. However, it is the most expensive and physically disruptive method, generally making it one of the last methods used.

IV. Water Testing

Analyzing a water sample for lead can provide additional information regarding if a LSL is present. While the presence of lead can assist in the decision-making process, it is not a pure indicator of a LSL. Homes built before 1986 are more likely to have lead pipes, fixtures and solder inside the home, after the service line. The Federal Safe Drinking Water Act has reduced the maximum allowable lead content -- that is, content that is considered "lead-free" -- to be a weighted average of 0.25 percent calculated across the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures and 0.2 percent for solder and flux.

Homes built after 1986 may still have lead contamination because even if the plumbing is considered “lead-free,” it may still contain trace amounts of lead. Leaching describes the process by which water in the plumbing system can dissolve lead from pipes and solder. Soft, corrosive or acidic (low pH) water is more likely to cause leaching. Water left standing in the pipes over an extended period also increases leaching. The longer the water stands in the pipes, the greater the possibility of lead being dissolved into the water.

Taking water samples is a useful tool for identifying the presence of lead, but due to the many factors which could result in a water sample showing a positive lead result, this method should not be used as the only means of identifying a LSL.

The Cost of Lead Service Line Replacement

I. Factors Influencing Replacement Cost

From a technical standpoint, the replacement of a LSL is a relatively simple process which can usually be completed in one day. Estimating the cost of the replacement, however, can be more difficult due to the site-specific nature of each replacement. The following factors will influence the cost of LSL replacement:

- **Service Line Length -** shorter service lines will require less pipe, less excavation, less time, less site restoration, etc. Longer service lines will require a larger amount of those items, resulting in a higher cost.

- **Geography -** the location of the service line within New York State can significantly impact the replacement cost due to ease of construction access (rural, suburban, urban), regional cost differences (i.e., lower in the Northern Region versus New York City), soil types (sand, clay, rock), etc.

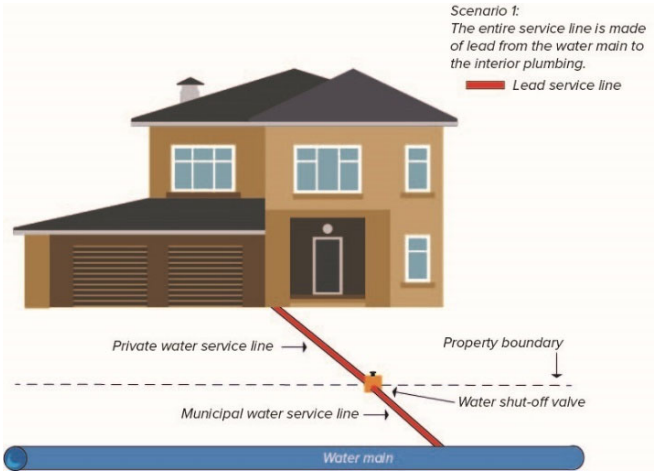
- **Construction Entity -** municipalities can use their own work force to replace LSLs, hire outside contractors to do the work or have homeowners hire their own plumbing contractor. Depending on the other factors listed in this report, the less expensive construction entity for one municipality may be more expensive for another.

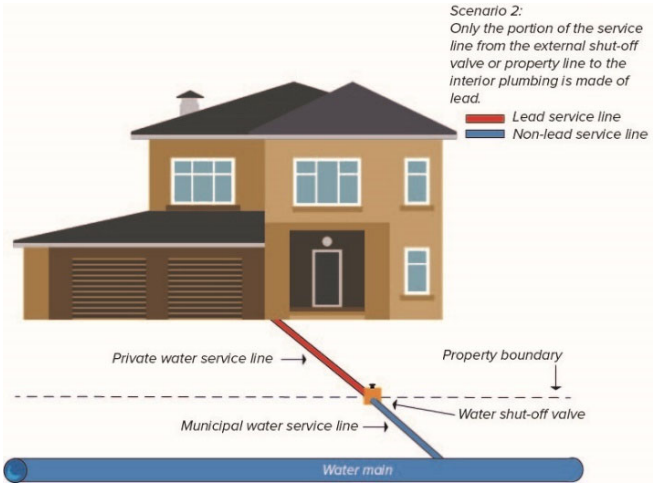
- **Method of Construction -** water service lines are generally replaced via the open trench (Figure 4) or trenchless (Figure 5) method, which digs sending and receiving holes and utilizes a directional drilling machine to insert the new pipe under the ground. The open trench method requires more excavation and site restoration than the trenchless method, generally resulting in a higher cost.

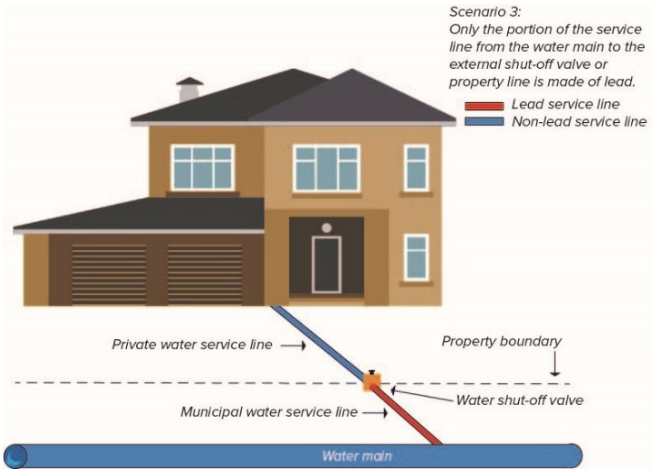
Figure 4

Figure 5

- **Full or Sectional Replacement -** knowing which portions of the service line contain lead, per the three scenarios illustrated below, will influence how much of the service line is replaced. Full replacements cost more than sectional replacement.







- **Other Costs -** administration, engineering, legal and other programmatic costs will be part of a municipal LSL replacement program, especially if it includes work on private property (scenarios 1 and 2 above).

II. LSLRP Estimated Replacement Costs

During the development of the LSLRP, the Department researched construction data and other existing reports to arrive at a cost range for a "typical" LSL replacement. Based on that research, the Department estimates the replacement of a full LSL (from the public main to the residence) can cost between $5,000 and $10,000.

Although implementation of the LSLRP is still in the early stages, several awarded municipalities have begun replacing LSLs and submitting cost documentation for reimbursement. The reported expenses result in a wide range of costs, as follows:

- Sectional LSL replacement completed by municipal employees - between $1,500 and $3,000
- Sectional LSL replacement by outside contractor - between $5,000 and $7,000
- Full LSL replacement completed by municipal employees - between $2,000 and $4,000
- Full LSL replacement completed by outside contractor - between $9,000 and $11,000

As expected, sectional replacements are generally less expensive than full replacements and replacements completed by municipal forces appear to be less expensive than those completed utilizing outside contractors because of the in-kind contribution of personnel service costs by the municipality. As the LSLRP moves forward, additional cost data will become available, allowing the Department to refine estimated LSL replacement costs.

Obstacles to Developing a Municipal Lead Service Line Replacement Program

Municipalities all have existing programs, workloads and financial commitments included in their annual budgets. Creating a new infrastructure improvement program on top of those existing items can be challenging for any municipality, regardless of size, geographical location or financial status. The following issues were encountered by many of the LSLRP awarded municipalities during the development and implementation of their local programs.

I. Program Creation/Internal Coordination

After the LSLRP awards were announced, the Department worked closely with the awarded municipalities to assist them in the creation of their local LSL replacement program. While several of the municipalities had been independently planning to begin a LSL replacement program, most had not and were starting from the beginning stages. The following common issues were encountered:

- Municipalities had to decide whether to perform the work with their own employees, hire an external contractor, or use a combination of the two. This turned out to be a difficult decision for some municipalities, requiring more internal coordination than anticipated. One large city originally chose to hire an outside contractor, then changed their mind and had to revise their program to use municipal employees.
- Creating and executing any new municipal program requires a lot of work by many employees. In developing LSL replacement programs, coordination between municipal departments proved to be difficult in a few cases. Staffing levels, existing workload, municipal meeting schedules and unexpected emergencies are some of the items contributing to reduced operational efficiency between departments.

II. Locating Lead Service Lines

While using the methods described earlier in this report, many LSLRP funded municipalities had difficulty physically locating LSLs.

- Many municipalities did not have the historical records available to create an inventory of water

service lines that may contain lead.

- Of the municipalities that did have historical records, many found them to be inaccurate, resulting in the excavation of non-LSLs. One municipality's records turned out to be only 20 percent accurate in identifying LSLs, while another municipality's records were less than 10 percent accurate.
- One municipality scratch-tested more than 150 water service lines, finding only seven (7) made of lead.

III. Available Workforce/Finding Contractors

Most municipalities have the staff and equipment required to replace a LSL. However, because of other existing priorities, those resources are not always available to perform the work. As a result, the cost to replace the LSL may be less expensive using municipal employees, but municipalities must often hire contractors to replace LSLs.

For those choosing to hire an external contractor, several LSLRP awarded municipalities had difficulty finding a contractor willing to perform the work, with some receiving one or no bids to posted requests. The municipalities provided the following as issues and possible reasons for the difficulty:

- Few local contractors qualified to perform the work.
- Small amount of work in the contract (replacing 5 to 10 LSLs).
- Contract requirements (i.e., Minority/Women Business Enterprise).
- Bids received were much higher than anticipated.

IV. Public vs. Private Ownership

In most cases, two entities are responsible for water service lines. The portion from the watermain to the curb stop/property line is usually owned by the municipality while the remaining portion to the home is owned by the property owner. A temporary agreement is generally required in order for the municipality, or their contractor, to perform work on private property. Securing that agreement is another administrative step which can delay LSL replacement.

A Plan for New York State

I. Current Need

In 1991, the United States Environmental Protection Agency (EPA) published the Lead and Copper Rule (LCR) to control lead and copper in drinking water. The LCR establishes an action level for lead in public drinking water at 0.015 milligram per liter (mg/l). The LCR requires public water systems to collect tap samples from sites served by the system that are likely to have plumbing materials containing lead. If more than 10 percent of tap water samples at the selected sample sites exceed the lead action level of 0.015 mg/l, then the water system is required to notify homeowners and take steps to reduce lead levels in the public drinking water supply. The leaching of lead from pipes is one way in which the LCR can be exceeded.

II. Inventory

As stated previously in this report, a major obstacle to replacing LSLs is knowing their location. Most municipalities do not have an inventory of water service lines, and the ones that do are generally of limited accuracy. To overcome this obstacle, the first step of a statewide LSL replacement program should be the creation of a water service line inventory.

III. Funding

A 2016 survey by the American Water Works Association estimates there are 360,000 lead service lines in New York State. Using a conservative cost estimate of $7,500 to replace a full LSL, the minimum cost to achieve 100 percent replacement throughout New York would be $2.7 billion.

As with all infrastructure replacement projects, including LSLs, the source of funding is a primary concern. While New York's LSLRP has begun the process, and the $30 million allocated is a historic commitment from New York State, it amounts to roughly 1 percent of the total estimated to achieve 100 percent LSL replacement. Future funding allocations from both the federal and state level are required to allow municipalities to continue the progress the LSLRP has started.

Recommendations for Municipalities

I. Evaluating the Status of Lead Service Lines

Through the development of the LSLRP, is has become evident that municipal knowledge of LSLs varies greatly across New York State. Some municipalities already have a robust replacement program in place while others are unsure how many LSLs they may have and where they are located. The methods described earlier in this report can aid municipalities in determining if there are likely to be LSLs in their service area.

If the likelihood of LSLs is high, or if they are already a known issue, municipalities should review their ability to address the presence of LSLs and how they would replace them. Preparing internally before engaging the community is a vital step in enacting a successful LSL replacement program.

Some areas of discussion include:

- Does our municipality contain LSLs?
- Are the LSLs full or sectional?
- Who owns each portion of the LSL?
- How do we currently communicate with the community? Have LSLs been mentioned in the past?
- Is there internal municipal support for a LSL replacement program?
- Is there community interest/support for a LSL replacement program?
- Is sufficient funding available to replace the municipally owned portions of LSLs?
- Is funding available to assist homeowners in replacing their portion?

- Is pre- and post-replacement flushing guidance available?
- How would our LSL replacement program be structured?

II. Guidance for Replacement of Lead Service Lines

Municipal LSL replacement programs should be tailored to meet the specific needs of each municipality. During the development of a program, administrators should account for work force, available funding, timing/schedule, previously scheduled construction projects, etc. when determining the best course of action.

The following is a partial list of items to include as part of a municipal LSL replacement program outline:

- The approximate number and location of LSLs remaining in the service area. If unknown, outline the steps to be taken to identify and locate them.
- How will LSLs be chosen/prioritized for replacement?
    a) Will homeowners apply for replacement? If so, is there an eligibility and/or ranking criteria? Will replacements be "first come, first serve"?
    b) If there is no application process, how will the municipality choose which LSLs to replace?
    c) Will LSLs to schools, day care centers or other sensitive populations be prioritized over others?
- The entity performing the replacement work (municipal forces or outside contractor).
    a) Define the scope of work.
    b) Solicitation of bids from outside contractors (if applicable).
- The estimated cost range for LSL replacements.
    a) Financial structure.
    b) Municipal cost versus property owner cost.
    c) Engineering, administrative, legal costs?
- Who will oversee the LSL replacements (municipal employee, external project manager)?
- Property owner outreach procedures.
    a) Introduce/advertise the program.
    b) Application process (if applicable).
    c) Pre- and post-replacement guidance for homeowners.
- Post-replacement street and/or property restoration.

The Department is available to assist municipalities in the development of their local LSL replacement programs. Additional information about the LSLRP can be found on the Department's LSLRP web page: https://health.ny.gov/LSLRP

The following LSL replacement resources can also aid municipalities:

- U.S. Environmental Protection Agency (Basic Information about Lead in Drinking Water) - https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water

- U.S. Government Accountability Office (Additional Data and Statistical Analysis May Enhance EPA's Oversight of the Lead and Copper Rule) - https://www.gao.gov/assets/690/686909.pdf
- American Water Works Association (Communicating About Lead Service Lines) - https://www.awwa.org/portals/0/files/resources/publicaffairs/pdfs/finaleadservicelinecommguide.pdf
- American Water Works Association Standard C810-17 (Replacement and Flushing of Lead Service Lines) - https://www.awwa.org/store/productdetail.aspx?productid=65628258
- Lead Service Line Replacement Collaborative - https://www.lslr-collaborative.org/

Appendix A

LSLRP Eligible Municipalities

1. Municipalities listed in this appendix have met all three of the LSLRP eligibility thresholds described in the "Implementation of the Lead Service Line Program" section above and are presented alphabetically by Regional Economic Development Council region.

2. The column titled "Houses Built Before 1939" represents data from the 2010 Census.

3. The column titled "0-6 Y.O. Children With BLL >5 (Five Year Total)" represents NYSDOH Childhood Lead Poisoning Prevention Program data from 2011 through 2015 (5 years). The column titled "Population 0-6 Years Old" represents Census data from calendar year 2016. To calculate the percentage of children with a BLL >5, the data has to be put on the same temporal scale. To accomplish this, divide the "0-6 Y.O. Children With BLL >5 (Five Year Total)" column by five, to get a one year average, before dividing by the total number of children. The following example is for the City of Albany:

   0-6 Y.O. Children With BLL >5 (Five Year Total) = 2,301
   Population 0-6 Years Old = 5,758

   BLL% = (2,301/5) / (5,758) * 100 = 7.99%

4. The Median Household Income columns represents data from the 2010 Census.

LSLRP Threshold Eligible Municipalities

REDC Region	Municipality	County	Houses Built Before 1939	0-6 Y.O. Children With BLL >5 (Five Year Total)	Population 0-6 Years Old	% of 0-6 Y.O. Children With BLL >5	Region Median Household Income (RMHI)	Median Household Income (MHI)	% Difference MHI to RMHI
Capital Region	Albany city	Albany County	25478	2301	5758	7.99	61320	49381	-19.47
Capital Region	Argyle town	Washington County	663	31	232	2.67	61320	63240	3.13
Capital Region	Athens town	Greene County	561	17	286	1.19	61320	63293	3.22
Capital Region	Ballston town	Saratoga County	804	31	692	0.90	61320	81162	32.36
Capital Region	Brunswick town	Rensselaer County	1303	43	818	1.05	61320	82208	34.06
Capital Region	Cairo town	Greene County	1052	29	425	1.36	61320	52295	-14.72
Capital Region	Catskill town	Greene County	2116	112	840	2.67	61320	47198	-23.03
Capital Region	Chatham town	Columbia County	1113	18	255	1.41	61320	81402	32.75
Capital Region	Chester town	Warren County	596	9	231	0.78	61320	57314	-6.53
Capital Region	Claverack town	Columbia County	1161	42	351	2.39	61320	75234	22.69
Capital Region	Coeymans town	Albany County	669	34	634	1.07	61320	70625	15.17
Capital Region	Cohoes city	Albany County	4365	276	1117	4.94	61320	52380	-14.58
Capital Region	Colonie town	Albany County	4021	149	5022	0.59	61320	82992	35.34
Capital Region	Corinth town	Saratoga County	923	24	443	1.08	61320	61467	0.24
Capital Region	Coxsackie town	Greene County	984	36	475	1.52	61320	66757	8.87
Capital Region	East Greenbush town	Rensselaer County	1175	28	1210	0.46	61320	85790	39.91
Capital Region	Fort Edward town	Washington County	1315	88	422	4.17	61320	46836	-23.62
Capital Region	Ghent town	Columbia County	854	35	329	2.13	61320	70365	14.75
Capital Region	Glens Falls city	Warren County	4000	148	966	3.06	61320	53208	-13.23
Capital Region	Glenville town	Schenectady County	3319	99	2107	0.94	61320	79654	29.90
Capital Region	Granville town	Washington County	1253	45	545	1.65	61320	52132	-14.98
Capital Region	Green Island town	Albany County	849	46	185	4.97	61320	47391	-22.72
Capital Region	Greenfield town	Saratoga County	502	13	576	0.45	61320	68856	12.29
Capital Region	Greenwich town	Washington County	938	34	345	1.97	61320	58438	-4.70
Capital Region	Hoosick town	Rensselaer County	1218	41	538	1.52	61320	61468	0.24
Capital Region	Hudson city	Columbia County	2412	233	474	9.83	61320	57929	-5.53
Capital Region	Johnsburg town	Warren County	632	16	167	1.92	61320	51099	-16.67
Capital Region	Kinderhook town	Columbia County	1050	36	527	1.37	61320	78919	28.70
Capital Region	Kingsbury town	Washington County	1929	232	938	4.95	61320	55000	-10.31
Capital Region	Lake George town	Warren County	542	6	213	0.56	61320	69231	12.90
Capital Region	Malta town	Saratoga County	546	33	1203	0.55	61320	75346	22.87
Capital Region	Mechanicville city	Saratoga County	1429	28	360	1.56	61320	58184	-5.11
Capital Region	Milton town	Saratoga County	1488	71	1528	0.93	61320	76753	25.17
Capital Region	Moreau town	Saratoga County	1141	49	990	0.99	61320	61859	0.88
Capital Region	Nassau town	Rensselaer County	765	31	290	2.14	61320	80156	30.72
Capital Region	New Scotland town	Albany County	1099	14	593	0.47	61320	83885	36.80
Capital Region	Niskayuna town	Schenectady County	2049	67	1809	0.74	61320	99500	62.26
Capital Region	Pittstown town	Rensselaer County	532	13	550	0.47	61320	68955	12.45
Capital Region	Rensselaer city	Rensselaer County	1914	114	639	3.57	61320	59183	-3.48
Capital Region	Rotterdam town	Schenectady County	2242	67	2255	0.59	61320	70917	15.65
Capital Region	Salem town	Washington County	637	49	155	6.32	61320	58750	-4.19
Capital Region	Sand Lake town	Rensselaer County	1066	24	578	0.83	61320	79957	30.39
Capital Region	Saratoga Springs city	Saratoga County	4888	77	1789	0.86	61320	83756	36.59
Capital Region	Saratoga town	Saratoga County	949	15	377	0.80	61320	71071	15.90
Capital Region	Schaghticoke town	Rensselaer County	851	24	561	0.86	61320	79296	29.32
Capital Region	Schenectady city	Schenectady County	18014	1595	5045	6.32	61320	45000	-26.61
Capital Region	Schodack town	Rensselaer County	1238	54	921	1.17	61320	84306	37.49
Capital Region	Stillwater town	Saratoga County	784	17	635	0.54	61320	71994	17.41
Capital Region	Stockport town	Columbia County	518	10	199	1.01	61320	58220	-5.06
Capital Region	Troy city	Rensselaer County	13999	1175	3377	6.96	61320	44151	-28.00
Capital Region	Warrensburg town	Warren County	988	28	296	1.89	61320	50031	-18.41
Capital Region	Waterford town	Saratoga County	1735	97	561	3.46	61320	67805	10.58
Capital Region	Watervliet city	Albany County	3447	146	739	3.95	61320	52536	-14.32
Capital Region	White Creek town	Washington County	579	22	213	2.07	61320	55283	-9.84
Capital Region	Whitehall town	Washington County	1079	80	311	5.14	61320	51023	-16.79
Central NY	Auburn city	Cayuga County	7467	580	1909	6.08	56532	52776	-6.64
Central NY	Brutus town	Cayuga County	549	20	360	1.11	56532	54096	-4.31
Central NY	Cazenovia town	Madison County	1012	11	487	0.45	56532	92277	63.23
Central NY	Clay town	Onondaga County	957	117	5051	0.46	56532	73335	29.72

LSLRP Threshold Eligible Municipalities

REDC Region	Municipality	County	Houses Built Before 1939	0-6 Y.O. Children With BLL >5 (Five Year Total)	Population 0-6 Years Old	% of 0-6 Y.O. Children With BLL >5	Region Median Household Income (RMHI)	Median Household Income (MHI)	% Difference MHI to RMHI
Central NY	Constantia town	Oswego County	549	11	348	0.63	56532	63313	11.99
Central NY	Cortland city	Cortland County	4749	171	1167	2.93	56532	56433	-0.18
Central NY	Cortlandville town	Cortland County	1047	34	589	1.15	56532	58827	4.06
Central NY	De Witt town	Onondaga County	2074	88	1690	1.04	56532	79683	40.95
Central NY	Eaton town	Madison County	542	10	252	0.79	56532	51464	-8.97
Central NY	Elbridge town	Onondaga County	716	20	465	0.86	56532	72299	27.89
Central NY	Fulton city	Oswego County	2820	143	948	3.02	56532	47695	-15.63
Central NY	Geddes town	Onondaga County	2041	89	1191	1.49	56532	63973	13.16
Central NY	Granby town	Oswego County	800	15	565	0.53	56532	47627	-15.75
Central NY	Hamilton town	Madison County	979	23	242	1.90	56532	67770	19.88
Central NY	Homer town	Cortland County	1056	16	448	0.71	56532	63737	12.74
Central NY	Madison town	Madison County	525	18	199	1.81	56532	54068	-4.36
Central NY	Manlius town	Onondaga County	1982	63	2349	0.54	56532	87329	54.48
Central NY	Marcellus town	Onondaga County	715	23	500	0.92	56532	67097	18.69
Central NY	Mexico town	Oswego County	875	16	388	0.82	56532	56804	0.48
Central NY	Oneida city	Madison County	2575	89	788	2.26	56532	54191	-4.14
Central NY	Oswego city	Oswego County	4755	225	1077	4.18	56532	54297	-3.95
Central NY	Richland town	Oswego County	895	16	448	0.71	56532	55708	-1.46
Central NY	Salina town	Onondaga County	2282	153	2088	1.47	56532	58013	2.62
Central NY	Sandy Creek town	Oswego County	724	47	278	3.38	56532	58641	3.73
Central NY	Skaneateles town	Onondaga County	1523	11	436	0.50	56532	90694	60.43
Central NY	Syracuse city	Onondaga County	34214	6171	10479	11.78	56532	37485	-33.69
Central NY	Van Buren town	Onondaga County	1086	30	882	0.68	56532	60383	6.81
Finger Lakes	Albion town	Orleans County	1724	77	519	2.97	54414	54792	0.70
Finger Lakes	Arcade town	Wyoming County	551	6	256	0.47	54414	58371	7.27
Finger Lakes	Arcadia town	Wayne County	2534	113	951	2.38	54414	53351	-1.95
Finger Lakes	Attica town	Wyoming County	750	39	260	3.00	54414	56161	3.21
Finger Lakes	Avon town	Livingston County	742	30	479	1.25	54414	70925	30.34
Finger Lakes	Batavia city	Genesee County	3538	175	1042	3.36	54414	48222	-11.38
Finger Lakes	Brighton town	Monroe County	3027	76	2166	0.70	54414	84737	55.73
Finger Lakes	Caledonia town	Livingston County	563	43	330	2.61	54414	67644	24.31
Finger Lakes	Canandaigua city	Ontario County	2236	64	748	1.71	54414	68448	25.79
Finger Lakes	Carlton town	Orleans County	541	27	180	3.00	54414	57054	4.85
Finger Lakes	Castile town	Wyoming County	933	30	175	3.43	54414	59107	8.63
Finger Lakes	Chili town	Monroe County	815	58	2022	0.57	54414	71744	31.85
Finger Lakes	Covert town	Seneca County	504	37	126	5.87	54414	57125	4.98
Finger Lakes	East Rochester town	Monroe County	1436	31	432	1.44	54414	51422	-5.50
Finger Lakes	Gainesville town	Wyoming County	519	12	135	1.78	54414	51597	-5.18
Finger Lakes	Galen town	Wayne County	923	40	373	2.14	54414	48528	-10.82
Finger Lakes	Gates town	Monroe County	796	91	1863	0.98	54414	61486	13.00
Finger Lakes	Geneseo town	Livingston County	956	15	374	0.80	54414	76681	40.92
Finger Lakes	Geneva city	Ontario County	3517	248	849	5.84	54414	52026	-4.39
Finger Lakes	Gorham town	Ontario County	874	12	326	0.74	54414	75303	38.39
Finger Lakes	Henrietta town	Monroe County	1303	86	2702	0.64	54414	68998	26.80
Finger Lakes	Huron town	Wayne County	550	11	106	2.08	54414	50357	-7.46
Finger Lakes	Irondequoit town	Monroe County	5608	119	3080	0.77	54414	62985	15.75
Finger Lakes	Jerusalem town	Yates County	943	15	224	1.34	54414	61563	13.14
Finger Lakes	Le Roy town	Genesee County	1310	68	537	2.53	54414	61629	13.26
Finger Lakes	Livonia town	Livingston County	1068	14	617	0.45	54414	64917	19.30
Finger Lakes	Lyons town	Wayne County	1401	170	357	9.52	54414	46079	-15.32
Finger Lakes	Manchester town	Ontario County	1693	24	638	0.75	54414	57877	6.36
Finger Lakes	Marion town	Wayne County	812	10	365	0.55	54414	64870	19.22
Finger Lakes	Mendon town	Monroe County	833	20	678	0.59	54414	107524	97.60
Finger Lakes	Milo town	Yates County	1802	75	629	2.38	54414	51349	-5.63
Finger Lakes	Mount Morris town	Livingston County	875	60	308	3.90	54414	60718	11.59
Finger Lakes	Murray town	Orleans County	969	34	320	2.13	54414	55556	2.10
Finger Lakes	North Dansville town	Livingston County	1394	56	430	2.60	54414	41691	-23.38
Finger Lakes	Nunda town	Livingston County	539	18	251	1.43	54414	60337	10.89
Finger Lakes	Oakfield town	Genesee County	711	24	211	2.27	54414	56964	4.69

LSLRP Threshold Eligible Municipalities

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Finger Lakes	Ontario town	Wayne County	751	24	797	0.60	54414	75596	38.93
Finger Lakes	Palmyra town	Wayne County	1522	31	571	1.09	54414	61371	12.79
Finger Lakes	Pembroke town	Genesee County	755	9	320	0.56	54414	59402	9.17
Finger Lakes	Perry town	Wyoming County	1327	71	347	4.09	54414	51016	-6.24
Finger Lakes	Phelps town	Ontario County	1125	28	481	1.16	54414	68831	26.50
Finger Lakes	Ridgeway town	Orleans County	1788	88	510	3.45	54414	51801	-4.80
Finger Lakes	Rochester city	Monroe County	64121	7646	15531	9.85	54414	36173	-33.52
Finger Lakes	Seneca Falls town	Seneca County	1545	19	559	0.68	54414	53723	-1.27
Finger Lakes	Seneca town	Ontario County	563	5	175	0.57	54414	67708	24.43
Finger Lakes	Shelby town	Orleans County	1004	36	369	1.95	54414	50435	-7.31
Finger Lakes	Sodus town	Wayne County	1899	30	574	1.05	54414	56578	3.98
Finger Lakes	Starkey town	Yates County	596	16	288	1.11	54414	54826	0.76
Finger Lakes	Sweden town	Monroe County	1258	34	717	0.95	54414	64319	18.20
Finger Lakes	Warsaw town	Wyoming County	1392	71	362	3.92	54414	51950	-4.53
Finger Lakes	Waterloo town	Seneca County	1258	67	526	2.55	54414	50539	-7.12
Finger Lakes	Wheatland town	Monroe County	534	22	356	1.24	54414	72955	34.07
Finger Lakes	Williamson town	Wayne County	1005	22	454	0.97	54414	61939	13.83
Finger Lakes	Wolcott town	Wayne County	899	25	294	1.70	54414	42253	-22.35
Finger Lakes	Yates town	Orleans County	589	19	164	2.32	54414	48698	-10.50
Long Island	East Hampton town	Suffolk County	2459	40	889	0.90	80589	94352	17.08
Long Island	Glen Cove city	Nassau County	2298	101	1206	1.67	80589	85033	5.51
Long Island	Hempstead town	Nassau County	58838	1947	48192	0.81	80589	101442	25.88
Long Island	Long Beach city	Nassau County	5232	49	1500	0.65	80589	99672	23.68
Long Island	North Hempstead town	Nassau County	18522	580	14125	0.82	80589	117878	46.27
Long Island	Riverhead town	Suffolk County	1727	76	2338	0.65	80589	84179	4.45
Long Island	Shelter Island town	Suffolk County	798	15	132	2.27	80589	95625	18.66
Long Island	Southampton town	Suffolk County	5796	154	3339	0.92	80589	91332	13.33
Long Island	Southold town	Suffolk County	3132	190	1272	2.99	80589	88144	9.37
Mid-Hudson	Amenia town	Dutchess County	551	11	252	0.87	79296	61378	-22.60
Mid-Hudson	Beacon city	Dutchess County	2566	101	793	2.55	79296	68655	-13.42
Mid-Hudson	Bedford town	Westchester County	1811	53	1633	0.65	79296	142029	79.11
Mid-Hudson	Bethel town	Sullivan County	714	17	243	1.40	79296	54118	-31.75
Mid-Hudson	Callicoon town	Sullivan County	696	5	203	0.49	79296	62127	-21.65
Mid-Hudson	Clarkstown town	Rockland County	2396	252	6116	0.82	79296	114659	44.60
Mid-Hudson	Cornwall town	Orange County	1544	25	967	0.52	79296	90357	13.95
Mid-Hudson	Cortlandt town	Westchester County	2847	103	3175	0.65	79296	112299	41.62
Mid-Hudson	Deerpark town	Orange County	802	31	620	1.00	79296	64575	-18.56
Mid-Hudson	Delaware town	Sullivan County	608	13	148	1.76	79296	71645	-9.65
Mid-Hudson	Dover town	Dutchess County	654	17	618	0.55	79296	64462	-18.71
Mid-Hudson	Eastchester town	Westchester County	4837	126	2382	1.06	79296	134137	69.16
Mid-Hudson	Esopus town	Ulster County	1227	67	729	1.84	79296	75779	-4.43
Mid-Hudson	Fallsburg town	Sullivan County	1158	93	856	2.17	79296	46150	-41.80
Mid-Hudson	Goshen town	Orange County	1525	75	827	1.81	79296	99308	25.24
Mid-Hudson	Greenburgh town	Westchester County	8805	353	5897	1.20	79296	127787	61.15
Mid-Hudson	Harrison town	Westchester County	2032	94	2135	0.88	79296	130224	64.23
Mid-Hudson	Haverstraw town	Rockland County	1989	307	1789	3.43	79296	81168	2.36
Mid-Hudson	Highlands town	Orange County	1019	36	847	0.85	79296	85486	7.81
Mid-Hudson	Hyde Park town	Dutchess County	957	98	1303	1.50	79296	77166	-2.69
Mid-Hudson	Kingston city	Ulster County	6172	708	1559	9.08	79296	58601	-26.10
Mid-Hudson	Liberty town	Sullivan County	1532	86	556	3.09	79296	59926	-24.43
Mid-Hudson	Lloyd town	Ulster County	1120	74	642	2.31	79296	76875	-3.05
Mid-Hudson	Mamakating town	Sullivan County	1596	40	944	0.85	79296	71414	-9.94
Mid-Hudson	Mamaroneck town	Westchester County	5151	187	2244	1.67	79296	150918	90.32
Mid-Hudson	Marlborough town	Ulster County	847	65	575	2.26	79296	86289	8.82
Mid-Hudson	Middletown city	Orange County	4963	633	1289	9.82	79296	58248	-26.54
Mid-Hudson	Monroe town	Orange County	1310	211	7055	0.60	79296	63152	-20.36
Mid-Hudson	Montgomery town	Orange County	1901	107	1729	1.24	79296	76036	-4.11
Mid-Hudson	Mount Kisco town	Westchester County	870	60	517	2.32	79296	75909	-4.27

LSLRP Threshold Eligible Municipalities

REDC Region	Municipality	County	Houses Built Before 1939	0-6 Y.O. Children With BLL >5 (Five Year Total)	Population 0-6 Years Old	% of 0-6 Y.O. Children With BLL >5	Region Median Household Income (RMHI)	Median Household Income (MHI)	% Difference MHI to RMHI
Mid-Hudson	Mount Pleasant town	Westchester County	4998	228	3023	1.51	79296	128304	61.80
Mid-Hudson	Mount Vernon city	Westchester County	11288	1059	5106	4.15	79296	61477	-22.47
Mid-Hudson	New Rochelle city	Westchester County	12392	600	4106	2.92	79296	91553	15.46
Mid-Hudson	New Windsor town	Orange County	704	48	1612	0.60	79296	81684	3.01
Mid-Hudson	Newburgh city	Orange County	6192	1748	1422	24.59	79296	41432	-47.75
Mid-Hudson	Newburgh town	Orange County	1535	131	2107	1.24	79296	84966	7.15
Mid-Hudson	North East town	Dutchess County	657	9	141	1.28	79296	64773	-18.31
Mid-Hudson	Orangetown town	Rockland County	3816	132	3612	0.73	79296	111960	41.19
Mid-Hudson	Ossining town	Westchester County	4315	369	1905	3.87	79296	101616	28.15
Mid-Hudson	Pawling town	Dutchess County	731	32	533	1.20	79296	96611	21.84
Mid-Hudson	Peekskill city	Westchester County	3200	495	1382	7.16	79296	64844	-18.23
Mid-Hudson	Pelham town	Westchester County	2414	118	1031	2.29	79296	141821	78.85
Mid-Hudson	Philipstown town	Putnam County	1101	40	594	1.35	79296	101900	28.51
Mid-Hudson	Pine Plains town	Dutchess County	578	26	168	3.10	79296	63750	-19.60
Mid-Hudson	Plattekill town	Ulster County	594	70	701	2.00	79296	64208	-19.03
Mid-Hudson	Pleasant Valley town	Dutchess County	568	54	696	1.55	79296	98518	24.24
Mid-Hudson	Port Jervis city	Orange County	2604	208	734	5.67	79296	48029	-39.43
Mid-Hudson	Poughkeepsie city	Dutchess County	6493	1206	2059	11.71	79296	46547	-41.30
Mid-Hudson	Poughkeepsie town	Dutchess County	2075	90	2527	0.71	79296	84167	6.14
Mid-Hudson	Ramapo town	Rockland County	3405	944	13760	1.37	79296	80688	1.76
Mid-Hudson	Rhinebeck town	Dutchess County	1120	17	408	0.83	79296	76973	-2.93
Mid-Hudson	Rochester town	Ulster County	636	13	511	0.51	79296	60969	-23.11
Mid-Hudson	Rockland town	Sullivan County	966	24	267	1.80	79296	53780	-32.18
Mid-Hudson	Rosendale town	Ulster County	1277	27	449	1.20	79296	77786	-1.90
Mid-Hudson	Rye town	Westchester County	5199	607	2244	5.41	79296	77790	-1.90
Mid-Hudson	Saugerties town	Ulster County	2656	72	1313	1.10	79296	59513	-24.95
Mid-Hudson	Shawangunk town	Ulster County	848	46	788	1.17	79296	81179	2.38
Mid-Hudson	Southeast town	Putnam County	1086	43	1148	0.75	79296	97391	22.82
Mid-Hudson	Stanford town	Dutchess County	614	9	196	0.92	79296	68587	-13.50
Mid-Hudson	Thompson town	Sullivan County	1221	86	959	1.79	79296	46821	-40.95
Mid-Hudson	Ulster town	Ulster County	964	26	864	0.60	79296	66884	-15.65
Mid-Hudson	Wallkill town	Orange County	1336	105	1594	1.32	79296	71802	-9.45
Mid-Hudson	Wappinger town	Dutchess County	1108	165	1719	1.92	79296	85722	8.10
Mid-Hudson	Warwick town	Orange County	2680	60	2328	0.52	79296	97724	23.24
Mid-Hudson	Washington town	Dutchess County	1020	26	269	1.93	79296	69534	-12.31
Mid-Hudson	Wawarsing town	Ulster County	1948	61	637	1.92	79296	49714	-37.31
Mid-Hudson	White Plains city	Westchester County	8619	502	2651	3.79	79296	93691	18.15
Mid-Hudson	Woodbury town	Orange County	678	41	828	0.99	79296	114120	43.92
Mid-Hudson	Yonkers city	Westchester County	24604	1868	10230	3.65	79296	66601	-16.01
Mohawk Valley	Amsterdam city	Montgomery County	5383	509	1118	9.11	51041	48648	-4.69
Mohawk Valley	Amsterdam town	Montgomery County	782	17	337	1.01	51041	66063	29.43
Mohawk Valley	Boonville town	Oneida County	784	48	338	2.84	51041	55344	8.43
Mohawk Valley	Broadalbin town	Fulton County	706	20	365	1.10	51041	61964	21.40
Mohawk Valley	Camden town	Oneida County	884	9	376	0.48	51041	64461	26.29
Mohawk Valley	Canajoharie town	Montgomery County	1083	48	321	2.99	51041	56875	11.43
Mohawk Valley	Caroga town	Fulton County	705	2	80	0.50	51041	59286	16.15
Mohawk Valley	Cobleskill town	Schoharie County	921	36	270	2.67	51041	63995	25.38
Mohawk Valley	Frankfort town	Herkimer County	1368	28	504	1.11	51041	53882	5.57
Mohawk Valley	German Flatts town	Herkimer County	3115	197	999	3.94	51041	51541	0.98
Mohawk Valley	Gloversville city	Fulton County	5098	928	1244	14.92	51041	34974	-31.48
Mohawk Valley	Herkimer town	Herkimer County	2049	180	546	6.59	51041	46477	-8.94
Mohawk Valley	Johnstown city	Fulton County	2111	157	618	5.08	51041	45500	-10.86
Mohawk Valley	Johnstown town	Fulton County	642	21	391	1.07	51041	65386	28.10
Mohawk Valley	Kirkland town	Oneida County	1587	25	465	1.08	51041	73750	44.49
Mohawk Valley	Lee town	Oneida County	620	23	490	0.94	51041	58390	14.40
Mohawk Valley	Little Falls city	Herkimer County	1944	126	372	6.77	51041	55655	9.04
Mohawk Valley	Manheim town	Herkimer County	810	22	248	1.77	51041	45104	-11.63
Mohawk Valley	Mayfield town	Fulton County	640	31	434	1.43	51041	53909	5.62
Mohawk Valley	Middleburgh town	Schoharie County	636	10	252	0.79	51041	60000	17.55

LSLRP Threshold Eligible Municipalities

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Mohawk Valley	Milford town	Otsego County	536	20	148	2.70	51041	51222	0.35
Mohawk Valley	Minden town	Montgomery County	949	105	346	6.07	51041	42813	-16.12
Mohawk Valley	Mohawk town	Montgomery County	539	30	322	1.86	51041	63906	25.21
Mohawk Valley	New Hartford town	Oneida County	2010	83	1293	1.28	51041	76985	50.83
Mohawk Valley	Northampton town	Fulton County	837	12	184	1.30	51041	53484	4.79
Mohawk Valley	Oneonta city	Otsego County	3553	81	472	3.43	51041	54563	6.90
Mohawk Valley	Oneonta town	Otsego County	531	26	286	1.82	51041	70033	37.21
Mohawk Valley	Otego town	Otsego County	551	14	200	1.40	51041	45326	-11.20
Mohawk Valley	Otsego town	Otsego County	1078	21	202	2.08	51041	57727	13.10
Mohawk Valley	Palatine town	Montgomery County	533	32	295	2.17	51041	51908	1.70
Mohawk Valley	Paris town	Oneida County	746	13	289	0.90	51041	63221	23.86
Mohawk Valley	Richfield town	Otsego County	624	38	160	4.75	51041	49479	-3.06
Mohawk Valley	Rome city	Oneida County	5633	467	2427	3.85	51041	53128	4.09
Mohawk Valley	Sangerfield town	Oneida County	632	41	225	3.64	51041	54931	7.62
Mohawk Valley	Sherrill city	Oneida County	551	7	253	0.55	51041	67824	32.88
Mohawk Valley	St. Johnsville town	Montgomery County	640	28	189	2.96	51041	42075	-17.57
Mohawk Valley	Trenton town	Oneida County	761	23	368	1.25	51041	77340	51.53
Mohawk Valley	Unadilla town	Otsego County	710	70	331	4.23	51041	55096	7.94
Mohawk Valley	Utica city	Oneida County	15641	4030	4507	17.88	51041	39987	-21.66
Mohawk Valley	Vernon town	Oneida County	864	12	411	0.58	51041	56987	11.65
Mohawk Valley	Verona town	Oneida County	836	15	519	0.58	51041	57177	12.02
Mohawk Valley	Vienna town	Oneida County	564	11	463	0.48	51041	52417	2.70
Mohawk Valley	Webb town	Herkimer County	1015	7	102	1.37	51041	55125	8.00
Mohawk Valley	Westmoreland town	Oneida County	546	17	445	0.76	51041	67378	32.01
Mohawk Valley	Whitestown town	Oneida County	2558	104	1232	1.69	51041	64016	25.42
Mohawk Valley	Worcester town	Otsego County	724	29	152	3.82	51041	48564	-4.85
New York City	Bronx borough	Bronx County	190475	133	62004	0.05	57258	38320	-33.07
New York City	Brooklyn borough	Kings County	496187	283	200341	0.04	57258	48751	-14.86
New York City	Queens borough	Queens County	281813	224	132335	0.04	57258	62068	8.40
New York City	Manhattan borough	New York County	399461	48	81330	0.01	57258	79522	38.88
New York City	Staten Island borough	Richmond County	35039	24	32213	0.02	57258	82911	44.80
North Country	Adams town	Jefferson County	952	34	436	1.56	50090	57823	15.44
North Country	Alexandria town	Jefferson County	1177	20	312	1.28	50090	57717	15.23
North Country	Brownville town	Jefferson County	1214	20	492	0.81	50090	57653	15.10
North Country	Canton town	St. Lawrence County	1178	30	605	0.99	50090	63796	27.36
North Country	Cape Vincent town	Jefferson County	577	7	133	1.05	50090	67059	33.88
North Country	Champion town	Jefferson County	907	20	443	0.90	50090	45903	-8.36
North Country	Champlain town	Clinton County	969	27	447	1.21	50090	57179	14.15
North Country	Chesterfield town	Essex County	563	5	131	0.76	50090	61250	22.28
North Country	Croghan town	Lewis County	762	17	217	1.57	50090	48185	-3.80
North Country	Ellisburg town	Jefferson County	1137	37	336	2.20	50090	51297	2.41
North Country	Gouverneur town	St. Lawrence County	1365	101	567	3.56	50090	52095	4.00
North Country	Harrietstown town	Franklin County	2016	29	394	1.47	50090	61809	23.40
North Country	Hounsfield town	Jefferson County	824	7	253	0.55	50090	71224	42.19
North Country	Le Ray town	Jefferson County	1178	67	2403	0.56	50090	42549	-15.05
North Country	Lisbon town	St. Lawrence County	637	12	337	0.71	50090	51399	2.61
North Country	Lowville town	Lewis County	801	69	324	4.26	50090	58517	16.82
North Country	Lyme town	Jefferson County	716	3	114	0.53	50090	58925	17.64
North Country	Malone town	Franklin County	1957	81	682	2.38	50090	46383	-7.40
North Country	Massena town	St. Lawrence County	1703	35	991	0.71	50090	47633	-4.90
North Country	Moriah town	Essex County	1132	19	315	1.21	50090	41224	-17.70
North Country	Morristown town	St. Lawrence County	553	4	154	0.52	50090	45764	-8.64
North Country	Norfolk town	St. Lawrence County	749	28	387	1.45	50090	45026	-10.11
North Country	Ogdensburg city	St. Lawrence County	2902	104	705	2.95	50090	44932	-10.30
North Country	Plattsburgh city	Clinton County	3132	68	960	1.42	50090	59075	17.94
North Country	Plattsburgh town	Clinton County	739	28	881	0.64	50090	65489	30.74
North Country	Potsdam town	St. Lawrence County	1885	50	918	1.09	50090	49750	-0.68
North Country	Schroon town	Essex County	626	10	88	2.27	50090	49688	-0.80

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North Country	Stockholm town	St. Lawrence County	602	11	313	0.70	50090	46250	-7.67
North Country	Theresa town	Jefferson County	624	18	236	1.53	50090	53818	7.44
North Country	Ticonderoga town	Essex County	1461	38	406	1.87	50090	49750	-0.68
North Country	Watertown city	Jefferson County	6525	546	2533	4.31	50090	43625	-12.91
North Country	West Turin town	Lewis County	535	29	125	4.64	50090	55461	10.72
North Country	Westport town	Essex County	542	9	69	2.61	50090	62813	25.40
North Country	Willsboro town	Essex County	632	3	87	0.69	50090	53393	6.59
North Country	Wilna town	Jefferson County	1364	45	670	1.34	50090	51237	2.29
Southern Tier	Addison town	Steuben County	529	21	225	1.87	49411	52259	5.76
Southern Tier	Bainbridge town	Chenango County	706	49	209	4.69	49411	54191	9.67
Southern Tier	Barton town	Tioga County	1639	73	644	2.27	49411	46700	-5.49
Southern Tier	Bath town	Steuben County	1874	98	782	2.51	49411	49261	-0.30
Southern Tier	Binghamton city	Broome County	13074	1103	3157	6.99	49411	39176	-20.71
Southern Tier	Candor town	Tioga County	648	13	424	0.61	49411	52522	6.30
Southern Tier	Canisteo town	Steuben County	825	48	245	3.92	49411	49771	0.73
Southern Tier	Cohocton town	Steuben County	697	42	193	4.35	49411	55000	11.31
Southern Tier	Colchester town	Delaware County	500	8	137	1.17	49411	44940	-9.05
Southern Tier	Colesville town	Broome County	613	30	433	1.39	49411	57659	16.69
Southern Tier	Corning city	Steuben County	2721	56	808	1.39	49411	46868	-5.15
Southern Tier	Delhi town	Delaware County	828	19	176	2.16	49411	54157	9.60
Southern Tier	Dickinson town	Broome County	625	71	255	5.57	49411	56953	15.26
Southern Tier	Dix town	Schuyler County	835	29	291	1.99	49411	51435	4.10
Southern Tier	Dryden town	Tompkins County	1216	36	1123	0.64	49411	71294	44.29
Southern Tier	Elmira city	Chemung County	7557	578	2456	4.71	49411	37417	-24.27
Southern Tier	Elmira town	Chemung County	1493	21	466	0.90	49411	63750	29.02
Southern Tier	Erwin town	Steuben County	715	24	606	0.79	49411	73083	47.91
Southern Tier	Franklin town	Delaware County	543	29	171	3.39	49411	59271	19.95
Southern Tier	Greene town	Chenango County	1038	14	381	0.73	49411	55536	12.40
Southern Tier	Groton town	Tompkins County	957	18	455	0.79	49411	66658	34.90
Southern Tier	Guilford town	Chenango County	528	8	211	0.76	49411	49855	0.90
Southern Tier	Hancock town	Delaware County	849	17	208	1.63	49411	53187	7.64
Southern Tier	Hector town	Schuyler County	847	10	300	0.67	49411	53397	8.07
Southern Tier	Hornell city	Steuben County	3255	273	763	7.16	49411	42364	-14.26
Southern Tier	Horseheads town	Chemung County	2001	43	1341	0.64	49411	59155	19.72
Southern Tier	Ithaca city	Tompkins County	6321	49	819	1.20	49411	63367	28.24
Southern Tier	Lansing town	Tompkins County	610	20	803	0.50	49411	75080	51.95
Southern Tier	Middletown town	Delaware County	979	26	190	2.74	49411	48877	-1.08
Southern Tier	New Berlin town	Chenango County	693	41	188	4.36	49411	56667	14.68
Southern Tier	Norwich city	Chenango County	2293	133	533	4.99	49411	51630	4.49
Southern Tier	Owego town	Tioga County	2206	106	1378	1.54	49411	68013	37.65
Southern Tier	Oxford town	Chenango County	871	42	238	3.53	49411	51823	4.88
Southern Tier	Roxbury town	Delaware County	690	16	160	2.00	49411	61935	25.35
Southern Tier	Sherburne town	Chenango County	811	38	306	2.48	49411	54872	11.05
Southern Tier	Sidney town	Delaware County	1166	61	434	2.81	49411	47008	-4.86
Southern Tier	Southport town	Chemung County	1400	57	629	1.81	49411	48378	-2.09
Southern Tier	Stamford town	Delaware County	593	23	125	3.68	49411	49375	-0.07
Southern Tier	Ulysses town	Tompkins County	694	40	332	2.41	49411	77859	57.57
Southern Tier	Union town	Broome County	8229	469	3724	2.52	49411	58233	17.85
Southern Tier	Urbana town	Steuben County	720	17	146	2.33	49411	57031	15.42
Southern Tier	Walton town	Delaware County	1372	52	303	3.43	49411	47612	-3.64
Southern Tier	Wayland town	Steuben County	992	31	269	2.30	49411	46970	-4.94
Southern Tier	Windsor town	Broome County	634	20	495	0.81	49411	46779	-5.33
Western NY	Alden town	Erie County	911	22	570	0.77	46427	64167	38.21
Western NY	Allegany town	Cattaraugus County	633	25	388	1.29	46427	63451	36.67
Western NY	Amherst town	Erie County	4381	221	7525	0.59	46427	86611	86.55
Western NY	Amity town	Allegany County	514	15	163	1.84	46427	43802	-5.65
Western NY	Aurora town	Erie County	2192	27	978	0.55	46427	87391	88.23
Western NY	Bolivar town	Allegany County	573	23	191	2.41	46427	46432	0.01

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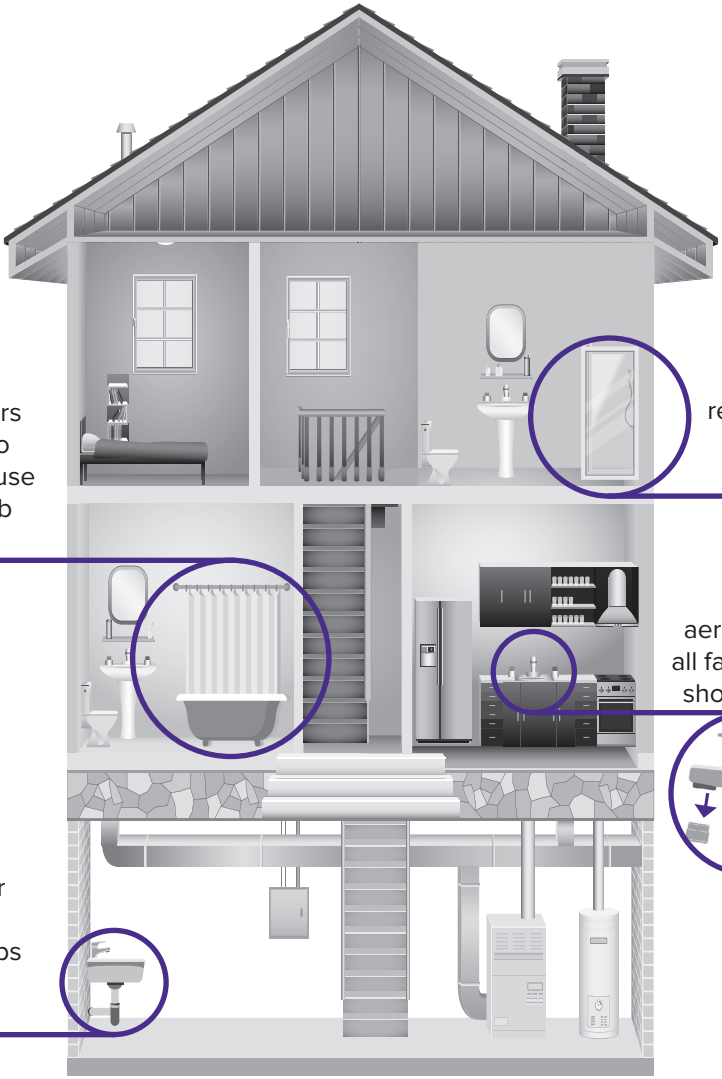
Western NY	Buffalo city	Erie County	100235	7600	19660	7.73	46427	37488	-19.25
Western NY	Busti town	Chautauqua County	939	26	476	1.09	46427	59306	27.74
Western NY	Carroll town	Chautauqua County	617	10	219	0.91	46427	52520	13.12
Western NY	Chautauqua town	Chautauqua County	2038	9	267	0.67	46427	57585	24.03
Western NY	Cheektowaga town	Erie County	5649	296	5530	1.07	46427	57146	23.09
Western NY	Collins town	Erie County	758	34	321	2.12	46427	59621	28.42
Western NY	Concord town	Erie County	1054	27	598	0.90	46427	60318	29.92
Western NY	Cuba town	Allegany County	673	30	246	2.44	46427	57072	22.93
Western NY	Dayton town	Cattaraugus County	504	12	135	1.78	46427	53393	15.00
Western NY	Dunkirk city	Chautauqua County	3961	213	597	7.14	46427	37431	-19.38
Western NY	Eden town	Erie County	835	13	494	0.53	46427	72712	56.62
Western NY	Ellery town	Chautauqua County	656	11	286	0.77	46427	68563	47.68
Western NY	Ellicott town	Chautauqua County	1775	97	540	3.59	46427	52185	12.40
Western NY	Franklinville town	Cattaraugus County	751	37	241	3.07	46427	48333	4.11
Western NY	Hamburg town	Erie County	4226	91	3968	0.46	46427	74324	60.09
Western NY	Hanover town	Chautauqua County	1459	30	484	1.24	46427	55880	20.36
Western NY	Hartland town	Niagara County	739	9	314	0.57	46427	51250	10.39
Western NY	Jamestown city	Chautauqua County	8851	987	2404	8.21	46427	42781	-7.85
Western NY	Lackawanna city	Erie County	3412	93	1375	1.35	46427	42396	-8.68
Western NY	Lancaster town	Erie County	3360	76	3183	0.48	46427	75013	61.57
Western NY	Lewiston town	Niagara County	603	22	872	0.50	46427	73767	58.89
Western NY	Lockport city	Niagara County	5809	217	1627	2.67	46427	49038	5.62
Western NY	Lockport town	Niagara County	662	50	1599	0.63	46427	70137	51.07
Western NY	New Albion town	Cattaraugus County	577	22	187	2.35	46427	45500	-2.00
Western NY	Newfane town	Niagara County	1344	21	646	0.65	46427	59937	29.10
Western NY	Newstead town	Erie County	1307	21	573	0.73	46427	66199	42.59
Western NY	Niagara Falls city	Niagara County	13198	931	3902	4.77	46427	42200	-9.10
Western NY	North Collins town	Erie County	593	19	213	1.78	46427	50917	9.67
Western NY	North Harmony town	Chautauqua County	506	9	172	1.05	46427	57188	23.18
Western NY	North Tonawanda city	Niagara County	4773	132	2046	1.29	46427	60536	30.39
Western NY	Olean city	Cattaraugus County	4757	196	1170	3.35	46427	48553	4.58
Western NY	Persia town	Cattaraugus County	606	12	187	1.28	46427	48750	5.00
Western NY	Pomfret town	Chautauqua County	2925	23	670	0.69	46427	64829	39.64
Western NY	Porter town	Niagara County	752	22	395	1.11	46427	68846	48.29
Western NY	Portland town	Chautauqua County	1123	8	310	0.52	46427	56282	21.23
Western NY	Portville town	Cattaraugus County	539	12	248	0.97	46427	53719	15.71
Western NY	Randolph town	Cattaraugus County	609	26	205	2.54	46427	51750	11.47
Western NY	Ripley town	Chautauqua County	635	17	205	1.66	46427	46981	1.19
Western NY	Royalton town	Niagara County	1298	14	596	0.47	46427	62308	34.21
Western NY	Salamanca city	Cattaraugus County	1729	90	545	3.30	46427	40197	-13.42
Western NY	Tonawanda city	Erie County	3028	43	992	0.87	46427	57275	23.37
Western NY	Tonawanda town	Erie County	6692	280	4434	1.26	46427	62308	34.21
Western NY	Wellsville town	Allegany County	1521	74	510	2.90	46427	46037	-0.84
Western NY	West Seneca town	Erie County	2628	97	2704	0.72	46427	68455	47.45
Western NY	Westfield town	Chautauqua County	1586	29	342	1.70	46427	45465	-2.07
Western NY	Wilson town	Niagara County	868	22	410	1.07	46427	58600	26.22

Appendix B

Post Lead Service Line Replacement Flushing Guidance

Lead Service Line Replacement Program

How to flush your indoor plumbing



For showers attached to bathtubs, use the bathtub faucet

For standing showers, remove the shower-heads

Remove aerators from all faucets and showerheads

Remember to include laundry tubs and utility sinks

- To begin, turn on the cold water faucets on the lowest floor of your home and move up floors until all the cold water faucets are on.
- After 30 minutes, turn off all cold water faucets on the lowest floor of your home and move up floors until all the faucets are off.

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Lead Service Line Replacement Program

How to flush your indoor plumbing

If your lead service line has been replaced, small amounts of lead from your old service line may have entered the pipes in your house. As a result, you should not use any water (hot or cold) before flushing your indoor plumbing. To flush your indoor plumbing thoroughly, make sure to just use COLD water (no hot) and follow these steps:

STEP 1. Locate all water faucets in the house where you can run the water without the sink or tub overflowing.

- Be sure to include any laundry tubs and utility sinks.
- For showers attached to bathtubs, use the bathtub faucet.
- For showers not attached to bathtubs, remove the showerheads, if possible.
- Make sure all drains are open and clear so water can flow freely down the drains.

STEP 2. Remove aerators (screens) from faucets and showerheads.

STEP 3. Turn on faucets in the basement or lowest floor of your home.

- Open COLD water faucets all the way and let the water come out as fast as it can.
- Note that the water may splash and spray because you have removed the aerators.
- Keep the water running from all faucets at the highest rate possible.

STEP 4. Repeat STEP 3 on each floor of your home, moving from the bottom up.

- Repeat this step until you fully open all COLD water faucets on all floors of the home.

STEP 5. After all the faucets are open, let the water run for 30 minutes.

STEP 6. After 30 minutes, turn the water off.

- Start with the basement or the lowest floor.
- Move up to each floor, closing the faucets in the order that you opened them.

STEP 7. Clean the aerators and put them back on each faucet.

- If aerators are old or worn, consider replacing them with new ones.

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