

Lead Weight:

How We Can Drop This Drinking Water Threat for Good

September 29, 2020



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Metropolitan  Planning Council

[METROPLANNING.ORG/LEADINOURWATER](https://metroplanning.org/leadinourwater)



Metropolitan**Planning**Council
Welcome and overview

Josh Ellis
MPC Vice President

Learn more at currentwater.org

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Housekeeping notes

- Q&A
 - We'll have some special guests join us for the Q&A.
 - We'll still have time for general audience questions. Please use the Q&A function, not chat, to submit questions.
- This webinar is being recorded. We'll send out the recording in about a week, along with a Chicago Water Week survey.

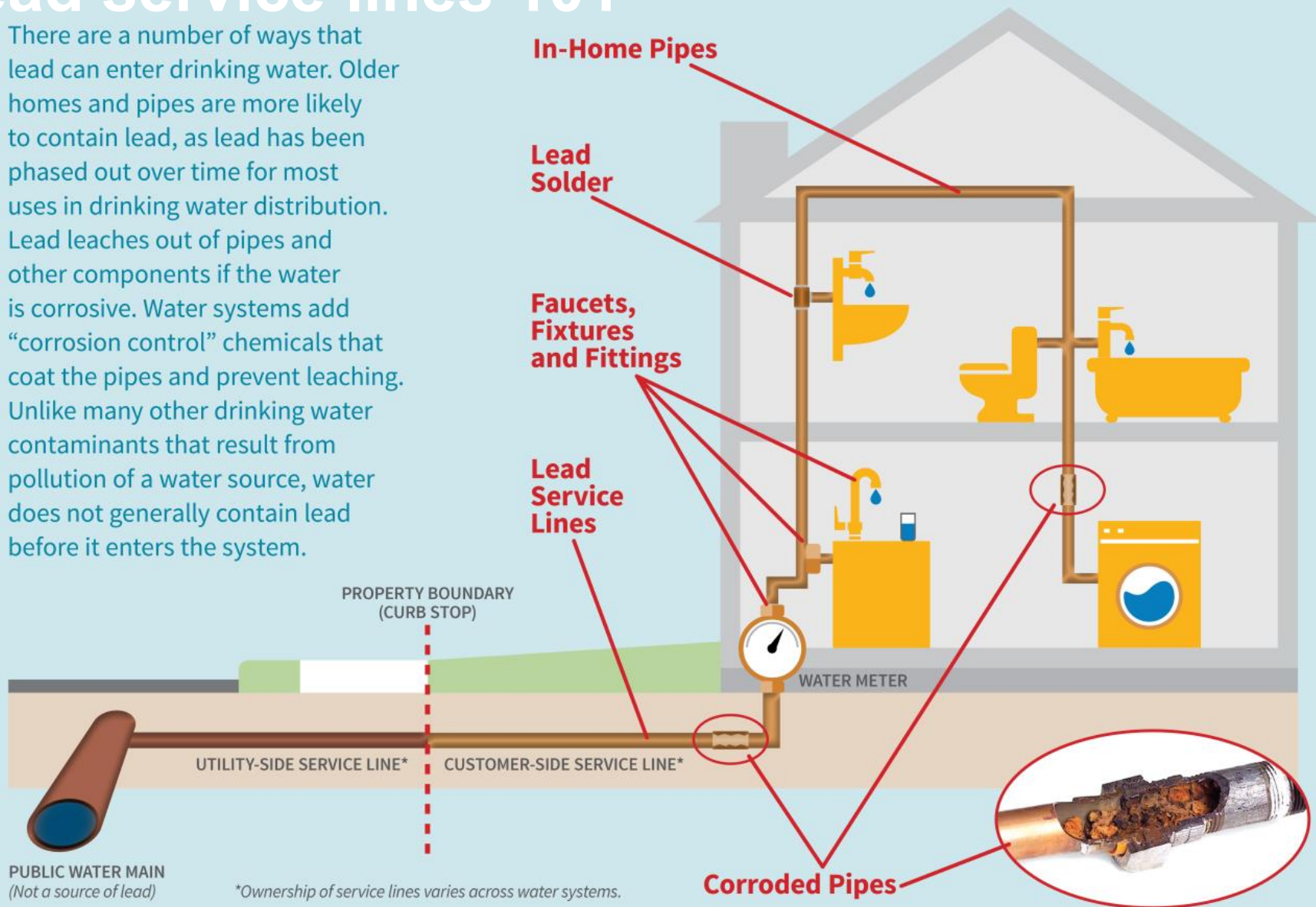
Introductions

- Lindsay McCormick, Program Manager, Chemicals and Health Program, Environmental Defense Fund
- Andrea Holthouse Cheng, Deputy Commissioner, City of Chicago Department of Water Management
- Illinois Rep. Lamont J. Robinson (D-Chicago)
- Illinois Sen. Heather Steans (D-Chicago)

How Lead Gets Into Drinking Water

Lead service lines 101

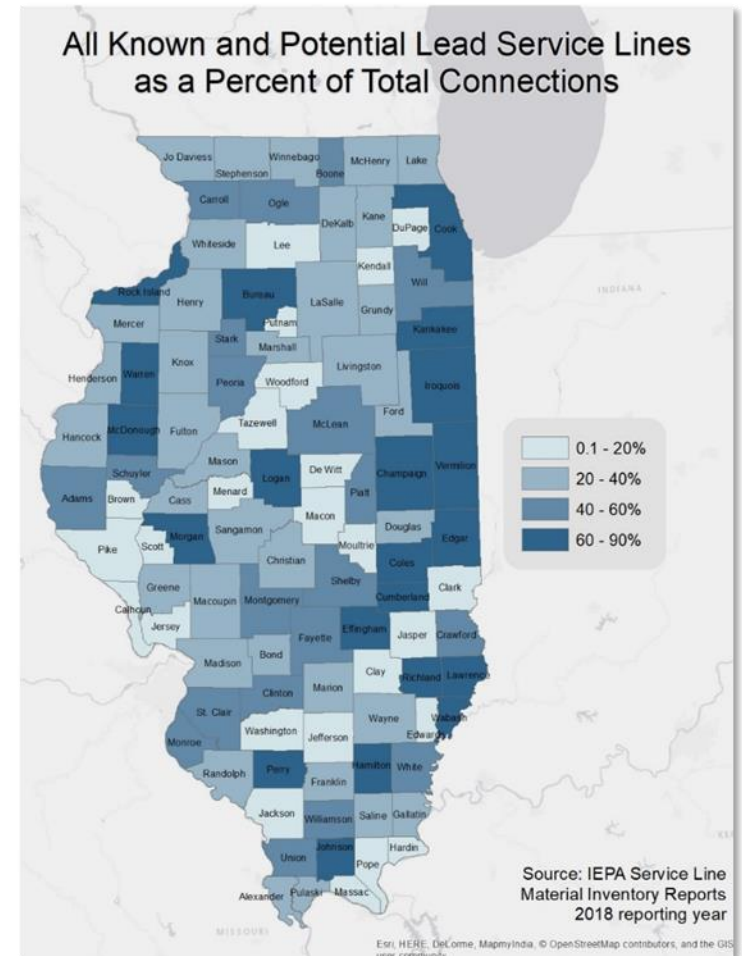
There are a number of ways that lead can enter drinking water. Older homes and pipes are more likely to contain lead, as lead has been phased out over time for most uses in drinking water distribution. Lead leaches out of pipes and other components if the water is corrosive. Water systems add “corrosion control” chemicals that coat the pipes and prevent leaching. Unlike many other drinking water contaminants that result from pollution of a water source, water does not generally contain lead before it enters the system.



*Ownership of service lines varies across water systems.

A huge problem in Illinois

- Over 686,000 known lead service lines
- Over 1 million potential lead service lines



LSL advocacy in Illinois

- 2016-17: Law passed requiring:
 - All utilities to submit an inventory of service line materials to Illinois Environmental Protection Agency
 - Testing of lead in drinking water at schools and daycares
- Municipalities replacing LSLs across the state (Evanston, Rockford, Galesburg)
- Bills introduced requiring
 - Stricter lead in drinking water guidelines in parks
 - Ban on leaded garden hoses
- 2018-20: Advocacy for statewide lead service line replacement bills

National Perspective: Lead Pipes & Equitable Replacement

Chicago Water Week
September 29, 2020

Lindsay McCormick, MPH
Program Manager, Chemicals & Health
Environmental Defense Fund
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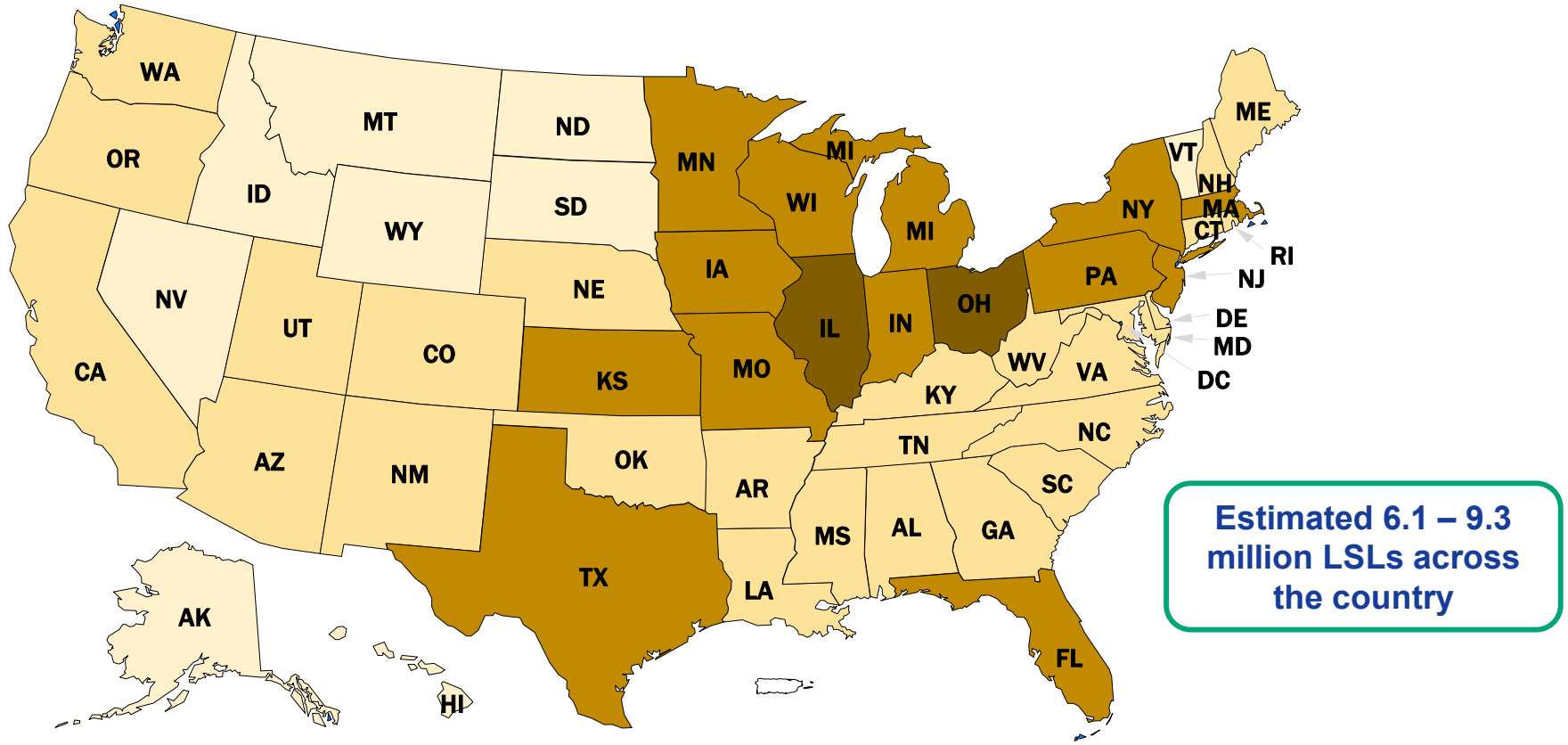


Lead: A toxic legacy

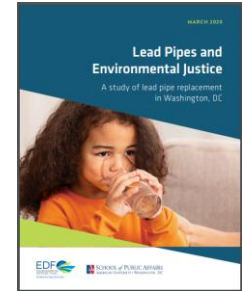
- No safe level of exposure to lead
 - Harms children's **brain development**, contributing to learning and behavioral problems and lower IQs
 - Can result in **cardiovascular disease** in adults
- Low income individuals and people of color are **disproportionally impacted** nationwide
- **Sources** of lead
 - Lead-based paint
 - Soil and dust
 - Drinking water
 - Food and consumer products



Lead service lines across the country



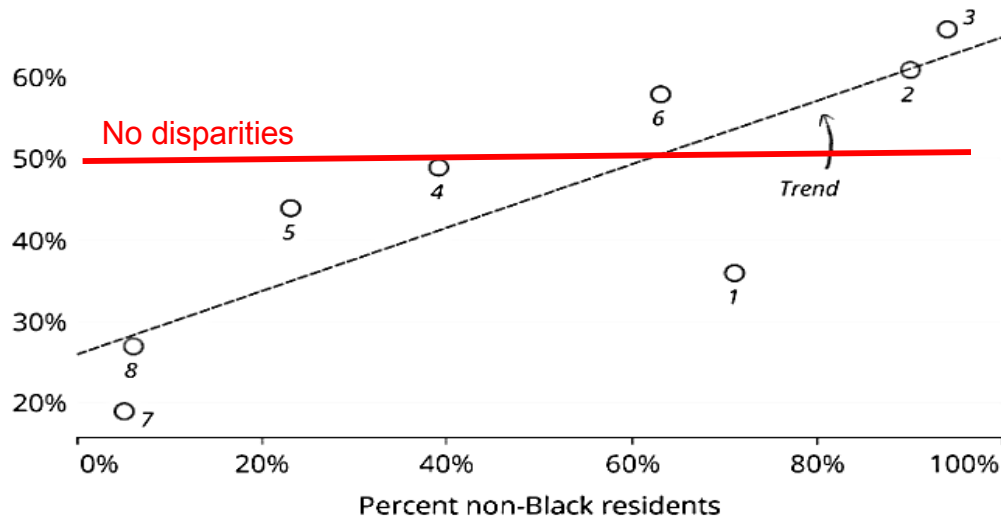
American University & EDF Report: Lead Pipes and Environmental Justice



Study methods & findings

- Analysis of 3,400 lead pipe replacements in Washington, DC
- During infrastructure projects, rates of full replacement lowest in predominantly black, low-income areas of city; >2X higher in wealthiest area of city
- Full replacement initiated by resident much more common in wealthiest areas of city

Percent of lead service lines fully replaced by ward, Washington, D.C. (2009–2018)



Grist graphic based on AU/EDF report

2019 DC ordinance largely addresses equity issues

- ✓ Prohibits partial replacements during infrastructure work, free replacement on private side
- ✓ Redresses past partials (50-100% cost covered)

Report: edf.org/ZWJV

Equitable LSL replacement

Best practices

- Provide private side funding
- Strictly limit partial replacement
- Sequencing replacement thoughtfully

*“LSL replacement initiatives should **address barriers** to participation so that consumers served by LSLs can **benefit equitably**, regardless of income, race or ethnicity.”* – LSL Replacement Collaborative

Select model cities & utilities

Cincinnati, OH	<ul style="list-style-type: none">✓ Ordinance to replace all LSLs in 15 years✓ Cost sharing grant covers up to \$1,500 of private side✓ Landlord must disclose LSL to tenant
Denver, CO	<ul style="list-style-type: none">✓ Committed to replacing all LSLs in 15 years entirely at city's expense✓ Sequencing replacement includes factors such as income status and presence of children
American Water	<ul style="list-style-type: none">✓ Committed to replacing all LSLs at utility's expense

What are other Midwest states doing?

State	Estimate of LSLs	Set goal	Enable funding	Develop state inventory/survey	Mandate replacement practices	Require disclosure to homebuyers
Illinois	686,000 to >1 million	--	--	Mandatory	Yes	Good
Indiana	206,000 to 599,000	--	Rates and loans	Voluntary (Full survey)	--	Limited
Iowa	160,000	--	--	--	--	Limited
Michigan	460,000	Yes	Rates	Mandatory (Full survey)	Yes	Good
Minnesota	260,000	--	Grants	--	--	Voluntary
Missouri	330,000	--	Rates	--	--	None
Ohio	650,000	--	--	Mandatory (Limited inventory)	--	Limited
Wisconsin	240,000	--	Rates and grants	Mandatory (Full inventory)	--	Good

See EDF's full tracker: <https://www.edf.org/health/state-efforts-support-lsl-replacement>

National efforts

Federal funding

- Amendment to House Moving Forward Act: \$22.5 billion for lead pipe replacement – prioritizing disadvantaged and environmental justice communities
- House appropriations for FY 2021: \$1 billion for lead pipe replacement

Environmental justice community:

“A community with significant representation of communities of color, low-income communities, or Tribal and indigenous communities, that experiences, or is at risk of experiencing higher or more adverse human health or environmental effects.”

Lead and Copper Rule

- EPA proposed revisions in October 2019; final anticipated any day
- Equity considerations of proposal:
 - Does not mandate full replacement; continues to place financial burden on homeowner
 - Partial lead pipe replacements from utility-initiated infrastructure improvements allowed to continue



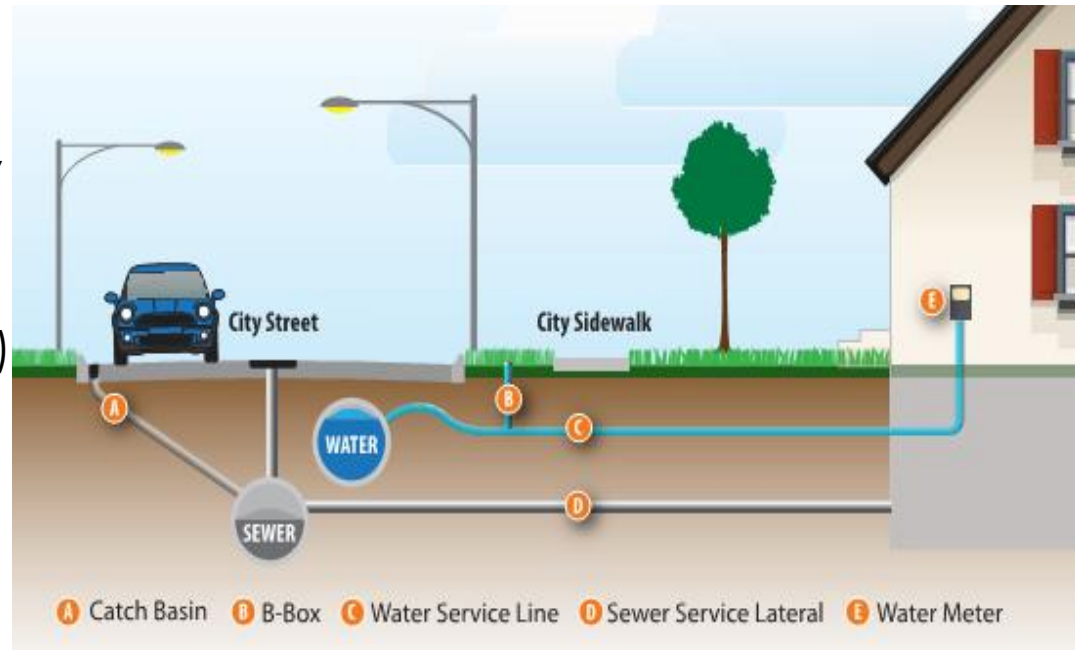
Data-Driven Decisions: Chicago's Lead Testing Programs & LSLR Program

Andrea Holthouse Cheng Ph.D., P.E., Deputy Commissioner,
Dept. of Water Management



★ Lead Service Lines in Chicago

- City has approximately 389,900 lead service lines
 - Public Side: City Responsibility (Water Main to B-Box)
 - Private Side: Homeowner Responsibility (B-Box to House)
- City water currently below EPA lead action limit
 - 90% of samples must be below 15 ppb; Chicago 90th-percentile is 9.1 ppb



- Mainly single family & 2-flats have lead service lines
 - Installed pre-1986 & $\leq 2''$ diameter → probably lead (or maybe galv. iron)
 - Installed post-1986 & $\leq 2''$ diameter → copper
 - $> 3''$ diameter → cast iron or ductile iron



Lead Testing Programs

- Lead and Copper Rule (LCR)
 - Reduced Monitoring - 50 Homes Every 3 years
 - 10 Full Profiles – Quarterly
- 311 Program
 - Voluntary Consumer Program
- Chicago Department of Public Health (CDPH)
 - Part of Lead Exposure Investigation
- Lead Research Studies
 - Before and After Water Main/Meter
 - Ultrasonic Meter Study
 - Optimized Corrosion Control Pipe Loop

★ Lead Testing Programs: 311 Program

Free 311 lead testing kits & visits

- Chicago has offered free lead in-home testing at least 1986
- Began offering lead kits as opposed to in-home testing in 2016 due to spike in requests
- 3 bottles for samples at 0, 2, and 5 minutes of flushing
- Created apps in GIS to efficiently handle scheduling & tracking



- 2015
 - 50 requests
- April 2016 - Sept. 2020
 - 88,823 lead test requests
 - 76,302 kits mailed
 - 26,900 kits returned
 - 35.25% return rate
 - 22,294 kits analyzed
 - 1,754 kits had any of the 3 bottles > 15ppb (7.87%)



Lead Testing Programs: Chicago Dept. Public Health

2011-2012 CDPH Study

- Lead-based paint/resulting dust, abundant in pre-1978 housing, is the primary source of lead poisoning in children
- Chicago children are required to have their blood lead levels tested at 1, 2, and 3 years old
- Lead poisoning is on the decline in Chicago
 - 1997: 24,879 (24.3%) in children aged 0-6 years
 - 2015: 617 (0.7%)
- Typical lead exposure investigation already checked for:
 - Lead paint and dust (esp. near window sills)
 - Other dangers such as lead-containing home remedies & toys
 - Potential exposure at other locations where the child spends time
- DWM worked with Public Health to add water testing to the investigation
- **No correlation found between lead levels in water and blood lead levels in Chicago**

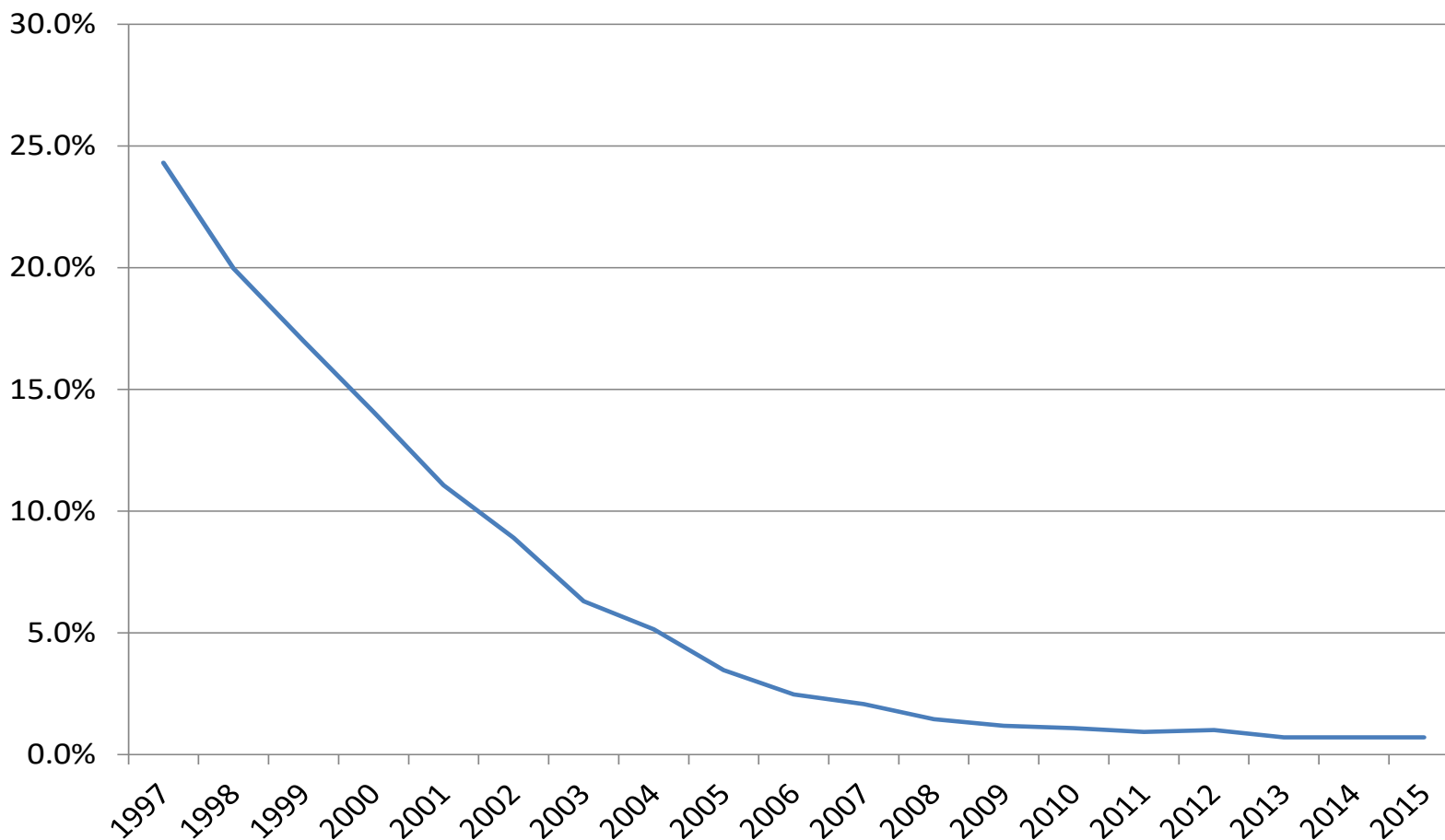
2016 – Current CDPH Study

- Of the 217, 14 had any sample >15 ppb
- Highs related to vacancy, low water usage, & homes undergoing rehab



Blood lead levels (BLLs) in children continue to decrease

Percentage of Chicago Children (aged 0-6) with Venous Blood Lead Tests ≥ 10 mcg/dL, 1997-2015



Lead Testing Programs: Lead Research Studies & Pipe Loops

Water Quality Study – field research

- To determine if there is any correlation between water main/meter installation & elevated lead levels
- Largest study of its kind to date - want a *statistically significant* data set (goal is 1,000's of homes)
- Before & after water main replacement
 - Water Main replacements are prioritized by age of main, break history, material type, coordination efforts
- Before & after water meter installation
- Before & after ultrasonic water meter installation



In-Plant Research Studies

- Bench-scale, pipe loop, and full-scale research designed to test the impact of switching from blended phosphate to orthophosphate for corrosion control
- Research also looked at changing location of phosphate addition within treatment process



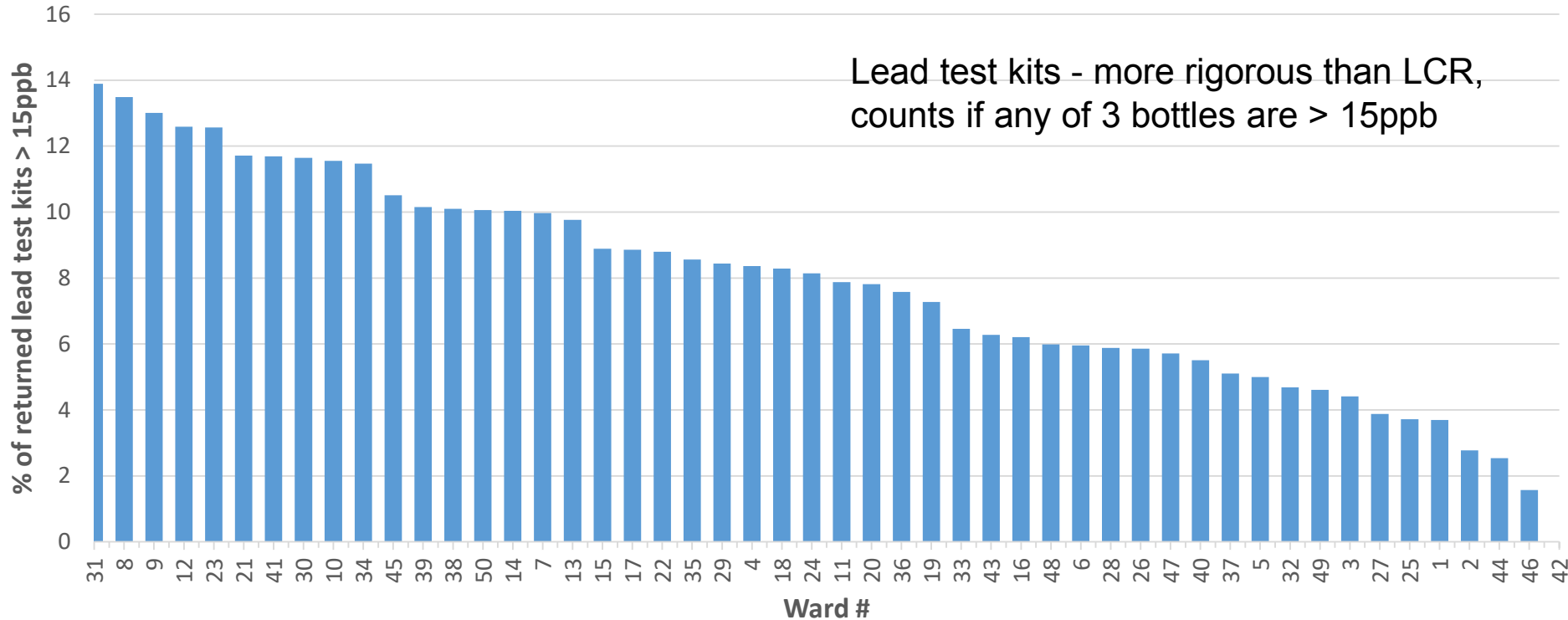
Water Filter Program

- Water pitcher filters NSF-53 certified (no substitutions) to reduce lead and 6 filter cartridges are distributed
 - to any resident in a home that has elevated levels of lead
 - as part of water meter installation
 - as part of water main or sewer main replacement projects
 - given expected LCR revisions, in the future as part of repairs, etc.
- Filters can be requested by calling 312-742-2406 or at www.chicagowaterquality.org/filters
- Residents notified of eligibility via
 - mailed letters from DWM,
 - postcards,
 - emails (when available), or
 - Alderman notification.
- Over 60,000 filter sets distributed since Dec 2018



Case Study: Lead by Ward

- % lead test kits > 15ppb is consistent between residential neighborhoods, regardless of socioeconomic status
- All residential neighborhoods have lead in Chicago
- Non-residential areas or high-density residential areas such as downtown business district have service lines too large in diameter to be made of lead



★ LSLR Summary

- To prepare Chicago for pending regulations and maintain its leadership in the water industry, we are
 - Developing a plan for replacing all ~389,900 lead service lines
 - Exploring grants to fund the program and reduce the financial burden on City residents

Phase I: (Low cost & high impact)

- Equity LSLR – Funded by CDBG grants/Unique to City
- Homeowner-Initiated LSLR
- Block-level LSLR alongside water main replacement – Funded with IEPA SRF Loan with Principal Forgiveness

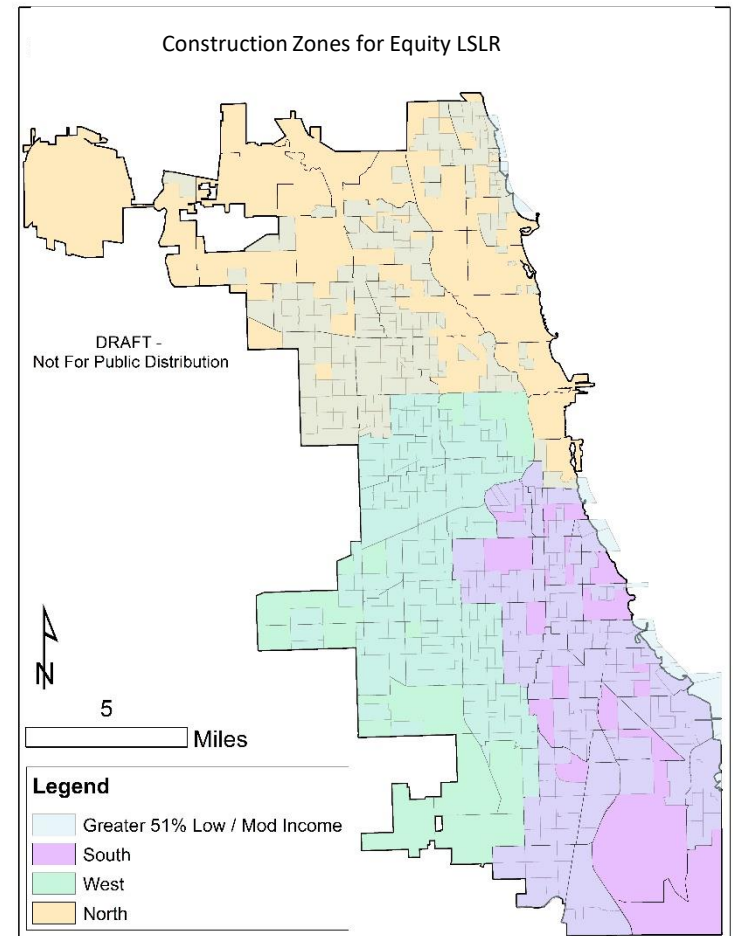
Phase II: (Proactively integrates future regulations into existing practices)

- LSLR alongside water and sewer main replacements
- LSLR for public side water service line breaks
- Public LSLR when notified of private side replacement

Chicago drinking water is currently in compliance with State and Federal Lead Regulations.

Phase I – Equity LSLR

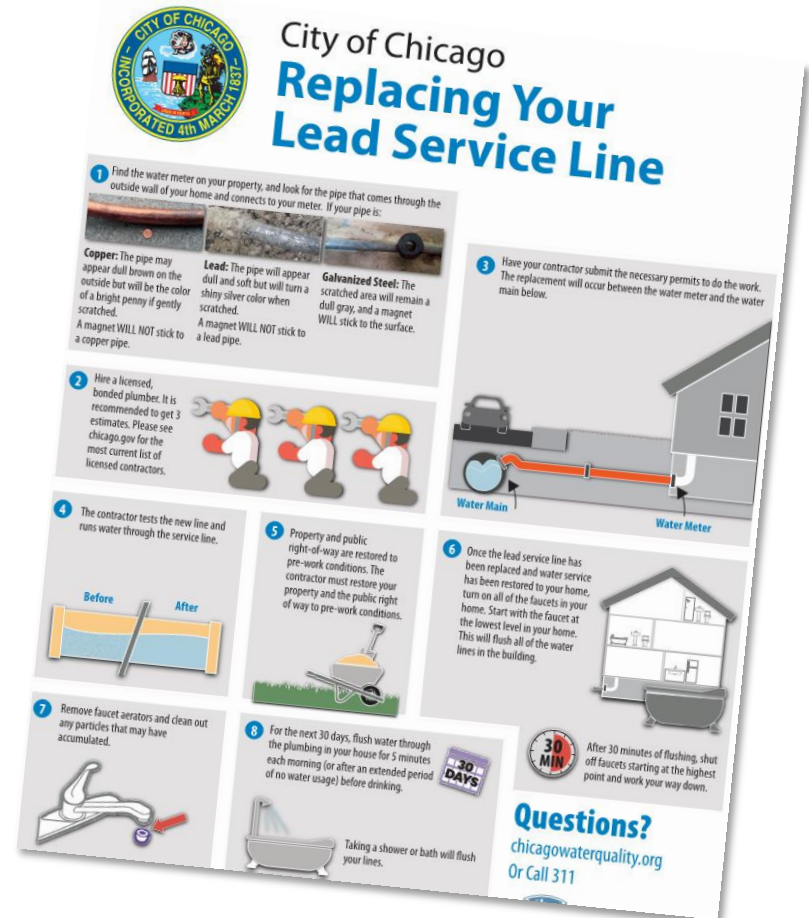
- Unique to Chicago
- Summary: Free full LSLR for low-income homeowners with tested lead >15 ppb
 - Focused on low-income neighborhoods
- City Cost: \$20,000-\$26,000 per full LSLR
- Funding: Grants (CDBG, SRF, WIIN)
 - Up to \$15M CDBG planned for 2021
- Estimated Annual Replacements: 400-800
- Timeline:
 - Late 2020: Bid contract, pass ordinance and begin accepting applications
 - 2021: Begin construction; continually review applications and apply for grants



Replacements capped by region and prioritized by neighborhood income

Phase I – Homeowner-Initiated LSLR

- Summary: Homeowners replacing their full LSL receive:
 - Streamlined permitting process
 - Subsidized permit fees
 - Suggestions on contractor selection
- City Cost: \$400 in material costs (~\$3,100 in foregone fees) per full LSLR
- Funding: Operating budget
- Estimated Annual Replacements: < 100 (40 in 2019)
- Timeline:
 - Late 2020: Passage of fee waiver ordinance
 - January 2021: Fee-waiver applications open for submission



City will eventually be required to pay for public side under proposed LCR revisions

Phase I –LSLR Alongside Water Main Replacement (Block-Level)

- Summary: Replace water main & associated full LSL along one block in low/moderate income area
 - Review construction techniques / coordination
 - Gauge public participation
 - Update cost estimates and identify efficiencies
- City Cost: \$15,000-\$25,000 per full LSLR
 - Water main costs additional
- Funding: Up to \$4M SRF principal forgiveness (application submitted to IEPA & pending review)
- Estimated Replacements: 50
- Timeline: 2020/ 2021: Bid Contract, public outreach, and project construction (pending IEPA approval)





Phase II - LSLR With Water & Sewer Main Replacements

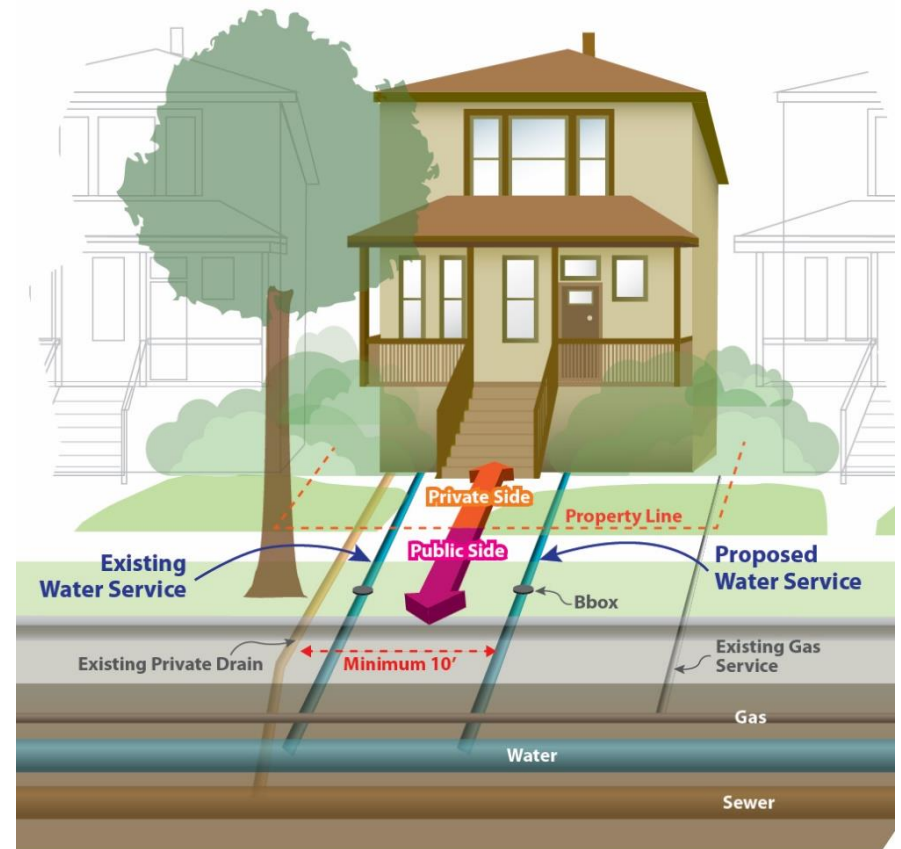
- Summary: City replaces public side of lead service line & encourages homeowner to replace private side during water main and sewer main projects
- City Cost: \$10,000-\$18,000 per public-side LSL
 - Additional cost to City if elects to subsidize private side
- Funding: Grants & Loans
- Estimated Annual Replacements: 160/mile of water main (average)
- Timeline: After passage of revised Lead and Copper Rule

City of Chicago:
2019 CIP Locations with More LSL



Phase II – LSLR for Water Service Line Breaks

- Summary: Replace the LSL for:
 - Public side leak/break - by City
 - Private side leak - by homeowner (full LSLR should be encouraged by City)
- City Cost: \$12,000-\$20,000 per public-side LSLR
 - Current cost for a repair \$4,000-\$7,000
 - Additional cost to City if choose to subsidize private side
- Funding:
 - Currently, repairs are paid for by Operating Budget
- Estimated Annual Replacements: 4,000-5,000
- Timeline: After passage of revised Lead and Copper Rule



Cannot cap number or geographic distribution of replacements.



Summary of Costs

Program	Target # of Annual LSLR	Who Pays for Service Line	Cost to the City per LSL ⁽³⁾	Subsidies by City	Total Approximate Annual Cost
Equity LSLR	600	City	\$25,000 (Limited Restoration)	Public and Private Side	Up to \$15M for 2021 (Funded by CDBG)
Homeowner-Initiated LSLR	<100	Homeowner (Until Regulations Change)	\$400 ⁽¹⁾	\$3,100 ⁽¹⁾	\$40,000 Annual (Funded by City)
Block-Level LSLR Alongside Water Main Replacements	50	City	\$25,000 (Limited Restoration)	Public and Private Side	\$4 M available (Funded by IEPA SRF Principal Forgiveness)
LSLR Alongside Water Main Replacements (estimated 10 - 20 miles of water mains annually)	160 LSLs/mile or 2,400 LSLs/15 miles	City Pays for Public Side; Homeowner Pays for Private Side ⁽²⁾	\$13,000 (public side only) plus ~\$5,000 for re-pavement	Public Side LSL; No Permit Fees ⁽²⁾	\$45M (\$3 M per mile – LSLR only with full re-pavement)
Service Line Breaks	4,500	City Pays for Public Side; Homeowner Pays for Private Side ⁽²⁾	\$15,000 (current repairs avg. ~\$5,500)	Public Side LSL; No Permit Fees ⁽²⁾	\$67.5M (Current repairs avg. ~\$25 M)

(1) \$3,100 is approximate permit fees subsidized by City. Cost of \$400 includes materials for new meter and B-box; City labor and equipment costs not included.

(2) Private side LSLR subsidies can be offered by City in the form of a loan or a service line fee financed over a set period of time.

(3) Engineering, construction management and program management costs not included.



LSLR Cost Estimate Breakdown

Item	Long-Side LSLR	Short-Side LSLR
Copper Water Service	\$7,000	\$5,000
Ductile Iron Drain Service (when water/sewer separation unavailable)	\$3,000	\$2,500
Pavement Demolition and Restoration	\$9,000	\$4,500
Water Main / House Connections and Appurtenances	\$4,500	\$4,500
Site Restoration, Including Sidewalk	\$2,000	\$2,000
Traffic Control	\$500	\$500
Total Estimate per LSL	\$26,000	\$19,000
Cost Range (-30%/+50%)	\$18,000 - \$39,000	\$13,000 - \$29,000

Notes:

- Costs are construction costs only, including markups and 15% contingency. Design, construction management, inspection, and customer outreach not included.
- Full restoration (trees, porches, fences, landscaping) not included.
- Costs will vary based on actual service line length and home's internal plumbing layout.
- Pavement costs assumes patching and milling the trench. If full road reconstruction is required, costs could be up to \$1.5 M per mile in road repair.



Working Group Framework

Mission Statement: To provide stakeholder and community feedback on the LSLR options developed by the City in order to inform program design and promote participation.

- 3-4 meetings in Fall 2020-Winter 2021
- Topics may include:
 - Program element overview and regulatory framework
 - Best practices on LSLR programs across the country
 - Equity program refinement
 - Funding and financing options
 - Public engagement
- Invite representatives from:
 - Regulatory agencies
 - Nonprofit and community organizations
 - Local agencies and City representatives
 - Policy experts

Rep. Lamont J. Robinson
(D-Chicago)

LEAD SERVICE LINES: A STATEWIDE PROBLEM

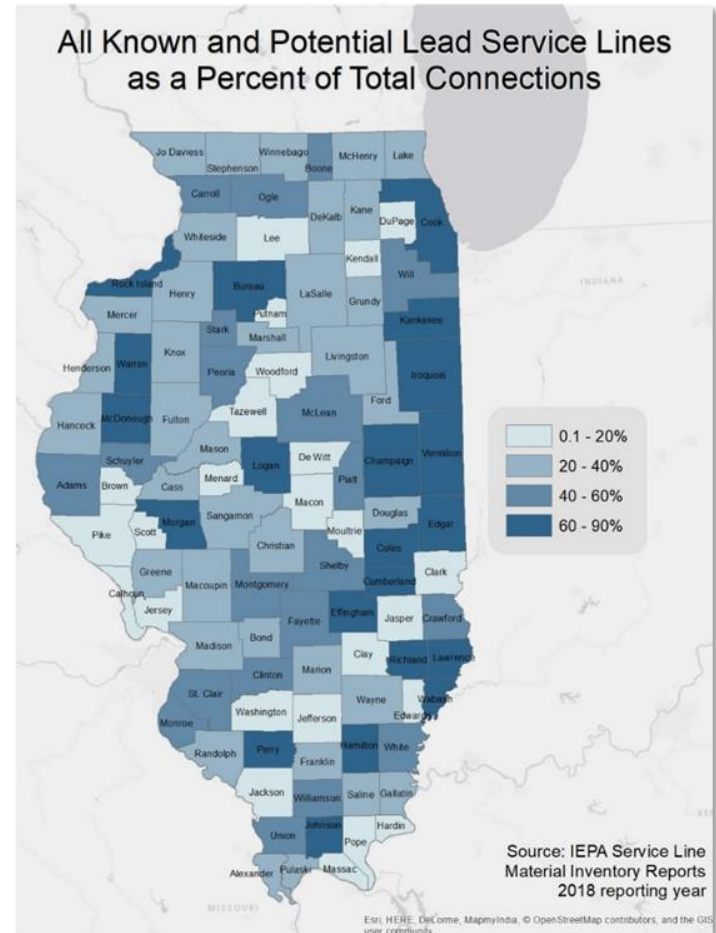
A public health threat

- Illinois is at the wrong end of the spectrum.
 - IL has a greater percentage of children with lead levels of 5 or higher than any state but Rhode Island (based on data states report to the CDC).
- We are all affected. For example:
 - in 2017, 1,470 Illinoisans died prematurely from heart disease attributed to lead exposure, costing nearly \$28 million in hospitalization costs alone.
- Effects are worse in Black and Brown communities—which I know from personal experience.

Areas of concern: Chicago

Chicago's lead stats

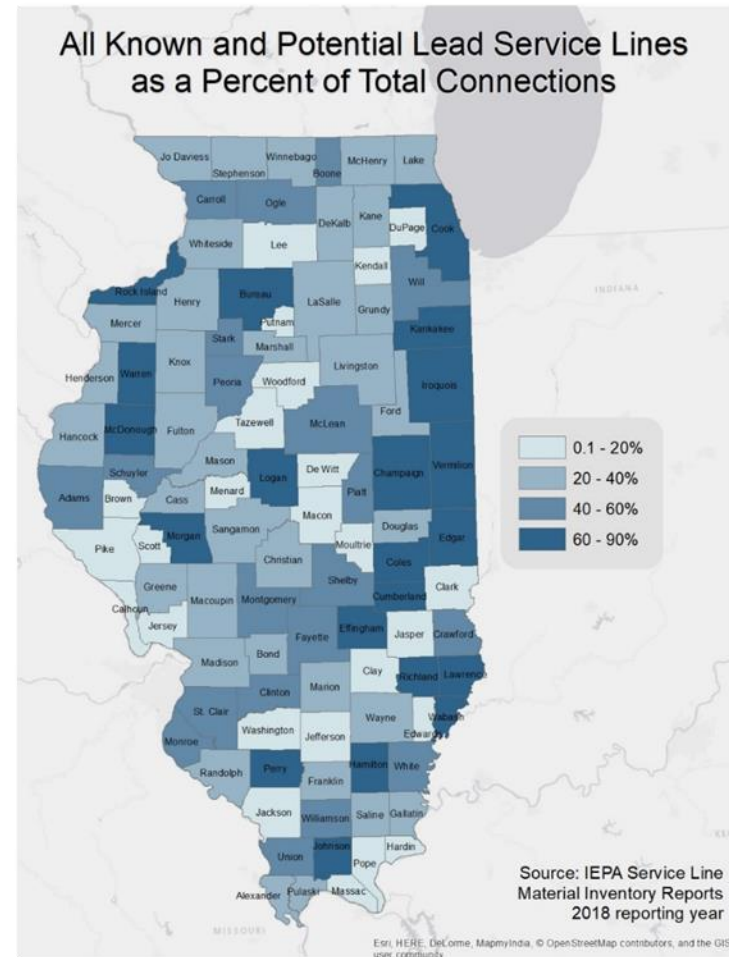
- 389,893 lead pipes
- 119,468 pipes of unknown material, potentially lead
- 90,571 children tested in 2016
- 3.3% of children two years old or younger tested for blood lead levels ≥ 5 ug/DL; 0.7% had BLLs ≥ 10 ug/DL



Areas of concern: Metro East

Centreville's lead stats

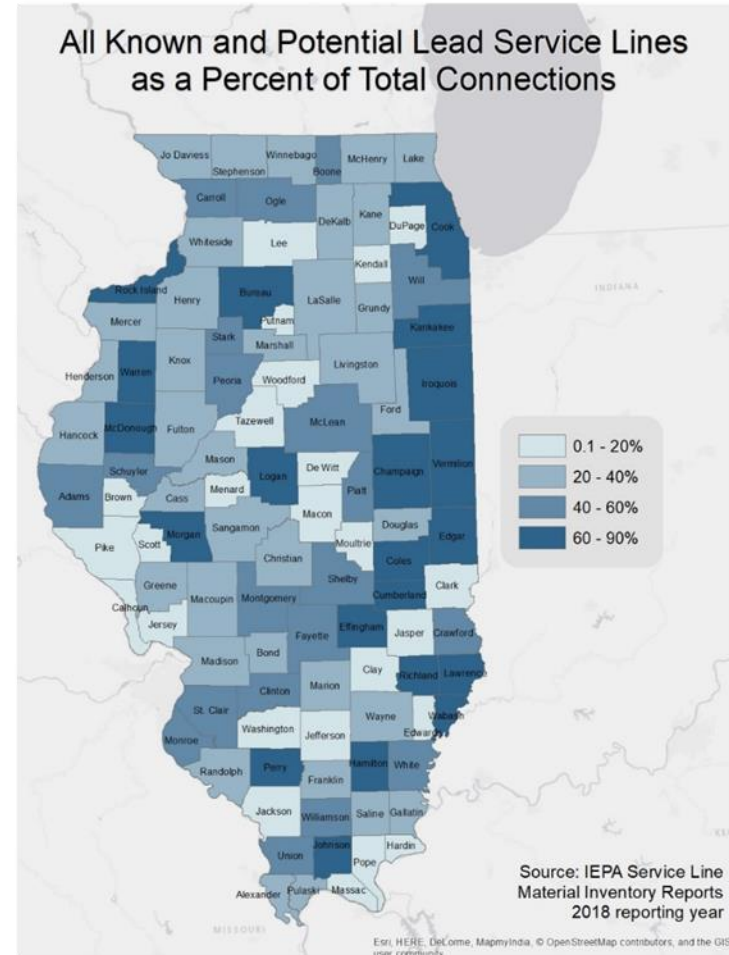
- 833 lead pipes
- 4000 unknown/ potentially lead
- 4.9% of children six years old or younger tested for blood lead levels between 5-9 ug/DL; 1.1% had BLLs ≥ 10 ug/DL
- 5.4% of children two years old or younger tested for blood lead levels ≥ 5 ug/DL; 1.1% had BLLs ≥ 10 ug/DL



Areas of concern: Galesburg

Galesburg's lead stats

- 1504 lead pipes
- 306 unknown/ potentially lead
- 543 children tested in 2016
- 7.4 % of children six years old or younger tested for blood lead levels between 5-9 ug/DL; 3.1% had BLLs \geq 10 ug/DL
- 9.4% of children two years old or younger tested for blood lead levels \geq 5 ug/DL; 3.7% had BLLs \geq 10 ug/DL



The time is now to eliminate LSLs

- **We can protect people's health and prevent another community-wide public health crisis.**
 - Replacing LSLs nationwide would protect >350,000 children born in 2018 and provide \$2.7 billion in future benefits. (Pew)
 - Prevent more Flints, and all related costs.
- **We can reinvigorate the economy.**
 - ~144,000 jobs (MPC)
- **We can address inequity.**
 - COVID-19 has highlighted many inequities, including access to clean, safe, affordable water.
 - LSL replacement is a step toward equitable access to clean water.
 - \$2.2B in higher lifetime earnings, better health, and other gains (Pew)



Lead Service Line Replacement: Solving A Statewide Problem

Heather Steans

Sept. 29, 2020



LSL Replacement and Notification Act overview

- Establish a plan, funding, and timeline for Illinois water utilities to replace all lead service lines.
- Set forth an equitable, feasible process based on national best practices.
 - Require all Illinois water utilities to inventory their service lines to identify unknown lead service lines.
 - Give those with more lead service lines more time to replace them.
 - Require utilities to prioritize service line replacement at facilities used by high-risk populations, such as preschools and daycares.



Equity provisions in the Act

- **Replace all, not some.** Bill would provide funding to cover the full cost of replacing every lead service line in Illinois.
- **Fair funding source.** All Illinois water users would pay a small fee on their water bills, but ...
- **Low-income protections.** By establishing the first Low-Income Water Assistance Plan in Illinois, income-eligible water users would receive water rate discounts.
- **Replacement plan.** Communities disproportionately affected by lead service lines should receive funds first.
 - Focus on vulnerable populations.
 - Include rental, not just single-family homes, as well as commercial.
- **Job benefits.** Workforce equity provisions must ensure black and brown workers receive jobs generated by lead service line replacement.



Sets utilities up for success

- **Dedicated funding**
- **State agency capacity.**
- **Technical assistance.** We want utilities to be able to succeed in all stages of this process. So our bill is dedicating resources to ensure that utilities can inventory, plan, and replace their LSLs.

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WEBINAR

**SAFE SCHOOL WATER
IN MICHIGAN: COVID-19
AND BEYOND**

SEPT 30, 10 A.M. - 11 A.M. ET

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