Lead Pipe Timeline

- **1800’s**: Cities moving away from LSL Use
- **1930**: Installation on a major scale
- **1970**: Changes to plumbing Codes
- **1977**: LIA Campaigns End
- **1988**: Effective LSL ban
Inventories are the **right place to start** but many utilities lack reliable or complete data.

**The Potential Cost of Digging**

- 6-10 **Million** LSLs Nationwide
- $200-$400/line for hydrovacing
- $1,000-2,500/line for excavation
- $2,000-$5,000 to replace
- $1.2 - $20 **Billion** to identify
- $9 - $50 **Billion** to replace
Lead Service Line Probability Finder

**Goal:** To reduce the number of unknown service lines in an **efficient** and **strategic** way.

01. Upload Service Line Parameter Data
   Confirmed LSLs and Non-LSLs

02. Match with Tax Parcel Data
   Publicly-sourced

03. Run Algorithms
   Decision Trees & Spatial Analysis

04. Generate Probabilities
   For all locations
Preliminary Inventory

- Gather existing data
- Conduct Inventory

Year 1-5

Maintain Inventory & Replace Lines

- Prioritize Areas
- Replace/Update Lines

Year 5-20
Gather Existing Data

- **Examine Existing Data**
  - Material types
  - Install year
  - Pipe size
  - Contractor records

- **Layer in City Records**
  - Tax parcel data
  - Plumbing codes

Lead Service Line Collaborative, 2019
Verify & Complete the Inventory

- Infrastructure projects
- Lead check swabs
- Profile samples
- Scratch test instructions
- Customer engagement
- Marketing strategies

Lytle et al., 2019
Prioritize Areas

- **By Predictions**
  - Tiered approach
  - Blocks or neighborhoods

- **Environmental Justice & Public Health**
  - Children under 6
  - Pregnant individuals
  - High water sample results
  - BLL Data
  - Socioeconomic
Replace/Update Lines

- **Coordinating Replacement with Normal Operations**
  - Relining mains, service connection updates, meter relocation, road resurfacing, water loss reduction programs

- **Strategic LSLR Programs**
  - Neighborhood Pilots
  - Phased

- **Outreach with Predictions**
  - Communicating value
Communicating Value

Newark employs local residents in effort to replace lead water pipes

PUBLIC BENEFITS
$10-27 Million

LSLR Program
$1-$2.7 Million

Average LSLR Replacement (339 LSLs) for small systems in Indiana (IDEM Survey, 2016) at replacement costs of $3K-$8K/LSL (EPA, 2016)

A state report out of Minnesota estimate $10 in benefits (IQ only) for every $1 spent on LSLR (MDOH, 2019). This does not include improved home value, improved cardiovascular health in adults, improved health equity, and other studied benefits.
Issues

1. Unclear LSL definitions
2. Bad data in, bad data out
3. Inconsistent data

Lessons Learned

- Be specific and codify those definitions
- Identify data sources and uncertainties
- Make data mgmt planning part of your team’s LSLI strategy & communicate that strategy
Questions