INTEGRATED WATER RESOURCE MANAGEMENT CASE STUDY:

LANSING LEAD PIPE REPLACEMENT PROGRAM

PROJECT SUMMARY

Lansing, Michigan used innovative technology and an integrated water management approach to accelerate and complete its program to replace all lead service lines.

WHAT HAPPENED?

Problem Statement and Project Goal

State Senator Virgil Bernero, motivated by the Washington D.C. lead crisis, advocated for the City to accelerate its existing lead service line replacement program. In 2004, the BWL agreed to an accelerated program. By 2016, all 12,150 lead service lines had been replaced. Up to this day, water quality test results have not detected lead in Lansing's drinking water.

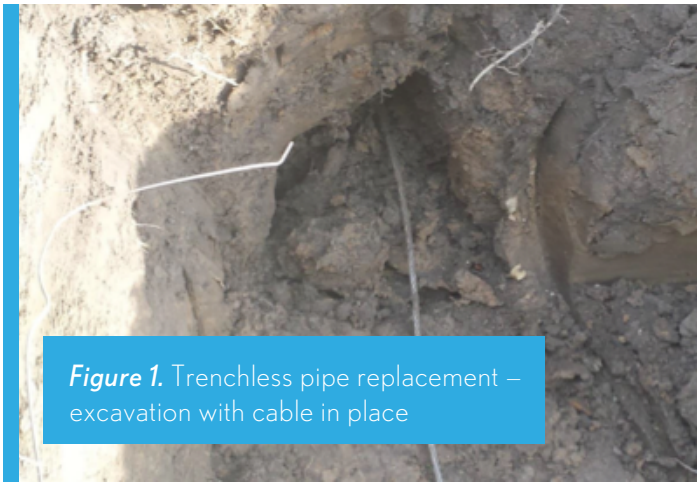


Figure 1. Trenchless pipe replacement – excavation with cable in place

Figure 2. Trenchless pipe replacement – pulling cable and lead service line

Photo: Scott Smithson, Flickr/Creative Commons

Drivers that spurred on the Project/Program: ***What lifted the project off the ground?***

- ☐ Community Demand
- ☐ Policy
- ☑ Politics
- ☐ Practitioners
- ☐ Financing
- ☐ Unclear
- ☐ Other

Legislator and mayoral support accelerated the program.

Challenges/Barriers to adopt: ***What were the challenges to moving the project forward?***

- ☐ Community Demand
- ☐ Policy
- ☐ Politics
- ☐ Practitioners
- ☑ Financing
- ☐ Unclear
- ☐ Other

Cost savings were achieved through innovative construction technology and smart cross-departmental utility coordination.

Proponents: ***Was the project supported by government or community members?***

- ☑ Public
- ☐ Private

Cooperation between politicians and the public utility moved the project forward.

HOW DID IT HAPPEN?

Ingredients for Success

The Lansing Board of Water and Light (BWL) began a lead service line replacement program in 2000. The BWL did not have detectable lead in its drinking water. However, two state legislators, Michael Murphy and Virgil Bernero, advocated for BWL to accelerate the lead service line replacement program, for the benefit of public health and to avoid potential emergency actions. Bernero initially failed to convince the BWL to accelerate its program. To persuade the BWL, Bernero formed a task force that included professors from Michigan State University and other experts.

In 2004, the BWL agreed to initiate an accelerated program. Program funding was provided through a water rate increase. To minimize the cost and ground disruption, City engineers designed and employed innovative trenchless pipe replacement technology, which uses a cable to thread the lead pipe out and the new copper pipe in. The BWL also employed an integrated water management approach: by coordinating construction with the Combined Sewer Overflow Separation project, the City avoided wasting funds by excavating and repaving the street twice (i.e., separately for each project).

Because the City owns the entirety of the residential water service line entering the home, no additional funding or construction coordination was required from private property owners. However, BWL engaged residents throughout the process, by distributing brochures, conducting open houses, and adding recommended customer precautions to the Water Quality Report.

System Specifications, Scale, and Cost

Lansing's Board of Water and Light is municipally owned and governed by a Board of Commissioners. The Board of Commissioners sets policy and approves budgets and utility rates. The 800-mile drinking water distribution system contains two water conditioning plants, which provide lime-soda softening for groundwater drawn from 125 wells. The BWL serves 59,000 consumer accounts, with an average daily demand of 22 Million gallons of water. The lead service line replacement program cost an estimated $44.5 Million to replace 12,150 lead pipes throughout the city.

Figure 3. Trenchless pipe replacement – inside house, pulling new service line out of building

Beneficiary

The program benefited all Lansing residents who avoided any risk of lead exposure due to lead-containing water service lines.

Decision-Making Timeframe

2000: Lansing Board of Water and Light begins lead service line replacement program

2001: State Senator Bernero begins investigation of lead service lines

2001 - 2004: Bernero launches lead pipe task force

2004: BWL agrees to accelerate lead service line replacement program

2004: BWL initiates lead service line replacement program *(funding source: water rate increase)*

2016: Lead service line replacement program removes all lead service lines in the city

Ongoing: BWL continues water quality testing under EPA's Lead and Copper Rule

Funding, Financing, and Management

Project funding was provided through a water rate increase.

DID IT WORK?

Maintenance, Monitoring, and Outcomes

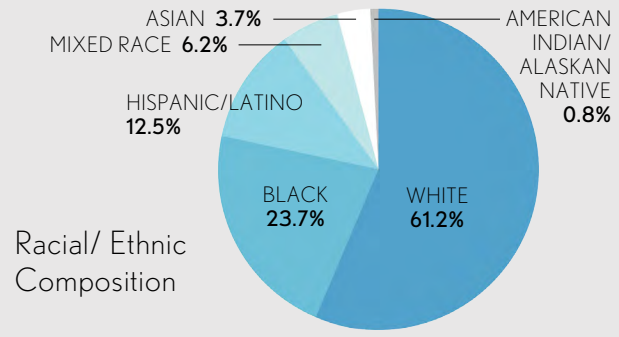
As all lead pipes have been removed, no maintenance is necessary beyond what would have been required previously (e.g., monitoring for leaks). The BWL uses corrosive control additive to coat the pipes and further prevent leaching. The levels of corrosive control chemicals leaving water conditioning plants are tested every four and half hours to confirm that proper levels of the additive are present in the water. The BWL conducts periodic lead and copper testing every three years to ensure water safety. The most recent test results, in 2014, continued to indicate no detectable lead in the drinking water.

Lessons Learned

When considering water infrastructure program, municipalities should use an integrated approach that considers interactions between systems. For example, a city should evaluate the long-term impact of combined sewer overflows on its drinking water source. Short-term opportunities should also be evaluated. For example, Lansing used a proven approach of reducing utility project costs by coordinating construction across the sewer and drinking water agencies. By doing so, the City avoided wasteful practices such as excavating and repaving the same street twice, for two separate water infrastructure programs.

In addition, cost savings can be achieved by using innovative technology, such as trenchless pipe replacement. BWL is available to respond to inquiries from cities interested in employing this technology.

COMMUNITY FACTS
LANSING, MICHIGAN



Racial/ Ethnic Composition

Population 2016	114,773
Population change since 2010	+0.7%
Median Age	32 years
High School graduate or higher	87.6%
Total housing units	55,194
Median Household Income	$35,563
Individuals below poverty level	29.6%

Features: **Lansing is the state capital of Michigan, and home to Michigan State University.**

RELEVANT PROJECT CONTACT DETAILS:

Mayor Bernero and Steve Serkaian, BWL's executive director of public affairs, were the sources interviewed for mainstream media coverage. Bernero indicates in interviews that he is willing to offer advice to other cities looking to replace lead pipes. Angie Goodman is BWL's Water Quality Administrator was interviewed for this case study – 517-702-7059.

SOURCES:

1. Goodman, Angie. 'Lansing Board of Water and Light's Lead Service Line Replacement Program.' Lansing Board of Water and Light. https://www.lbwl.com/Community-Impact/Water-Quality/Lead-Service-Line-Replacement-Presentation/
2. Clark, Anna. (2016). 'The City That Unpoisoned its Pipes.' NextCity. https://nextcity.org/features/view/flint-lansing-michigan-replaced-lead-water-pipes
3. Carmody, Steve. (2016). 'Lansing's Last Lead Service Line Being Replaced This Week.' Michigan Radio. http://michiganradio.org/post/lansings-last-lead-service-line-being-replaced-week
4. Kinney, Jen. (2016). 'Landing Removes Last Lead Pipe.' NextCity. https://nextcity.org/daily/entry/lansing-removes-last-lead-pipe
5. Delano, Stephen PE. (2017). 'Lining Technologies as Alternatives to Replacement of Lead Service Lines.' O'Brien & Gere Engineers, Inc. http://www.obg.com/uploads/insights/AWWA-Delano.pdf

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