

SLFRF (ARPA) Projects

Water Distribution Main Replacement

Infrastructure Stats

- ~325 miles of Water Distribution Pipes
- 2020 = 17 main breaks, 8 = spun cast pipe.
- 165 miles surveyed for Leak detection annually
- Replacement of public-side lead service lines
- 50 – 100 years asset life
- Lead public service lines (main to curb) are replaced regardless of condition.
- LCA prepares preliminary conceptual designs five years into the future.

Expense

- Watermain Replacement Cost per mile = ~\$2.1M
- Annual savings per mile for the rate payer= \$143,616
- Project life savings on 30-year loan = \$4.3M
 - 3 miles = \$12.9M (Saving over 30 years)
- Paving -sharing program will still work, the City will pay itself.
 - Benefits- infrastructure improvements on city owned streets including construction of ADA handicap ramps.

Regulatory

- **Water Main Replacement** - The CLA OS required two miles of pipeline to be replaced annually. In 2021, per the settlement agreement, the program continues with a reduced minimum requirement of one mile through 2024. The asset integrity is maintained by proactively monitoring the impact by increasing the leak detection program requirement by 50%. (see above “Leak Detection”). Replacing cast iron mains will reduce the frequency of breaks in the system which create customer outages and unaccounted for water and will reduce the potential for damage which can occur to private property from catastrophic pipe breaks. In conjunction with the pipeline replacement program, all lead and gray iron service piping from the main to the curb shall be replaced regardless of condition.

49% of the water distribution pipes in the City were installed between 1870 and 1944. Between 1944 and 1963, the City utilized spun cast iron pipe, which accounts for another 19% of the system pipes. Unfortunately, this type of pipe has been shown to be the most prone to breakage. Replacement of the spun cast iron pipe has been a City priority for several years. As noted above, of the 17 main breaks in 2020, eight involved spun cast pipe.

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- **Leak Detection** - LCA must perform leak detection on at least 165 miles of distribution pipes annually; therefore the entire distribution system is checked for leaks every two years. Finding and repairing leaks is cost effective, reduces unaccounted for water losses, and can prevent possible property damage. LCA is required to further investigate any identified leaks to determine the nature and severity of the leak. (CLA OS A6.10.2)

On a quarterly basis, LCA submits reports to the City, which include activities associated with leak detection and repair activities, including, but not limited to miles of mains surveyed, location of identified leaks, pipe diameters, characteristics of the leaks, dates of identification of the leaks, estimated volume of leakage, and dates of leak repair.

- **Pipe Prioritization Assessment Program (Program)** is the method by which each year's program is developed. The program produces a quantified ranking of all pipes in the City system and identifies the water mains to be replaced by using various sources of data including but not limited to pipe age, pipe material, break history, geology and ground subsidence history. In addition, as part of the selection process LCA coordinates with the City Streets Department, other utilities and PennDOT (when necessary). When a street is to be resurfaced, the pipe underground will be replaced to minimize the potential for a water line break in a newly resurfaced street. (CLA OS A6.19.2)

- **Number of Main Breaks:** the more breaks on a given pipe, the more critical for replacement.
- **Pipe material/age:** consistent with the LCA lease agreement, spun cast iron pipe and pit cast iron pipe greater than 100 years in age was given highest priority as the City's experience has determined these main are most likely to fail.
- **Pipe Diameter:** larger pipes are generally more critical to the delivery of water in the system and thus given a higher criticality score.
- **Static Pressure:** the loss of water and expense to repair for breaks on high pressure pipes is generally greater than lower pressure pipes and thus given a higher criticality score.
- **Customer Types:** Pipes serving customers such as hospitals, schools, etc. that would result in the biggest impacts if water service is lost were given a higher priority.
- **Sinkholes:** Pipes which located in areas with a history of sinkholes were given a higher priority.

FYI: Pipe Condition Assessment – An additional assessment due to a multiple main breaks on the 17th and Chew (Huckleberry) line, LCA has committed to a condition study to evaluate why this occurred. The results should be available summer 2021.