

Subject: DES- Water main relining versus replacement analysis

**FY 2018 Proposed Budget
Budget Work Session Follow-up**

4/13/2017

The following information is provided in response to a request made by Mr. Jay Fisette at the work session on 3/28/2017: Would like information on the cost of relining versus replacing water lines. Would like a reminder of the staff response to a constituent letter received on the topic previously.

In January 2017, Mr. Kovenock wrote a letter to the County Board concerning the relative cost of water main cleaning and relining versus water main replacement. In response to his letter, staff provided the following information:

The primary benefit of cleaning and lining water mains is to resolve rusty water and discoloration issues. The lining also increases the life of the main by reducing or eliminating corrosion that occurs in unlined pipes. We also replace the valves at most intersections of a cleaning and lining project area, which gives us better control of the system. Mains with a history of breaks are replaced, and not relined, and we have an extensive replacement program as well. However, with a finite budget, multiple approaches are used to maintain a high-quality water system.

The cost to replace a water main is nearly double the cleaning and lining cost. Restoring the area to its existing condition. i.e., backfilling to grade, stone, curb and gutter, asphalt, pavement markings, etc. Cleaning and lining is much less disruptive, with minimal cuts in the street. Accounting for restoration costs, replacement is about triple the cost of cleaning and lining. We analyze the system, accounting for breaks and water quality complaints, to determine which mains need work and which approach makes the most sense. We also keep apprised of new materials and technologies and what other jurisdictions and water utilities are doing.

Below is some additional information about the two programs, which further explain the differences between the programs, why they are not interchangeable, and why one solution would be chosen over the other depending on the issue to be remedied.

Arlington County employs water main cleaning and relining mainly to remedy aesthetic issues such as taste, odor, and color, but also to increase the flow to fire hydrants. Discoloration in drinking water is typically caused by iron oxide (rust). Over half of the mains in Arlington are either unlined cast or unlined ductile iron pipe that rust over time. Normally, this rust is “stable,” meaning that it does not dissolve into suspension and discolor water flowing through the pipe. However, when the water system is

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disturbed, rust particles can flake off of the pipe walls and discolor the water. Rust may also build up in low-flow areas, such as water mains at the end of a pipe system, piping in cul de sacs, or pipes near the pressure zone boundaries in the system.

The relining of water mains involves the cleaning of the pipes through scouring the inside of the pipes to eliminate hard deposits, called tubercles, caused by corrosion. The cleaned pipe is then lined with cement mortar for a new smooth surface which is less susceptible to corrosion. Relining can extend the life of water mains by eliminating the internal corrosion process; however, its benefits are not structural and it is not a substitute for replacing aged water mains.

Water main replacements are typically employed for older pipes with a history of breaks. Water mains typically have an estimated life of 100 years but a number of factors influence the piping's total useful life. When appropriate, relining of pipes is preferred because it is much less disruptive to the community than replacement, which typically involves digging up sections of the roadways during the replacement process.