

September 20, 2017

Mr. Jack Carlisle

Mr. Jimmy Pernell

Re: Follow up to community council meeting

During the September 2017 Lake Junaluska Community Council meeting a question arose about the relative economic impact of meter replacement compared to replacement and refurbishment of water and sewer lines. The assertion was that water line replacement would have a higher economic impact but no supporting facts were provided.

My curiosity was peaked, so I developed a comparison and calculated the economic impact in terms of payback time—how many years of the hard dollar cost savings it would take to pay back the project costs. Net present value method could be used; however, the payback time is a simple method that provides a reasonable comparison, especially since no debt financing would be used for either project. The hard dollar, or direct cost, savings is only one aspect of the investment decisions regarding water and sewer system refurbishment and renewal.

Two cases were compared: the project for water and sewer refurbishment as presented in the 2012 Cavanaugh report and the water meter renewal project as described in my report to the community council. The cost savings are based on the Water Loss Audit report's findings that 18% of the purchased water is lost due to leakage—a valuation of \$61,570. A reasonable assumption is that the real water loss would be reduced by 50% or about 9% level. The value economic optimum water loss for very small systems is an elusive number, but 10% is a reasonable value.

The meter replacement program underway impacts revenue due to increased water and sewer usage fees. I believe it is appropriate to consider both systems together; however, combined water and sewer and as well as water only were calculated. The same information provided in the report to the community council was used in the attached analysis.

The limitation of this analysis is that the service life of water mains and water meters is different, 25 years and 70 years respectively. These service lives are based on AWWA information and analysis. The ratio of the payback time to the economic life is a reasonable estimate of the relative value. The smaller the number, the more advantageous to the community and system.

Table 1 summarizes the calculations. The savings listed in the table are the annual amounts.

Replacing mains will reduce the cost of water losses as will replacing worn meters. Replacing a defective fire hydrant is essential for public safety but has no economic impact on the APW water and sewer system. Replacing a sewer line that is leaking or allowing storm water infiltration has public health impact but no economic impact on the APW water and sewer system. In addition, the customer service expectations of the community include always having water and sewer available along with satisfactory water quality (safety, taste, and color).

Conclusions:

1. The payback time of the water meter replacement (18 years) is much shorter than either the water and sewer program (58 years) or only the water program (38 years).
2. The payback time to asset life ratio suggests these two cases have a very similar impact on the hard dollar financial aspects of the system.
3. The assertion that the water main replacement should be prioritized ahead of water meter replacement based on economic impact is not supported by this analysis.
4. Decisions on replacement details must consider noneconomic factors such as public safety, public health, and customer service. These factors are essential to consider in any water and sewer system refurbishment work plan.

Respectfully submitted,

Chuck Lipp,

Volunteer

AWWA member

Resident Lake Junaluska

Table 1. Comparative payback time of projects

Project: As described in Cavanaugh				
	Thousands of dollars	Payback time, years	Ratio payback time to asset life	
Annual savings, 50% of RWL	\$31			
Water refurbishment	\$1,185	38.5	0.51	
Sewer refurbishment	\$589			
Water and sewer refurbishment	\$1,774	57.6	0.77	
Project: Meter replacement				
Annual savings, 75% of AWL	\$12,750			
Ultrasonic Radio Read meters	\$224,000	17.6	0.70	