Municipal Water Utility Regulation

Challenges of Pipeline Replacement

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Buried No Longer: Confronting America’s Water Infrastructure Challenge

- American Water Works Ass’n, 2012 Report
- Report analyzes drinking water infrastructure needs
  - Original timing of water system development
  - Types of pipe materials and where installed
  - Life expectancy of pipe materials in actual operating environments
  - Replacement costs for each type and size of pipe
  - Probability distribution for the “wear-out” of each type of pipe
### Figure 6: Aggregate Needs for Investment in Water Mains Through 2035 and 2050, by Region

#### 2011-2035 Totals

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<th>Region</th>
<th>Replacement</th>
<th>Growth</th>
<th>Total</th>
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#### 2011-2050 Totals

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Buried No Longer: Key Findings

• Needs are large
  • Delaying investment can mean increased rate of pipe breakage and deteriorating water service

• Household water bills will go up

• Important regional differences
  • Midwest needs to focus more on replacement than growth
  • Population shifts means fewer local customers to pay the cost

• Important differences based on size
Costs Keep Coming

• National level investment roughly double from $13 billion (2010) to almost $30 billion by 2040 for replacement alone

• Level of investment must be sustained for many years (several decades)

• Sustained replacement of pipe networks unlike other capital outlays (treatment plant or storage tank)

• Many utilities may choose to finance infrastructure replacement on a “pay-as-you go” basis rather than through debt financing
**Milwaukee Water Rate Case**

*Docket 3720-WR-108; PSC Ref#: 223601; decided 10/30/2014*

- Focus on Milwaukee’s pipeline replacement program
- MWW has 1,961 miles of main
- Approved depreciation rate is 77-years
- Would have to replace between 20-25 miles of main every year to ensure useful life not exceeded
- Condition of mains will require even more accelerated replacement
Milwaukee Pipeline Material

• Main installed between 1943-1963 (post WWII) has shorter life than pre-WWII pipe
  • MWW has 431 miles of this vintage pipe
  • Remaining life for this pipe is 34 years
  • Remaining life for pre-WWII pipe is 54 years; 843 miles

• MWW would need to replace 28 miles of main per year to upgrade each vintage of main by end of remaining life
**Commission Order to Milwaukee**

- Milwaukee proposes to replace 20 miles a year by 2020
- Commission accepts proposal – but comments that it is minimum amount of work that will be needed
- Requires MWW to retain a consultant to evaluate main break records and provide an estimate of upcoming capital needs for main replacement efforts
- Must report back to the Commission every 6 months
Milwaukee Prefers Cash Financing

- MWW typically cash financed pipeline replacements
- Under standard PSC rate-setting, there would be insufficient cash to fund level of replacement the Commission believes is necessary (28 mi/yr for 34 yrs)
- Commission says:
  - Fundamental problem that MWW has not made steady annual investments in main replacements
  - Cash financing becomes particularly difficult when a utility has not replaced a consistent number of miles of main each year
MWW Offers Debt Funding Proposal

• MWW proposed revised funding plan that proposes to issue $92 million in debt by 2020 for funding

• Commission accepts funding plan
  • Even if MWW issued $100 million in debt, MWW’s total debt would only be 27.65% of total capital structure
“While the Commission’s ratemaking provides municipal water utilities a great deal of latitude in selecting their financing methods, the Commission must balance equity to current rate payers and intergenerational equity when financing infrastructure. Because MWW’s funding needs are likely to be greater than its proposed $92 million in debt and it appears to have ample future bonding capacity, it is reasonable for the Commission to advise MWW that it may need to issue more debt than the amount proposed in its revised financing plan in order to meet its upcoming infrastructure replacement needs.”
Marshfield Water Rate Case
Docket 3420-WR-106; PSC Ref#: 303885; decided 5/26/17

• Marshfield developed a water main replacement program
  • 33 miles of spun-cast main (1945-1967 vintage)
  • 90% of main breaks attributed to this main
  • Estimated replacement cost $35 million

• Discussed funding of water main replacement program with PSC staff

• Prepared a study showing impact of financing replacements vs. cash funding replacements
Borrowing: 20-year at 4.00%

The below chart illustrates annual debt service based on a static $1,050,000 every other year, at 4.00% over 20 years. The key takeaway is that after 20 years of increasing debt service requirements, a steady state is reached at $773,000.
Cash Funding

Cash funding $500,000 per year has a steady annual cost of $500,000. A benefit of cash funding is avoided interest payments and debt issuance costs. Another benefit is the significant staff time, both at the Utility and City, needed to prepare documents related to the bonding is avoided. The downside is that the full $500,000 must be absorbed by the ratepayers in year one.

Annual Cash Funding $500,000
Marshfield Proposal

• Marshfield proposes to cash fund main replacement
  • Requests a higher rate of return (7.5% instead of 5.0%) to fund $580,000/yr
  • Would use traditional methods to fund the remainder
Staff’s Intergenerational Equity Concerns

• Cash funding infrastructure replacement can create intergenerational equity concerns
  • Cost recovery from current ratepayers in order to pay for long lived assets that benefit future generations
  • But concern mitigated if utility makes a consistent base level of main replacement every year

• Also PSC’s current depreciation method based on age life can raise intergenerational equity concerns too
“Water mains have very long lives compared to most other assets in utility service. Around 100 years ago, it cost about $2.00 per foot to install main. Applying the age-life method, current ratepayers are paying an allocated portion of the original $2.00 per foot cost of a main that was installed one hundred years ago but is still in service. However, the current cost to replace this main is now about $150 per foot. Once the main is replaced, rate payers will pay the allocated portion of mains that cost $150 per foot. This can raise concerns about intergenerational equity, as a utility may not evenly replace its infrastructure over time.”
PSC Staff Reaction to Marshfield Proposal

• Acknowledges benefits of cash funding some main replacements
  • Recognizes Marshfield entering what will be an ongoing, multi-decade period of replacements

• But concerned with higher rate of return proposal
  • Ratepayers may end up paying for main replacement twice – once in current rates, and again when the plant added to rate base and included in future rates

• Recognizes the difficulty of obtaining more cash under the traditional utility basis of rate-making
“Under the rate base rate of return regulation, a certain amount of infrastructure can be financed with current earnings and for the remainder of the necessary investment, a utility typically issues bonds. Marshfield’s current capital structure consists of $12 million of earning equity and $11 million of debt for the water utility along. This is the balance of debt and equity that the earnings based on rate based rate of return regulation has allowed Marshfield to maintain, while managing the replacement cycle for its other water infrastructure. However, because main replacement costs have essentially not previously been a part of this balance, financing future main replacements could alter this balance of debt and equity significantly.”
Staff Proposal – Expense Depreciation

• Proposes allowing an increase in depreciation expense for mains by a fixed amount ($580,000) per year
• Funds to be used for main replacement each year
• $580,000 would be added to plant each year
• $580,000 would be added to depreciation expense each year
• No increase in net rate base
• Similar to increasing maintenance expense by $580,000 per year
• Adopted by Commission; PSC REF# 303885
Janesville Rate Case
Docket 2740-WR-110

- Proposes main replacement program of $3.5 million/year
- Main replacement proposed to be funded entirely by expense depreciation
- Proceeding is ongoing
Madison Water Utility Rate Case
Docket 3280-WR-114; PSC REF#: 352551; decided 11/1/2018

• Madison is 10 years into a 40 year main replacement program
  • Goal to replace 10 miles of main per year
  • Currently uses revenue bonds to finance the program

• Rate case request
  • $2 million in expense depreciation
  • Use to provide cash funding for main replacement program

• Withdrew request in this rate case
  • Expressed intent to include in next rate case
Madison’s Debt Funding Requires Higher Rate of Return

• Madison’s current capital structure is 85% debt to 15% equity
• Bond covenants require net revenues at least 1.25X debt service
• A 8% rate of return is required to meet debt coverage requirements
• “Commission is reluctant to authorize a percent return on rate base that is significantly higher than the benchmark rate of return, unless MWU can demonstrate that its cost of debt and its debt ratio are high enough to require a return of that level. In this case, MWU, with a composite cost of debt of 4.51 percent and a high debt ratio of 78.12 percent has met that test. The Commission finds it reasonable to adopt an 8.00 percent rate of return for the purpose of supporting the financial health of the utility.”
Commission Requires Madison to Submit Financial Plan

• “[T]he Commission finds it reasonable for MWU to prepare and submit a plan detailing actions that will be taken to strengthen its financial condition such that the standard municipal rate of return will be sufficient to support its required credit metrics in the future.”

• The plan must include
  • Actions to achieve benchmark rate of return for municipal utilities and capital structure of 50% debt and 50% equity
  • Goals, operational adjustments, timeline, milestones, etc
  • Evaluation of use of a surcharge as a future tool
Madison Plan Filed
PSC Ref#: 358776; Filed January 1, 2019

• Includes infrastructure investment goals, cash-reserve, capital-structure, debt-coverage, and return-on-rate-base goals
• Describes trade-offs between goals
• Increased rates allows continued infrastructure investment, provides funds for cash reserves and pay-as-you-go capital projects.
• Paygo capital projects improve capital structure, but do not reduce rates
• Reduced infrastructure investment allows PSC benchmarks to be achieved sooner
• Delay in nonessential projects could save money in the short-run, but deferred replacements could be costly in the long-run
PSC Benchmarks for WI Water Utilities Based on Utility Rate Making

• Rates based on utility’s revenue requirement determined using a “utility-basis”

• Revenue requirement = O&M expenses + taxes + depreciation + rate of return

• Rate of Return
  • Commission uses a benchmark rate of return for municipality utilities in absence of better information
  • For a utility with a balanced capital structure, “the benchmark rate of return results in an adequate return on equity”
  • Benchmark return at time MWU’s application was finalized was 5.10%
Municipal Rates Set Based on Cash Needs in Other States and Other Contexts

- In other states, municipal water utility rates typically determined on a “cash needs basis”
- Revenue requirement = O&M expenses + taxes + debt service payments + pay go capital expenditures + specified reserves
Different Source of Funding for Debt Service and Capital Improvements

• Under utility basis
  • Rate of return
  • Depreciation

• Cash needs
  • Debt payment
  • Pay-as-you-go capital funding
Utility – Basis Approach

Raftelis, Water and Wastewater Finance and Pricing, Exhibit 8.2.
Cash Needs Approach

Raftelis, *Water and Wastewater Finance and Pricing*, Exhibit 8.3
Figure 2. Economic Regulatory Jurisdiction for the Water Sector

Source: Based on surveys by the Institute of Public Utilities (MSU) and the staff of the Wisconsin Public Service Commission.
Thank You

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