2018 PA AWWA Conference

What's it worth to you?

Valuation of Water Systems

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Water Infrastructure Renewal:
How much will it cost and how finance?

Pipeline 1	Pipeline 2
Installed 1860	Installed 1860
Brown sandy soil	Brown sandy soil
Moderate soil corrosivity	Moderate soil corrosivity
6" Cast Iron Pipe	6" Cast Iron Pipe

31% Thickness Loss

1% Thickness Loss

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What is the true value of your water or wastewater system?

- Knowing what drives value, and what does not, will help all interested parties know what their asset is worth!

- Interested parties include:
  - **State and Municipal Executives**
  - **Financiers – banks and bondholders**
  - **Purchasers**
  - **Local Taxpayers**

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Why are valuations needed?

- Government Mandates
- Internal Planning
  - Ease of other economic burdens including pension funding
  - Municipal bond refinancing
- Transaction-Related (financial reporting, tax)
  - Public-Private Partnerships
  - Outright sale
  - Possible flotation
- Insurance
- Collateral Financing
- Liquidations

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State Mandates

Legislation Promoting Acquisition of Trouble Systems

- Many states requiring system operators that can NOT fund capital repairs/upgrades, to consider selling or P3's
- Some states and Public Utility Commissions ("PUCs") are requiring independent appraisals to determine asset value
  - Many municipalities unaware of the extent of their assets
  - **75% of the total replacement cost is buried infrastructure**
- Recent Mandates:
  - New Jersey: WIPA, S2412
  - Illinois: Public Act 09-0213 (HB 1379)
  - Missouri: HB 142
  - Indiana: Act 1319
  - Pennsylvania: 2016 Act 12

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WHAT is a Valuation?

- A “valuation” is a study/analysis to determine the monetary value of something (i.e. – an asset or a liability). It is an independent opinion of value.

- A valuation typically differs from an evaluation in that the latter will look at the functionality and operational characteristics of an item, but may not provide a monetary value.

What is value?

1. **Fair Value or Fair Market Value:** the price an asset or liability would change hands between a willing buyer/seller, both fully aware of the facts, with no compulsion to buy/sell, as of a specific date.
2. **Reproduction / Replacement Cost:** the cost to replace/reproduce an asset today using identical/similar materials that can equal/match the functionality / utility of the subject asset.
3. **Liquidation Value:** the price an asset/liability would change hands between parties, within a defined/set time period, as of a specific date.

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Measuring Value in a Water System

- Key Question:

  What is the true value of the water or wastewater system?
- Repeat: Knowing what drives value, and what does not, will help all interested parties know what their asset is worth
- Buried assets represent the **most risk** with accurate valuations
  - Lack insights into the actual condition and remaining service life
    - Pipe is hidden underground – no visual mechanism to verify *good pipe* versus *bad pipe*
    - All pipes degrade and fail over time but at varying rates
  - **Buried infrastructure represents over 75% of the water system replacement cost**
  - Reliance on pipe failure history and age is ineffective
    - Up to 70% of water mains being replaced have many years of remaining service life

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Valuation Approaches

1. **Cost Approach:** based on the principle of substitution in that a prudent investor would not buy an asset for more than the cost to replace it, less all forms of depreciation and obsolescence.
2. **Market Approach:** determines value by looking at comparable assets that have sold in the marketplace, and adjusting such comparables (based on capacity, condition, etc.) to equate them to the subject asset.
3. **Income Approach:** determines value by looking at the present value of future economic benefits of owning the subject asset.

Market and Income Approach
Difficulties

- **Market Approach:** determines value by looking at comparable assets that have sold in the marketplace…
  - **Issue: How do we find such comparables and adjust them to the subject asset?**

- **Income Approach:** determines value by looking at the present value of future economic benefits of owning the subject asset.
  - **Issue: How can this be determined if the subject asset is not an income-producing property, or if projections are not available?**

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Methods of Applying Cost Approach

- Determine the reproduction / replacement cost new
  - Trending
  - Direct pricing (i.e. – engineering studies)
  - Cost-to-Capacity study
  - Ensure all hard and soft costs are captured (installation, freight, tax, etc.)
- Measure and quantify physical deterioration (or “wear and tear”)
  - Chronological age vs. effective age
  - Condition assessment, e.g., Acoustic Wall Thickness Test
  - Remaining life input

Normal Life = Effective Age + Remaining Life

- Measure/quantify functional obsolescence (a decrease in value due to internal issues within the system)
- Measure/quantify economic obsolescence (a decrease in value due to external issues far and away the system
  - **Inutility**
  - **Business Enterprise Value ***

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*Cost approach results may be compared to the results of an income approach to ensure the value of the overall business can support the value of the discreet pieces.

Cost approach Example

- (2) Ten HP pumps at a local pump house
- Subject Cost – $60,000
- Subject Capacity – can pump 50 gallons/minute
- Subject Age – 9 years
- Subject Condition – Fair

	Cost App.
Replacement Cost New (Installed)	$70,000
Normal Life	12
Effective Age	9
% Good	25%
RCNLD	$17,500
Obs. Adj.	None
Final Value	$17,500

Valuation Process: Water Systems

Water system valuation typically utilizes the cost approach:

- The historical costs capitalized are trended to determine reproduction cost new today

OR

- Current construction cost estimates are compiled to determine the replacement cost
- Depreciation and/or obsolescence is quantified and applied to adjust the reproduction/replacement cost to estimate fair market value
- The results of this analysis may be compared to the results of an income approach to ensure the value of the overall business can support the value of the discreet pieces including:
  - The water distribution system
  - Any owned real estate
  - Any/all identifiable intangible assets

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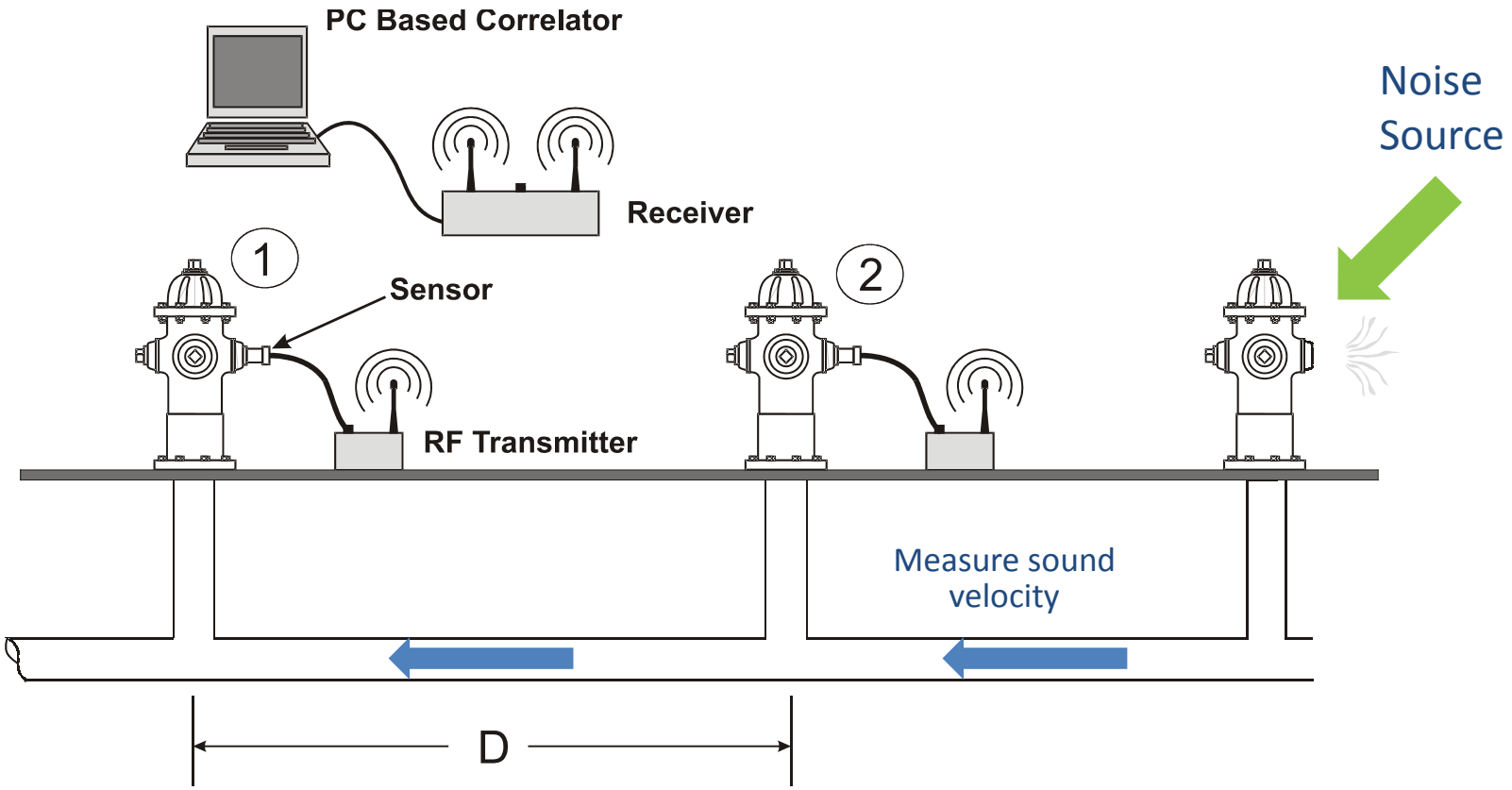
Acoustic Wall Thickness Testing



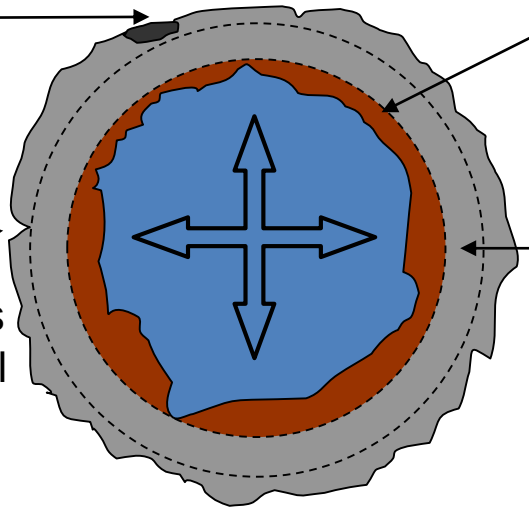
AWT Service

Direct Measure of a Pipeline's Structural Strength

- Sound is introduced into the pipe
- This pressure wave causes pipe wall to "flex" on a microscopic level
- Axi-symmetric vibration mode (S_1,n=0) is isolated with ePulse software
- Thicker (and therefore stiffer) pipe walls are more resistant to this "breathing" causing this particular wave to travel faster
- Measuring this phenomenon allows calculation of remaining average wall thickness

Graphitized material: Not structural, not measured

Tuberculation: Not structural, not measured



Longitudinal Crack: Reduces structural thickness over its full length

Structural Wall Thickness: Maximum continuous band of metal resists flexing under microscopic pressure of sound waves inside the main

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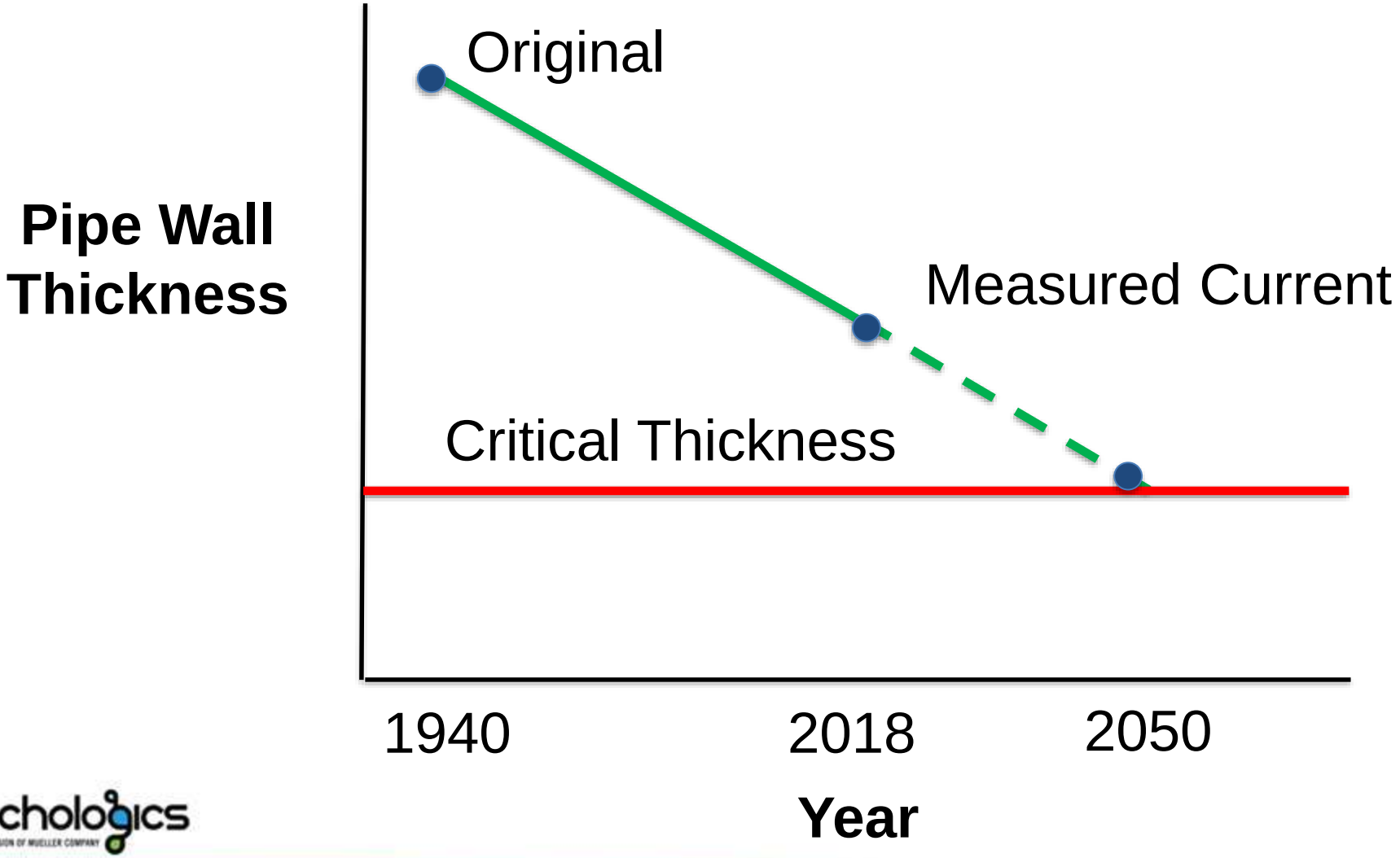
Case Study: City of Newark

Remaining Service Life Overview



Example: City of Valverde Facts

- The City of Valverde ("Valverde") operates a water system
  - 3,000 miles of buried distribution pipes, predominantly 6" cast-iron
- System initially constructed in 1940
  - Material upgrades made in 1998 and 2004 where 40% of the buried infrastructure was replaced.
- Valverde must replace/upgrade the remaining 60% of its buried infrastructure
  - Funds are not available
  - Per state regulations, a buyer must be found
  - During the search period, an unsolicited offer from Ajax Capital Corp. of $150 million is offered to own/operate the system.

Example: City of Valverde - 2

Asset Description	Date in Svce.	Life (Yrs)	Cost Basis	Net Book Value
Infrastructure	1940	40	$ 150,000,000	$ 0
Pump Houses	1940	20	300,000	0
Wastewater System	1975	25	4,500,000	0
Wastewater System Upgrade	2010	25	6,500,000	5,200,000
Truck Fleet	2010	5	500,000	0
New Water Tower	2014	25	1,400,000	1,300,000
Totals			**$ 163,200,000**	**$ 6,500,000**

- Valverde conducts an internal appraisal where it applies indexes from Bureau of Labor Statistics to inflate the cost basis from $163.2M to $350M
- Depreciation is applied based on chronological age from the records, held at 20% good based on the local property tax tables.
- The value of the system is calculated to be $70M ($350M x 20%)
- No value is allocated to the vehicle fleet as it's deemed immaterial

Pitfalls in Valverde's Value Estimate

The desktop analysis took the asset ledgers at face value. However, an independent valuation determines the following:

- The buried infrastructure upgrades made in 1998 and 2004 were never capitalized
- While the cost per mile capitalized in 1940 is represented at $50,000/mile, an independent engineering study estimates that the cost today would be $800,000 / mile, which the indices applied do not accurately capture.
- Based on the material of construction of the newer pipes, and the location of the older pipes, a condition assessment was done that determined the pipes are effectively 40% good versus 10 - 20% good.
- Including the vehicle fleet at $0 is not reflective of market value, as there is an active market for used trucks that are equipped with the tools and repair items necessary to maintain a system

Independent Valuation: Valverde

Asset Description	Cost Basis	RCN	% Good	Fair Value
Infrastructure	$150,000,000	$2,400,000,000	40%	$960,000,000
Pump Houses	300,000	1,000,000	40%	400,000
Wastewater System	4,500,000	15,000,000	40%	6,000,000
Wastewater System Upgrade	6,500,000	Inc. Above		Inc. Above
Truck Fleet	500,000	750,000	N/A	275,000
New Water Tower	1,400,000	1,500,000	95%	1,425,000
Totals	$163,200,000	$2,418,250,000		$968,100,000

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Results of Valverde Analysis

- The estimated value of the system is well above the offering price of $150 million based on the additional due diligence conducted.

- Initial CAPEX planning based on the capitalized costs would need to be revisited, as the true cost to replace a mile of pipe is not indicative of what was capitalized historically.

- If no internal or external due diligence were conducted, would assuming NBV of $6,500,000 have been a reasonable proxy for Fair Value?

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Beware: Valuation Myths

- **Myth #1:** Net book value is a good proxy for fair market value
  - *Reality:* Net book value is an accounting exercise to recapture costs over time and runs to zero after a set amount of years. Assets in operation whose costs are written off may (and are) still operating, thus adding value and are worth more than zero!
- **Myth #2:** Utilizing the cost basis on the books to "desktop" the system is sufficient
  - Reality: Depending on the passage of time, indices may not truly capture the true cost today of a system, not to mention the fact that if certain items of a system were no capitalized but expensed, all parties may not have a complete picture of "what's out there," thus understating value!
- **Myth #3:** "My system is old…it's worthless! I'll sell it for the value in the customer base!"
  - *Reality:* Utilizing certain technologies, the remaining service life (RSL) of a system can be determined. The RSL can be compared to the design life, and applied against the current cost of the system to determine a true estimate of value!

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Final Considerations

- All three approaches to value are considered, not all may be used.
- If two or more methods are used, all approaches should be reconciled to each other.
- Valuations / appraisals are more art than science, but by conducting the necessary due diligence and gathering all the facts and circumstances, the probability of making a material misstatement in value is mitigated.

- **What's it worth to you?**

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QUESTIONS

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