ION End-to-End Water Management

WATER PERFORMANCE

IMPACT ON AFFORDABLE HOUSING INVESTMENT AND LENDING

Water is one of the largest and most unpredictable expenses in affordable housing, with over half lost to invisible leaks that drain billions from the industry each year. These inefficiencies reduce NOI, weaken underwriting accuracy, and limit financing potential.

This white paper examines the financial impact of unmanaged water performance on development and lending, while highlighting proven strategies that reduce costs by up to 60%. By addressing water waste, investors and lenders can strengthen asset performance, improve underwriting reliability, and unlock long-term value.

Executive Summary

Water expenses are a major and often unpredictable variable cost for affordable housing properties. Over 50% of the water consumed and paid for in affordable housing is wasted. The industry loses an estimated 390 billion gallons of water annually to invisible leaks, primarily consisting of running toilets, water heaters, and other plumbing fixtures. These leaks cost the affordable housing industry over $5.8 billion per year.

In addition, current water underwriting models, whether green standards, HUD's Utility Schedule Model, or developer comparables, do not accurately reflect real-world performance, often underestimating consumption or embedding inefficiencies, which can lead to unreliable budgets, reduced NOI, and limited financing potential.

Eliminating invisible water leaks through real-time leak detection and ongoing water use monitoring allows the affordable housing industry to proactively manage water use, creating a significant opportunity to recapture capital and promote financially sustainable development.

Through data driven insights and automated work orders, ION's End-to-End Water Management platform helps developers address the invisible water loss challenge, driving down portfolio water consumption, and costs by 60% and enabling developers to maintain water use levels at 30-40% of the industry average. Today, more than a third of the top 50 affordable housing developers use ION's End-to-End Water Management solution to significantly reduce lost operating income across more than 100,000 units.

This white paper explores the current state of water use in affordable housing, offering a detailed analysis of existing consumption and invisible water loss patterns, water rate trends in the US, and a comparative review of properties using the ION End-to-End Water Management solution. It includes case studies at both the property and portfolio levels, as well as an evaluation of how optimized performance can improve underwriting practices.

As water becomes more scarce and costly, reducing water waste through state-of-the-art water optimization not only strengthens financial outcomes but also supports long-term community sustainability, benefiting owners, investors, lenders, and residents alike.

Multifamily Water Consumption Analysis

Understanding water use in multifamily housing is key to advancing efficiency and sustainability. This analysis synthesizes findings from three major sources—the USGS, Public Supply and Domestic Water Use in the United States, the EPA / Fannie Mae 2017, Water Score for Multifamily Housing in the U.S., and the Water Research Foundation, Water Use in the Multi-Family Housing Sector—to estimate water consumption in multifamily housing, normalized in Gallons per Bedroom per Day (GBD)*.

The USGA findings estimated the national average water consumption in Gallons per Capita per Day (GPCD) of 82. Using a normalization factor of 1.5 residents per bedroom which is inline with standard affordable housing underwriting methodologies provides an estimated Gallons per Bedroom per Day (GBD) of 123. However, the data in this report includes consumption for all domestic use and was not isolated to multifamily.

The findings from the EPA Water Score is isolated to 258 multifamily properties. Using the mean averages of the data set (units, bedrooms, and consumption) established an average estimate of 148 GBD.

The findings from the third source, the Water Resource Foundation, was also isolated to multifamily consumption and consists of data from five major U.S. water systems. The average multifamily water consumption across these systems was estimated at 70.2 GPCD. Using the same normalization factor of 1.5 residents per bedroom provides an estimated Gallons per Bedroom per Day (GBD) of 105.3.

For the purposes of modeling in this white paper we will use the most conservative estimate for multifamily water consumption, 105 GBD, established by the Water Research Foundation report.

Data Sets and Citations

Comparison of GBD Estimates

Data Source	GBD Estimate	Context
USGS: Public Supply and Domestic Water Use in the United States	123	Includes all domestic water use in estimates
EPA / Fannie Mae 2017: Water Score for Multifamily Housing in the U.S.	148	Isolated to multifamily consumption only
Water Resource Foundation: Water Use in the Multi-Family Housing Sector	105.3	Isolated to multifamily consumption and the most conservative estimate

2024 Assessment Data without ION

This data set provides examples of multifamily affordable water performance at properties not using the ION End-to-End Water Management platform. The intent is to provide understanding of affordable water consumption in comparison to the multifamily surveys previously provided. These water performance assessments were conducted in the first three quarters of 2024.

Developers	Total Properties	Total Units	Total Bedrooms	Annual Consumption in Gallons	Avg GBD
54	236	25,765	48,874	1,741,822,043	102

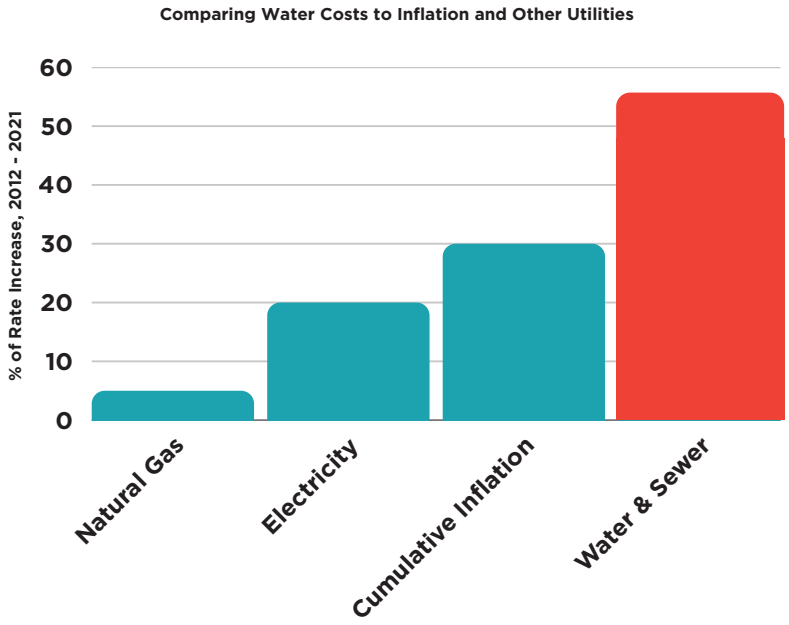
These findings align with the independent multifamily surveys, quantifying average water consumption in affordable properties in excess of 100 GBD.

*GBD = Total gallons/# of bedrooms per unit/# days in a period

Multifamily property owners often bear the cost of excessive water use: 105 gallons per bedroom per day (GBD) on average.

National Trends in Residential Water and Sewer Rates: A Decade of Rising Costs

Over the past decade, residential water and sewer rates in the U.S. have risen by 4% to 6% annually on average, outpacing inflation and other utilities such as electricity and natural gas, which have remained relatively stable.



From 2012 to 2021, typical household water and sewer bills increased by over 50%. This steep rise is driven by factors such as aging infrastructure (EPA estimates that the U.S. needs over $743 billion in water infrastructure investment), costly regulatory compliance, increased demand in water-scarce regions (cities facing droughts, and rapid population growth, are turning to more expensive water sources), and climate-related water scarcity.

Due to a host of housing and funding challenges at all levels of local, state and federal government, financial pressure on property owners, especially in affordable housing, is growing. As a result, incorporating water effective management from project development through operations is essential. These systems can reduce operating costs, improve cash flow, support long-term affordability, and help projects meet water efficiency standards.

US water and sewer rates are rising far faster than inflation and other utilities, making proactive management of water expenses a priority in controlling operating costs.

Existing Approaches to Water and Sewer Underwriting

Accurately projecting water and sewer costs is critical in affordable housing underwriting, as these expenses affect operating budgets, tenant affordability, and long-term financial viability. Three common methods include:

1. Green Building and Loan Models

Green models (e.g., Fannie Mae, USGBC, EPA) estimate water use based on fixture efficiency and assumed resident behavior. They do not account for invisible running water leaks or degraded fixtures and therefore often underestimate true water consumption.

2. HUD Utility Schedule Model (USM)

The USM, builds in inefficiencies typical of outdated public housing stock. USM models are not incorrect for older properties similar to public housing; however, they are typically inefficient, potentially lowering NOI and limiting debt sizing.

3. Developer and Investor Comparables

Developer comparables offer real-world benchmarking but depend heavily on the similarity of performance and water management practices between selected properties. This risks operational inefficiencies and unattainable, inaccurate budgets if comparables are not, in fact, truly comparable to begin with.

Across all models, a critical weakness is the lack of proactive strategies to align underwriting assumptions with maintainable asset management performance. No current model actively addresses the reality of current invisible running water leaks in operating properties or future invisible running water leaks in new construction, which inflate costs and erode financial performance over time.

Incorporating real-time leak detection, and ongoing water use monitoring into both design and operations, can align budgets with actual performance, safeguard cash flow, and improve long-term outcomes for developers, lenders, and investors alike.

Current water underwriting models either underestimate actual water usage or embed water inefficiencies, which lead to unmaintainable budgets or reduced NOI, and limited financing potential.

End-to-End Water Management Performance Analysis

This analysis evaluates real-world water usage across over 30,000 affordable housing units using the ION End-to-End Water Management platform. This performance can be compared to typical multifamily consumption used for underwriting benchmarks.

Awareness of improved water efficiency potential, and its direct impact on operating income, provides investors and lenders with a differentiated advantage throughout the deal life cycle when the ION End-to-End Water Management platform is applied:

- New Construction – Underwriting to an optimized, sustainable water proforma increases planned NOI, enabling greater debt sizing, stronger equity placement, and reduced exposure to expense volatility.
- Debt Service Coverage Ratio (DSCR) Stabilization – Properties with narrow coverage ratios can strengthen NOI by reducing water costs, improving covenant compliance and meeting efficiency benchmarks, without tapping reserves or new capital.
- Acquisitions – Many assets are mispriced due to hidden water inefficiencies. Investors and lenders that surface these value-add opportunities gain a competitive edge and create instant upside.
- Debt Expiration / Recapitalization – Deals approaching maturity can protect valuation and access more favorable refinancing terms by demonstrating reduced operating expenses and stronger net cash flow through water performance.
- Dispositions – Enhancing water efficiency prior to sale raises NOI and asset value, improving exit pricing and investor returns.

The evaluations of this data set includes these variables: property location, tenancy, year built, efficiency of plumbing fixtures, date of ION implementation, efficiency of typical plumbing fixtures, and whether ION's End-to-End Water Management solution was installed during construction or added to an existing operating property.

NOTE: Data set includes properties from the ION platform that meet the following criteria: developers with 500 or more units on the platform AND installations with single or double point of entry sensors which capture 100% of unit consumption.

ION Performance on Tenancy Variable

Tenancy	Properties	Units	Bedrooms	Years on ION	Average GBD
Family	170	25,741	52,668	2.96	43.8
Senior	35	6,029	9,600	3.02	32.8
Total	205	31,770	62,268	2.97	41.9

The current multifamily consumption average of 105 GBD often includes inefficiencies like invisible water leaks and fixture degradation into underwriting estimates. In contrast, **ION managed properties average 41.9 GBD, a 60% improvement in water consumption.** For a 100-unit, 200-bedroom property, this equates to roughly **$69,000 in annual budget savings, with water use reduced by ~4.6 million gallons.**

Additional performance insights can be estimated based on property tenancy. In the data above, average performance for senior properties average 32.8 GBD as compared to 43.8 GBD for family properties. This provides $78,000 in budget savings based on 5.2 million gallons in reduced consumption. See analysis here.

Also provided is a data subset of ION managed properties (for water usage) in which developers provided utility bills to demonstrate consumption prior to the implementation of the ION End-to-End Water Management system and after. ION's End-to-End Water Management system enabled these properties to reduce consumption by 53%.

Water Rate Change Analysis

Average Rate Water + Sewer from Pre-ION Bills	Average Rate Water + Sewer from Post ION Bills	Average Years Between Bill Sets	Overall Water + Sewer Average Rate Increase	Annualized Average Water + Sewer Rate Increase
$0.013	$0.0167	2.5	32%	11.71%

Of note, the annual increase in combined water and sewer rates (charges from utility providers per gallon for water and sewer) exceeded 11%, which was greater than the national annual average increases outlined previously. **Significant increases in water pricing increases the need for optimized water efficiency as these properties would have experienced rate increases without the offsetting benefit of decreased water consumption.**

For lenders, this translates to stronger DSCR and additional loan capacity via NOI and valuation uplift. Investors benefit from lower volatility, long-term savings, and added asset value at disposition.

Recommendations

- **New Construction** – Underwrite to ION performance benchmarks (e.g., 45 GBD or lower), with tailored assumptions by tenancy type (e.g., 42 GBD for family, 33 GBD for senior) to strengthen NOI projections and reduce expense risk.
- **DSCR Stabilization** – Prioritize watchlist assets for water performance evaluation to uncover NOI lift opportunities that improve coverage ratios without requiring reserve draws or additional capital.

- **Acquisitions** – Integrate ION water assessments into acquisition due diligence as a value-add service for general partners, revealing mispriced opportunities and strengthening buy-side positioning.
- **Debt Expiration / Recapitalization** – Assess properties at least 24 months before maturity, focusing on assets with underperforming DSCR or facing refinancing headwinds from higher rates, to unlock NOI upside and improve recap outcomes.
- **Dispositions** – Evaluate assets prior to sale to capture untapped NOI from water savings, ensuring general partners and investors realize full value at exit.

ION End-to-End Water Management eliminates usage volatility, leaving utility rate increases as the sole driver of future cost escalation.

Benefits of Water Optimization

End-to-End Water Management in affordable housing transforms invisible running water waste into value, boosting NOI while delivering environmental and social benefits.

Resident Impact:

- 390 billion gallons conserved in affordable housing at $0.015/gal could save affordable communities over $5.8B annually
- Reinvesting even 10% of these savings for amenities or resident services can provide sustainable impact for residents
- Example: A 100-Unit property can reduce water use by 4.6M gallons annually, saving about $68K/year, which can cover virtual resident services fees for years or fund other resident amenity projects

Localized Benefits:

- Reduced consumption means reduced operating costs for local utilities
- In aggregate $1.17B of associated expenses related to energy, water treatment, and Maintenance, Repair and Operations can be avoided
- Local water management and conservation targets can also be expedited by avoiding unnecessary drain on water basins

- By addressing water waste, affordable housing stakeholders not only improve operational efficiency but also create a ripple effect of social, environmental, and financial impact benefits

Addressing invisible water waste boosts operational efficiency while driving social, environmental, and financial benefits.

Case Studies

The following case studies provide context to the value End-to-End Water Management can drive along the lifecycle of affordable communities:

Underwriting Impact

- Harmony Housing, New Bern, NC - New Construction overcame funding gap challenge by using ION's End-to-End Water Management platform comp data to substantiate increased NOI, enabling a $1.2M increase in debt sizing.

Portfolio Impact

- Kittle Property Group (KPG) Case Study
  - An ION partner since 2019, KPG now saves over $8M per year and maintains water usage at approximately 32% of typical affordable housing water usage across its property portfolio.
- Dominium Case Study
  - An ION partner since 2014, Dominium now saves over $12M per year and maintains water usage at approximately 34% of typical affordable housing water usage across its property portfolio.
- Pivotal Case Study
  - Savings can be achieved quickly once ION's End-to-End Water Management system is installed. Pivotal, an ION partner since 2024, has achieved over $1M in annual savings and maintains water usage at approximately 38% of typical affordable housing water usage across its property portfolio in just one year.

Acquisition Impact Case Study

- Dominium's acquisition of Crossings at Cape Coral, FL was performing at 110 GBD post-acquisition and ION system implementation property achieved 40 GBD and maintained an NOI increase of $16K, increasing asset value by over $3M.

Disposition Impact Case Study

- Leading up to a disposition event, KPG deployed ION's End-to-End Water Management platform at a poorly performing property, realizing a 50% reduction in consumption on the T12 leading to an increased valuation of $2.8M.

Summary

Achieving and sustaining water efficiency has historically been difficult in affordable housing, yet it is essential to long-term asset performance and community impact. ION delivers the only End-to-End Water Management solution designed specifically for this sector, enabling portfolios to consistently control and optimize consumption. Today, ION partners use and pay for 60% less water than industry averages, across property types and vintages. This performance, validated at scale, is helping investors and lenders strengthen deals, support general partners, preserve affordable housing, and advance environmental sustainability.

Thank you to the ION partners who aided and provided feedback on the development of this white paper including:

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