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JAMES A. GRAASKAMP CENTER *for* REAL ESTATE

MULTIFAMILY IMPACT COUNCIL

Water Efficiency as a Competitive Advantage:

Dominium and ION: A Partnership in Affordable Housing

Full Report

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Introduction

Jack Sipes dove in headfirst when he joined Dominium as its Chief Management Officer in 2012. Sipes, now a Partner at Dominium and the affordable housing giant's Executive Vice President, set out to determine where resources were leaking out of operations (ok, enough water puns). He directed his team to analyze water usage and billing rates across its growing portfolio of affordable rental housing to determine which properties suffered from abnormally high rates of water consumption. At the time, Dominium, which now owns and manages more than 40,000 homes across 19 states, was plotting a building boom that would dramatically increase its affordable housing portfolio. If it could decrease its water consumption and prove a pattern of lower operating costs to its lenders, it could leverage more debt and, ultimately, build more affordable homes.

It has long been commonplace within the industry for owners to address rising water costs through (1) installation of low-flow fixtures and devices and (2) hiring 3rd party providers to install unit-level water submeters and bill residents directly for usage. Many owners reason that low flow fixtures and devices such as toilets using fewer gallons per flush and aerators engineered to reduce water flow rates during handwashing could better align the amount of water needed for these activities with the amount of water used. Similarly, many presume that if tenants pay for water directly, they will only use the water they absolutely need, driven by the embedded assumption that tenants lacking direct responsibility for their usage must use much more water than they require for daily living. Dominium tried both techniques in parts of its portfolio but remained unsatisfied with the results. Low-flow devices represented improvement, but working alone did not control runaway costs. While submetering companies approached Dominium with big promises, they too failed to deliver proportionate results.

For reasons this report covers in greater depth below, billing tenants for water usage tends to create mixed results. There can be benefits which may not always exceed costs, and as a solution predicated upon active tenant participation, it can quickly become a managerial challenge. The feature of individual unit submetering that Sipes and Dominium found beneficial was the granularity of the data it produced and thus, the greater control they could now exert over water outcomes. With monthly unit-level water usage data, Sipes directed his analysts to note problem units and then direct property management to enter those units to assess for failures such as leaky faucets or running toilets. In other words, rather than relying on tenants to adjust consumption, submetering revealed an opportunity for management to directly address inefficiencies within the property. Now focused on optimizing management practices to decrease water usage, Dominium needed a more robust and actionable dataset. Sipes recalls specific frustration at waiting for monthly bills to arrive so they could identify and inspect

problem units. “For all we knew, that unit had been a problem for up to 30 days. Just think of all the water you can waste in 30 days!” Sipes recalled. He was increasingly open to working with 3rd parties formulating new water solutions, or perhaps even redefining the water problem.

Meanwhile, ION Water entered the marketplace in 2014 with a focus on dramatically expanding tools available to multifamily operators to analyze and address water issues. According to Jack Howell, ION’s founder, ION Water demonstrates its value through data. ION’s strategy is to place at least one smart sensor in each residential unit and transmit that data as quickly as possible to the owner to drive action. ION is laser focused on water waste. Its sensors not only detect leaks immediately, but they also track leak velocity and duration and can often identify the leaky fixture itself. ION’s user-friendly intelligence platform transmits the most relevant facts to ownership and management daily, alerting them of pressing water issues so that they can dispatch maintenance for quick repairs. The sum of these efforts equals dramatic water savings.

If it seems like ION’s End-to-End Water Management solution set was tailor made for Dominium, that might be true. After all, Howell did not build ION Water from an engineer’s perspective, or as an environmental activist. He is a real estate industry veteran. Prior to ION, Howell led multifamily development and acquisitions for a private equity group in Louisville, Kentucky and held other industry positions prior to that. According to Howell, all multifamily housing suffers from high water bills, not just the affordable sector. He notes conversations with leaders of national multifamily REITs who complained of the problem. As he worked to build ION, Howell determined that affordable housing partners were well suited to adopt its technology due to the sector’s unique regulatory requirements and downward financial pressure to control costs in narrow margin operating environments. Government regulated affordable housing, which limits owners' ability to raise rents in response to utility cost increases and requires owners to hold buildings for 15+ years, was a logical sector to work with. Naturally occurring affordable housing (NOAH) - unsubsidized properties that remain affordable due to market conditions rather than regulatory mandate-presents a similar profile, as owners typically maintain long hold periods to maximize asset value appreciation and face the same downward financial pressure to control operating costs.

In 2014 Jack Sipes agreed to work with ION Water on an acquisition/rehabilitation (or “Aq-Rehab”) project called Lake Crest. Howell recalls the relationship as being tough at first. He remembers “400 or so” emails back and forth, site visits, and a detailed plumbing analysis. However challenging its beginnings, the Dominium/ION partnership started to bear fruit with this first project. Before ION began at Lake Crest, the development consumed an average of 160 gallons per bedroom per day (GBD). After stabilization with ION, it averaged 55 GBD, a

reduction of nearly 70%. A more recent case study by ION found that across its portfolio of work in affordable housing, properties consistently reduce water consumption by 50-60%, declining from an industry baseline of roughly 105 GBD to approximately 45-50 GBD after stabilization. ION's intelligence platform provides the ability to identify and document invisible leaks in real time, allowing owners to intervene immediately rather than waiting for monthly utility bills.

Today, Dominium's partnership with ION saves over $12 million annually across its portfolio. ION offers two pricing structures depending on property type (New Construction or Operating Properties), each producing a strong return on investment when paired with a sustained reduction from ~105 GBD to ~45 - 55 GBD and rising municipal water rates[1]. When these costs are evaluated against actual performance data monitored through the ION's End-to-End Water Management system the return on investment profile becomes clear.

Our analysis of 29 anonymized properties monitored by ION reveals that water savings range from 16 to 52 gallons per bedroom per day (25th to 75th percentile), with a median reduction of 36 gallons - equivalent to approximately 41% of pre-ION consumption. Applying these observed savings distributions to a 15-year NPV model tested across discount rates of 3% to 15%, ION adoption generates positive risk-adjusted returns in the vast majority of scenarios. At the median savings level (P50), a 1-bedroom operating property unit yields an NPV of $606–$1,475 depending on the discount rate assumed; a 2-bedroom unit yields *$2,074–$4,602;* and a 3-bedroom unit yields $3,543–$7,729. ROI multiples at the median range from 0.95x for 1-bedroom units to 4.84x for 3-bedroom units. Only one scenario, 1-bedroom units at the lowest observed savings tier in low water-rate markets, showed ION adoption as not yet financially justified: 1-bedroom units at the lowest observed savings tier (P25, ~31% reduction), where ION fees modestly exceed water savings over the 15-year period. It is worth noting that this single below-breakeven scenario is context-dependent. The financial case for 1-bedroom units at the P25 savings tier is particularly sensitive to local water rates. In municipalities with above-average utility costs, even this scenario yields positive returns. More importantly, affordable housing developments are rarely composed of a single unit type. When ION End-to-End Water Management adoption is evaluated at the property level across a typical unit mix, the strong NPV generated by 2- and 3-bedroom units more than offsets the modest shortfall in the most conservative 1-bedroom scenario, producing a compelling portfolio-level return in virtually all cases.

Full sensitivity results by bedroom size, water savings percentile, and discount rate are presented in Section IV.

[1] ION Water, *Water Performance Impact on Affordable Housing Investment and Lending*, ION Water, 2024, pp. 2-3, 8-11.

Our study explores the Dominium/ION partnership in depth. We take a deeper look into the nature of the Dominium/ION working relationship and, using data generated by the partnership, offer insights into what makes it work and which portions of Dominium's portfolio stand to gain the most from this work. Next, we examine the financial mechanisms that allow Dominium to benefit from water savings, followed by the environmental benefits of reducing water consumption. Finally, we will offer some recommendations for consideration for affordable housing developers, subsidy providers and interested industry participants.

Part I. How the Dominium/ION Partnership Works

Dominium was founded in 1972 by Jack Safar and David Brierton and has emerged to become one of the nation's most respected and prolific developers, owners, and managers of affordable housing. Dominium is dedicated to, "addressing the nation's housing crisis through lasting and impactful solutions." They also believe that "everyone deserves the dignity and stability of a place to call home." Dominium is a multigenerational company that has been in business for 50 years. With more than 1,200 employees they are committed to helping solve the affordable housing crisis through a comprehensive approach that delivers excellent performance while improving communities across the U.S.

In many cases, it is impossible for Dominium and other owners/operators of affordable housing to address water pricing.[2] Recognizing this constraint, Dominium looked for ways to address the more attainable target of water consumption. In this paper we will examine in detail how Dominium partnered with ION Water to address inefficiencies in water usage through unit-level monitoring, leak detection, and follow up from property management.

ION's End to End Water Management System Explained

ION aims to reduce water consumption in the affordable housing market by gathering water usage data in unique and actionable ways. They envision a more sustainable affordable housing market, where both affordable housing developers and communities can thrive through improved water efficiency. Their revolutionary End-to-End Water Management system changes the game for affordable developers, allowing them to harness real-time water data to reduce costs and add value to their properties.

A traditional water billing meter tracks the water consumption of an entire building and is read monthly. ION's End-to-End Water Management system is a three-part solution that improves water efficiencies by identifying and analyzing unit level water events, pinpointing malfunctions,

[2] U.S. Environmental Protection Agency**,** *Water Affordability Needs Assessment: Report to Congress*, U.S. EPA, December 2024

and generating automated work orders to stop water loss quickly. The platform has been proven to reduce monthly consumption and water bills by 60%+compared to industry averages. ION's technology produces data 20,000 times more granular than a typical billing meter, enabling ION to identify leaks efficiently and accurately and generate automated work orders that allow maintenance teams to act swiftly. Unlike traditional master meters that measure total building consumption monthly, ION's platform captures unit-level data in real time, identifying leaks and generating automated work orders before losses escalate. This granular monitoring enables Dominium and ION to reduce water use significantly, with stabilized consumption levels well below typical industry averages for comparable multifamily buildings.

Dominium & Ion Partnership

Dominium has prioritized operational sustainability as part of its long-term strategy, with water management coordinated through its utilities management function led by Tabitha Parkinson, Director of Utilities Management. Accordingly, ION implements its water monitoring system through six steps under Tabitha's general oversight: planning, installation, reporting, analysis, maintenance, and ongoing management. Prior to installation at each property, ION works with Dominium's utilities management team to evaluate the expected operational and financial impact of the system and presents these findings to support internal decision-making. Once approved, ION installs sensors in each unit to capture unit-level water data. These sensors then transmit data to ION's intelligence platform in real time for continuous analysis and reporting. Maintenance personnel receive automated work orders that enable rapid response to identified issues. Finally, ION supports ongoing operations by monitoring water consumption around the clock and producing financial impact reports that help property owners understand realized cost savings and long-term performance.

ION's Technological Approach

ION's real-time, sensor-driven approach to water consumption monitoring collects highly granular, unit-level data. This allows it to detect abnormal flow patterns associated with leaks and malfunctioning fixtures. Success with ION's system is based on the understanding that water waste is not driven by discretionary tenant behavior as is often assumed but by hidden mechanical inefficiencies that persist undetected for long periods.

ION's system uses sensors that uniquely capture thousands of data points per gallon, a level of granularity that allows it to detect even very small leaks that conventional meters miss. Fixtures and appliances within the home have unique water usage signatures. A brief and swift water pull might signify handwashing at the kitchen sink. Sustained usage over an hour could signify a clothes washer, and dishwashing could last 2 hours. ION's consistent tracking of

typical water usage patterns refined over more than a decade of evaluating real world resident and property behavior identifies abnormal vs. normal use patterns, enabling it to recognize and diagnose leaks in real-time. ION's sensors not only mark this irregularity but can use the velocity of the leak and other markers to provide actionable work orders for the specific unit and fixture in disrepair. Data summarized through the ION End-to-End water management platform for this case analysis indicate that buildings using ION's system exhibit lower average gallons per bedroom per day relative to baseline conditions commonly observed in LIHTC portfolios. Within this framework, ION generally benchmarks portfolio performance toward an operational target of approximately 45-50 GBD, or roughly 10% of total consumption attributable to leakage, recognizing that actual results vary by property. Across multiple Dominium properties in the Midwest and East Coast, early-stage deployment surfaced a range of previously undetected leak conditions, particularly at common points of use such as toilets and water heaters, which are prominently identified in the ION intelligence dashboard. These types of issues would typically remain unnoticed until reflected in monthly billing data. As illustrated by the platform, leak-related volume can represent a meaningful share of total consumption, suggesting that reductions in leak-driven water use account for a substantial portion of observed savings. This pattern is consistent with broader operational insights from Dominium's portfolio and reinforces the role of continuous monitoring in capturing savings that are not driven by changes in resident behavior.

Pre-installation assessment and planning

While Dominium now includes ION's End-to-End Water Management system in all new construction processes, it must determine property by property, which existing developments should receive ION monitoring. ION's process begins with full assessment of the property's water history and plumbing set-up. ION reviews the building's past water consumption, plumbing age, layout, and common trouble spots. They also estimate how much water the property is likely losing and the potential financial savings from ION's system implementation. This data is then combined with local utility rates to help Dominium understand the expected consumption reduction and financial impact, while providing its maintenance teams a baseline to compare current performance against projections. For Dominium, this framing aligns with portfolio-level asset management practices, where capital and operating investments must demonstrate clear cost justification before deployment. By quantifying expected water and wastewater cost savings, the pre-installation phase converts ION from a purely technical solution into a financially motivated management tool that provides a clear rationale for adoption before the system is installed.

Installation of unit-level sensors

Once the plan is approved, ION engineers install flow sensors in every unit and critical mechanical spaces. The installation is usually quick and minimally disruptive. These sensors track water flow continuously and detect patterns that signal a leak or an abnormal consumption event. This unit-level data establishes a baseline for normal water use in each apartment, allowing deviations to be flagged quickly once monitoring begins.

Real-time data transmission and analytics

After activation, the sensors transmit live data to ION's cloud platform. The software analyzes the water flow every minute and immediately flags unusual behavior such as continuous flow, critical leaks that require immediate attention, fixtures in disrepair, abnormal usage and other anomalies. This shift from reactive to real-time management is a major improvement over traditional utility billing. ION's End-to-End Water Management system also helps owners identify consumption trends and compare building-level and unit-level behavior.[3]

Ongoing monitoring, stabilization, and long-term optimization

Following installation, ION moves into a stabilization phase that Dominium views as the most operationally intensive period. Parkinson explained that this stage involves close coordination between ION and on-site teams, with daily review of unit-level data and water consumption reports to identify both large and small leaks that had previously gone unnoticed under monthly billing systems. Maintenance staff respond to a steady flow of alerts and continuously address fixture failure leaks across units and can conduct resident awareness campaigns for specific heavy users or across the property. Daily water consumption declines and gradually reaches a stable baseline as these issues are resolved. After stabilization, the system shifts into continuous monitoring and long-term optimization. Dominium uses ION to identify mechanical inefficiencies and infrastructure-related losses over time. Ongoing monitoring communicates new leaks daily, ensuring fixes to take place quickly and initial savings are preserved. From Dominium's perspective, this continuous oversight is essential to maintaining reliable water performance across its large LIHTC portfolio.

Automated alerts and maintenance response

When an irregular flow is detected, ION automatically generates a unit-specific alert and work order, allowing Dominium's maintenance staff to respond immediately. The alert identifies the affected unit and the likely issue, enabling staff to act immediately. This is critical given that a single running toilet can waste more than 6,000 gallons per month if left undetected.[4] Traditional monitoring systems often allow these losses to persist for days or weeks, increasing both water costs and the risk of damage. ION's daily reports display gallons per bedroom per day (GBD), the type of leak that is occurring and the exact location to help Dominium distinguish normal usage from leak-driven consumption. Parkinson indicates that

[3] ION Water, *ION Water Technology Overview*, 2023
[4] American Water Works Association, *Water Audits and Loss Control Programs* (2020)

approximately 90% of identified water issues are leak-related rather than behavioral. Across Dominium's portfolio of roughly 20,000 units monitored by ION, water costs are billed back in only about 40% of properties, underscoring Dominium's commitment to proactive leak detection and swift remediation by management.

Part II. How Water Savings Impact Dominium's Business Model

This case study examines household water spending as it relates to housing affordability. The affordable housing industry norm is to view water spending as a subset of utility costs, which itself is a subset of housing costs. The U.S. Department of Housing and Urban Development (HUD) defines housing affordability as paying no more than 30% of income on housing costs (rent plus utilities), and the industry has used this standard for several decades. While not commonly referenced by affordable housing industry actors, the US Department of Environmental Protection (EPA) has defined water affordability as not in excess of 2.5% of household income. There may not be consensus around EPA's affordability metric, as other researchers in recent years have considered water to be affordable if it does not, for example, exceed 10% of income, 8 hours of work (per month) at minimum wage, etc. These other measures tend to be focused on extremely low-income households. While this case study does not advance new ideas on what constitutes water affordability, we are interested in these efforts and wonder whether specifically indexing water costs to determine their own affordability may offer a more nuanced understanding of housing affordability and augment our efforts therein.[5]

Who pays for tenant water usage is a fundamental business decision at the core of affordable housing operations underwriting and management.[6] Dominium, like many other affordable housing operators, has debated the logic of charging tenants for water usage versus paying water costs themselves. If owners pay for tenant water usage, they can often charge more in contract rent. If tenants pay for water usage, the owner must factor the tenant's estimated water payment into a "utility allowance," and the maximum potential contract rent is reduced by the amount of that allowance. These rent limits and utility allowances[7] are established annually by HUD.

[5] U.S. Environmental Protection Agency (EPA),Water Affordability Assessment: Report to Congress. Pages 77-78. (2024).

[6] Some housing finance agencies, such as Pennsylvania's, do not allow LIHTC developments to be underwritten or operated with tenants paying for water. This paper assumes that developers have the choice, when in fact they may be constrained.

[7] Housing Finance Agencies may also permit other methods for deriving utility allowances, such as calculations performed by project engineers.

Figure A. 50% Income Limits and Rent Limits — Dane County, WI (2025)

50% INCOME LIMITS				
COUNTY	**ONE**	**TWO**	**THREE**	**FOUR**
Dane	**$45,450**	**$51,950**	**$58,450**	**$64,900**
50% RENT LIMITS				
COUNTY	**ONE**	**TWO**	**THREE**	**FOUR**
Dane	**$1,136**	**$1,299**	**$1,461**	**$1,623**

Source: HUD, 2025 Income Limits – Dane County, WI (50% AMI)

In regulated affordable housing developments, tenants are “income qualified” to live in units set aside at Area Median Income (AMI) levels, such as 30%, 50%, 60% or 80% of the AMI. Maximum monthly gross rents at each income level are established, based on 30% of the income limit divided by 12 months, based on the notion that households paying more than 30% of their take home pay are “rent burdened” and at risk of not being able to afford other critical expenses. For example, in Figure A, a family of three with an income less than $58,450 qualifies as 50% of the area median income for Dane County, WI. Therefore, tenant rent is limited to a maximum of $1,461 per month. The LIHTC program requires this $1,461 to include contract rent plus a utility allowance. A utility allowance is an estimate of what a tenant would pay in utilities per month in a specific unit if the operator of the property is choosing to charge for utilities. It is important to note that this amount is simply an estimate not the amount the tenant is actually billed for utilities, which is based on actual usage.

Figure B. Allowances for Utilities — Zone 10, Dane County (HUD Schedule)

Category	Fuel Type	0 BR	1 BR	2 BR	3 BR	4 BR
Heating	Natural Gas	$20	$23	$26	$30	$33
	Bottle Gas	$34	$40	$46	$52	$58
	Electric	$27	$45	$63	$81	$99
	Oil/Coal/Other	$29	$34	$39	$44	$49
Cooking	Natural Gas	$16	$17	$18	$20	$21
	Bottle Gas	$6	$9	$11	$14	$16
	Electric	$8	$11	$14	$18	$21
	Other	—	—	—	—	—
Other Electric		$38	$49	$61	$72	$83
Air Conditioning		$2	$4	$7	$9	$12
Water Heating	Natural Gas	$7	$11	$15	$18	$22
	Bottle Gas	$12	$19	$25	$32	$39
	Electric	$17	$26	$36	$45	$55
	Oil/Coal/Other	$11	$17	$24	$30	$36
Water		—	—	—	—	—
Sewer		—	—	—	—	—
Trash Collection		—	—	—	—	—
Range/ Microwave		$4	$4	$4	$4	$4
Refrigerator		$6	$6	$6	$6	$6
Other		—	—	—	—	—

Total		**$237**	**$315**	**$395**	**$475**	**$554**

Source: HUD Utility Allowance Schedule – Zone 10

Figure B is an example of the Dane County allowance for utilities for 0-4-bedroom apartments using HUD's online calculator. The figure highlights the dollar amounts of the component costs of the utility allowance associated with a three-bedroom unit that uses only electric fuel sources. The total utility allowance in Figure B is $235 which is the estimated amount that a tenant would pay living in this unit. When calculating the maximum contract rent, the owner must subtract the utility allowance from the maximum rent allowed for that county. Going back to our example from earlier and referencing figure D, according to these figures, a family of three in a three-unit apartment, at 50% AMI, with a $235 utility allowance, would pay a maximum contract rent of $1,226 (Figure C).

Figure C. Maximum Contract Rent Calculation — 50% AMI, Family of Three

50% Income – Family of Three	
Income Limit	**$58,450**
Gross Rent Limit	**$1,461**
Less: Utility Allowance	**($235)**
Maximum Contract Rent	**$1,226**

One might logically assume that when the owner decides to pay for water, they are judging that the amount of the utility allowance will meet or exceed actual tenant water costs. In other words, when the owner pays for water, it buys the utility allowance. **In fact, there are reasons to believe that the decision to pay for water should have more to do with the owners ability to stabilize and reduce water costs. Some of these reasons include:**

Reason 1: The relationship between tenant rents and charging for water is not zero-sum at the higher AMI levels

Most LIHTC properties include units at a variety of different AMI levels. At the lower levels (50% AMI and less), the developer has financial incentive to charge up to the maximum allowable rent. Operating expenses on a per unit basis for these AMI level units frequently exceed the maximum allowable rents, and what's more, the demand for them is robust. It's unlikely that a developer will struggle to lease up these units regardless of the market due to high demand for affordable housing at lower income levels.

At higher AMI levels, from 60% to 80% AMI, a developer may choose not to set rents at the highest allowable levels due to concerns that rents may approach or even exceed comparable market rate units, jeopardizing their ability to lease those units and maintain high occupancy levels. Developers who aren't "maxing out" allowable rents across all units are less concerned that asking tenants to pay for water will decrease their gross rental receipts.

Reason 2: The Water Utility Allowance Can Change Over Time, Subject to External Forces

State Housing Finance Agencies and other affordable housing funders require different methodologies for determining utility allowances. Some will require developers to use a schedule formulated by the local housing authority while others will require use of the HUD model. The HUD model relies on regional data to create project-specific utility allowances. Other agencies allow engineer-calculated allowances furnished by developers. Since the developer or operator's engineer is familiar with the actual building, its performance (if it's an existing asset) and its water efficiency measures, engineer-created allowances tend to be smaller and preferred by developers. Still, affordable housing requires a long hold period, and with the potential for actual water costs to climb (impacting all models, and the engineered models sooner than the others) and the possibility that a state agency could change its requirements or utility allowance evaluation methodologies, which are challenging to predict far into the future.

Reason 3: Recovering Water Costs Is Uncertain When Tenants Do Not Pay

Owners must consider what happens should a tenant fall behind on their individual water bill. While ongoing nonpayment of rent constitutes grounds for intervention, responsible operators are increasingly turning to resident partnership tools to address payment challenges before they escalate-including Housing Stability plans to structure repayment, rent-splitting services that allow residents to pay in smaller increments throughout the month, and data analytics that flag early signs of financial distress so that staff can intervene proactively. Despite these tools, often very little legal recourse exists for unpaid water bills. When tenants do not pay for water, owners experience the revenue implications twice by not being able to recover those costs and capping their ability to increase rents having elected to include water in the utility allowance. By electing not to bill residents for water, owners decrease their downside risk.

Reason 4: Billing Tenants May Not Cause Them to Reduce Water Usage

Research by the California Urban Water Conservation Council suggests that submetering can reduce water consumption by 15.3%, but that the cost per unit to achieve that reduction exceeds the savings. While this finding is meaningful from an environmental toll perspective, owners managing tight operating budgets cannot justify the expense. According to their

findings, “the average apartment’s indoor (water) use is highly price-inelastic.” When residents are billed directly, the amount of water used decreases only marginally. The study determined that submetering and resident direct billing would be more likely to benefit larger luxury apartments whose residents may have more ability to decrease optional, vs. necessary water consumption. Another argument in the research posits that, “price responsiveness of property owners appears to be significantly greater than that of sub metered renters, the wisdom of sending price signals to the less responsive party remains questionable.”[8] Essentially, it is ill-fated to place the responsibility for controlling water usage on the party that, economically speaking, is least motivated.

Dominium’s portfolio-level ION data supports this finding. Analysis of monthly unit-level water consumption across a subset of eight multifamily properties shows that average tenant water use did not increase following the introduction of billing and, in fact, declined modestly. Portfolio-wide average indoor water consumption decreased from approximately 41 GBD in the pre-billing period to 35 GBD during the billing period, representing a 14.8% reduction. However, concurrent ION data indicates that most observed water savings were attributable to the identification and repair of previously undetected leak events rather than changes in tenant behavior in response to billing. This suggests that system-level leak detection, rather than price signaling to tenants, was the primary driver of reduced water consumption. The underlying unit-level consumption and leakage data supporting this analysis are provided in the attached dataset for reference.

As Jack sifted through these findings, the picture became clear. Dominium was not going to solve its water problem by shifting responsibility to residents. The data simply did not support it. The properties that had reduced consumption most meaningfully had done so because management intervened, not because tenants changed their behavior. If Dominium was going to control water costs at scale, it would have to do so itself. So how would retaining that control drive long-term financial value? In the next section, we explore this further.

How controlling water cost can increase NOI and unlock lower cost financing

Net Operating Income (NOI) represents a property’s profitability before accounting for debt service. NOI is found by taking the gross income of the property and subtracting operating expenses. Water is a line item within operating expenses, so when water costs decrease due to declines in water usage, NOI increases. While NOI is related to profitability, in affordable housing it is also related to project feasibility and financial stability over a long hold period.

[8] California Urban Water Conservation Council, *Submetering of Multi-Family Residential Properties* (Prepared by John Koeller and Anil Bamezai, Western Policy Research, November 2005)

Lenders underwrite projects with greater NOI as having stronger repayment capacity for their monthly debt service payments, thereby enabling those owners to leverage more debt.

Implications for New Construction

When underwriting new construction, higher NOI means a higher property valuation as well as a higher debt service coverage ratio (DSCR), meaning one can support a larger permanent mortgage. The larger the permanent mortgage, the smaller the sources of "gap" financing required, such as Tax Increment Financing (TIF), Federal Home Loan Bank Affordable Housing Program funds (FHLB AHP), other local funds, impact equity funds, and other similar sources that an affordable housing development may need to achieve feasibility. The combination of these factors helps ensure projects are financially secure and resilient. If Dominium can convince its lending partners to consistently underwrite at an increased NOI due to lower, consistent water costs, Dominium can finance units more efficiently, effectively allowing them to build more.

Implications for Preservation and/or LIHTC Re-Syndication

After the 15-year LIHTC compliance period ends, properties generally need a capital infusion to support a physical refresh. This infusion can then extend asset viability, increase its amenity space or green construction elements and, if re-syndicated, its affordability. Achieving a higher NOI through water cost savings allows Dominium to once again receive a larger loan due to an increase in the value of the property and its ability to service debt. A more robust capital stack may allow the owner to "pencil out" a project using a fresh allocation of LIHTC, increasing the property's longevity, energy efficiency, and long-term affordability.

Whether the strategy is long-term preservation, acquisition/rehabilitation, refinance, or otherwise, increasing NOI at any point in the hold period strengthens both asset value and investor returns. When affordable housing owners are financially motivated to decrease water usage, their incentives are aligned with broader social and environmental interests. For an industry that revolves tightly around public-private partnerships via LIHTC, property tax abatement, and other government programs, it is worth exploring how driving towards those broader social and environmental objectives can support public interests while elevating private enterprise.

Part III. Environmental and Social Implications of Decreasing Water Usage in Affordable Housing

Water usage plays an important role in the sustainability and long-term viability of affordable housing projects where resource efficiency directly impacts both social and environmental outcomes. In this section, we summarize key dynamics in multifamily water usage and the environmental implications of conserving water in this context.

Aging and Inefficient Water Infrastructure

In most cities in the United States, water infrastructure is stressed due to increasing water demand and rising climate risk. According to the American Society of Civil Engineers (ASCE) 2025 infrastructure report, drinking water infrastructure across the U.S. has an average "C-" grade, indicating systems in poor condition with emerging signs of deterioration while stormwater infrastructure earned a "D+", reflecting aging systems with significant deficiencies and requiring urgent investment.[9] The U.S. Environmental Protection Agency (EPA) estimated that 14-18% of treated drinking water is lost before it reaches end users due to leakages associated with aged water infrastructure. Water loss rate exceeds 30% in some cities. These losses increase water utility costs and often mean that more water volume is distributed than what the customer actually uses. The cost of this inefficiency is ultimately passed through to average consumers and property owners. Studies by Madias and Pacific Institute in 2022 show that efficient water management systems can reduce per-unit water demand by up to 30% and lower a building's carbon footprint significantly.[10] Efficient water usage helps to lower demand on municipal water infrastructure, reduces the required energy for water treatment and distribution, and minimizes the greenhouse gas emission associated with heating and pumping water. These benefits underscore the importance of efficient consumption of water in advancing sustainability.

Rising Domestic Water Consumption

Domestic water consumption accounts for approximately 11% of total water consumption. Based on the World Resource Institute (WRI) 2020 report, domestic water consumption has grown by 600% between 1950 and 2014.[11] Driving factors such as population growth, higher per-capita indoor usage from appliances such as washing machines and dishwashers, increased outdoor irrigation in suburban neighborhoods, expanded building square footage per household, and more time spent in the home in general.[12] Indoor residential use in the U.S. averages 82 gallons per person per day. Some of the main domestic water usage activities

[9] American Society of Civil Engineers (ASCE), *2025 Report Card for America's Infrastructure*, ASCE, 2025.
[10] Pacific Institute, *Water Use Efficiency and Conservation*
[11] Otto and Schleifer, *Domestic Water Use Grew 600% Over the Past 50 Years* (WRI, 2020).
[12] U.S. Geological Survey, *Estimated Use of Water in the United States in 2015*, USGS Circular 1441 (2020).

are showering (20%), washing-machine usage (17%), toilet flushing (24%) and outdoor activities such as swimming pools (19%) according to a report by EPA WaterSense in 2016.[13] The process of treating, heating, and pumping water requires a substantial amount of energy. The average U.S. treatment facility consumes 1500-2000 kWh per million gallons treated which equals 0.0015-0.002 kWh per.[14] Every drop of water wasted in homes is wasted alongside the energy embedded in its treatment and delivery which results in unnecessary greenhouse gas emissions and costs. Reducing water waste by one million gallons can save up to 2000 kWh of energy and lower the cost of operation and associated greenhouse gas emissions. With hundreds of residents sharing water infrastructure in multifamily affordable housing developments, inefficient water consumption increases wastewater generation and the pressure on already stressed wastewater treatment facilities. Using water resources efficiently in affordable housing projects will yield multiple environmental benefits ranging from conservation of natural water resources, to improving water quality to reducing greenhouse gas emissions. Additionally, the lifespan of existing infrastructure can further be extended if developers and property managers adopt the usage of technology that monitors water consumption and tracks leakages, promoting environmental responsibility in the process.

Part IV. Data Analysis and Results

i. Dataset Description

This analysis draws on anonymized performance data from 29 Dominium properties monitored by ION's End-to-End Water Management system. Pre-ION water consumption across these properties ranged from 36 to 250 gallons per bedroom per day (GBD), with a mean of 92 GBD and a median of 85 GBD. Post-ION savings ranged widely across the portfolio: the bottom quartile of properties (P25) achieved savings of 16 GBD — a 31% reduction — the median property (P50) saved 36 GBD (41% reduction), and the top quartile (P75) achieved 52 GBD (55% reduction). These three performance tiers serve as the basis for the scenario analysis that follows. A blended water and sewer rate of $0.016 per gallon with 3% annual escalation was applied. Please note that there is evidence to suggest that annual escalation is currently greater than 3%, we understand that the industry convention is to underwrite at 3% annual cost escalation and to broadly challenge that underlying logic is beyond the scope of this case study.

ii. Return on Investment: Does ION's System Value Scale with Bedroom Count?

[13] U.S. Environmental Protection Agency (EPA), *Residential Indoor Water Use in the United States*, WaterSense Program, 2016.
[14] Electric Power Research Institute (EPRI), *Electricity Use and Management in the Municipal Water Supply and Wastewater Industries* (2013).

The short answer is yes, and meaningfully so. Across the 29-property dataset, ROI multiples rise sharply with unit size at every savings tier (Figure X). At the median savings level, 3-bedroom unit yields a 4.48x return, while a 2-bedroom unit at the same savings level yields 2.89x, and a 1-bedroom unit yields a 0.95x return. At the 75th percentile, 3-bedroom returns reach 7.44x and 2-bedroom returns reach 4.63x.

This scaling effect reflects a structural feature of the ION fee model: platform fees are charged per unit rather than per bedroom, while savings accrue per bedroom. Larger units therefore generate proportionally more water savings against the same fixed fee base, producing compounding returns as unit size increases.

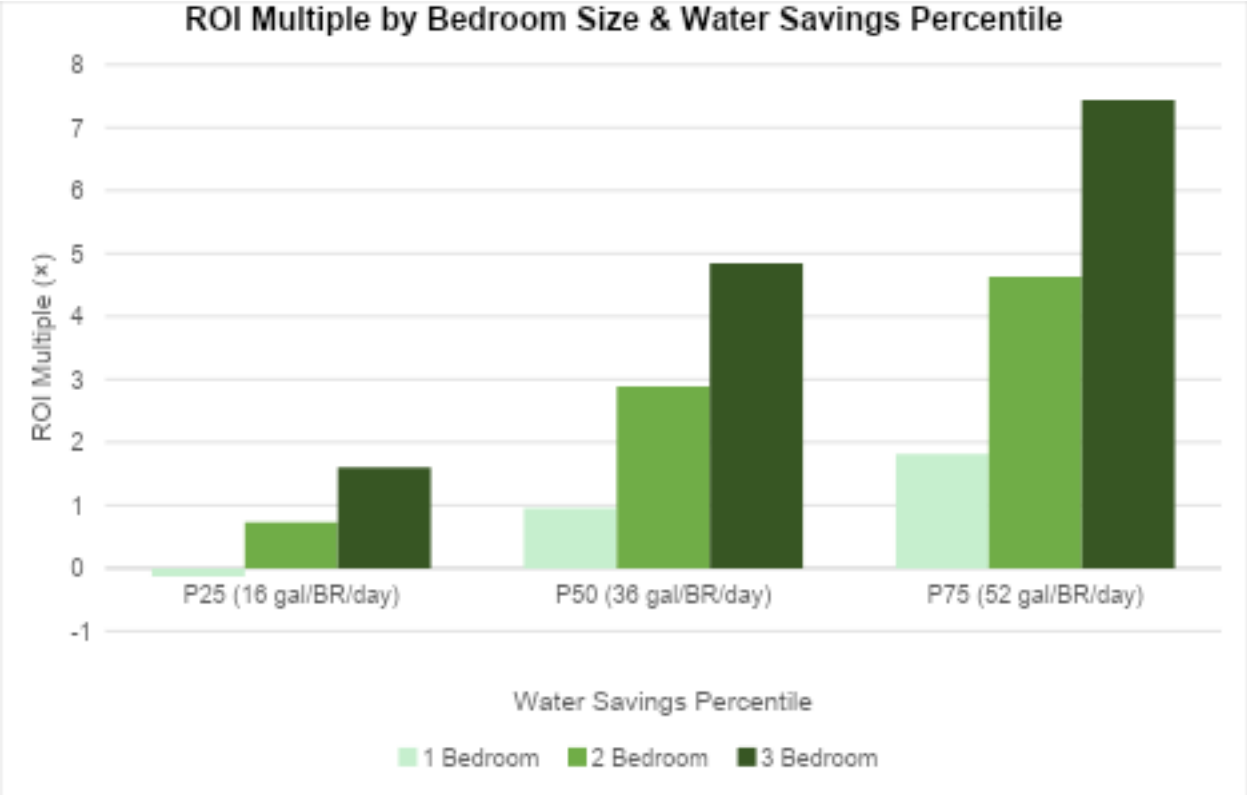

Figure D. ROI Multiple by Bedroom Size and Water Savings Percentile: Fifteen-year ROI multiple by bedroom type and water savings percentile (P25/P50/P75), expressed as a ratio of net savings to total ION platform fees ($2,040/unit).

iii. Benchmark Analysis

To make the financial threshold explicit, we apply four performance benchmarks: scenarios with negative NPV are classified as *not worth it*; NPV of 15 years of savings $0–$2,500 (ROI 0-1x) as *marginal*; $2,500-$6,000 (ROI 1-4x) as *good*; and above $6,000 (ROI above 4x) as strong. Applying these benchmarks across discount rates of 3% to 15%, all 2-bedroom and 3-bedroom scenarios produce positive returns across every discount rate tested. Even at the

most conservative assumptions, lowest savings tier and highest 15% discount rate, a 3-bedroom unit yields $1,095 and a 2-bedroom unit yields a positive NPV of $443. At the median savings level (P50), a 3-bedroom unit ranges from $3,543 at a 15% discount rate and a $7,729 NPV at 3% rate, while NPV for a 2-bedroom unit ranges from $2,074 to $4,602—spanning moderate to strong returns across the full discount rate range tested (Figure E).

ION End-to-End Water Management system adoption is an approximate financial breakeven in only one scenario: 1-bedroom units in the bottom quartile of water savings (P25, ≤31% reduction), where fees modestly exceed cumulative savings by approximately $210-$263 per unit. This represents the lowest-performing 25% of properties in the dataset. However, it is critical to note that this single below-breakeven scenario is context-dependent. The financial case for 1-bedroom units at the P25 savings tier is particularly sensitive to local water rates. In municipalities with above-average utility costs, this scenario would yield positive returns. More importantly, affordable housing developments are rarely composed of a single unit type. When ION End-to-End Water Management adoption is evaluated at the property level across a typical unit mix, the strong net present value generated by 2- and 3-bedroom units more than offsets the modest shortfall in the most conservative 1-bedroom scenario, producing a compelling portfolio-level return in virtually all cases.

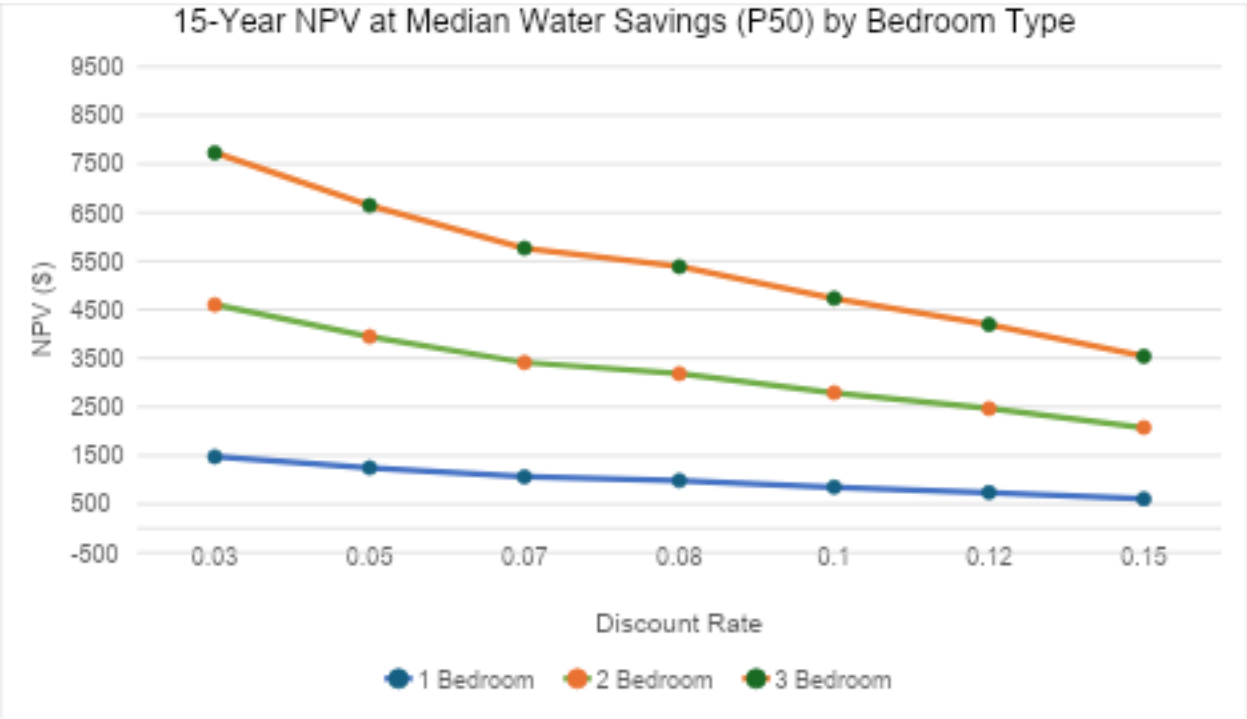

Figure E. NPV at Median Savings (P50) by Bedroom Size and Discount Rate: 15-year NPV ($) at median observed water savings (36 gal/BR/day) by bedroom type, across discount rates of 3%–15%.

iv. Breakeven Threshold

A practical question for developers evaluating ION adoption is: *how much savings does a property actually need to break even?* The answer is surprisingly low. At a 10% discount rate, a 3-bedroom unit needs just 7 gallons per bedroom per day in savings to reach an NPV of zero. A 2-bedroom unit needs only 10 gallons per bedroom per day, while a 1-bedroom unit requires 20 gallons per bedroom per day. (Figure F). The vast majority of properties in the dataset exceed these thresholds.

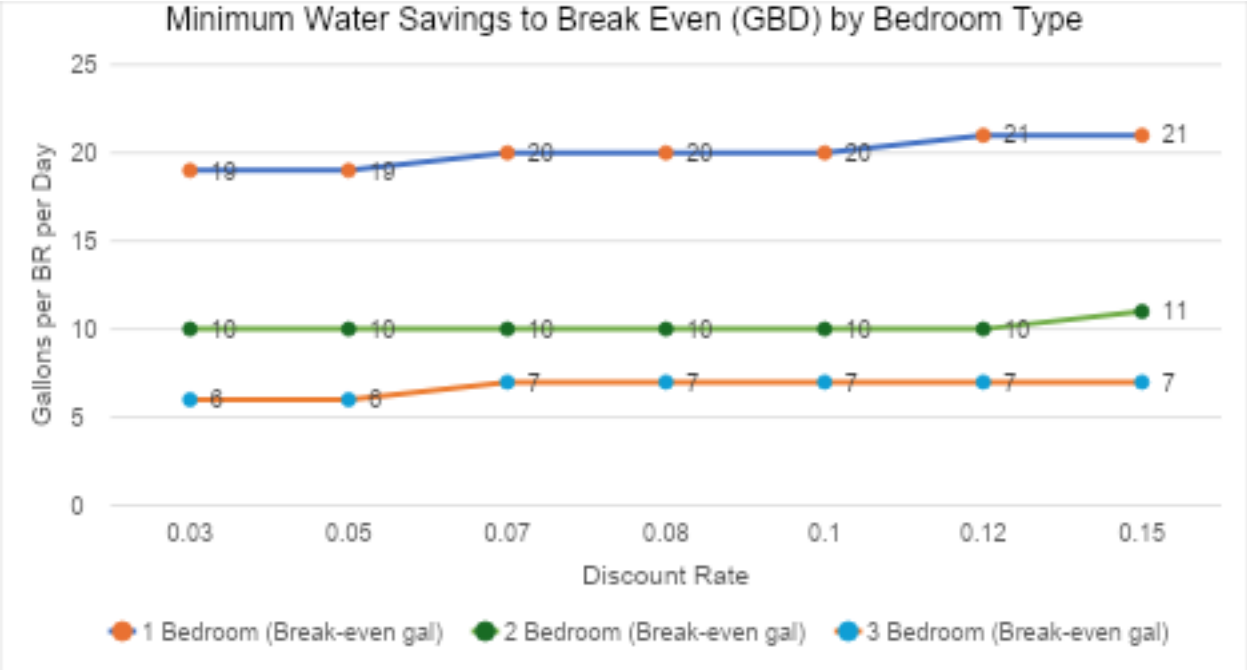

Figure F. Breakeven Water Savings Threshold by Bedroom Size] Caption: Minimum daily water savings (gallons per bedroom) required for NPV ≥ $0, by bedroom type across discount rates of 3%–15%.

The 15-Year NPV and ROI sensitivity model including sensitivity tables and escalation parameters is provided as a digital appendix here.

Part V. Considerations for Affordable Housing Developers and Affordable Housing Subsidy Providers

For affordable housing developers, water management increasingly influences day-to-day asset performance and longer-term investment decisions. Because rents are capped, changes in operating costs tend to flow directly through to cash flow and debt coverage rather than being absorbed by higher revenues. Water and sewer expenses are distinctive in this respect

because they are shaped by internal building conditions rather than purely external pricing decisions. Undetected leaks, failing fixtures, and aging plumbing systems can steadily increase water consumption without improving resident comfort or service quality. Technologies that address these internal losses therefore operate less as cost-saving tools and more as mechanisms for risk control, helping owners maintain predictable operating performance and preserve debt capacity. This perspective also helps explain why some commonly used conservation approaches have delivered inconsistent results in LIHTC properties. Strategies that rely on influencing tenant behavior, such as submetering or direct water billing, assume that residents have both the visibility and ability to decrease water use meaningfully. In practice, much of the excess consumption in affordable housing is driven by mechanical failures that residents aren't likely to notice or report to maintenance. Research documenting the limited price responsiveness of multifamily water demand reinforces this point. In rent-restricted settings, shifting responsibility to tenants can also introduce administrative complexity and payment risk, while leaving the underlying sources of water loss unresolved. Approaches centered on unit-level monitoring and early leak detection therefore align more closely with how water inefficiencies arise in these buildings.

As our research suggests, this type of approach may generate a greater impact at larger unit levels. As the graphic above demonstrates, water pricing and expenditures can vary widely from place to place (see Figure G below), and higher water cost areas stand to benefit more from water and leakage reduction systems. These are all considerations for affordable housing policymakers and subsidy providers to consider. For subsidy providers and public agencies, the implications of water efficiency extend beyond individual properties. Public capital and operating subsidies are often deployed to stabilize housing over long time horizons, yet ongoing cost volatility remains a common source of financial stress in aging portfolios. Investments that reduce avoidable water losses help moderate this volatility by lowering exposure to infrastructure-related cost increases and unexpected operating shortfalls. At a system level, these measures also interact with broader concerns about the condition of municipal water infrastructure and the prevalence of non-revenue water. By supporting strategies that improve building-level efficiency, subsidy programs can help protect public investment, reduce the likelihood of future recapitalization needs, and advance policy goals related to environmental sustainability, infrastructure resilience, and long-term affordability.

Figure G

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