

# Submeter Data and Water Leak Detection Help Apartment Building Property Owner Cut Utility Expenses by Over Half



*Cheverly Crossing Apartment Building, a 60-unit property, installed submetering to track water/sewer, electricity and natural gas.*

Comprehensive submetering approach leads to dramatic savings for owners of master metered, 60-unit apartment building.

## INTRODUCTION

Cheverly Crossing, NOVO Properties' mid-rise apartment building located in Hyattsville, Maryland, was experiencing high utility expenses that were being heavily impacted by water, sewer, electric and gas usage. To address the problem, Bruce Hurd, a partner at NOVO, decided to monitor all three utilities at the building, which is more than usual since most companies only track electricity. Hurd selected the submetering manufacturer H2O Degree based on its more comprehensive approach to monitoring and reporting compared to competitive options. This case study describes how the submetering installation at Cheverly Cross-

ing led to a dramatic reduction in utility costs by monitoring submeter data to adjust tenant billing. It also shows how reporting water leaks resulted in further savings by prompting the property manager to proactively fix maintenance issues and encouraging tenants to reduce their consumption. Due to the success of the program, three additional submetering projects have been completed at other NOVO properties.

## SUBMETERING INSTALLATION

Cheverly Crossing is a six-floor building with 60 apartment units, each containing a breaker panel and a gas furnace with an air conditioner. The property's water system is riser-piped with a central gas boiler generating domestic hot water energy. With the installation of H2O Degree's measurement and control

system, NOVO began monitoring the apartment building's electric, water, sewer and domestic hot water energy — as well as the heat run-time of gas used for heating.

Figure 2. H2O Degree's battery-powered wireless water meter (M54120) is used to measure water consumption at Cheverly Crossing apartments.



Figure 3. H2O Degree wireless thermostats monitor and control HVAC functions and simultaneously act as a wireless transceiver.



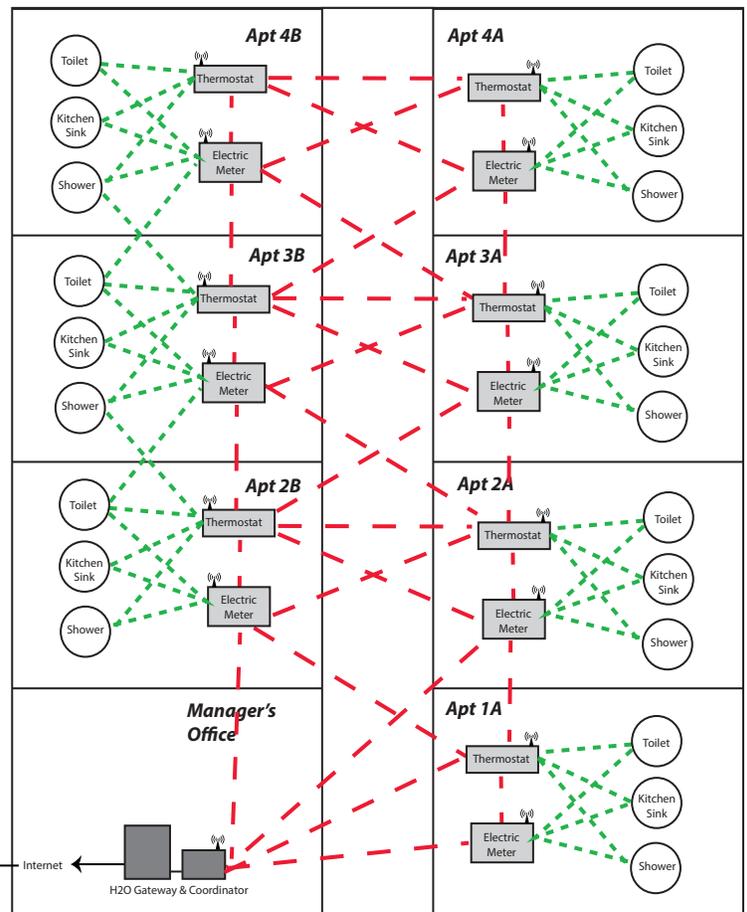
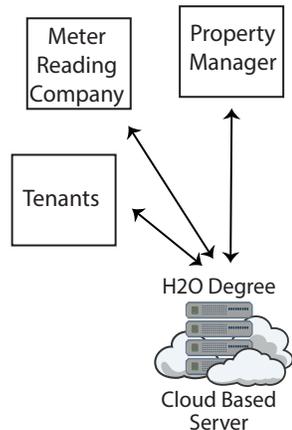
Figure 4. H2O Degree's wireless meters communicate utility data at NOVO's Cheverly Crossing Property.

In each apartment unit, H2O Degree's battery powered wireless water meters (Figure 2) were mounted at the tub, shower, toilet and kitchen hot water feed using four meters per apartment. The devices provide a radio interface to remotely monitor and collect water consumption data from the H2O Degree flow sensor. The meters monitor actual water usage in gallons and records the number of events, the duration of events and water temperature.

H2O Degree's battery-powered water meters communicate with a transceiver (Figure 3).

At Cheverly Crossing, the thermostats and electric meters act as transceivers. This is a unique feature of H2O Degree's wireless mesh network, resulting in substantial savings over traditional wireless repeater networks.

The diagram in Figure 4 shows how H2O Degree's comprehensive metering system is installed throughout the building.

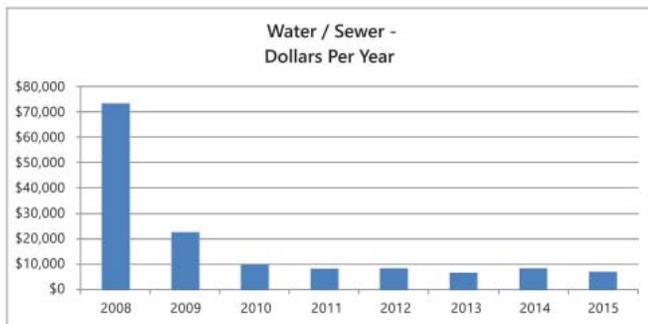


Wireless Water Meters talk directly to any Wireless Mesh Transceiver that responds to signal (Green Line). Wireless Mesh Transceivers, Thermostats or Electric Meters act as a receiver and a transmitter sending data from one device to another. Data is transmitted via the mesh network (Red Line) to H2O Coordinator and Gateway. Gateway sends data via the Internet to H2O Degree Cloud Based Servers for access from any location where Internet access is available. Note: Battery powered meters will only communicate with one transceiver at a time. This diagram represents a variety of transmission possibilities and will change depending on building configuration and environmental changes.

## CHANGING TENANT BEHAVIOR

Once the submeters were installed, Cheverly Crossing's meter reading company began receiving daily billing reports based on the utility consumption data for each tenant. In addition to electricity, water/sewer and gas, the property owner was able to monitor — and bill for — domestic hot water energy (DHW). An essential calculation shown on the report is the Average Daily Consumption, or ADC, which is typically 70 gallons of water per day for a typical one bedroom apartment. However, Cheverly Crossing's ADC was a staggering 200 gallons!

*Figure 5. Proactive maintenance at Cheverly Crossing based on H2O Degree's leak report helped achieve immediate, and dramatic water savings.*



The tenants, now receiving individual bills based on their actual usage, immediately changed their behavior based on the financial incentive to conserve. They reduced their heating and cooling demands when their apartments were unoccupied, in addition to turning off lights, shutting windows and making sure that toilets weren't running.

*Figure 6. H2O Degree's customer-facing website and mobile app allows users to adjust thermostat settings remotely and conserve energy usage.*



## CHANGING LANDLORD BEHAVIOR

An extremely useful side benefit of the remote monitoring system was that the property manager could use data — which reports and compares demand for heat to average set-points and temperatures every hour — to proactively fix problems. For example, the property manager previously had to rely on complaints from the tenants to be aware of a problem with the HVAC systems. But after submetering was installed, the manager had visibility into HVAC malfunctions that surfaced from monitoring the usage data and could repair the units before they became an issue with the tenants.

In addition to monitoring and recording water consumption for tenant billing, the H2O Degree wireless water meters also detect leaks.

Once the submeters were installed, submetering data collected at each tenant location was used to create Leak Detection Reports. H2O Degree delivered daily leak detection reports via e-mail to the Cheverly Crossing property manager so that maintenance staff could respond and make repairs before the leaks could generate significant waste. And by pinpointing water leaks in exact locations, building maintenance was able to replace specific parts — flapper valves, stuck chains, cracked flow valves, etc.

The behavioral change by the maintenance team, based on the Leak Detection Reports, combined with the tenants' water conservation, resulting from accurate water billing, enabled Cheverly to bring its Water ADC from 200 to 80 gallons in the first year — and lowered it even more in subsequent years.

Hurd, the NOVO property partner, noted the importance of having H2O Degree's Leak Detection Report identify what was leaking, and why, so that the right parts could be in hand when maintenance knocked on the door. "The results," he said, "are far better than even we forecast."

## MONITORING RESULT: WATER AND SEWER

The Cheverly Crossing apartment building installed its water submetering system in July 2009. The water/sewer rates provided by Cheverly's water utility WSSB (Washington Suburban Sanitary Commission) are

graduated, so that high consumption is penalized with a much higher rate per thousand gallons.

While Cheverly Crossing reduced water use by 66% in the last 12 months compared to the baseline, they reduced their water/sewer expense by over 80%. The building's water/sewer averaged \$115 per apartment per month in the first nine months of 2008 — in the first half of 2010 dropped to an impressively lower \$13.25 average. In the first year after the submetering installation, Cheverly's total water/sewer expense went from \$73,320 in 2008 down to a significantly lower \$13,565 during 2009. And since 2010, the results have been maintained at this low level (Figure 5.)

### MONITORING RESULTS: ELECTRICITY

The submetering system for monitoring electricity at Cheverly Crossing was installed in February 2009. While leak detection prompts the property owner to take action themselves by fixing problems causing wasted water, tracking electricity throughout the building enables the owner to collect the data they need to bill tenants according to the tenants' actual electricity usage.

Tracking electric usage at Cheverly Crossing immediately resulted in a 33% decline in use. The three critical summer months in the first year of metering, consumption was down by 49% compared to the same three months of the prior year. Savings was \$24,126 per year, of which \$16,500 accrued in the summer months alone.

The H2O Degree thermostats were purchased by Cheverly to track heating energy use of the gas furnaces, but they also allow residents to control air conditioner use, but just as importantly, they were able to use H2O Degree's Green Thermostats to control utility use.

Green thermostats are easy to program with a simple menu function in one of three user-determined language (English, Spanish or French). Residents who want to conserve can view a thermostat dashboard on the H2O Degree website (Figure 6) to show them results, or they can use a mobile app. To save energy, residents can aggressively schedule temperatures to rise when they are not home and to return to more comfortable levels for when they return home.

### ONGOING SAVINGS

When the first year of submetering results from Cheverly Crossing were analyzed, NOVO Properties showed a \$70,000-plus per year cash flow improvement and a \$1.32 million boost in property valuation (\$22,000 per unit).

Today, Cheverly Crossing Apartments continues to enjoy the dramatic drop in utility consumption that was first tracked in 2010. The results have been so successful, NOVO Properties has installed H2O Degree submeters at three additional NOVO apartment buildings in Maryland: Canonbury Square and Tudor Place in Hyattsville property and Finian's Court in Lanham.

*For more information on H2O Degree products or the successful project at Cheverly Crossing, contact H2O Degree at (215) 788-8485 or visit us online at [www.H2ODegree.com](http://www.H2ODegree.com).*



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