

Water Conservation Retrofit Strategies

A Guide for Multi-Family Apartment Owners and Managers



NIAGARA
CONSERVATION®

Background

Water Consumption in Multi-Family Housing

- 1/5th of the US population lives in multi-family rental housing
- Most of these residents do not pay a water bill as it is embedded in their rent
 - *Hence they are free to use as much water as desired without additional charges*
- Rising treatment/distribution costs are transferred to the owners of the apartment buildings



Water Conservation

Why Should We Conserve?

Multiple Benefits:

- Lower energy consumption by reducing water heating and treatment needs
- Lower water and energy bills through more efficient use of water both indoors and in common and outdoor areas
- Increase property values through the modernization of water using fixtures & appliances
- Make more water available during droughts or periods of limited supply

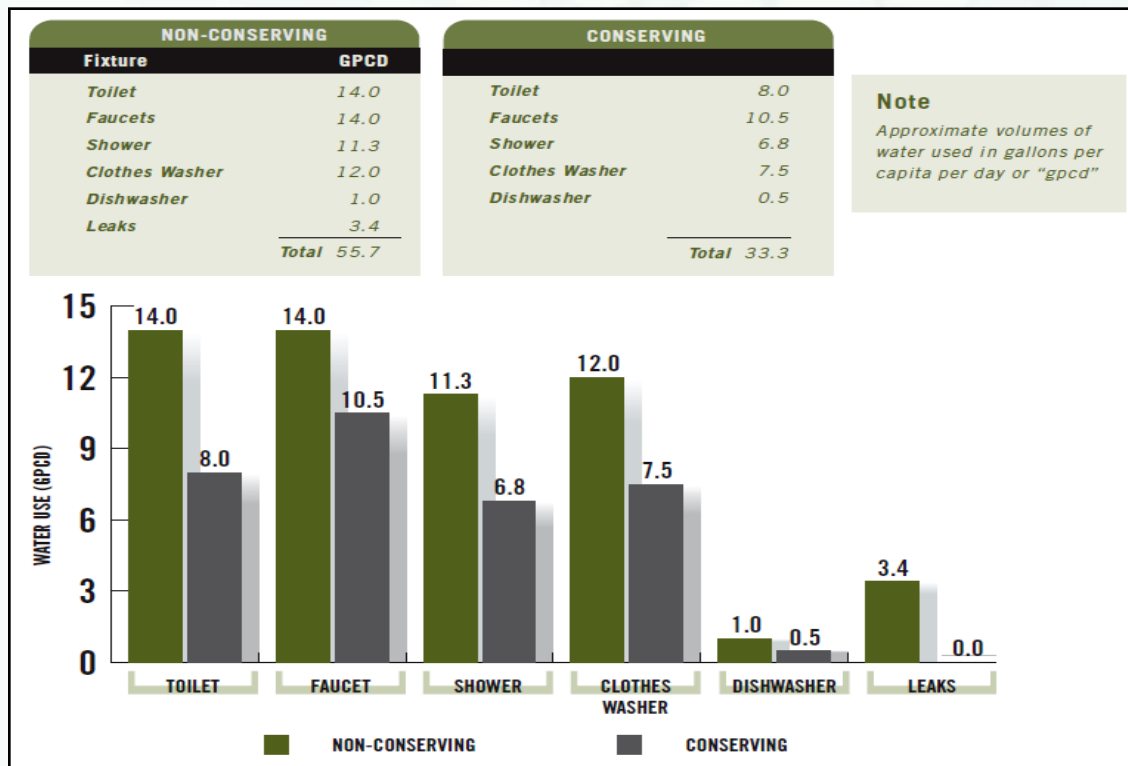
Water Conservation:

“any action that reduces the amount of water withdrawn from water supply resources, reduces consumptive use, reduces the loss or waste of water, improves the efficiency of water use, increases recycling and reuse of water, or prevents pollution of water.”¹

¹ New Mexico Office of the State Engineer

Indoor Water Use

Typical Water Use in Apartment Units

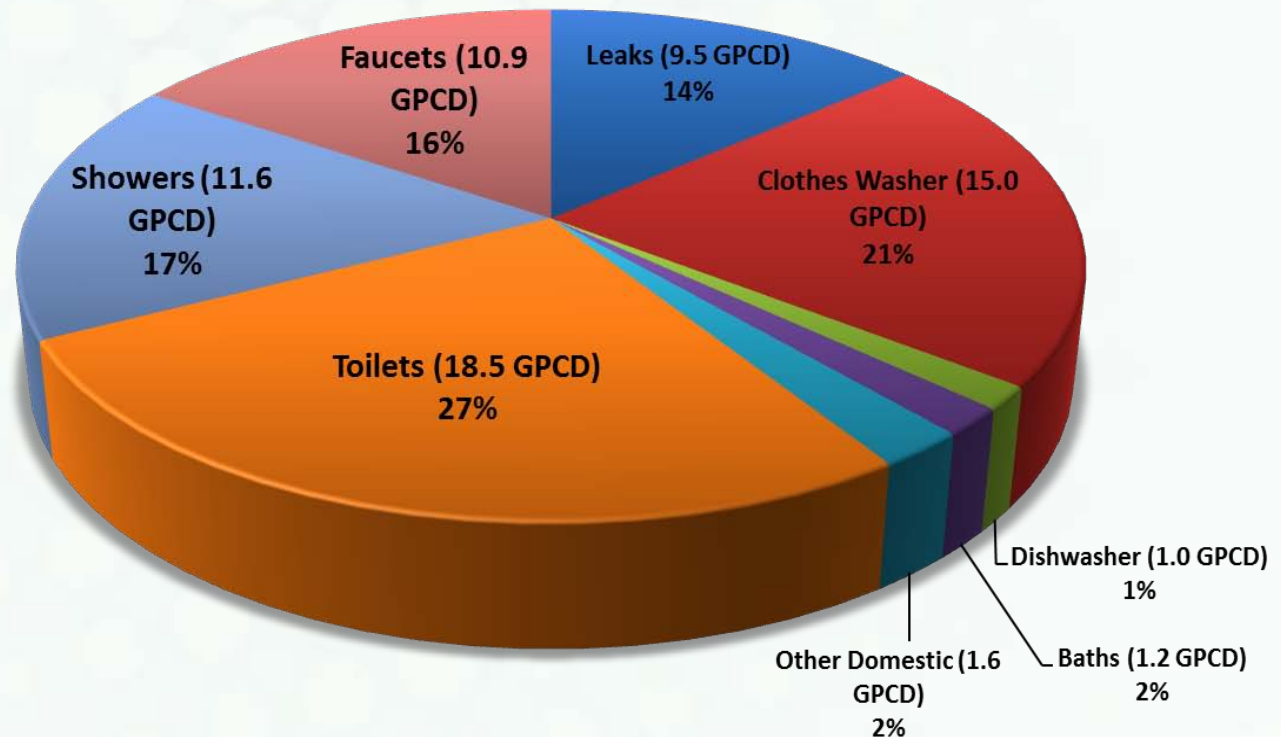


- The volume of water in a non-conserving household can range from 80-150+ gallons
- Two adults living in an apartment with non – conserving devices may use about 56 gallons per person per day.

Indoor Water Use

Average Use in a Non-Conserving Home²

- Average use in non-conserving home: *69.3 (gpcd)*
- Water use from faucets, showerheads, and toilets alone can amount to 41 gallons per capita per day.
- That's 60% of an individual's daily indoor water use



² Vickers, Amy. *Handbook of Water Use and Conservation: Homes, Landscapes, Businesses, Industries, Farms*. Amherst, MA: Waterplow, 2001. Print.

Water Conservation

Strategies

There are typically two water conservation strategies practiced:

1. Behavioral changes to educate and motivate people to become conservation-conscious and engage in conservation practices
2. Hardware measures to modify, repair, or remove/replace water using fixtures or appliances
 - As tenants may lack the motivation to conserve water, multi-family owners/managers must depend on retrofit strategies to reduce consumption and lower their operating costs

Retrofit:

To provide with parts, devices, or equipment not in existence or available at time of original manufacture. To install or fit a device for use in an existing structure, especially an older dwelling

Indoor Retrofit Strategies

- Quick payback strategies
 - Low-flow faucet aerators
 - Low-flow showerheads
 - Toilet inserts
 - Leak detection and repair
- Utility-financed strategies
 - Toilets through direct-install programs
 - Install devices available free of charge in water conservation kits
- Strategies involving utility rebates
- Strategies involving manufacturer discounts
- Submetering



Quick Payback Strategies

- **High-Efficiency Faucet Aerators**
 - Save up to 18 gallons per faucet per day
- **High-Efficiency Showerheads**
 - Save up to 10 gallons per showerhead per day.
- **Toilet Inserts**
 1. Displacement Devices
 - Save up to 4 gallons per toilet per day
 2. Quick-Closing Flappers
 - Save up to 12.5 gallons per toilet per day
 3. Water Level Adjustment Devices
 - Save up to 2.5 gallons per toilet per day
- **Leak Detection and Repair**
 - Severe leaks in toilets can drain over 100 gallons per day
 - Modest leaks from fixtures and showerheads can lose 3 to 7 gallons per day per device



Utility-Financed Strategies

• Toilets Through Direct-Install Programs

- Water utilities recognize the water saving potential of high-efficiency toilets (HETS) and offer incentives to replace older models
- 1992 Energy Policy Act established national manufacturing standard of 1.6 GPF for toilets
- The Niagara Stealth® 0.8 GPF ultra high-efficiency (UHET) toilet cuts standard in half and saves up to 54 gallons per household per day over older 3.5 GPF models



Stealth® 0.8 GPF Ultra High-Efficiency (UHET) Toilet

• Devices Through Water Conservation Kits

- Water utilities frequently offer water conservation kits to customers within their service areas
- Water conservation kits typically include a high-efficiency showerhead, two or three high-efficiency faucet aerators, toilet displacement devices, leak detection tablets and informational materials



Niagara Conservation Water EcoKit™

Other Strategies

- **Rebate Programs**

- Utilities promote the adoption of HETs through rebate programs
- Rebates typically range from \$40 to \$100 per toilet

- **Manufacturer Discounts**

- Get Info from Matt regarding Niagara's high volume discounts

- **Submetering**

- Installation of water meters on water supply lines allows property managers to track water consumption for each unit
- Residents become responsible for their own water bills





Indoor Water Use Assessment

Retrofit Payback Period

Estimate of Indoor Water Conservation Potential , Costs, and Payback			
Item	Toilet	Showerhead	Faucet
1. Flush volume in gallons per flush (GPF) for existing toilets; flow rate in gallons per minute (GPM) for existing faucets and showerheads	3.5	2.5	2.2
2. Flush volume or flow rate for Niagara Conservation water conserving replacements	0.8	1.5	1
3. Potential reduction in water use	2.7 GPF	1 GPM	1.2 GPM
4. Daily use for each device	5 Flushes/Person	10 Min/Person	12 Min/Person
5. Annual water savings (Gallons)	19,710	14,600	21,024
6. Total Gallon Dollar Savings	\$ 78.84	\$ 58.40	\$ 84.10
7. Total kWh Dollar Savings	—	\$ 114.00	\$ 72.00
8. Dollars saved per year	\$ 78.84	\$ 172.40	\$ 156.10
9. Cost of retrofits/replacements	\$ 180.00	\$ 6.00	\$ 1.00
10. Rebate amounts, if any	\$ 50.00	—	—
11. Net costs	\$ 130.00	\$ 6.00	\$ 1.00
12. Payback period in years	1.6	0.03	0.006
*Savings tool assumptions: household size of 4, 5 flushes/person, 10 minute shower use, 12 minute aerator use, 365 days annually			
*Water/Wastewater & kWh ratios based on Federal Energy Management Program (FEMP) calculations			

← Matt must enter values

Retrofit

Why Retrofit?

Water Conservation:

