

# Water Savings Models for AMI's and Customer Portals

*Developed by Heather Rose, Fall 2019*

## AMI Smart Meters

*Water savings from early leak detection and repair.*

$$\text{Water Savings} \left( \frac{\text{Af}}{\text{yr}} \right) = [L] \times [SF\_GPCD] \times [P_f \times H \times CpH_{avg}] \times \frac{365 \text{ days}}{\text{year}} \times \frac{1 \text{ Acrefoot}}{325,851 \text{ gal}}$$

### Terms:

*L = Average leaks in residential homes, 13% (DeOreo 2016)*

*SF\_GPCD = Single family gallons per capita per day for utility.*

*Data available from Texas Water Development Board*

*P<sub>f</sub> = Participation Factor, Fraction of SF connections with AMI's*

*H = number SF Connections in Service Area*

*CpH<sub>avg</sub> = Average capita per Household = 2.63 (US Census 2019)*

### Does not account for:

Users failing to fix leaks once found.

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## Customer Online Portal

*Water Savings from user behavioral changes from information learned through customer portal.*

$$\text{Water Savings} \left( \frac{\text{Af}}{\text{yr}} \right) = [B] \times [SF\_GPCD] \times [P_f \times H \times CpH_{avg}] \times \frac{365 \text{ days}}{\text{year}} \times \frac{1 \text{ Acrefoot}}{325,851 \text{ gal}}$$

**Terms:**

$B$  = Behavioral Component, water use reduction due to education and awareness of household water use provided by meter portal, 6.8% (Davies et. al 2014)

$SF\_GPCD$  = Single family gallons per capita per day for utility.

Data available from Texas Water Development Board

$P_f$  = Participation Factor, Fraction of SF connections with online customer portal

$H$  = number SF Connections in Service Area

$CpH_{avg}$  = Average capita per Household = 2.63 (US Census 2019)

**Does not account for:**

Users failing to check customer portal or change usage behavior

**Resources:**

Davies, K., Doolan, C., van den Honert, R., Shi, R. (2014). *Water-saving Impacts of Smart Meter Technology: An empirical 5 year, whole-of-community study in Sydney, Australia*. AGU Publications.

Available at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2014WR015812>

DeOreo, William (2016). *Residential End Uses of Water*. Water Research Foundation.

Available at: <http://www.waterrf.org/Pages/Projects.aspx?PID=4309>

Texas Water Development Board. *Regional Water Planning Data*.

<https://www.twdb.texas.gov/waterplanning/data/rwp-database/index.asp>

US Census Bureau (2019)

<https://www.census.gov/quickfacts/fact/table/US/HCN010212>