



Automated Enforcement of Outdoor Watering Restrictions

May 17th, 2018

Fresno: A Leader in Water Conservation

- On January 14, 2010, the Fresno City Council approved a contract with Badger Meter, Inc. to provide a Fixed-Network Automated Meter Reading (AMR) and Metering System
- Since 2013, every residential property within the City has Advanced Metering Infrastructure (AMI) technology (aka - “Smart Meters”)
- Fresno is one of few cities with a complete & consistent citywide AMI water meter system with hourly water meter data

Water Conservation Updates: Enforcement

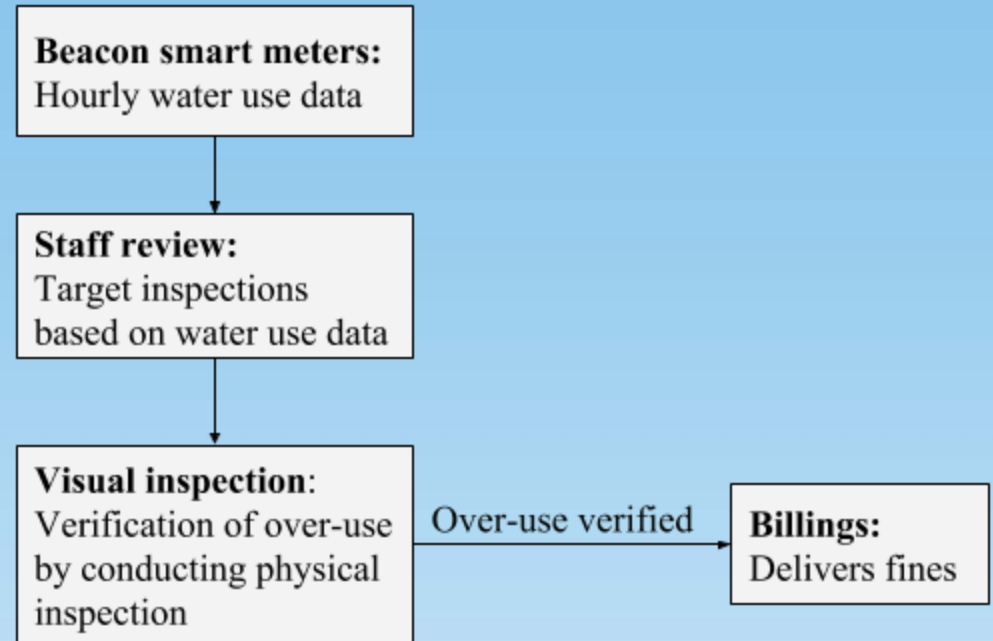
- In 2017, City Council authorized the Department of Public Utilities (DPU) to use AMI technology for water conservation, establishing an excessive use threshold of 300 gal/hr
- In 2017, City Council also authorized an updated fine schedule:
 - First Incident – Notice
 - Second Incident – \$50 fine
 - Third Incident – \$100 fine
 - Fourth Incident & every Incident thereafter – \$200 fine
 - If a customer has more than six consecutive months of water waste, water service may be terminated.
 - Note: Incident counts are to be reset on January 1 of each year

Water Conservation Updates: Harnessing Technology

- On March 8, 2018, the City Council approved a contract for a new data management system (Beacon System) to allow for full utilization of the AMI technology, including the Eye on Water customer access portal. Eye on Water empowers customers to monitor real time hourly water usage data for their property, launching on June 1, 2018

Summary of Current Enforcement Method

- The current method requires significant effort by city staff
- Under current method, city staff cannot cover all violations

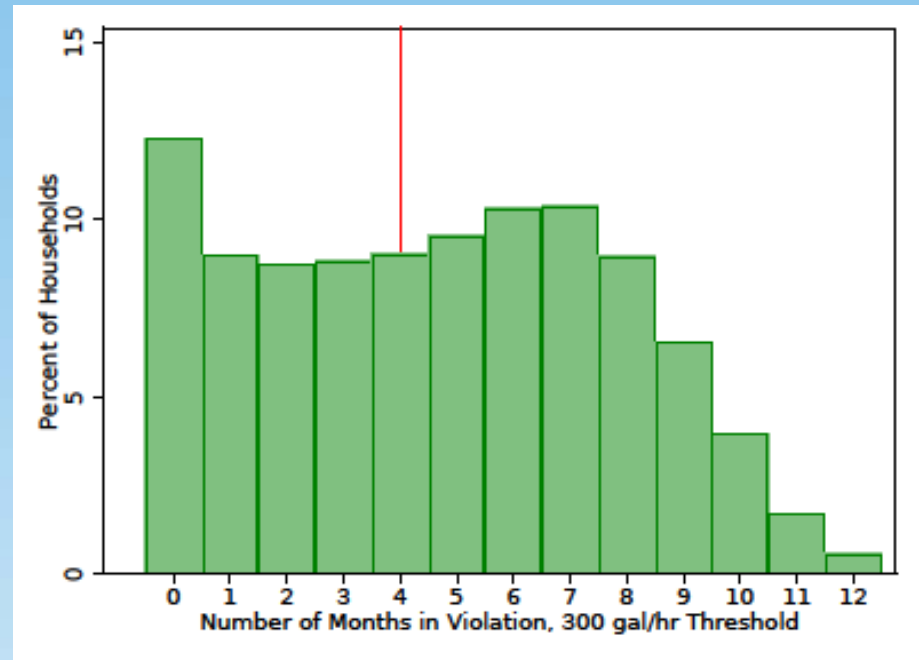


Automated Enforcement Challenge: Fine Burden

While automated enforcement will theoretically drive compliance, there could be **high costs to customers**

Based on historic data, **almost 80% of customers** would have received a fine in 2016 under the current enforcement ordinance

70% of customers would have paid *more money in fines* than on their *yearly water bill*



Automated Enforcement Challenge: Implications

- While the City of Fresno has the potential to fully implement an automated enforcement system, DPU has been applying discretion in using hourly data for enforcement purposes.
- As a result, **execution of enforcement has been limited.**

Solution: A One-Summer Pilot (July 1 – Sep 30)

- The City of Fresno and UChicago have partnered to develop a pilot program that seeks to **find the best method of enforcement**
- Purpose of the pilot project: **To fully utilize the technology available to determine the most appropriate enforcement strategy that best meets conservation goals while minimizing the customer fine burden**

Research Groups

Two dimensions to be researched:

1. Method of Enforcement
2. Varying Fines

Schedule of Fine Thresholds and Probabilities

Fine	Method	Automated Enforcement		
	Visual Inspection	300 Gal	500 Gal	700 Gal
Baseline Fine (\$50, \$100, \$200)	45% (~45,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)
50% Fine Discount (\$25, \$50, \$100)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)
75% Fine Discount (\$12.50, \$25, \$50)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)

Dimension 1: Enforcement Methods

Question 1: How much more effective can automated enforcement be at inducing conservation vs. the current visual inspection method?

During the pilot, customers will be assigned to either receive:

- 1) Visual Inspections (current method), or
- 2) Automated Enforcement (meter data)

Dimension 1 (cont.): Finding the Right Enforcement

Question 2: Can **higher enforcement thresholds** be just as or more effective at generating conservation?

– *Higher thresholds → fewer fines → lower burden on customers*

During the pilot, customers will be assigned to either receive:

- 1) Visual Inspections (current method), or
- 2) Automated Enforcement (meter data)
Enforcement thresholds (**OUTSIDE** of proper watering hours)
 - 1) Baseline (300 gal/hr threshold)
 - 2) Reduced Enforcement 1 (500 gal/hr threshold)
 - 3) Reduced Enforcement 2 (700 gal/hr threshold)

Dimension 2: Finding the Right Fine Schedule

- Question: Can **lower fines** be just as or more effective at generating conservation?
 - *Lower fine amounts → less punitive → less burdensome to customers*
- To test this, customers will be randomized into three different fine schedule groups:
 - Current Fine Schedule
 - 50% discount of Current Fine Schedule
 - 75% discount of Current Fine Schedule

Random Assignment

- The pilot will cover all single-family customers
- 45% of population has no change in their enforcement method or fines
 - Larger visual inspection group in order to limit the number of fines that are issued , based on the capacity of conservation staff
- 55% of population receive different combination fines and thresholds
 - Each sample group will consist of no more than 5% of the customer population
- Random assignment is needed for equity purposes – demonstrating no preference or discrimination
 - Each council district will have an equal share of households in each treatment group

Putting it all Together

All variations are **less stringent** than, or equal to, what has been adopted by Council and outlined in the Fresno Municipal Code

Schedule of Fine Thresholds and Probabilities

Fine	Method	Automated Enforcement		
	Visual Inspection	300 Gal	500 Gal	700 Gal
Baseline Fine (\$50, \$100, \$200)	45% (~45,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)
50% Fine Discount (\$25, \$50, \$100)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)
75% Fine Discount (\$12.50, \$25, \$50)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)	5% (~5,000 hhds)

Measures of Success

1. Reduction in customer's daily water use (overall)
2. Compliance with regulations – for visual vs. automated enforcement.
3. Compliance with regulations – for reduced fine schedules
4. Number of phone calls and complaints received

Communication Strategy

To maximize impact of pilot, DPU will integrate pilot program messaging into its communications strategy for Summer 2018 through:

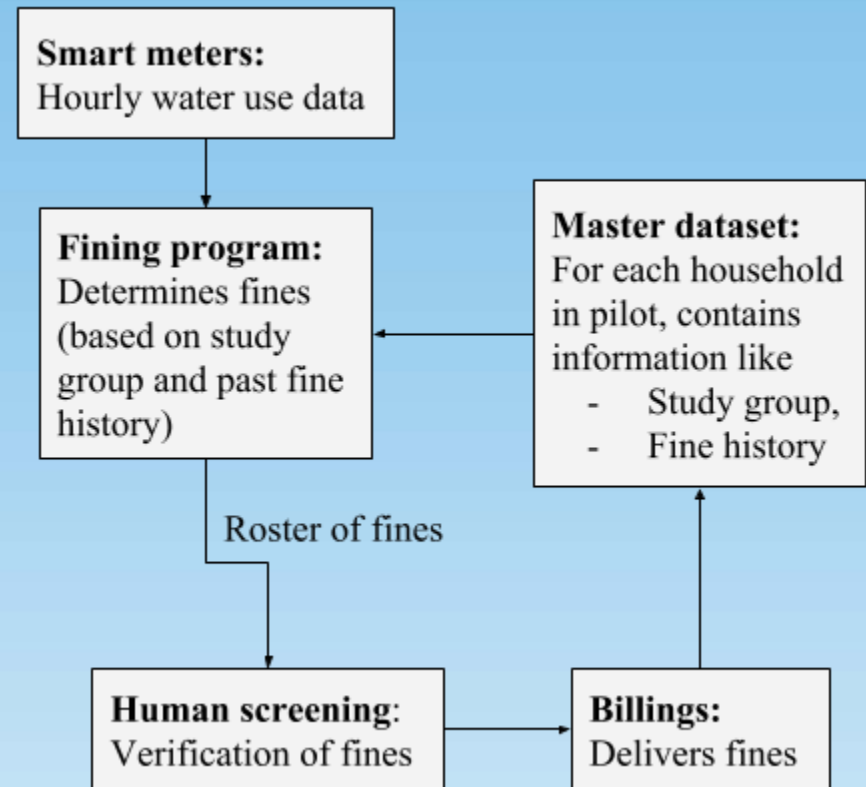
- **Mailers:**
 - June 1 – Initial mailers sent out to describe program identify each property’s assigned research group
 - July 1 – Second set of mailers arrives to remind of program & notify of the program start
- **Utility bill inserts:**
 - June inserts to include 3-Day Watering Schedule, Eye on Water, Pilot Project
- **Informational page on City’s website & Social Media:**
 - Customers can identify their research group by entering property address
 - Include FAQ and contact number

Implementation

Visual Inspections will follow current method

Automated Inspections will be based on meter readings:

- UChicago to assist City staff with computer program to automatically generate violations
- Conservation staff to continue to exercise discretion as needed



Customer Service

- Increased number of calls expected
- UChicago and DPU to work together in writing a script & FAQ sheet to assist customer service reps through calls
- UChicago and DPU to work together in setting up a callback system to aid any phone congestion

Opting Out

- Customers who want to opt out of the pilot will be able to do so by email, website, or phone.
- Customers will be reminded that **staying in the pilot is most likely more beneficial to them due to the reduced fees and higher enforcement thresholds.**
- Customers who opt out will receive enforcement in accordance with the current Municipal Code – that is 300 gal/hr, baseline fine schedule

Option to Pause Pilot

- City will have the option to pause project if systems are not able to handle increases in calls, billing issues, etc.
- If the pilot is paused, no new notices or fines for violations will be issued to allow for a reduction in backlog
- Within a week, the City and UChicago will reevaluate their systems, and will only resume issuing notices for violations if it is determined that there are sufficient resources to handle the expected volume of phone calls, notices or public complaints.

Pilot Timeline

- June 1:
 - Eye on Water launch
 - Initial Pilot Project mailers sent out
 - Utility bill inserts go out
 - 3-Day Watering Schedule begins
- July 1:
 - Pilot Program begins
 - Reminder mailers arrive
- September 1: 2-Day Watering Schedule begins
- September 30: Pilot Project ends
- October 1 – Enforcement reverts to current methods
- November 30 – UChicago presents initial findings to City

Resources Needed

- City Resources:
 - Mailers – printing and mailing costs
 - Notices and Fines – printing and mailing costs
 - Staff time – to handle increased notices and fines
 - Outreach and communications
- UChicago Resources:
 - Programming services
 - Telephone system
 - Staff support for data analysis and program implementation
 - Temporary staff to assist in implementation

Benefits to City

- Valuable data & analysis – re: excessive water use threshold, fine schedule, compliance
- Improved policy – increased compliance with schedules, decreased city wide water use
- Capacity building – management systems and computer software necessary to utilize water meter data for enforcement

Thank you.

Appendix



Pilot Partner: UChicago Energy & Environment Lab

The University of Chicago launched Urban Labs in 2015 to help cities **identify and test the best policies** to improve the lives of their citizens. Together with our partners, Urban Labs:

- Identifies promising solutions to urban challenges
- Tests the most promising urban policies and programs
- Scales up social policies effectively and cost-efficiently
- Urban Labs has five labs: crime, education, health, poverty, and **energy & environment**.

The Energy & Environment Lab has been collaborating with the City of Fresno since early 2016.

Energy & Environment Lab: Partnerships with Other Cities

- **Chicago:** To reduce disposable bag use, UChicago partnered with the City of Chicago to analyze a seven-cent tax on all paper and plastic checkout bags.
- **Baltimore:** UChicago and the City of Baltimore have been working together since early 2017 to design and test a pilot intended to increase residential recycling through a mailer-campaign and a neighborhood-level recycling competition.
- **New York City:** UChicago has partnered with the New York City Department of Environmental Protection to conduct behavior-change, demographic, socioeconomic and consumption-related analyses related to a program to reduce residential water demand during heavy rainfall events.