



# The Value of Public Engagement Campaigns in Ensuring the Success of Advanced Metering Infrastructure (AMI) Implementation

## CASE STUDIES

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# The Value of Public Engagement Campaigns in Ensuring the Success of Advanced Metering Infrastructure (AMI)

Introducing a new technology requires a communication campaign designed with an understanding of the target customer's values, perceptions, and behaviors. In the case of Advanced Metering Infrastructure (AMI), utilities often struggle to encourage customer uptake of the technology. The insights into human behavior, perceptions and attitudes offered by behavioral science can help shape smart communications and outreach campaigns that resonate with target customers — increasing social and environmental awareness and appreciation of the value of the public services offered by water and electric utilities.

The second section of this white paper includes case studies from utilities that have had success at rolling in AMI technology among their customers and encouraging them to make close if not full use of its capabilities. Some of the elements of the behavioral models discussed in the first section of the white paper have been incorporated into the communications outreach used in these campaigns.

Varying levels of public engagement have resulted in different outcomes. The programs are in different phases of implementation and will therefore give the reader a sense of the outcomes by milestone. Case studies were selected based on the availability of data, metrics and access to utility staff for interviews.

## Case Studies

The case studies selected are:

1. Arlington Water Utilities, TX
2. City of Round Rock, TX
3. Fort Collins Utilities, CO
4. Georgetown Utility Systems, TX
5. City of Plano, TX

## Arlington Water Utilities, TX

Arlington, TX is the third-largest city in the Dallas-Fort Worth metropolitan area with a population of 379,577. Between April 2011 and August 2012, Arlington Water Utilities (AWU) embarked on an AMI project. The first phase involved a pilot project to install 17,000 AMI meters in four of its highest cost-to-read billing groups (Dustan, 2016). In late 2013, the City began the second phase to switch over to AMI meters throughout the City.

AWU reported “Approximately \$2.4 million in yearly capital costs is budgeted for the 10-year AMI and meter replacement project. That is about \$1 million more per year than Arlington Water would need if it was replacing meters without AMI. The extra costs are recovered through operational savings” (Peterson, 2017).

AWU uses in-house labor to install the meters at a rate of approximately 9,000 per year in a project scheduled for 10 years (Dustan, 2016). The City has 108,098 water meters of which approximately 46,000 meters have been replaced with AMI technology (Dustan, 2016). Some of the benefits that attracted AWU to AMI technology include decreasing meter reading expenses, ease of leak detection, and generating backflow reports (Dustan, 2016). Another goal AWU sought to gain from AMI is improved customer education on water use and access to more detailed water usage (Dustan, 2016).

As AMI meters are installed, AWU sends letters notifying customers of the switch-out. A list of Frequently Asked Questions with information about the city-wide project accompanies the letters. In 2016, the City released a short Q&A video interview with the Assistant Director-Operations that included questions from the public on the project (City of Arlington, 2016).

In a continual effort to inform and empower customers through their water data, AWU ensures that Customer Service Representative (CSR) are well-trained. CSRs are trained extensively on the Meter Data Management (MDM) software as part of the new hire process. Since not all customers have access to their water usage data, representatives are “trained to look for issues that customers might want to address – such as constant water use or use at odd times of day – and communicate them to customers with usage concerns” (Peterson, 2017).

To address customer concerns, Communications Coordinator Traci Peterson (2017) explains,

“We have focused on communicating to customers that the meter is measuring the water in the exact same way that it always has, it is just the way that the readings are gathered that has changed. This is one of the reasons we have tried to get away from the term "smart meter" in our terminology.”

Generally, AWU is “not hearing a lot from the public” on the AMI project, as noted by the Meter Services Manager, John Norman (Ferguson, 2012). He continues to explain, most complaints have come from customers who noticed increased bills from more accurate registration of new meters installed. In an effort to gain more insight on the customer perception toward the new technology, in 2013, the City was approached by Texas A&M University for a research project.

Focused primarily on the residents in the original pilot project, the purpose of the research was to determine if the data from AMI could provide insight on how communities use water, in order to develop strategies to effectively manage and conserve water supply (City of Arlington, 2016). A&M developed a database and web portal providing data on customer usage per month, day, and hour; estimated bill amounts; multiple account support; and a utility dashboard for customer service (Berthold, 2016).

The top reasons provided by surveyed pilot project customers signed-up to the Texas A&M website was “curiosity/interest” followed by “checking bill/leak detection”; the most common reason for not signing up was lack of awareness and information (Berthold, 2016). A few other top reasons for customers not signing on to the web portal include “no time” or “forgot/ procrastinated/ disorganized” (Berthold, 2016).

Results from a survey of 174 customers conducted by the University in the summer of 2015 showed a majority (81 percent) gained a better understanding of their water usage (Berthold, 2016). More than half (approximately 54 percent) changed their behavior to promote conservation, primarily through leak detection and altering outdoor watering behavior (Berthold, 2016). The A&M research study is ongoing.

## City of Round Rock, TX

In 2015, the City of Round Rock, a large suburban community just north of Austin, began to upgrade its Automated Meter Reading (AMR) program to AMI. Conversion started as a pilot study in November 2009 with 300 homes and then expanded to a total of 29,000 residential and small commercial water meters, with a cost of approximately seven million dollars. As of February 2017, 91 percent of meters were converted. Funding for the project came from a combination of tiered water rates and capital improvement and self-financed construction funds.

Currently only utility staff can access hourly water usage on customers' account. Customer service representatives (CSR) educate callers on specific indoor and outdoor water usage as it pertains to their bills. New CSR staff are given a 30-minute training on the software and shown the relevant information to share with customers, including alerts on the account, usage graphs/charts, and water reports (City of Round Rock, 2017). The city is in the process of making the water usage data accessible to customers through a web portal by fall 2017.

The CSR staff have reported that customers are receptive when data about their water usage is explained to them and evidenced in their water reports (City of Round Rock, 2017). Helping customers to investigate water use makes it easier for CSRs to convince the former on the value of the data and also to take ownership for their bills. To date, utility staff report that when customers know that they can get specific daily or hourly water use data on their property, they are curious and want to learn more about the data and gain access to it (City of Round Rock, 2017).

Customers who are skeptical of the data have also been convinced otherwise when irrigation evaluations conducted by conservation staff are offered. Irrigation is the focus, as the majority of the time, unexpected high water use is the direct result of over-irrigation, lack of awareness/understanding of irrigation settings, and one of the main reasons for high bills. Irrigation audits have been offered since March 2009 regardless of the customers' type (AMI or AMR) of water meter. Audits consist of conservation staff sharing water reports, investigating irrigation techniques, and providing landscaping tips and best practices.

So far, the City has received only one complaint from a citizen. The complaint was with regards to the impact of radio frequencies (RF) from the AMI on health. The City provided proof in the form of studies demonstrating radiation from the AMI is minimal, especially in comparison to a mobile phone, and that the current RF standards are approved by the Federal Communications Commission.

The City wants to share usage data so customers can see water use in near real-time, receive alerts for potential leaks, and set threshold alerts when usage reaches a specific gallon amount use (City of Round Rock, 2016). In this way, the power to change behavior will be in the customers' hands through their bills. After AMI installation is complete, the City will execute a public education and awareness campaign in fall 2017. Ultimately, the City wants to encourage uptake of the web portal to allow customers to take more control and initiative in understanding their water usage (City of Round Rock, 2016).

## Fort Collins Utilities, CO

Fort Collins Utilities is a municipal utility providing electric, water, wastewater and stormwater services to the City of Fort Collins. The City of Fort Collins is located one hour north of Denver. Between early spring 2012 and summer 2013, Fort Collins Utilities replaced most of its old electric meters with AMI meters and installed communicating water modules for commercial and residential customers. A total of 65,000 electric meters and 33,000 water modules were replaced.

The project was partially funded using a Department of Energy Smart Grid Investment Grant and bonds. Roughly half of the electric portion of the project (\$34,890,127) was funded by the grant. The water department paid for all costs (approximately four million dollars) associated with water communication modules and installations.

Among other reasons, Fort Collins Utilities leadership adopted AMI to provide customers with better information on high and irregular water use, which also supports the community's conservation goals. Fort Collins Utilities offers an online web portal, "Monitor My Use", which allows customers to monitor water in one-hour intervals and electric use in 15- minute intervals. The web portal helps customers better understand their usage patterns and utility bills.

Sign-ups and interaction with the portal have been fairly modest. At the end of 2016, there were about 13,000 unique users (including spouses, renters and owners, etc.) with either water and/or electric service. Each of them has accessed the portal at least once, typically at the time of sign-up. As of 2016, customers visited the web portal an average of seven times over the course of their access time, with 95 percent of customers accessing the portal less than 25 times. The web portal also allows customers to set up bill alerts (email, text or both) when cost thresholds are reached, as well as high use alerts. Spike alerts are recorded for 180 days and triggered when use is higher than other intervals over that time period.

As a result of the AMI program, Fort Collins Utilities has been able to engage with its customers through new programs. In 2014, the utility began a program to provide early notifications to single-family customers when the AMI data indicated continuous water use, which is often the result of a leak or a running hose. Since the program began, staff provided over 3,000 notifications of instances of continuous use, helping customers curb unnecessary usage and avoid high bills and potential property damage.

Staff also has been able to use the AMI data to better evaluate the effectiveness of water conservation programs. One example is the Fort Collins Utilities free residential sprinkler audit program. Audits focus on customer education and empowerment by guiding customers through a visual inspection of irrigation zones to identify problems, developing custom watering schedules, and recommending system upgrades.

With pre-and post-hourly AMI data, staff was able to estimate the per-day and per-hour savings estimates from the audit. Preliminary analysis indicates that average use decreases by over 100 gallons per day, and average peak hour use decreases by over 50 gallons per day, after a sprinkler audit.

Fort Collins Utilities intends to expand the program by exploring the use of AMI data to enhance the WaterSmart Home Water Reports program; develop irrigation tools for commercial customers and homeowners' associations; and increase program participation and identify ongoing areas for improvement.



## Georgetown Utility Systems, TX

Georgetown is the county seat of Williamson County, directly north of Austin. Between 2010 and 2013, the City of Georgetown implemented AMIs to replace the obsolete AMR system originally installed in 1994 for both water and electric meters. A total of approximately 45,000 meters were replaced during the project. Funded using cash reserves and bond financing, the project cost \$10,300,000.

The AMI Replacement Project upgraded the existing one-way communication (meter to office) of the AMR technology with two-way communication (meter to office and back to meter), allowing for near real-time data collection. In addition to an end of life replacement for the AMR meters, the City's goal was to use selected conservation practices and programs to reduce per capita consumption in the entire Georgetown Utility Systems (GUS) service area from 231 Gallons Per Capita Per Day (GPCD) to 180 GPCD in 2018 and a 10-year goal of 160 GPCD by 2023 (Water Conservation Plan, 2014).

Data from the AMI system provides multiple register reads in 15 minute and hourly intervals on a daily basis for electric and water meters respectively. It also allows for leak identification in conjunction with the Meter Data Management system (MDMs), which has proven to be a successful customer-facing tool. The AquaMessenger Program was implemented in 2008 as a pilot under the then-existing AMR system.

Under this customer-initiated program, emails alert the customer when consumption is beyond a specific threshold (established by the customer) during the billing month. Approximately 2,000 customers utilize this program. The city also offers a web portal called Georgetown Utilities and Reporting Doorway, also known as "GUARD", that gives customers a daily look at their consumption patterns and billing history. The customer web portal has been publicized through newspaper articles, marketing materials, social media, local government television and the city's website.

After the completion of the AMI Replacement Project, the next major software implementation is a new Customer Information System (CIS) for billing and customer interactions which will allow the utility to further leverage the AMI technology. The utility is focused on improving customer satisfaction by leveraging both systems. Billing accuracy is one of the prime benefits of the AMI system.

Most calls to the Customer Care Call Center are inquiries regarding unexpectedly high bills. To respond to these inquiries, customer service representatives are trained to utilize the AMI and CIS data to education and identify usage patterns and trends. Customer Care Representatives also educate customers on the benefits of the customer web portal for usage and budget management and to help customers interpret their own data.

The CIS enables a more detailed comparison of delivered and billed usage and compares it against the amount of water-pumped making it easier to identify overall system usage. Both the AMI and CIS software systems working together enable the utility to provide reporting that is sortable by multiple fields, including customer class, meter size, rate table and date (City of Georgetown, 2012).

Georgetown will launch a marketing campaign to educate and encourage customers to access and use the customer web portal at the end of the CIS implementation to coincide with a redesigned customer portal. The utility also plans to use the AMI technology to leverage irrigation data and encourage best practices.

## City of Plano, TX

Between 2008 and 2012 the City of Plano, a major suburb of Dallas, adopted an AMI program for their water customers. The City has 84,000 accounts. A web-based portal provides 6-hour reads to customers uploaded every 24 hours. Approximately 57 percent of residential customers have subscribed online; residential accounts represent more than 90 percent of Plano's online registered water customers. The project cost \$22M in total and was funded using the Water and Sewer Fund.

The data resources have been available to customers since the system was completed in 2012. The customer portal was utilized as a strategic communication tool to educate customers who experienced high bills in 2015 once drought restrictions were lifted. In the summer of 2014, due to drought and water supply restrictions, outdoor watering was limited to once every other week.

In May 2015, water restrictions were lifted and watering guidelines allowed up to twice a week watering. Customers who set their controllers to twice a week were shocked by their bills. During summer 2015, the Customer & Utility Service Department experienced a higher than usual call volume — from 7,000 calls in July to 11,000 and 11,500 in August and September, respectively (Owens, 2016). Using data from the AMIs, customer service representatives were able to guide customers through their water bills and drive usage of the system's customer web portals to understand trends and readings.

Residents were able to assess their household water usage and understand that their sprinkler systems were often the cause of increased water usage. In April 2016, the City launched an outreach initiative to raise awareness among customers on how to access and interpret their accounts' AMI data to help better understand their water use and change behavior accordingly. The communications campaign included a wide range of interactive strategies, including handouts, social media challenges, educational workshops, and an online learning module.

The AMI data showed that the customer water waste was mainly attributed to heavy outdoor watering, so the City focused much of its outreach campaign on educating customers through websites, newsletters and bill inserts about ways to reduce outdoor water use. The educational materials are available on the City of Plano website and included in the End Notes of this report (City of Plano, 2017).

Information included guidance on how to repair sprinklers, Do It Yourself drip irrigation workshops, and classes on using native plants and xeriscaping. Customers had also an opportunity to win \$25 by completing an online learning module on best practices in lawn irrigation. The City also offered classes and outreach events on various urban water issues, from conservation to stormwater drainage.

The AMI data web portal also got a facelift when the City changed billing software. Previously, the portal landing page buried 'consumption' information in a separate tab. With the new look, the landing page provides a snippet to convey consumption information, in graphs as well as a summary list of the number of meter-reads over a given time frame.

Web page metrics indicate that customers were more likely to visit this consumption page during the summer months when bills tend to be higher. Peak page visits were between 7am and 11am. Overall call volumes to customer service representatives dropped from an average of 10,000 in August and September 2015 to an average of 6,500 calls in the same months in 2016 (Owens, 2016).

Moving forward, the City plans to enhance the portal to allow customers to set alert notifications, compare their usage to their ZIP code average usage, and export data.

## Conclusion

The available data suggests a strong potential for return on investment for utilities investing in AMI, if executed effectively and efficiently. Additionally, there is quantifiable and visible behavior change when an AMI project is accompanied with a communications campaign. The technology is still in its infancy, especially in the water sector. However, AMI technology is evolving fairly rapidly, especially in the services it offers to the end user.

Overcoming the barriers preventing customers from opting into the customer web portal is perhaps one of the most difficult tasks for utilities. However, customers are curious and want to gain insight on their electric and water use so they can gain control and take responsibility for their bills. An overarching theme in these case studies is using data to empower customers to make necessary changes based on the tips strategically placed in bill inserts or in the customer web portals.

In the same vein, utilities must be ready to provide customers with direct access to the information through either a web portal (long-term) or through customer service representatives (short-term). In order for customers to be empowered by the data, the first step is for the utility to interpret the data for customers as it pertains to their unique electric/water usage and habits. From that point on, the impetus then falls upon the customer to do what they want with that information. Hopefully, if the utility does all the right things to engage with the customer, the behavior change will sustain.

A primary concern considered during the planning phase of AMI implementation is public pushback and negative media. Based on these case studies, while utilities had concerns about community members protesting the perceived negative impacts to health, privacy and security, these did not significantly jeopardize the implementation of their AMI projects. However, this is the case most likely because the utilities addressed the issue rather than allowing misinformation to influence conversations on the issue.

The case studies suggest that well-designed strategic public outreach and engagement efforts implemented early in the AMI uptake were significant (i.e. greater than 50 percent) in encouraging participation. For this reason, it is especially important for messaging and outreach to appeal to the curiosity of innovators and early adopters, as is referenced in the associated white paper.

Messages are strengthened when rate structures are communicated in tandem with AMI outreach. This aids in customers' better understanding of the cost of water and energy and allows them to decide to conserve to achieve their own personal goals, whether those be to save money or protect the environment for future generations, or just out of curiosity for the technology offerings.

Education through advertising and marketing does not appear to be enough to prompt desirable behavior change. Utilities need to go deeper to understand the attitudes and perceptions motivating behavior change. Enough research has been conducted in the areas of social science, psychology and behavioral economics to provide communicators and decision-makers with feasible strategies to do more than just inform. Informing is enough to raise awareness, but a nudge in the form of an incentive or persuasive message will help to move the dial towards behavioral change.

The discussion in the white paper recognizes AMI technology is not necessarily a viable solution for all water and electric utilities. For utilities that have conducted a cost-benefit analysis and are able to determine a Return on Investment (ROI) on AMI installation, implementation of a communications component with a reasonable budget is strongly encouraged.

The models, strategies and case studies discussed in the white paper all provide resources for practitioners to help implement a holistic AMI campaign that fosters a relationship between the utility and its customers. Technology is changing our world in every fathomable aspect and public infrastructure services such as utilities need to adopt new technologies to keep up with the trends, or face the consequence of being left behind. Some of the key themes we have identified include:

**Targeting and Customization:**

Data from AMI systems make it possible to identify trends and patterns in usage over a given period of time. Additionally, AMI data allows for defining customer segments based on habits. For example, depending on the weather, time and amount of usage on a given day, AMI data can identify peaks attributable to an individual taking long showers or over-irrigating their lawn or running the house cooling/heating system inefficiently.

Based on AMI information, a utility could send personalized advice/tips/alerts or information on rebates, thereby making the customer more likely to adopt the recommended behavior or marketing offer. A targeted marketing and communications approach saves the utility time and money by focusing on the behaviors of customers that, when changed, are more likely to yield predictable and desirable results (Payton, 2016).

Personalized messaging using texts and email have proved to be successful at many utilities, including Baltimore Gas and Energy (BGE), whose Smart Energy Rewards program, a peak-time rebate program, has yielded savings of “nearly \$13 million over the two summers since the program launched in 2013” (Atta, Davis-Van C., 2015).

**Timing:**

Communications need to be strategically timed to prevent customer fatigue. Most customer education and engagement efforts are deployed after AMI smart meters are installed; such an approach does not serve the utility well. Early education (preferably before AMI installation) increases the success rate of effective outreach and thus, higher customer satisfaction.

Early education also helps build a reservoir of goodwill that can sustain the utility’s reputation during controversial times, such as during rate increases and major infrastructure repairs. There are other “moments that matter” in utility customer communication that help gain the “most important business outcomes, from improved customer satisfaction, to lower cost to serve, to greater cross-promotion of new services” (Atta, Davis-Van C., 2015). Some of the critical touch points include billing and payment communications, calls into customer service, rate changes, and new technology introduction.

**Control:**

It is important to highlight in an AMI campaign that consumers can control what they gain from the data and information provided by the technology. According to Sintov and Schultz (2015), “[i]t is equally important that consumers recognize that they can adjust such systems — and that participation benefits the environment.” Giving control is not good enough, however; consumers also need education and guidance on what to do with the information. Otherwise, consumers are not going to be continuously interested in the technology enough to inspire or invoke a behavior change.

**Persuasive Messaging:**

Campaigns that create the perception of a desired behavior being the social norm have been shown to garner majority community support and lead to change in behavior and perception. Put another way, messages based on the theme of “Everybody’s doing it!” to promote pro-environmental behaviors are most effective to gaining a desired outcome.

Detailed discussion and guidance on persuasive message building is available in the Hahn Public Publications - AMI White Paper and Character/Competency Messaging for Rate Increases.

**Consistent, Continuous Communication:**

Getting consumers to embrace a new idea or technology calls for a regular and consistent push of persuasive messages through reminders and alerts. The schedule of outreach has to be sufficiently robust for it to be appreciated by the customer, but not so extensive as to cause annoyance or fatigue, where the recipient shuts out the messages.

One of the best ways of maintaining consistent and continuous communication without losing the interest of the customer is by providing feedback. This is most commonly in the form of energy and water reports that provide detailed, unique and timely information about usage.

Reports can also include performance in comparison to similar and/or efficient households and tips to reduce water/energy consumption. Studies have shown that providing feedback of this nature to residential energy consumers has reduced usage from two to 20 percent (Fischer 2008; Ehrhardt-Martinez et al., 2010; Darby 2006).

**Strategic Placement:**

Both theoretically (through the use of communications models) and practically (as shown in case studies here), a common guidance is to publicize customers’ positive behaviors by adopting persuasive messaging and making those actions noticeable to other members of society. Understanding where people spend their time and strategically placing messages in those spaces will help raise awareness.

This is especially useful advice for well-designed bills and customer web portals — not only do utilities want people to know the information, they need them to engage with it and follow tips to take specific impactful actions.

## *End Notes:*

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