



DATE: March 13, 2017

TO: Council Sustainability Committee

FROM: Director of Utilities and Environmental Services

SUBJECT Advanced Metering Infrastructure Project Update

RECOMMENDATION

That the Committee discusses and comments on the proposed features to be included in a customer engagement web portal and provides staff direction on recommended features.

SUMMARY

In April 2016, the City Council authorized execution of a contract to purchase and install an Advanced Metering Infrastructure (AMI) Project. Project implementation has begun and close to 2,000 meters have been replaced, as of the end of February. The project maintains a strong focus on customer service and outreach. Staff is currently pursuing development of a customer engagement web portal to enhance the benefits of the project to customers and is seeking Committee input on selection criteria.

BACKGROUND

The City receives all its water supply from the San Francisco Public Utilities Commission (SFPUC) and distributes the water to residential, commercial, industrial, and governmental customers. Customers are billed for actual water use as measured by water meters, which are manually read on a bimonthly basis. For context, the City has approximately 34,000 customer endpoints (water meters).

Even with safety procedures in place, City meter readers have been prone to injury due to the repetitive nature of the work. Bimonthly meter reading also provides customers with limited and outdated consumption information, which can be inefficient in terms of conservation efforts because customers are unaware of their consumption throughout the bill period; and leaks can go undetected for weeks or months.

In recent years, the use of a technology known as Advanced Metering Infrastructure (AMI) has become more widespread in the water utility industry. AMI enables two-way communication over a fixed network between the utility system and metering endpoints (customers). This allows meters to be read, monitored, and managed from a remote, central location rather than relying on the physical read of a meter in the field by an employee.

AMI systems can provide many benefits, including allowing meters to be read more frequently (e.g. daily or hourly). The resultant interval data can be used for purposes beyond billing, such as consumption reporting, leak detection, tamper alerts, as well as to populate a customer web portal, which allows customers to see detailed water usage information and better understand and manage their water use.

The City's current meter stock is, on average, over forty years old, and needs replacement independent of how the meters are read. The AMI installation process would also provide the opportunity to update the current meter stock throughout the service area and allow the City to establish a comprehensive meter inventory with GPS coordinates for mapping purposes, and clean up any errors that have occurred during the transition from a paper-based system to an electronic inventory. AMI data would provide the City the opportunity to consider transitioning to monthly utility billing, as well as redeploy staff resources towards preventative maintenance activities and customer service.

In 2013, staff began to study the feasibility of implementing AMI in Hayward. Given the significant investment of resources, staff determined that it would be in the City's best interest to pilot-test three different AMI systems and to obtain equipment pricing for City-wide implementation of various systems. The intention was to have the success of the pilot program aide in the selection process to procure an AMI vendor for the City-wide AMI program. In summary, staff found that the vendor that best met the City's objectives was Aclara. On April 5, 2016, the Council authorized the City Manager to execute a contract with Aclara for the purchase and installation of an AMI system.

DISCUSSION

Project Kick-Off

Upon execution of the contract in late April, staff commenced project implementation. Prior to beginning the installation aspect of this project, there was significant preparation work required to facilitate a smooth project rollout. Activities during this time were predominately data driven (e.g. refining reports for number of meters by size, type, account, location, etc.) to ensure proper integration between the City's meter inventory and utility billing software, and the Aclara installation work order software. Staff also worked with Aclara to prepare installation schedules by route, complete a detailed meter box lid survey (as all lids will be replaced or modified as part of this project), and oversee the initial hardware ordering of meters and meter transmission units (MTUs).

City staff spent a significant amount of time reviewing installation procedures with the contractors who would be out in the field performing the work. The nature of the installation work requires extremely close coordination with Field Services staff, who are relied upon to provide timely direction to the contractor should they encounter any issues during the meter replacement and programming process. The details and protocols for this coordination (commonly referred to as the "return to utility" or RTU process) have been discussed at length, but will continue to be developed as the project proceeds.

While a contractor will handle all existing meter replacements, City staff will begin installation of AMI meters for new development moving forward. For this reason, in December 2016, a group of Field Services, billing, customer service, and administrative staff completed three-days of training with Aclara, which covered installation and programming of the MTUs and use of the Aclara software.

Another major project implementation task was refining locations for the twenty-seven data collector units (DCUs) installed throughout the City to collect meter reads and transmit them to a central server, as well as preparing the subject DCU sites for installation. Installation of DCUs began in December 2016. To date, twenty-two have been installed, and five are pending installation. The pending locations continue to be studied to determine the best placement to maximize reception for the reading area.

Meter Replacement To-Date

As of the end of February, just under 2,000 meters have been installed and programmed in various areas of the City. The replaced meters are currently reading at a 98% reception rate. The reception rate is defined as the number of transmissions received over a thirty-day period. The City's system is programmed to provide hourly reads (i.e. twenty-four reads per day per meter, or 720 reads over a thirty-day period). The required reception standard in the contract is 98.5%. The reasons behind the project not quite meeting reception standards at this point are 1) five of the DCUs have not yet been installed, which affects reception in that a meter may not have a DCU in close enough proximity to send a read, and 2) not all meter box lids have been replaced to allow better signal transmission, so a portion of the MTUs are not able to transmit through the existing concrete lid. This has been the case in a specific size of oval shaped lids where the replacement lid ordered had a small gap which staff deemed to be unacceptable and is therefore actively pursuing a solution.

Future Customer Web Portal

As mentioned previously, the interval consumption data generated from this project will populate a future customer engagement web portal, which would allow customers to see detailed water usage information and better understand and manage their water use. These portals, which can be accessed on a computer or smart phone, are becoming an increasingly popular tool to help customers monitor their consumption and allow the utility to communicate directly and in a timely manner with their customers. Staff expects to prepare and release a Request for Proposals (RFP) for selection of a customer engagement web portal vendor in the spring. There are many vendors which provide this service, but as is the case with AMI vendors, each product's features can vary slightly.

Proposed Features:

Preliminarily, staff has identified the following features to be highlighted and included in the RFP:

- Mobile and web based customer engagement platform design;
- Intuitive, functional, and customizable presentment of current and historical consumption data (graphs, charts, etc.);
- Ability for customer to customize alert thresholds (e.g. hours/days of continuous flow, water bill amount budgeting);
- Comparison tool between similar customers (i.e. how your usage compared to your “neighbors”);
- Real-time customer notifications (including text, email, IVR notification types) for outage, leak, and other communications;
- Water waste reporting including ability to snap photo and geocode address;
- Ability to view temperature and rainfall data on top of usage data;
- Multi-language support allowing customer to choose language type;

Staff requests that the Committee discusses and comments on the proposed features to be included in a customer engagement web portal listed above and provides staff direction on recommended features.

ECONOMIC IMPACT

The economic benefits of AMI to customers include greater control over water consumption, given increased interval data and a future customer portal and smartphone application, including prompt water leak notification. Most customers will also benefit from having more accurate meters because they will not be subsidizing a small percentage of customers with low-read meters and these customers will more equitably share their proportional cost of water. And, the system should aid in the community achieving greater water conservation results over time.

FISCAL IMPACT

The Adopted FY 2017 Capital Improvement Program (CIP) includes \$13.5M in the Water Replacement Fund for implementation of this project. This project will be entirely funded by the Water Enterprise and therefore has no impact on the General Fund.

SUSTAINABILITY FEATURES

Energy: Electricity/natural gas/other fossil fuels.

Leaks in the water distribution system or at customer sites represent not only lost water, but in some cases wasted energy to distribute it. With the timelier consumption information provided by AMI systems, the City can be proactive when it comes to leak detection. The DCU's for this project will also be solar powered.

Water: Efficiency and conservation.

The more frequent water consumption data made available as result of this project will provide detailed information to help measure the overall effectiveness of targeted conservation initiatives. This information can be used to inform customers about potential leaks or overly high consumption. Analyzing data by frequent time intervals could also enable the City to look at consumption profile data for education and awareness related to conservation. Customers will also be able to be notified of unusual increased or continuous water usage, which could be the result of a leak, because it will be easier to pinpoint the timing of the increased water usage with more frequent reads. Remote notification of leaks allows for the ability to alert customers to an issue before substantial water waste or excessive charges occur.

Air: Air emissions of pollutants.

Eliminating the requirement for manual meter reading also reduces the number of vehicle miles traveled by City staff, which is in support of the Climate Action Plan goals of reducing greenhouse gas emissions.

Solid Waste: Waste reduction and diversion.

This project will generate construction waste. However, given that most water meters are made of brass, much of the waste can be recycled. The concrete meter box lids that are being replaced with polymer lids as part of the project will also be recycled.

Purchasing: Consistent with the City's Environmentally Preferred Purchasing Policy.

The City's current meter stock is, on average, over forty years old, and needs replacement independent of how the meters are read. The new water meters are expected to last for at least the life of the AMI system (twenty years), and are considered a long-term investment. This complies with the subject purchasing policy, as it states that the maximization of life cycle economics is a factor to consider when determining that a product or service has environmentally preferable attributes. The meters are also mostly made of brass, which is a recyclable material. Other vendors offer a plastic/composite body meter that was specifically not chosen for this project.

PUBLIC CONTACT

The AMI project is arguably one of the most visible and customer-centric projects that the Utilities and Environmental Services Department has implemented in many years. The project affects every customer of the Hayward water system, and therefore customer outreach is a key component to a successful implementation.

In addition to having information about the project on the City's webpage, <https://www.hayward-ca.gov/your-government/AMI>, in advance of having a meter replaced, each customer also receives a notification letter explaining the process and what to expect during and after the replacement has been completed (Attachment I). A typical meter replacement for a residential customer can take less than thirty minutes, during which time the water service to the customer is shut off. On the day of the replacement, the contractor will attempt to contact the customer by knocking on the door in advance of beginning work to inquire if it is a good time for them to complete the replacement. If the customer expresses that they would prefer another time, the contractor will work with them to find an agreeable alternative. If the customer is not present, or does not answer the door, the contractor will verify if the water is running by checking the meter for movement, which can indicate that someone may be using the water but cannot come to the door, before shutting off the water. To replace a large commercial meter, it can take a few hours or more, therefore appointments will be made to minimize any impact to operations.

NEXT STEPS

The project is scheduled to be completed in December 2018, with an average of 1,200 meters completed each month. There is a potential for the pace to be increased, once some continued success has been demonstrated.

The customer web portal RFP is tentatively scheduled to be released in late March with an anticipated award by the City Council in May.

Prepared by: Corinne Ferreyra, Senior Management Analyst

Recommended by: Alex Ameri, Director of Utilities and Environmental Services

Approved by:



Kelly McAdoo, City Manager