WEST MONROE'S GUIDE TO WATER UTILITY AMI DEPLOYMENT

FROM PLANNING TO BENEFIT REALIZATION

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CONTENTS

INTRODUCTION: WHY AMI?

Many water utilities implemented automated meter reading (AMR) systems 15 years ago. This technology is quickly approaching the end of its useful life—utilities are seeing an increasing rate of battery failures, and vendors are investing fewer research and development dollars in this space. For utilities that rely on manual meter reading, labor costs continue to increase, and the manual process of reading meters and entering data is error-prone—which can result in inaccurate bills being sent to customers.

Water utilities are increasingly deploying advanced metering infrastructure (AMI), which transmits hourly water consumption data. This information is helpful to customers because it can help them conserve water and manage the size of their bill. It's also helpful to the utility, as it can help them proactively notify customers of leaks, reduce operational costs of meter reading, and enforce conservation goals or mandates.

Water utilities have been slow to adopt AMI due to:

Infrastructure and program costs

Unclear understanding of benefits

Technological uncertainty

Limited support from city councils/regulators

Impacts to employee roles and job classifications

Concerns about radio frequency emissions and safety

Highly publicized issues related to other water utility's AMI deployments

West Monroe developed and refined a proven approach for water AMI deployments. This methodology positions water utilities for a successful program from initial AMI viability assessment through mass deployment and benefit realization.

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◆ **SECTION 1**

Defining the strategy and high-level plan for AMI

OBJECTIVE

Define the purpose behind your water utility's AMI program, then develop an AMI program plan that identifies major workstreams, tasks, resources, milestones, and dependencies.

Water utilities implement AMI for a variety of reasons: failing AMR systems, conservation, high bill mitigation, inaccurate meter reading, high turnover in meter reading, regulatory mandates, etc. Once your utility has decided why it's time to move to AMI, detailed program planning can begin.

AMI programs are challenging to manage because they impact nearly every function from meter installation to issuing a customer bill—ultimately impacting a utility's end customers. These programs require coordination between multiple vendors and internal teams, new software, and accurate and timely communication. Successful AMI programs are typically guided by an AMI steering committee, with executive-level representation from field services, meter reading, engineering, technology, billing, customer service, and public affairs. It is critical for this group to meet regularly to make decisions, approve vendor contracts, hold teams and vendors accountable, and address program risks and issues.

A detailed AMI deployment plan should be developed, identifying what work needs to be done across each workstream, who will complete the work, when it will be done, and what dependencies exist. After review and approval from the AMI steering committee, this plan should be used to manage deployment activities, track and report status, and hold teams accountable.

ACTIVITIES:

- Establish an AMI steering committee with representation from field services, meter reading, engineering, technology, billing, customer service, and public affairs

- Identify success criteria and risks for the overall AMI program

- Create a detailed deployment plan, identifying work that needs to be done across each workstream, including who will complete the work, when it will be done, and what dependencies exist

- Determine the high-level geographic deployment plan by meter reading route, balancing the billing blackout window, difficulty of meter reading in each area (e.g.,

incorporating survey results, skip code data, or safety considerations), meter age, other planned initiatives, and infrastructure conditions

- Conduct a detailed review of the technology deployment plan, as these tasks are typically the highest risk and have the longest duration

- Manage program activities, track and report status, and hold teams accountable using the AMI project plan

- Identify how AMI will impact major roles within the utility (e.g., meter reading, technology) and be proactive in determining and communicating job impacts and reclassifications

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KEY QUESTIONS:

- What goals and priorities drive the AMI program? How does AMI support utility operations and customer service?

- Who will be on the AMI steering committee, how often will the committee meet, and who will prepare status updates and reports for each work stream?

- How will AMI devices be procured and installed?

- Will installations be performed in-house or using a vendor?

- How many indoor meters exist, and how will meter access appointments be requested, scheduled, and worked?

- Who will install AMI devices on commercial meters? What unique processes and accommodations will need to be made for commercial customers?

- When will software be installed and integrated? What is the testing process and who will perform tests?

- Who will be impacted by AMI? How will different roles be trained in installing/maintaining AMI devices, and using AMI data?
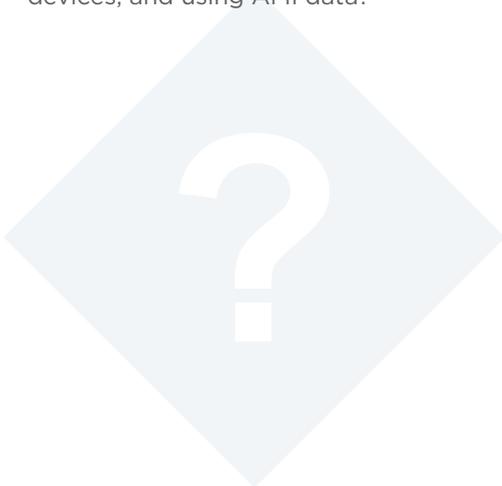
◆ **SECTION 2**

Assessing meter types, AMI compatibility, and infrastructure conditions

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OBJECTIVE

Sample assets in the field to determine condition, identify which meters will need to be replaced to support AMI, and plan for other infrastructure challenges.

To estimate the volume of field work and equipment needed to deploy AMI, a utility will need detailed information on current assets on the ground, including meters, meter boxes, pit lids, and valves. For utilities that conduct manual meter reading, the condition of assets is generally known, as meter readers touch field assets on a regular basis. For utilities who have transitioned to AMR, many meters may not have been touched for years—meaning meter location could be unknown, boxes may be buried, and lids could be broken—all of which will need to be addressed during the course of an AMI program.

ACTIVITIES:

- Develop an infrastructure survey to document meter types, age, box size and condition, lid size and condition, and valve condition (including availability of external mechanisms for shutoff, such as a curb stop)

- Select a random sample of meters, including both commercial and residential customers

- Survey field infrastructure and identify what repairs will be required

- Determine which meter types (e.g., integrated, wired) are compatible with AMI, versus which meters will need to be replaced; determine if register replacements are acceptable, or if the whole meter body will be replaced—and identify how this changes based on meter size

- Aggregate data and extrapolate findings to the broader meter population

- Conduct field trials to replace meters, boxes, lids, and valves, and time how long each activity takes

- Estimate the volume of work required to upgrade meters and supporting infrastructure as part of an AMI program; incorporate these costs into financial assessments and program planning

- Provide sub-meter GPS coordinates for meter locations rather than overall premises location; if this data is not available, capture it during AMI installation so that data integrity can be improved going forward and to avoid loss of institutional knowledge on meter locations as utility personnel will no longer be routinely visiting/locating meters

KEY QUESTIONS:

- What meter types are installed (e.g., integrated, wired, keyed)? How many meters will need to be replaced as part of the deployment?

- How old are meters? Are they under-registering or nearing end-of-life? If so, will they be replaced as part of AMI? Should meters that are nearing the end of their useful life be replaced early?

- Do meters contain a connector that could be attached to an AMI endpoint? If not, will meters/registers be replaced or will cables be spliced to connect to an AMI radio?

- What is the condition of meter boxes? For utilities using AMR, are meter locations known and accessible and/or have meter boxes been maintained?

- Are meter boxes and pit lids standardized, or will installation crews require variable stock?

- What meter box repairs will be necessary?

- What meter pit lids are in place? Will an AMI endpoint be able to communicate through the lid, or will lids need to be drilled/plasma cut/replaced?

- Do all premises have a service-side and customer-side valve? Will service line breaks be an issue?

- Do some premises require advanced planning for safety considerations (e.g., traffic control, two-person crew)?

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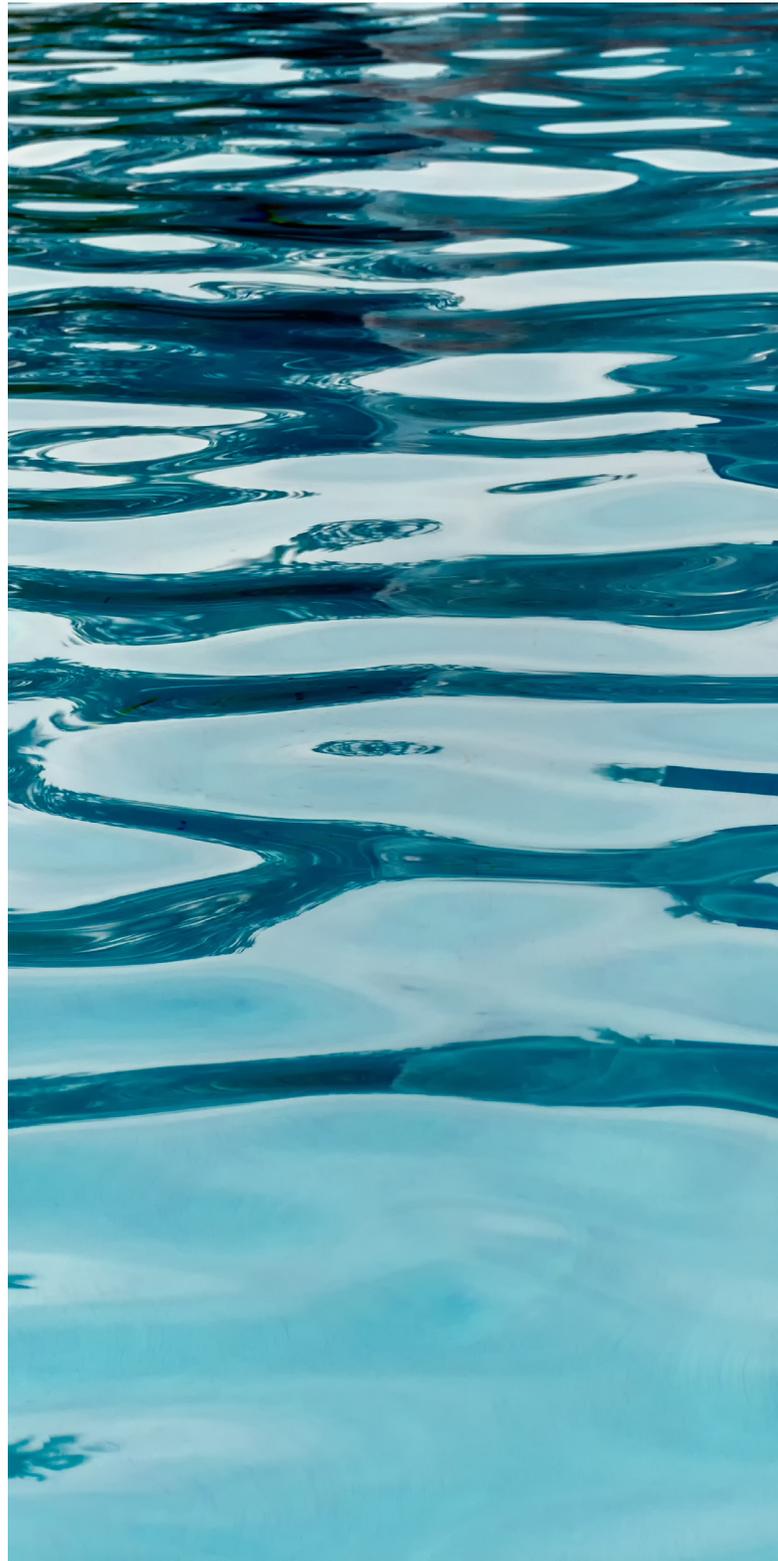
SECTION 3

Calculating AMI costs and savings

OBJECTIVE

Determine the tangible and intangible costs and savings of AMI, identify how customers will benefit from AMI technology, and budget to support a holistic AMI program.

AMI costs are front-loaded during the initial deployment. Key deployment costs include new meters and/or AMI radios, towers/vertical assets, data collectors, deployment labor, project management services, and AMI-supporting software (e.g., meter data management system, analytics package, customer portal). Long-term/post-deployment costs include replacement or extended warranties for meter/radio failure, leased tower space, technology maintenance and refreshes, and personnel to manage the AMI devices and network.

Savings are realized as AMI is enabled. Primary savings include meter reading labor, reduced system and customer-side water loss, read verification/field investigation labor and truck roll costs, move in/out labor and truck roll costs, high bill printing and postage costs, and call handling costs. Utilities that implement remote disconnect with AMI can also realize savings for turn on/off labor and truck rolls, but meters with this functionality are significantly more expensive and have some operational constraints.

ACTIVITIES:

- Obtain cost and life cycle estimates for key hardware, including meters, AMI radios, data collectors, towers, and AMI-supporting software; these costs should be corroborated by, and updated during, a competitive vendor selection process

- Determine deployment timeframe and if AMI endpoints/new meters can be installed with in-house labor, or if contractors are needed

- Estimate labor costs with respect to anticipated volume of meter replacements and AMI retrofits, including any needed infrastructure repairs (e.g., meter boxes, pit lids)

- Calculate labor costs of additional roles needed to support AMI at the utility (e.g., AMI program manager, network manager, AMI analyst, etc.)

- Quantify what savings will be achieved with AMI (e.g., reduced meter reading labor/vehicle costs, reduced call handle time)

- Validate key business case costs, savings, and assumptions with business, field, and technology stakeholders

- Identify how AMI will benefit customers (e.g., improved billing accuracy, leak alerts, self-service functionality)

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KEY QUESTIONS:

- What is the anticipated useful life of AMI? What battery-life warranty are your vendors offering? What network warranty are your vendors offering?

- How many years will it take you to deploy AMI (and therefore, after how many years will you begin to fully realize savings)?

- What failure rate do you anticipate for AMI devices and/or network devices?

- What customer communications efforts need to be included in your cost estimates (e.g., door hangers, letters, bill inserts, outbound calls)?

- How will call volumes and average handle time be impacted by AMI, both during deployment and long term when customers can view consumption information online?

- What activities will your utility be able to perform in-house, and what will need to be outsourced (e.g., meter/radio installation, data collector installation, project management, technology implementation)?

- What service order types will be reduced through AMI (e.g., high bill investigation, final reads, verify reads)? What labor and vehicle savings will be realized?

- What savings will you realize from automating meter reading, including labor and vehicle costs?

- What customer benefits will AMI deliver?

- How will AMI enable advanced rate design and enforcement of conversation goals?

- What impact will AMI have on vehicle miles driven and corresponding greenhouse gas emissions?

- What impact will AMI have on field service representative safety?

- Is your utility interested in utilizing a maintenance model (e.g., network-as-a-service (NaaS)) to contract out maintenance of the network, or performing all network maintenance in-house?

◆ **SECTION 4**

Evaluating telecommunications networks

OBJECTIVE

Understand available and emerging telecommunications network options that can be used to relay data from meters to data collectors. Identify which network types are best suited for your utility's service area, then evaluate network options through a competitive bidding process.

The telecommunications network relays data from meters or data collectors to the utility. AMI meters communicate to data collectors through a mesh network or a point-to-multipoint network. In a mesh network, data (meter reads) will hop from node to node until they reach a data collector. In a point-to-multipoint network, meter reads are transmitted directly from the meter to a data collector, without any intermediary steps. The best network architecture is a utility-specific decision, and is dependent on the utility's total service area, customer density, topography, battery life expectation, and future network usage (such as smart city applications). Water utilities have a variety of telecommunications network design and ownership options, including:

- **Private:** Built, owned, and operated by the utility

- **Shared/piggyback:** Leverages the network of a regional gas/electric provider

- **NaaS:** Owned by the utility, operated and maintained by the AMI solution vendor

- **Cellular:** Leverages the network of an existing cellular provider, such as Verizon or AT&T

- **LoRa/LoRaWAN (Long Range or Long-Range Wide Area Network) and similar Internet of Things (IoT) technologies:** Operated by the utility on an open, vendor-agnostic network

Privately-owned networks are the most common across the electric, gas, and water industries. Regulatory agencies and city councils recently have encouraged water utilities to evaluate shared/piggyback networks, with the goal of preventing the construction of redundant telecommunications networks across the same geography. Shared networks are great in concept, particularly for water utilities that have smaller operations or do not want the responsibility of maintaining a telecommunications network. Shared networks, however, have not been proven on a wide scale, and the economics of pricing a shared network competitively are challenging because the telecommunications infrastructure is only a small fraction of total AMI program costs.

Utilities are increasingly opting for NaaS agreements as they maintain ownership of the AMI infrastructure and fully leverage the vendor's expertise in maintaining optimal network health without developing extensive in-house proficiencies in telecommunications. Pricing of NaaS agreements has become more competitive, and vendors typically provide service levels that meet or exceed what a utility would be capable of in-house.

Some vendors offer cellular-equipped meters, meaning the meter can relay information to a utility through existing cellular networks, without a separate data collector. This eliminates the need for a utility to build or maintain a network. Cellular AMI deployments, however, generally have a shorter useable lifespan than other network types.

LoRa is an emerging technology that has primarily been deployed in Europe. In theory, a utility could equip a meter with a register containing a LoRa radio, which would relay information to a utility via a vendor-agnostic network. LoRa networks are increasingly available in urban areas, but generally have yet to be built to the size and scale needed for a water AMI deployment.

Implementing a singular AMI telecommunications network is the most efficient. Bifurcated or "hybrid" solutions (e.g., half private and half cellular) oftentimes require multiple types of AMI devices and complicate maintenance/ troubleshooting processes. Further, a bifurcated approach might also have back-office implications such as different interfaces into the customer information system.

An exception to this is water utilities that have significantly low customer density or challenging terrain conditions—such as extreme elevation changes. For these utilities, it may be most efficient to deploy a private or shared network, augmented by a cellular or LoRa network used for transmitting reads from remote meters. This is more complicated to maintain from an operations perspective but has the potential to be more cost effective than deploying numerous data collectors.

ACTIVITIES:

- Determine existing telecommunications experience and assets within your utility (e.g., SCADA operations, video surveillance, cellular backhaul, tank/tower sites)

- Complete a high-level propagation study based on your service territory (e.g., topography, utility-owned assets, customer density) to understand which telecommunications solutions would be well-suited for your service territory; this should be updated during a competitive vendor bid process

- Identify if local gas/electric utilities provide AMI on your preferred technology, and if they are interested in offering a shared network service

- Review emerging technologies such as cellular and LoRa and determine if your utility has a demonstrated need—and appetite—for this level of innovation

- Identify pros and cons of each network type and any knockout criteria

- Review service territory characteristics to identify preferred AMI vendors and telecom approach

KEY QUESTIONS:

- What is your utility's preferred AMI network architecture: mesh or point to multipoint?

- Are you fully deploying AMI in all areas or are there some remote/challenging terrain conditions where AMI may not be feasible?

- What network options are available in the region and are built on the preferred AMI technology?

- What spectrum frequency will be used (licensed in the 450 MHz band, unlicensed 900MHz ISM band)? How will interference be handled? How will spectrum selection impact battery life (because of likelihood of interference, transmit power, etc.)?

- How quickly could AMI devices be rolled out on this network? What upfront design and testing would be needed?

- What is the longevity of each network design? Will some be viable longer than others and, if so, how does this impact AMI program costs and savings?

- How is anticipated network longevity reflected in vendor warranties? Will the utility bear the costs if a network is retired or fails earlier than anticipated?

- How will data be transferred to the utility's meter data management system?

- How often will network devices require firmware upgrades or configuration changes? What is the upgrade process and what impact will this have on battery life?

- What other services might be provided on the telecommunications network in the future (video surveillance, distribution system monitoring, combined sewer overflow alerts)?

- Will 100% of the service territory be covered by the selected network design? Will a singular provider cover the entire service territory?

- How can the network be designed to maximize redundancy?

- What service-level agreements would exist for a non-private telecommunications network? How will the utility ensure data is relayed in an acceptable timeframe and quality?

- How viable are emerging network options and their respective vendors?

◆ **SECTION 5**

Procuring AMI technology

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OBJECTIVE

Define AMI and supporting software requirements and then select vendors who will meet or exceed requirements at a competitive price.

Three key factors differentiate AMI vendors: the types of meters they support, their network architecture design, and their product roadmaps. Some vendors provide an all-in-one AMI meter in which the AMI radio is integrated with the meter body. Others provide an external radio/antenna that is mounted within a meter pit or drilled through the pit lid. The best vendor roadmaps include commitment to ongoing research and development, plans for ancillary offerings (e.g., sensors, smart city solutions, alarms), and support AMI products through 15- to 20-year lifecycles with strong warranty commitments.

In addition to AMI hardware, supporting software will be necessary, including a network management system (also known as a headend system), meter data management system (MDMS), and customer portal. The network management system tracks the status of AMI radios and data collectors in the field, and will identify which devices are not communicating, or have other events/alarms such as a low battery. The MDMS is a repository for incoming interval meter reads, which the customer information system will reference to obtain reads for billing. The customer portal is a front-end system that customers can log into and view their consumption, subscribe to high usage alerts, and manage their account.

ACTIVITIES:

- Identify AMI functional requirements (e.g., AMI radio will provide automated reads of interval data with a 99.5% or higher success rate on a daily, weekly, monthly, and annual basis; AMI radio will provide battery-health indicator alarm with a 3- to 6-month warning period; radio will transmit reverse flow indicators based on programmable thresholds/parameters)

- Identify AMI technical requirements (e.g., traffic on AMI network will meet industry-accepted levels of encryption, authentication, and security, including AES 256 and IPsec; solution will support ban lists to prevent identified devices from connecting to the network in any way)

- Identify functional/technical requirements for AMI supporting systems, including a network management system, meter data management system, and customer portal

- Issue a request for proposal, requiring respondents to confirm whether individual requirements are met, and provide estimated pricing for devices, software, and professional services

- Use a weighted scorecard to select preferred vendors based on requirements and pricing

- Define service level agreements for vendors such as how read success rates are calculated and what read success rate must be achieved, requiring vendor commitments during the competitive bidding process

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KEY QUESTIONS:

- What is your utility's preferred AMI design for residential customers: all-in-one or a separate radio? How will commercial and industrial meters be equipped with AMI?

- How frequently will you pull in meter reads and what read success rate do you require? Will on-demand reads be available? If so, how will battery life be impacted?

- What type of battery warranty will your utility require (13-year, 15-year, 20-year)? Will the warranty cover full replacement or prorated credit for premature failure?

- What events and alarms will be provided? How soon should low-battery alarms be sent (e.g., 3 months, 6 months)?

- What credits will be provided if a vendor fails to meet service level agreements (e.g., read success rate, proactive battery failure alarms)?

- Do you prefer on premises software or hosted/ software as a service (SaaS) products?

- How many concurrent users need to be supported on each software package?

- What analytics and reports will the MDMS need to provide?

- How will customers be alerted of high or continuous consumption? What thresholds/configurations will a customer be able to set?

SECTION 6

Seeking council/ regulatory approval

OBJECTIVE

Create a compelling AMI story for city council and/or regulators that highlights customer, societal, and operational benefits. Seek and achieve approvals to support AMI pilot programs and comprehensive deployment.

Even in cases where water AMI programs do not produce a net positive financial benefit, many utilities and regulatory bodies view AMI as a worthwhile investment. When estimating the impact of your AMI program and communicating with regulators, call attention to the improved customer service provided with AMI, proactive high/continuous usage alerts, improved safety in the field, enhanced metering/billing accuracy, reduction in greenhouse gases, and better water conservation afforded by AMI.

ACTIVITIES:

- Create an AMI education document for city council/ regulators with information on the benefits of AMI to the utility, customers, and society—and then communicate this information proactively

- Facilitate meetings with key external stakeholders (e.g., council members, regulators, intervenors) to review the AMI education document, discuss the overall strategy, and address questions and concerns

- Share the tentative AMI strategy and plan with union leadership early so job impacts can be understood and planned

- Develop a comprehensive report which outlines the evaluation, cost centers, and key information to incorporate in direct council requests or utility commission applications

KEY QUESTIONS:

- Have any peer utilities in or near your service territory successfully deployed AMI? Have you conducted successful AMI pilots?

- Has your utility applied for AMR or AMI technology in the past? What lessons from this experience are being incorporated into your new program?

- Do you plan to create an opt-out program for customers who may not be interested in receiving the benefits of AMI?

- What is your utility or regulatory precedent for capitalizing program costs, including vendor-managed platforms (e.g., SaaS, NaaS)?

- Are there local public interest groups that should be included in education sessions or distribution?

- What local or regional initiatives can be supported by AMI data (e.g., smart city applications, conservation)?

- How will program benefits be tracked and communicated over time?

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SECTION 7

Redesigning business processes to leverage AMI data

OBJECTIVE

Redesign business processes to use AMI data, improving data quality, efficiency, and customer service throughout the utility. Understand which individual roles will be impacted by AMI and proactively communicate how roles will change.

To realize the benefits of AMI, utilities must change the way they operate. AMI impacts almost every area of the utility: the contact center, billing, meter reading, field services, and technology. Starting with your major processes (e.g., reading meters and billing) and your utility's most painful processes, discuss how AMI can be used to make operations more efficient. Now that the utility has access to nearly real-time reads, they can review high bills in the office rather than dispatching a truck, proactively notify customers of continuous or high consumption, process final bills using actual reads (rather than estimated), leave water service on between customer move in/outs, enforce conservation mandates, and modify rate design. New and changed processes will also require changes to technology such as revising the upload process to incorporate AMI reads and annotating outbound leak alerts within the customer information system.

ACTIVITIES:

- Create an AMI working team consisting of management from each department and a front-line employee from every department

- Identify what major business processes will be impacted by AMI and which processes could be made more efficient with AMI

- Design future-state process using AMI data, including which role performs each step and what technology changes are needed

- Document new business processes and technology changes to support AMI

- Communicate and train employees on new processes throughout the utility

- Request needed technology enhancements (including reports) to support AMI

- Consider which roles will be impacted by AMI (i.e., meter reading) and discuss what new responsibilities can be assigned to these individuals—such as maintaining AMI devices or monitoring the network

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KEY QUESTIONS:

- How will AMI devices be monitored and maintained after installation? Who will troubleshoot and reprogram devices?

- How will AMI reads be populated into the upload process/customer information system to be used for billing?

- How will customer service and billing use AMI data to answer customer questions and review high bill exceptions?

- What will the move in/out process look like with AMI? Will the water be turned off between customers or can it stay on since AMI provides hourly reads and can detect unauthorized usage?

- How will customer service processes differ for AMI versus non-AMI accounts throughout the multi-year AMI deployment?

- How will employees be trained to use AMI data to identify leaks? How will the adjustment policy and process change for customers with AMI and proactive leak alerts?

- How will AMI data be used to identify and resolve inactive accounts with consumption?

- How will AMI data be used to establish and enforce conservation goals?

SECTION 8

Managing customer service impacts

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OBJECTIVE

Identify the impact of AMI to customers and develop an outreach and engagement strategy. Inform customers proactively about AMI devices and design a policy and process for customers who insist on opting out of AMI. Help customers realize the benefits of AMI by maximizing email capture and portal registration.

AMI programs are highly public and prone to customer scrutiny. By proactively educating customers about the benefits of AMI, sharing case studies and customer testimonials, and communicating with customers both pre- and post-installation, utilities can gain support from their customers, community, and local elected officials. Water utilities begin seeing savings and operational improvements from AMI almost immediately. Utilities can prompt near-immediate customer benefits as well through granular insights on customer bills and, when possible, leak alert push notifications. Customers can maximize their realized benefits by registering on the customer portal, interacting with and understanding their consumption data, and subscribing to high consumption/continuous usage alerts.

Utilities with the highest level of AMI customer engagement conduct extensive education and outreach to register customers on the portal (e.g., asking to help register customers on every call, incentivizing registration with a one-time bill credit). Customers with portal access will receive nearly real-time usage alerts and can review their hourly water consumption and conservation goals.

ACTIVITIES:

- Develop an AMI outreach and customer communication strategy

- Develop an AMI fact sheet and frequently asked questions document; make this available on the website, in payment centers, and in community centers

- Update phone recordings to explain the purpose and benefits of AMI

- Educate local officials and community groups on the upcoming AMI program

- Collect and validate customer email addresses in the customer information system

- Send customers a pre-AMI letter 30 days before their installation describing the work that will be performed and the benefits of AMI

- Develop a policy and process for customers to opt out of AMI, including how this will be identified in the customer information system and what meter reading fees will be assessed in the future

- Post a door hanger notifying customers of successful or unsuccessful AMI installation

- Send a welcome-to-AMI email (or postcard, if no email is available), linking the customer to the portal registration website

- Note all outbound communications in the customer information system so this information is available to customer service representatives if a customer calls with questions

KEY QUESTIONS:

- Which local officials and community groups should be educated about AMI? Who will perform this outreach?

- What AMI opt-out options will exist? For opt-out customers, how often will meters be read, and will reads be manual or via AMR?

- How will opt-out customers be tracked within the customer information system? What fees will be assessed for manual meter reading and how will they be applied?

- What high/continuous usage notification channels will be available to customers (e.g., email, text message, push notification, robocall)? What extra outreach efforts will a utility make based on consumption volume?

- How can customers be encouraged and/or incentivized to register for the portal?

- How will customers be notified of high/ continuous usage if they are not registered on the customer portal?

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◆ **SECTION 9**

Managing AMI deployment

OBJECTIVE

Begin AMI deployment activities, including technology deployments, a small-scale pilot, and transitioning to and managing mass deployment.

Almost every customer meter will be physically touched during AMI deployment. AMI is then an opportunity to deliver excellent customer service through proper planning and training. Provide special training to field staff and contractors on professionalism, customer service, answering AMI questions, and escalating issues so customer interactions are positive and consistent. As you plan AMI deployment, conduct detailed route planning so meter replacements do not impact existing bill schedules, and determine how you will notify, schedule, and follow up on customer installations.

Deploying new software and integrating it to existing systems is one of the most challenging tasks of AMI programs. Most water utilities are accustomed to a single meter read per month (manual meter reading) or a handful of reads per cycle (AMR). AMI increases the volume of data coming into the utility exponentially, and new tools are needed to store, validate, share, and report on this data.

AMI programs require significant coordination between technology teams, field staff, customer service, elected officials, and customers. Piloting AMI on a small scale provides an opportunity for these teams to identify issues early, practice handoffs, and validate future-state business processes. Before the pilot begins, identify what criteria need to be met to transition to mass deployment. After the pilot, conduct a working session across all teams to resolve issues and answer questions prior to beginning mass AMI deployment.

Streamlined reporting is critical for AMI deployment as project managers will need to track multiple activities across different teams and contractors. Reports should be used to track installation of data collectors, installation of AMI endpoints, customer appointments scheduled/completed/missed, AMI saturation by route, unresponsive devices, AMI-related customer service calls, and AMI read success rates.

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ACTIVITIES:

- Procure permits and/or leased space for vertical assets/data collectors (if necessary)

- Identify process for ongoing network maintenance (e.g., moving data collectors for annual tank cleaning/painting) and disaster recovery needs

- Identify how deployment activities will be tracked and what reports are needed on a daily/weekly/monthly/quarterly basis

- Build the AMI fixed network (or work on lease/sharing agreements), if applicable

- Conduct detailed route planning for meter replacements to avoid issues with billing and align to fixed network activation

- Begin technology deployment and integration activities (meter data management system, network management system, customer portal)

- Train field staff and contractors on professionalism, customer service, AMI questions, and customer escalations

- Train staff on operations using AMI (including field service representatives who will install/maintain devices, customer service representatives who will answer customer questions about AMI, and billing who will be processing numerous meter exchanges and using AMI data for billing)

- Develop standard operating procedures for standard and atypical installation conditions to streamline decision-making in the field (e.g., serial number mismatch, unable to locate, inoperable valves, customer obstruction)

- Develop procedures for identifying field issues post-installation such as high/low usage, meter mismatch, missing work orders, etc.

- Create an audit checklist for AMI installations, including customer service norms, installation procedures, cleanliness, safety, proper uniform/identification, etc.

- Conduct a small field pilot to test AMI systems, hardware, network, and billing processes; install a few hundred devices to confirm field representatives are trained correctly, devices work as intended, the network meets read success criteria, and that reads are successfully transmitted to the customer information system for billing

- Conduct a lessons-learned review session from the AMI pilot and identify what should be applied/changed for the full AMI deployment

- Transition to mass deployment following the established geographic sequencing

- Conduct ongoing quality control checks, targeting 10% of new AMI installations to validate data, billing information, and post-installation photos

- Be proactive in communicating updates, risks, and issues internally so all employees are prepared to answer customer questions; provide the call center with regular updates and speaking points for key issues

KEY QUESTIONS:

- What permits are needed to mount data collectors on tanks/towers/streetlights? How will access to these facilities be provided for ongoing maintenance?

- How will network coverage be impacted when tanks are unavailable for cleaning/painting? Is the network fully redundant or can temporary poles or trailers be used to mount data collectors?

- What disaster recovery capabilities are needed? Can data collectors be quickly and/or temporarily erected to address issues that impact network availability such as fires and hurricanes?

- What service orders and reports will be used to track device installation? If contracting installation labor, how will work order management systems be integrated?

- How will deployment progress be tracked for data collectors and AMI endpoints? What reporting is needed? Who will initially build the reports and who will monitor reports during the deployment?

- How will technology functionality and system integration be tested?

- What training will be provided by vendors vs. what training will be performed in-house?

- What quality control will be performed on AMI installations (e.g., field, photo, data)? For vendors, what is the penalty for installation issues (e.g., backwards meter, non-transmitting device)?

- How will the utility follow-up on unsuccessful AMI installations (e.g., valve issues, access issues, unsafe conditions)?

- How will emergency, non-emergency, and customer-side breaks be addressed during deployment?

- How large will the AMI pilot be, and which customers will be included? Will you include all meter types, meter manufacturers, rate types, and customer classes?

- What criteria will be used to confirm the utility is ready to move from small-scale pilots to mass deployment?

- How will AMI endpoint deployments be timed based on data collector/fixed network activation?

- How will vendor contracts be audited to confirm commitments are being met?

- What is the escalation process for customer service issues during AMI deployment?

Realizing the benefits of AMI

OBJECTIVE

Confirm AMI saturation throughout the service area, validate that vendor objectives and service level agreements have been met, increase customer engagement with AMI, and realize tangible and intangible benefits associated with AMI.

As AMI programs come to a close, utilities oftentimes struggle with the last 2% of meters. These are usually the difficult meters that were skipped during deployment due to infrastructure issues or accessibility. To fully realize the benefits of AMI, water utilities want the highest saturation of AMI possible, as non-AMI meters still must be manually read, and meter reading becomes costly and inefficient when randomly scattered throughout the service territory. Before closing out the AMI program, work to get every possible meter equipped with AMI, and confirm that all AMI devices are transmitting reads. Maintaining AMI devices (e.g., replacing batteries, reprogramming, fixing antennas) is an ongoing process, and field service representatives should be trained in these areas before program closeout. AMI vendor contracts should also be reviewed prior to closing out the AMI program to confirm that vendor service level agreements are being achieved.

These activities help the utility operate efficiently using AMI but do little to benefit the customer. For customers to realize the benefits of AMI, they must be subscribed to high/continuous usage alerts and/or have a mobile application. By issuing targeted follow-up with customers, utilities can increase customer engagement with AMI and help customers derive value from this new technology.

Following successful deployment of AMI, utilities should transition from deployment management to steady-state ownership. Long-term network management will require dedication to the people, process, and technology changes established during program planning. Utilities can support customer service goals and increase operational efficiency by leveraging the near-real time data available through their AMI network. Advanced analytics may include customer-facing alerts (e.g., vacation usage, high or consecutive consumption) and optimized operations (e.g., district metered areas (DMAs), acoustic leak detection, meter rightsizing).

ACTIVITIES:

- Identify all remaining non-AMI meters and determine why AMI has not been installed (e.g., weak telecom signal, broken valves, opt-out)

- Complete infrastructure repairs as needed and install AMI on all possible meters

- Identify devices that are not transmitting or are displaying other events/alarms; repair devices on an ongoing basis and determine who is responsible for maintenance going forward

- Identify the process for collecting on vendor warranties and train staff to follow through on this process

- Review service-level agreements from vendors such as meter read success rate to confirm vendors are meeting or exceeding targets

- Identify customers who have not registered for high/continuous consumption alerts and create outreach plans (e.g., IVR recording, robocalls, letters, emails)

- Conduct marketing campaign for AMI, focusing on customer testimonials, case studies, and lower bills through conservation

- Update call center scripts to ask any unregistered customer to subscribe to the AMI customer portal/corresponding leak alerts

- Ensure new business processes are being followed (e.g., no longer rolling trucks to obtain meter reads for high bill issues) and realizing the expected benefits of AMI

- Develop and track key performance indicators for system, vendor, and personnel performance

- Establish an analytics center of excellence and data governance plan to leverage and enhance system benefits over time

KEY QUESTIONS:

- What installation issues have prevented 100% AMI saturation? How can these be addressed?

- How many devices are not transmitting reads, and why? Who will maintain these devices on an ongoing basis?

- What is the read success rate on an hourly, daily, weekly, monthly, and annual basis? Is data clean and ready to be used for billing?

- What outages have happened for key software and infrastructure? Are uptime and response time commitments being met?

- Are any outages/issues covered by warranties? Are staff aware of warranties and how to collect from vendors?

- What additional reports are needed to identify AMI issues and operate efficiently?

- What percentage of customers have registered for high/continuous consumption alerts? How can this percentage be increased?

- What analytics packages are offered by system, MDMS, and customer portal vendors? Are these being used to their maximum capability?

- What analytics and insights can be developed internally using AMI data to improve operations?

CONCLUSION: WHAT'S NEXT?

West Monroe has extensive experience in water AMI programs—from defining the initial strategy, to selecting technology and vendors, to managing deployment, program close-out, and benefit realization.

We help water utilities respond to changing regulations, business evolution, and growing customer expectations. Our dedicated team of utility industry professionals is a blend of engineering expertise, technology specialists, and industry experience.

We understand that water utilities face a host of challenges in a changing environment—including a resounding need to modernize infrastructure during the age of conservation. Technology like AMI can be key to making assets and processes smarter, delivery more reliable, and customer interactions more valuable. But with highly publicized water crises, limited resources, and increased rate pressures, the challenge is on.

We're here to help.

SJW
SAN JOSE WATER

CLIENT STORY

AMI strategy, business case, and regulatory support

West Monroe assisted San Jose Water (SJW) in developing an overall AMI strategy, including objectives, timeline, deployment phasing, labor strategy, and technology design. West Monroe also performed a field survey of SJW's infrastructure, helping to understand the quantity, size, type and condition of meters, meter boxes, pit lids, and service connections. Based on that assessment, the team developed a comprehensive business case and implementation plan for SJW's AMI program. Next, the team developed a request for proposal and led the vendor selection process for an AMI system provider, installation provider, and customer portal. West Monroe also provided regulatory support for the AMI application with the California Public Utilities Commission.

PROJECT RESULTS:

- Developed a strategic plan that considers financial, operational, and technical factors

- Created a deployment plan including overall program objectives, metering strategy, timeline, budget, deployment strategy, labor strategy, revised business processes, and change management

- Managed the end-to-end vendor selection process for an AMI system provider, installation provider, and customer portal

- Drafted testimony to support SJW's filing for regulatory approval, available here

dc
water is life ®

Late-stage AMI deployment & vendor management

West Monroe was engaged to help DC Water improve their AMI penetration by managing a contracted installation vendor as well as internal DC Water crews. West Monroe closely managed workmanship and productivity of field crews, executed all outbound customer communications across five different channels, and addressed infrastructure challenges.

PROJECT RESULTS:

- Managed procurement efforts for two competitive requests for proposals

- Developed 14 standard operating procedures for atypical installation types and 13 customer-facing education and communications materials

- Oversaw installation of AMI at 7,600 locations that were previously identified as most challenging

- Coordinated ancillary repairs via work with customers, field service, distribution teams, plumbers, and contractors

- Assisted in the inventory management of meters and AMI endpoints

- Facilitated relationship and orchestrated data transfer between utility and vendor IT

westMONROE

CLIENT STORY

AMI assessment & roadmap

A water utility brought in West Monroe to develop a vision and roadmap to guide operational improvements and maximize the return on its AMI investment.

West Monroe assessed existing pain points across the value chain, evaluated vendor performance, and observed key processes, applications, and analytics currently in use. The team compiled future-state projects into detailed initiatives with background, issue summary, considerations and risks, anticipated outcome, impacted personnel, anticipated cost, project duration, and project steps. We prioritized initiatives based on value, complexity, and priority to the squad and organization.

PROJECT RESULTS:

- Created a five-year roadmap of 24 initiatives, both tactical and strategic in nature, to enhance customer experience, manage revenue, operate efficiently, and innovate using AMI data

- The AMI roadmap became the model for roadmaps being developed by other "squads" across the organization (e.g., GIS, workforce management, water quality)

ABOUT WEST MONROE

West Monroe is a digital consulting firm that was born in technology but built for business—partnering with companies in transformative industries to deliver quantifiable financial value. We believe that digital is a mindset—not a project, a team, or a destination—and it's something companies become, not something they do. That's why we work in diverse, multidisciplinary teams that blend industry expertise with deep operational and technology capabilities—moving clients from traditional to digital operating models and creating products and experiences that transcend the digital and physical worlds. Our 2,000 employees have the opportunity to own a stake in the company, so when you partner with us you know we are committed—because your success is our success. Our undeniably different approach breeds undeniable results. **Visit westmonroe.com to learn more.**

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