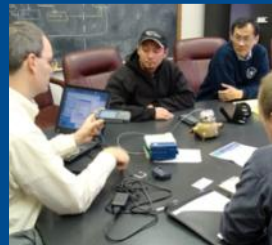


Some Strategies for AMI Project Success



Peer-to-Peer 2019

***Don Schlenger,
Ph.D.***

AMI Is Two Overlapping Projects with Stages

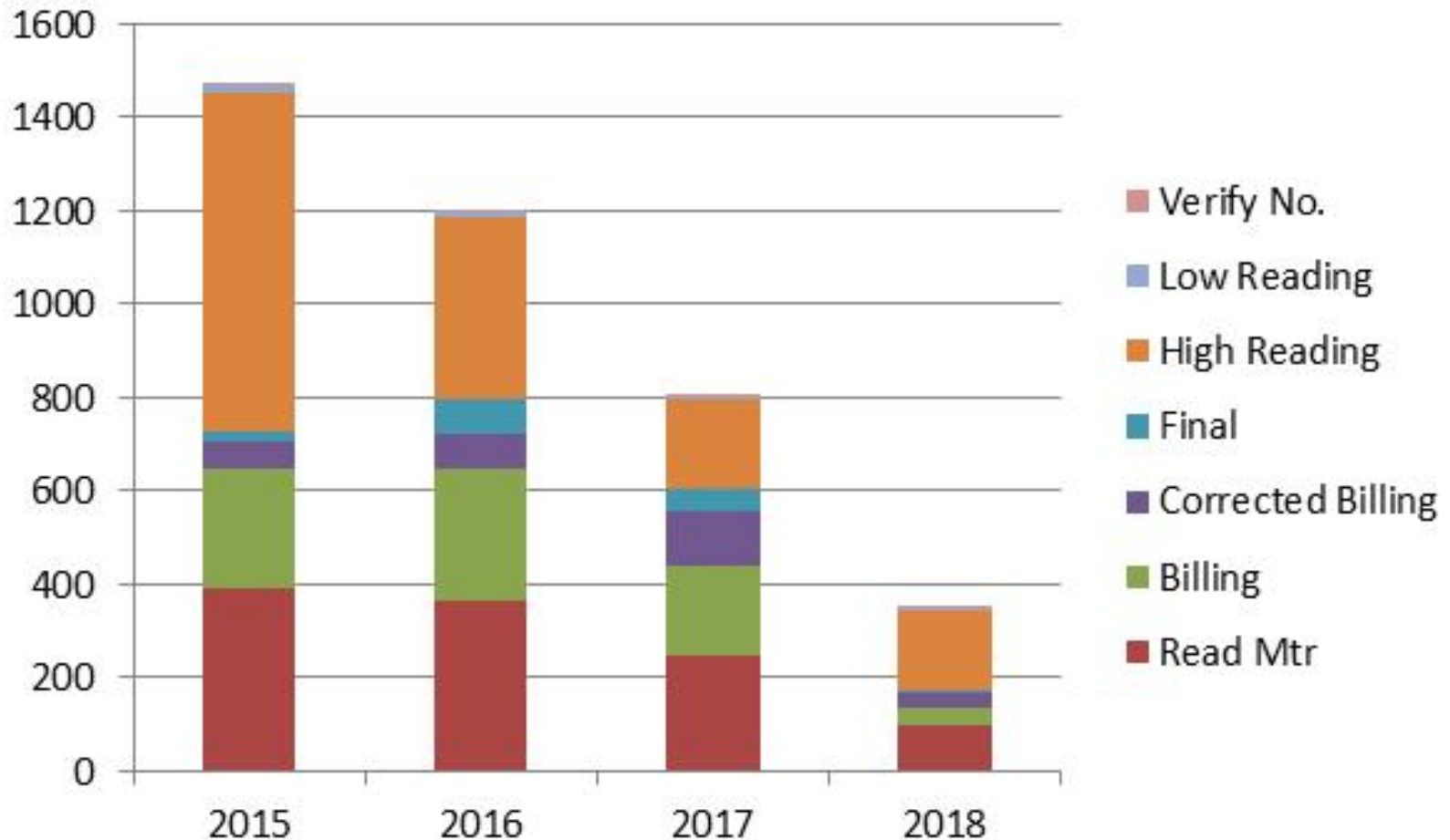
- **Deploying the AMI System**
 - **Feasibility Study**
 - **Solicitation of proposal, contract negotiations**
 - **Software Installation**
 - **Network and endpoint installation**
- **Redesigning Customer Service**
 - **Vision and roadmap**
 - **Policies and procedures**
 - **Application roll-outs**

AMI Both Enables and Requires Significant Customer Service Process and Policy Changes

- AMI enables previously unattainable levels customer service
- ROI may be insufficient without capturing this value
- Challenge: quantifying, capturing benefits

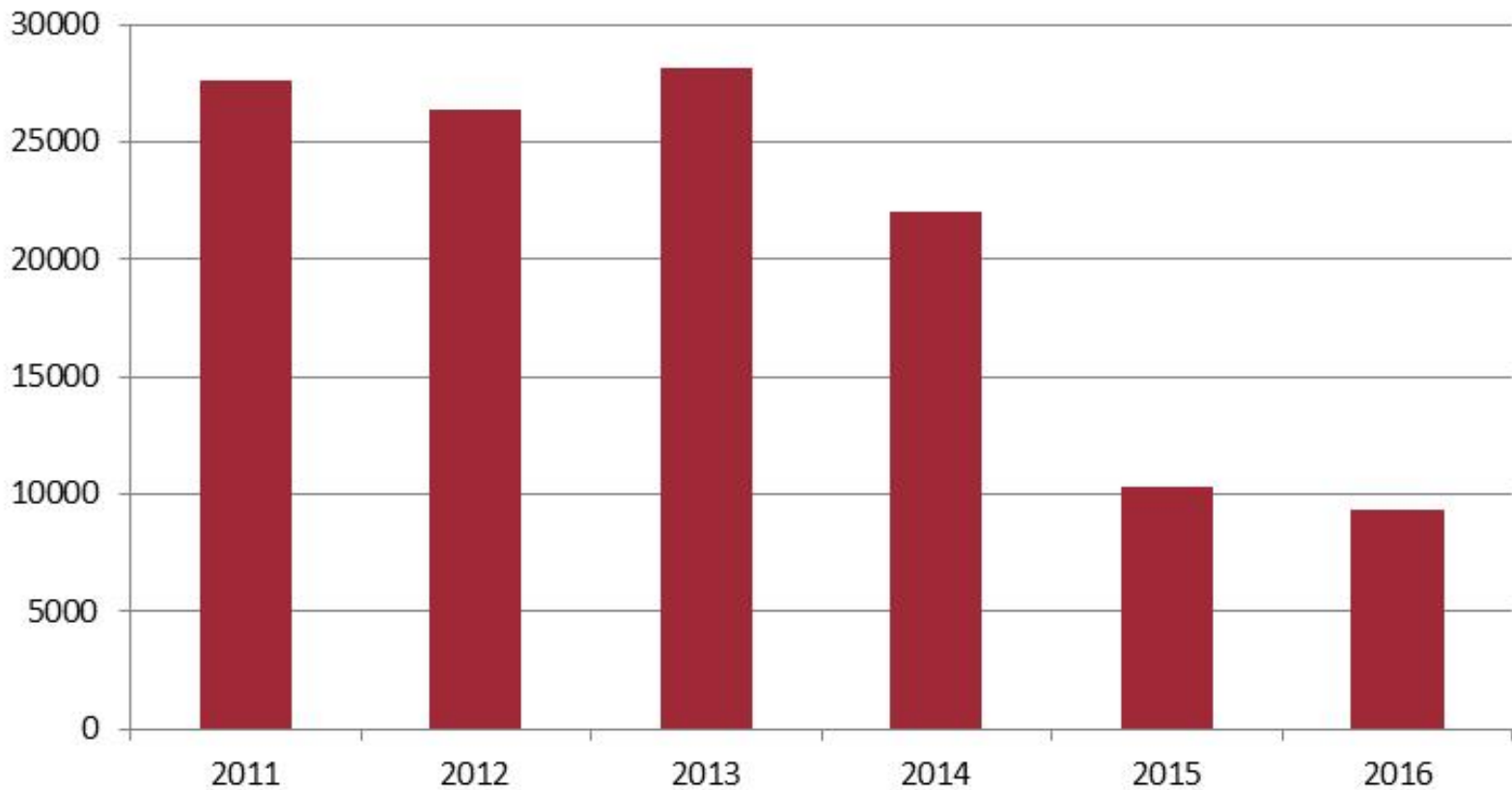


SCCRWA Reduced Meter Reading-Related Field Service Work by 75% (project still underway)

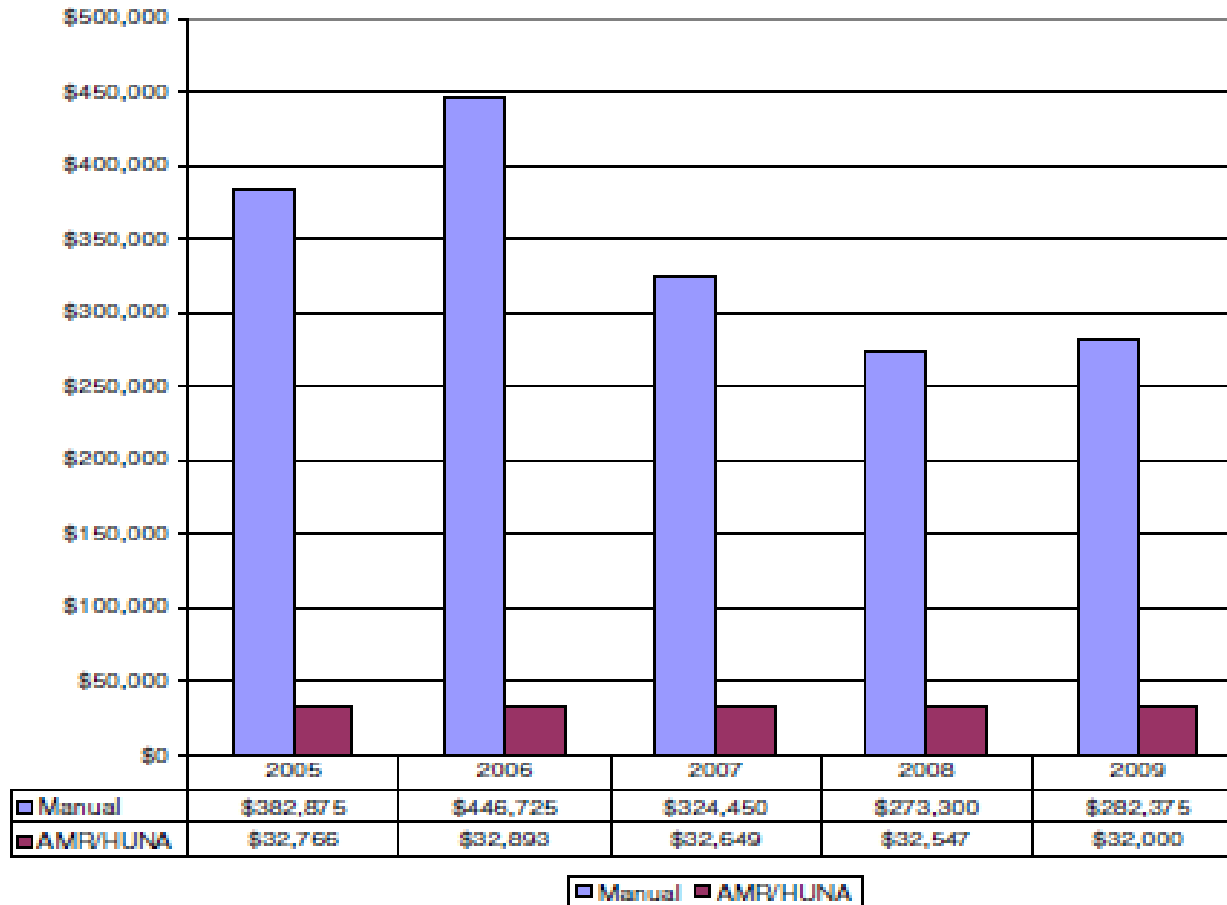


AMI Helped Cleveland Water Reduce Rereads/ Final Read Truck Rolls by 60%

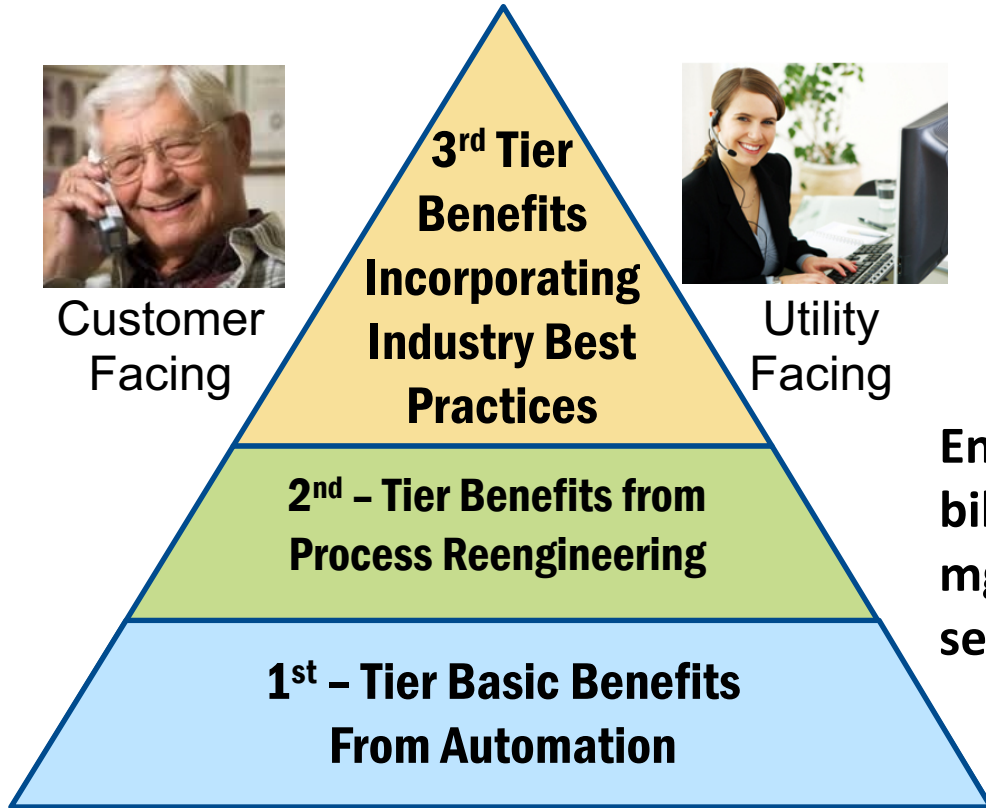
Reread/Final Truck Rolls



Benefits from Automating Final Reads with AMI at DC Water



Hierarchy of AMI Benefits



Service customization, sub-metering, backflow monitoring, non-revenue water analysis, distribution system optimization

Enhance customer service, monthly billing, proactive notification, meter mgt., revenue protection, customer self-service

Accurate bills. Reduce manual meter reading, estimated bills, rereads, final read visits

HIERARCHY OF AMI BENEFITS

AMI Enables New Approaches to Customer Service

Reactive

- “Do first”
- Rereads, investigations, etc.
- React to customers’ needs
- Undifferentiated service
- Hands-off relationships
- Task oriented



Proactive

- “Think first”
- Analyze consumption
- Scan for anomalies
- Differentiated service
- Closer customer relationships
- Process oriented



Other AMI Benefits Harder to Quantify

- Full field audit of accounts, connections, meters
- Support alternative rate structures (budget, time of use)
- Billing in finer resolution
- Facilitate submetering
- Peak and off-peak water conservation
- Potential to identify distribution system leaks
- Support other “smart utility” technologies
- Support municipal services (e.g., street light control)
- Perception of reliability, customer confidence
- More equitable service to customers

AMI Trials are High Leverage/High Risk

- **Many AMI Trials are Ineffectual**
 - **Insufficient size, duration**
 - **Unclear objectives, actionable outcomes**
 - **Insufficient resources to maintain equipment**
 - **Technology changes make results stale**
- **May be more cost-effective to visit other utilities**
- **Trial as mini-project**
 - **Establish, communicate clear, realistic objectives.**
 - **Establish concrete evaluative criteria**
 - **Establish size, duration based on objectives and evaluative criteria**
 - **What happens if trial is successful?**



Valuable Pre-Procurements Tasks

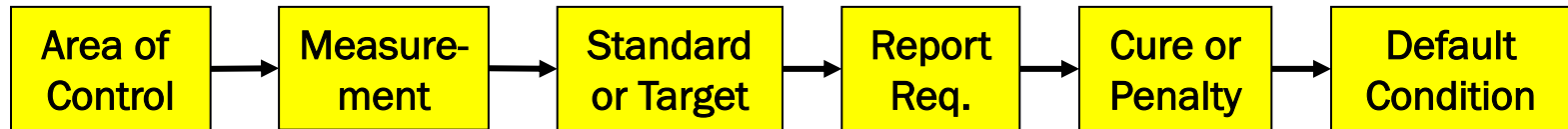
- **Establish customer service performance baseline**
 - **Estimates**
 - **Call center statistics**
 - **Truck rolls**
 - **Adjustments and write-offs**
- **Clean up CIS account database**
 - **Survey meter settings**
 - **Meter boxes, settings**
 - **Lids**
 - **Meter sort-counts**
- **Collect customer contact info**



Standardization, Interoperability and Open Sourcing

- **LPWAN alternatives to proprietary, dedicated networks**
- **Alliances and “open” networks (NB-IoT, LoRa, Wi-SUN)**
- **“Open” communications protocols**
 - **Testing and certification**
 - **Vendors might have to buy chipsets**
- **AMI component interoperability**
 - **Issues: cost, testing, security, loss of sales, liability**
 - **Licensing fees**
 - **Data format available to others?**
- **Standard connectors**
- **Software data interchange**
 - **Standard APIs**
 - **Data Exchange Protocols (CMEP, MultiSpeak, etc.)**
- **Request for Proposal language**
 - **How important (weighted criteria)? How to evaluate?**
 - **Sending a message to vendors**

Incorporate Installation Performance Measures in RFP and Contract



- Overall installation schedule progress
- Installation contacts
- Installation success rate
- Quality control inspection
- Trouble calls and responses
- CIS data validation
- Confirming read performance
- System performance
- Motor vehicle/personal injury

Write Multi-Stage System Acceptance Plan into RFP and Contract

- **Written plan, with pass/fail critical criteria (“gates”)**
- **Software and interfaces – installation, operation**
 - **Volume test**
 - **Documentation, user manuals**
 - **Bad data filters**
- **Network performance**
- **Pre-Installation Pilot**
 - **Full test of installation protocols, project control system**
 - **Find or simulate field anomalies - “fire drills”**
- **Final system acceptance test**
 - **Read performance**
 - **Redundancy**

AMI Contract Negotiations

- The entire procurement process is a negotiation.
- “Don’t show your cards” during procurement
- Utility has leverage *before* it selects a vendor.
- Bring your attorney into the process early—background.
- Many things are negotiable
- Make sure *all* parties (i.e., subcontractors) are at the table



AMI Deployment Project Mgt.: Many Plans

- **Project Mgt. Plan - schedule, milestones**
- **Testing Plan**
- **Risk management Plan/Risk Register**
- **Project Control and Procedures Manual**
- **Integration Plan**
- **Communications Plan**
- **Network Deployment Plan**
- **Endpoint Deployment Plan**
- **Meter Reading Transition Plan**
- **Materials Management Plan, including meter testing**
- **Human Resources Plan**
- **Training Plan**
- **Change Management**

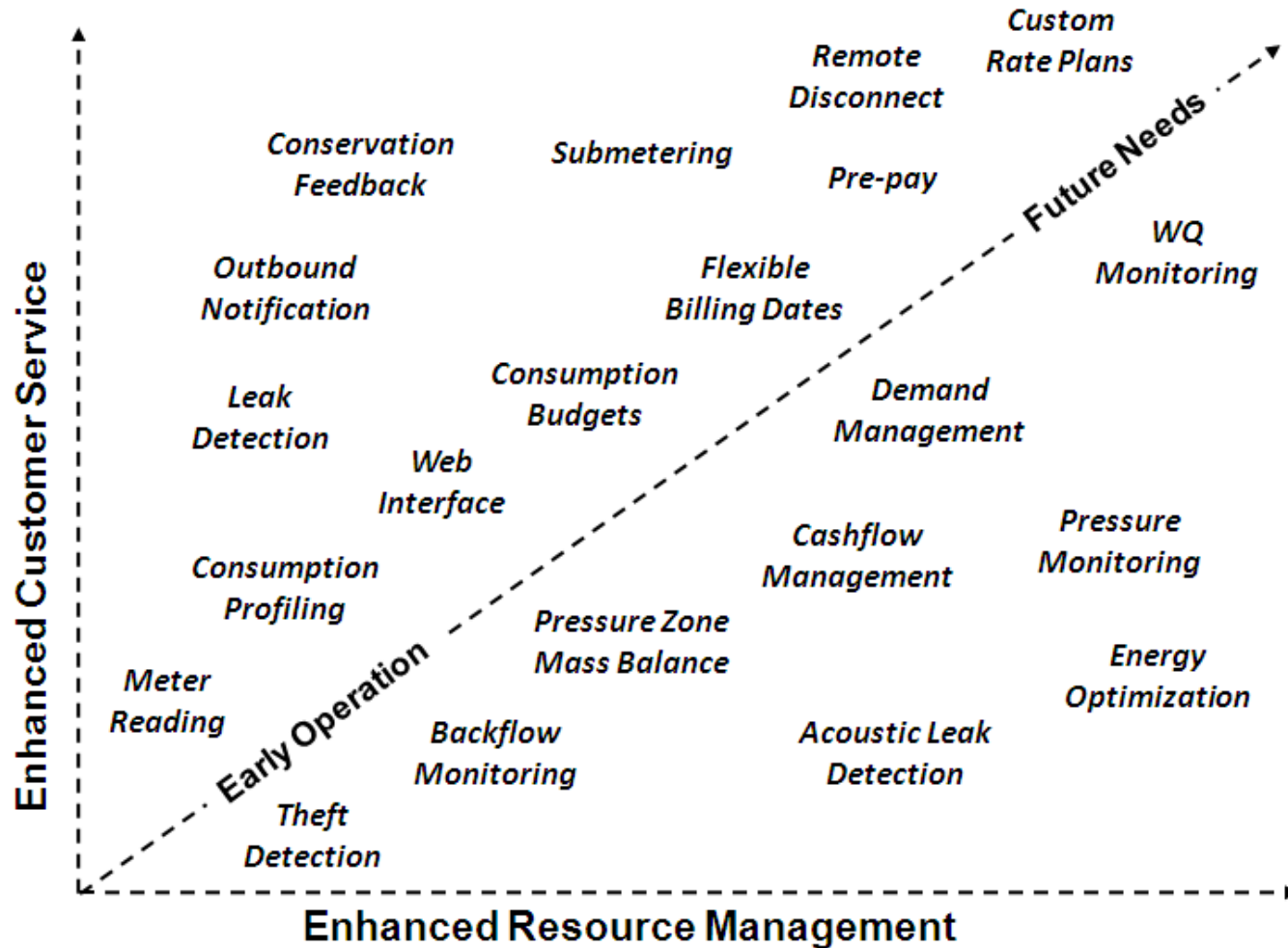
RFP, Contract, Pjt Mgt. Plan—Focus on Risk Mgt.

- Technology, project and business risks
- Risk=probability x impact
- Domino effect
- Risk planning – formal, conscious activity of PM/team
- Risk register continuously updated
- Clarify acceptable levels of risk (risk versus cost)
- For each risk, develop and agree on strategies: prevention, mitigation plan, contingency, or acceptance
- Contingency in budget

Operation and Maintenance Protocols

- **System performance**
 - Trend analysis
 - Performance standards
 - Protocol for alerts, alarms
 - Flags from system – nature and volume; first response
- **How quickly to respond to missed reads–triage**
- **Ability to estimate; tolerance for estimates**
- **Physical inspections**
- **Tweaking routes and cycles to maximize productivity, customer service**
- **Audits, manual reads**
- **Preventive maintenance on network**
- **Monitoring noise, protecting the frequency**
- **Contingency planning**

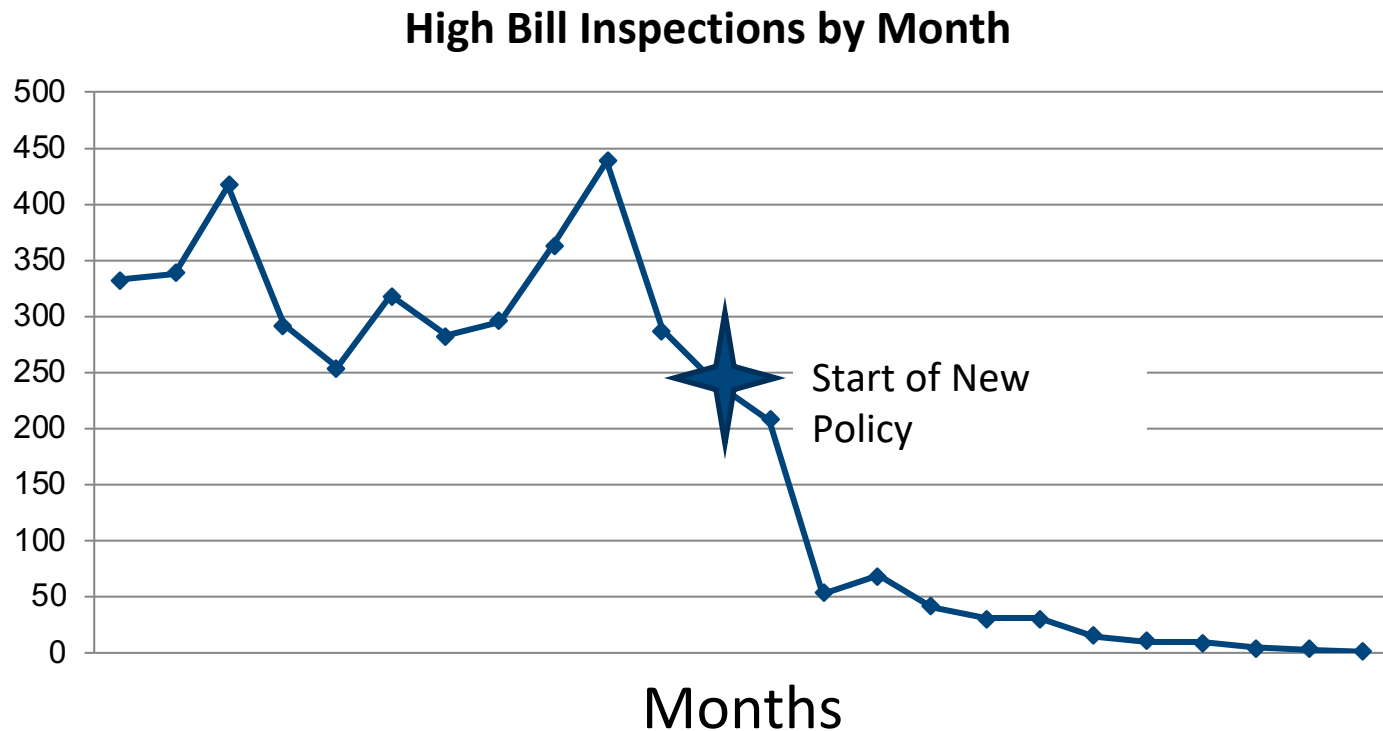
Strategy Needed for AMI Application Development Roadmap



AMI Policies to Increase Efficiency, Enhance Service, Minimize Cross-Subsidization

- Privacy of individual consumption information
- Mandatory participation; manual read charge
- Access to meter box and meter
- 3-day meter reading for billing window, otherwise estimated
- High use/leak inspection—fee
Final read—shutoff may be delayed. Utility will try to avoid turn-on charge.
- Customers must keep contact info up to date
- High consumption (“broken pipe”) commercially reasonable efforts to notify.
- Low flow continuous use (“leak”) commercially reasonable efforts to notify
- Courtesy adjustments—7 days from first notification only with electronic contact info provided
- Tampering w/meter or AMI device—statutory fine
- Delinquent/shut-off monitoring—service locked

Customer Notification, Available Data AND Policy Change Reduced High Bill Inspections

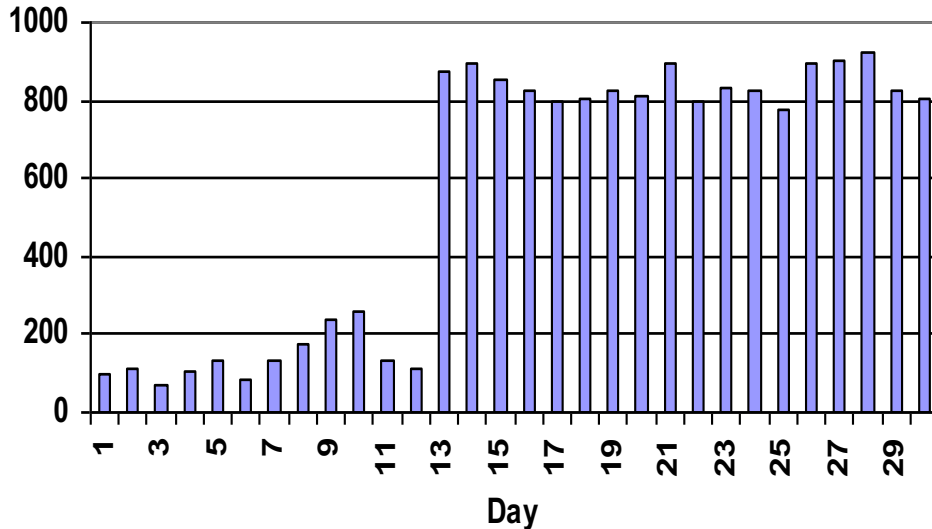


Data courtesy Kansas City Water Services Dept.

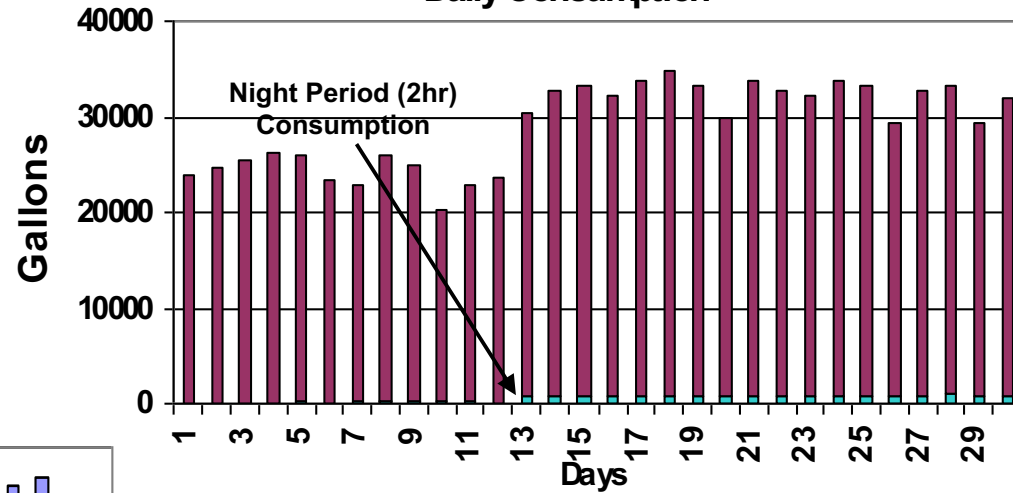
Example: Monthly or Daily Consumption Might Not Reveal Leak

6 gpm Leak in 200-Unit Apartment Building

Night Period (2AM - 4AM) Consumption



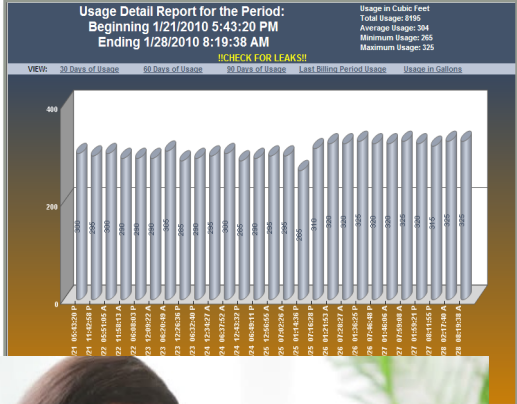
Daily Consumption



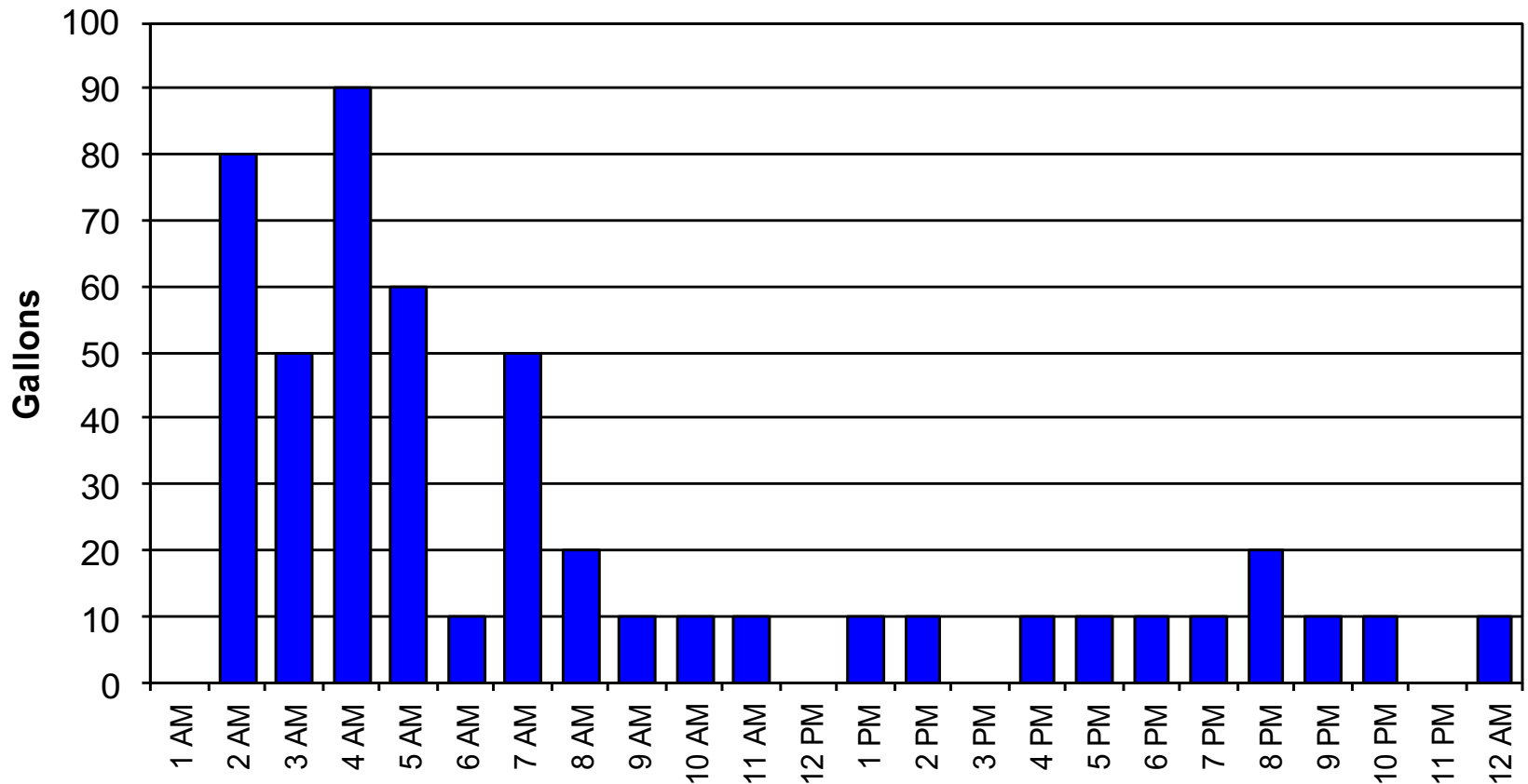
Example: Notifying Customer of Leak Before they Get a High Bill



versus

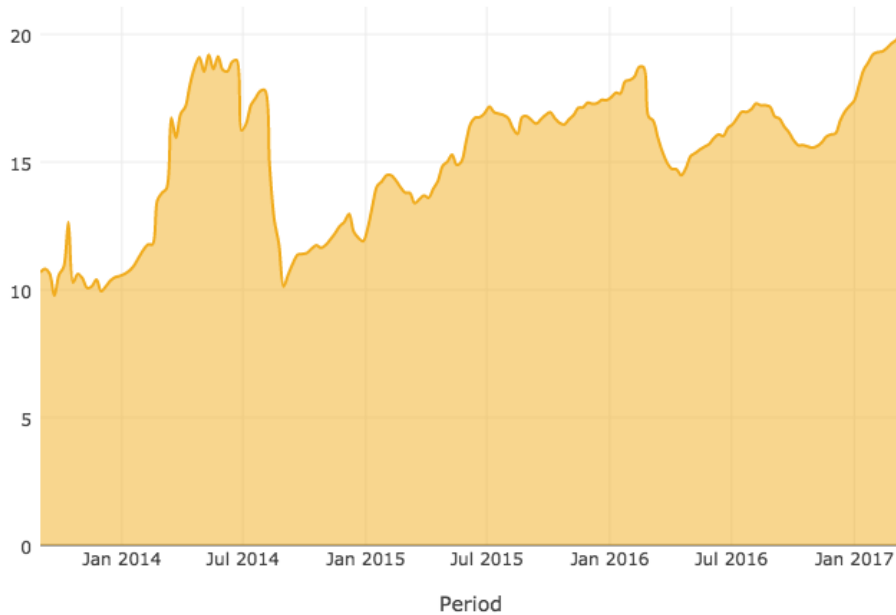


Consumption Profile Doesn't Show Continuous Consumption

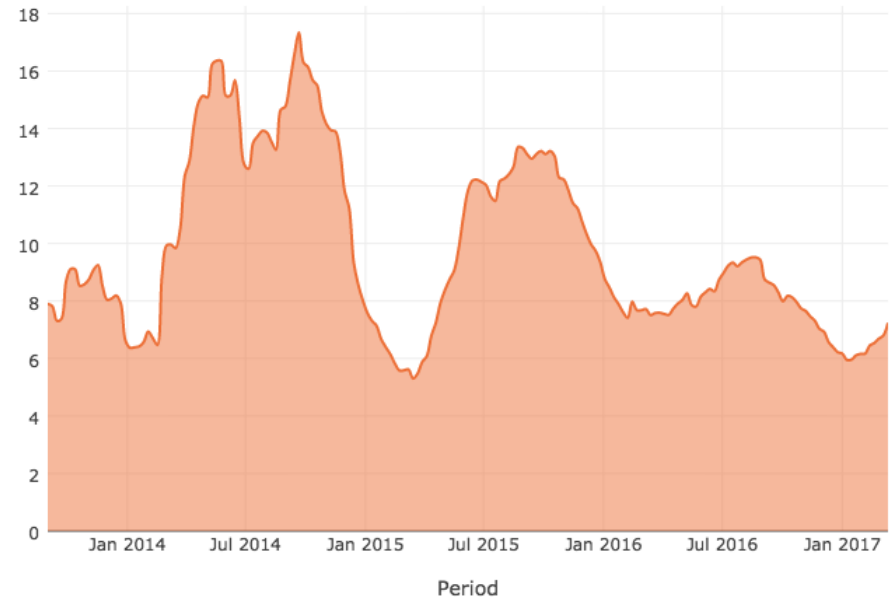


Only Fraction of Customers Use Web Portal

Registered Users, %



Quarterly Active Users, %



Data courtesy WaterSmart Software

Other Things Needed to Make an AMI System Effective (e.g., Leak Notification)

- Ability to contact customers (technology, resources)
- Up-to-date customer contact info (email addresses, cell phone nos.)
- Rules, algorithms (thresholds, contact frequency, etc.)
- Access to detailed consumption data (web portal, etc.)
- Analytics (“deeper dive;” customers don’t just want data)
- Customer profile info (e.g., pool, irrigation system, humidifier)
- Customer choices and options (e.g., can set thresholds)
- Revised business processes and policies (e.g., final read)
- Education and outreach
- Employee and customer behavioral changes
- Application maintenance

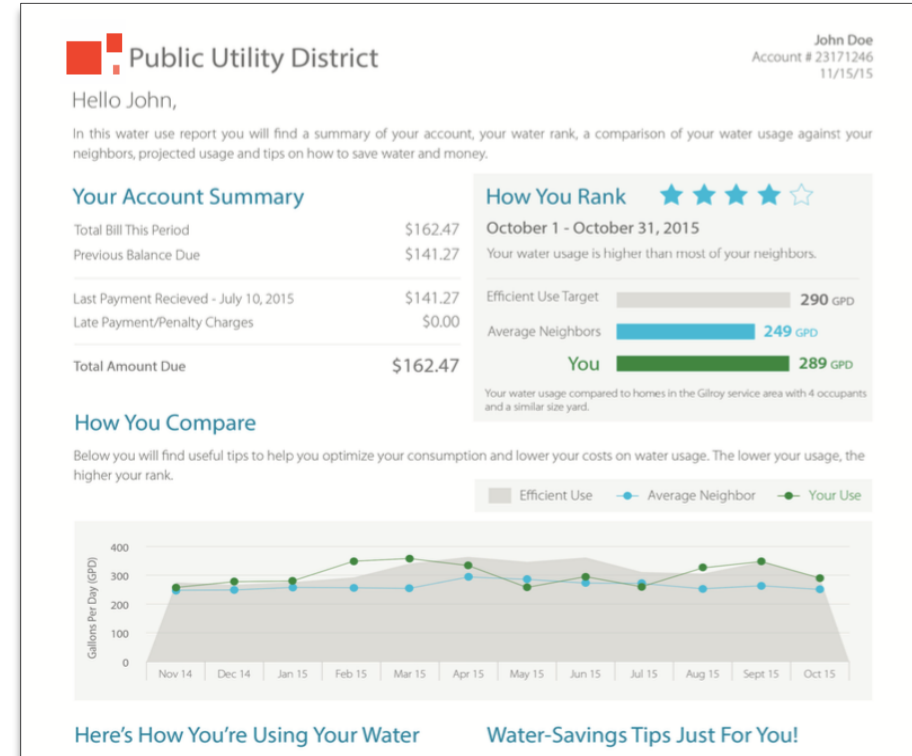
What (Some) Customers Want and Don't Want

Don't Want

- Raw data
- Difficulty accessing info

Want

- Comparisons (w/budget, others)
- Notification of problems
- Potential diagnosis
- Solution options
- Privacy



- **Not all customers the same – need multiple channels**

Cleveland Water Leak Notification

- **Customers w/meters ≤ 1 " automatically opted-in to notification**
- **Customers w/meters > 1 " must request auto notification**
- **Initial leak flag after 168 hours continuous consumption $>$ threshold**
 - **Thresholds: ≤ 1 " - 1 CF/hr; 1.5-3" - 10 CF/hr; 4-8" - 100 CF/hr**
- **Leak flag: letter and email (SMTP on web server)**
- **After 7 days, 2nd notice (email if portal profile; otherwise letter)**
- **After 14 days, 3rd notice**
- **After 90 days, notification process starts over**
- **Results:**
 - **As of 9/2015, 4.3% of customers got notices**
 - **86% of these no longer on leak report**
 - **91% of these resolved without response from customer**

Questions and Discussion

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