

Serving our customers

AMI Program Update

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July 9, 2025



Agenda

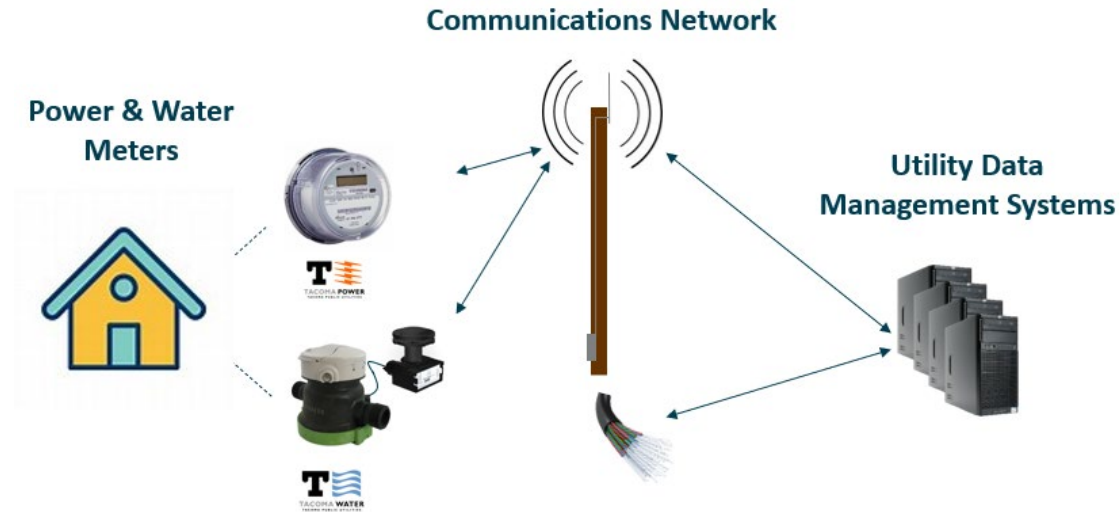
- Introduction
- Objectives & Scope
- Implementation Summary
- Benefits & Outcomes
- Lessons Learned & Best Practices
- Next Steps



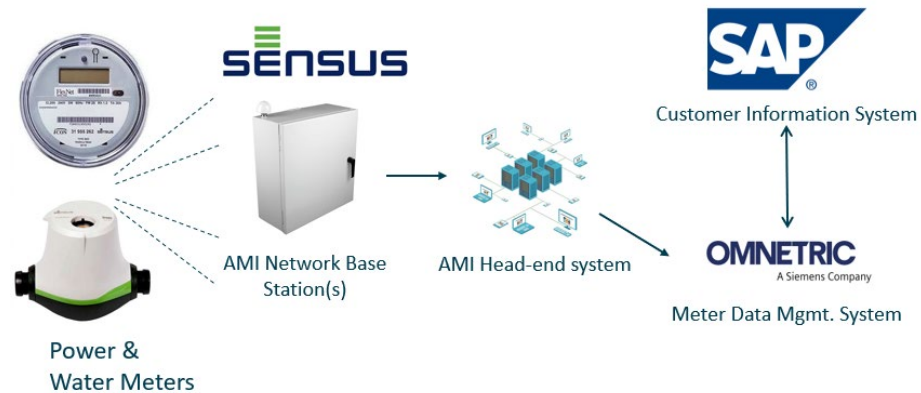
Advance Metering Infrastructure (AMI)



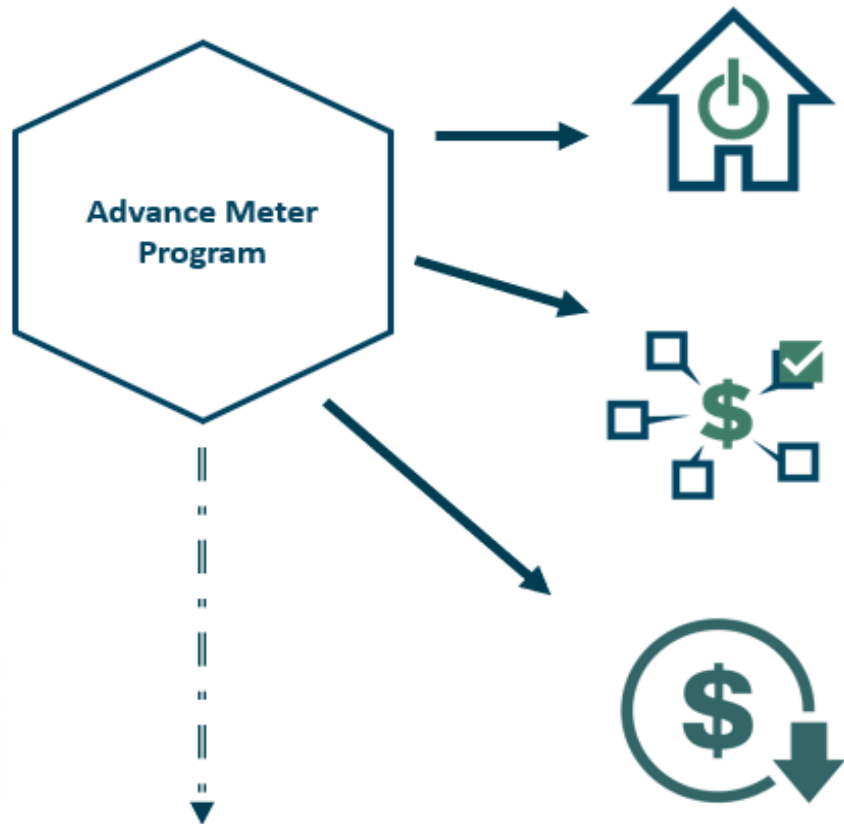
AMI System



AMI Solution Components



AMI: A Strategic Initiative



Grid Modernization Efforts
Smart Water Efforts

Foundational for Utility Modernization

- An **essential building block** of TPU
- A strategic focus for the **past few years**
- Will **modernize TPU services**

Delivers and Enables Benefits

- Monthly billing
- Automated meter reading
- Customer and TPU access to usage data
- Quicker outage and leak detection
- Data collection and input enabler
- PrePay - residential electric customers

Low Customer Cost

The cost to individual customers remains relatively low and is **spread over ten years**. Costs are **factored into the current rates**.

Beginning in 2019, the additional cost increase each year for the next ten years is about \$2.28/year for the average City of Tacoma residential power and water customer.

Decision to Pursue AMI (Internal & External)



- Regular program check-ins to governing bodies (over 13 presentations over a two-year period)
- Frequent reminders of the benefits and capabilities of AMI as boards and councils turned over
- [Public-facing online FAQ](#)
- Presence at neighboring city councils, neighborhood councils, and other community groups

General Program Overview



Scope: Deploy Advanced Meter Infrastructure and Capabilities

- Installation of approximately 290,000 advance meters
- AMI communications network installation
- Meter Data Management System (MDMS) implementation
- AMI to SAP integration
- Monthly billing transition
- Customer engagement portal deployment

Schedule:

2018 – 2025 (Revised) | 2018 – 2022 (Original)

Budget:

\$82M - \$84M (Re-baseline 2023) | \$81.7M (Original 2020)



Final electric installed by vendor (03/20/25)

Key Customer Benefits Roadmap



Advanced Meters Customer Benefits Roadmap

Updated February 2020

Customer Benefits Key

Reliability & Resiliency

Billing & Payment

Convenience



Phase 1 Functionality

To be completed by mid 2022

1. Basic meter to bill
2. Basic meter data reporting
3. Monthly billing
4. Customer meter options policy
5. Support for basic manual prepay process

1. Enhanced customer portal
2. Consumption data available via new portal
3. Enhanced outage notifications
4. Abnormal consumption notifications
5. Emergency water leak notifications

1. Remote meter reading
2. Remote disconnect/reconnect for power
3. Automated service order creation

Phase 1 Dependencies

1. Deploy AMI Network & Meters
2. SAP Integration
3. MDMS Implementation
4. New Customer Portal Deployment & Integration
5. New SAP Functionality for Fees

Phase 2 Functionality

To be completed between 2021 and 2023

1. Enhanced prepay functionality (via portal)

1. Asset analytics use cases
2. Engineering analysis & systems planning
3. Enhanced voltage monitoring
4. Revenue protection

Phase 2 Dependencies

1. Data Lake Integration
2. webMethods ESB Integrations
3. AMI Stabilization Work

Enabled Functionality

Features enabled by AMI but not in program scope
To be prioritized after 2023

1. New real-time rate models
2. Support for multi-service prepay (water, sewer, trash)

1. Enhanced SAP contact center tools via CIC upgrade
2. Enhanced demand & load forecasting
3. Enhanced grid & outage mgmt. operations
4. Distribution automation
5. Smart water capability
6. Smart City integration

Future Dependencies

1. SAP Customer Interaction Center Replacement
2. OMS & ESRI GIS Integration
3. Energy Management System Integration
4. SAP Configuration for New Rates
5. Embedded Taxes in Rates Removed from SAP

2020

2021

2022

2023

2024 and beyond...

Customer Benefits to Unlock



- Automated Meter Reading
- Enhanced Personal Privacy



- Easier Move-In & Move-Out
- Remote Reconnect/Disconnect for Electric



- Abnormal Consumption Notifications
- Emergency Water Leak Notifications



- Monthly Billing



- PrePay for Electric



- Expanded Ways to Save: Detailed Usage Data on Web Portal



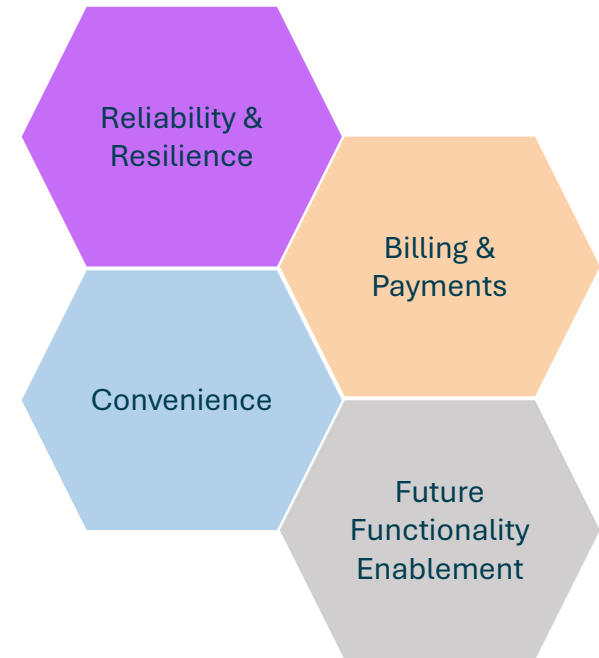
- Enhanced Customer Web Portal



- Selectable Bill Due Date



- Enhanced Customer Outage Notifications



Implementation Considerations

- ✓ Governance
 - Leadership sponsorship
 - Resource commitments
- ✓ Engagement
 - Customer Engagement
 - Program Communications
- ✓ Program Execution
 - Program Milestones
 - Meter Deployment Considerations
 - Customer and Utility Benefits to Deliver



6 Best Practices for a Successful Tech Implementation

Governance & Organizational Model



Effective Program Organizational Model

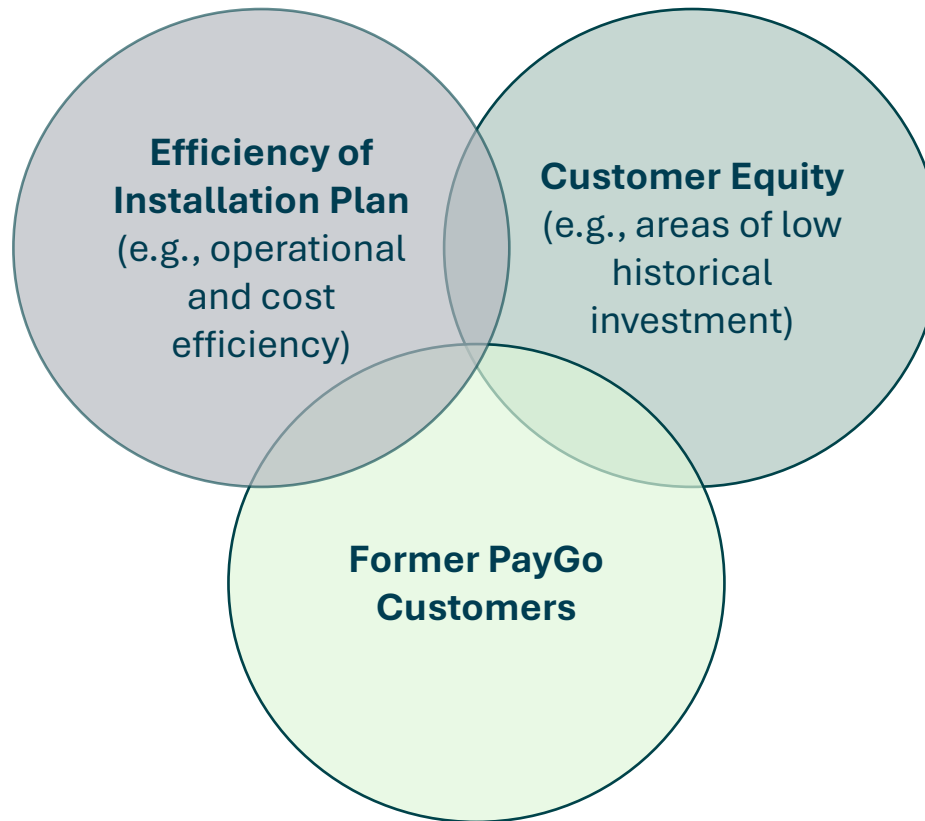


Major Program Milestones



Milestones	Procurement	Sys Integration	Pgm Mgmt	Deployment
Executed 5 major vendor contracts (approx. \$65M)	Complete			
Build a sandbox meter for testing		Complete		
Create an app to survey water meter boxes				Complete
Survey water meter boxes (104,450)				Complete
Connected the sandbox meters to the meter data management system		Complete		
Complete blueprint workshops and mapping business processes (57)		Complete		
Conduct a propagation study of TPU service area				Complete
Design a communication network, including 49 antennas				Complete
Complete policy updates, including 7 resolutions and 2 ordinances			Complete	
Complete core advance meter functionality Go-Live		Complete		
Complete installations in the initial deployment area				Complete
Convert the first route to monthly billing			Complete	
Provided customer usage data in MyAccount		Complete		
Developed a deployment plan balancing operational efficiency and equity				Complete
Establish a change agent network (55 staff)			Complete	
Shared customer communications (100+)			Complete	
Track and complete program KPIs (60+)			Complete	
Complete training hours (1,578) for 200+ staff			Complete	
Resource Planning – dedicated 338 staff and 100K+ hours to effort			Complete	
Finalized system integration for mass meter installations		Complete		
Complete all power and water meter installations				Complete

Meter Deployment Considerations

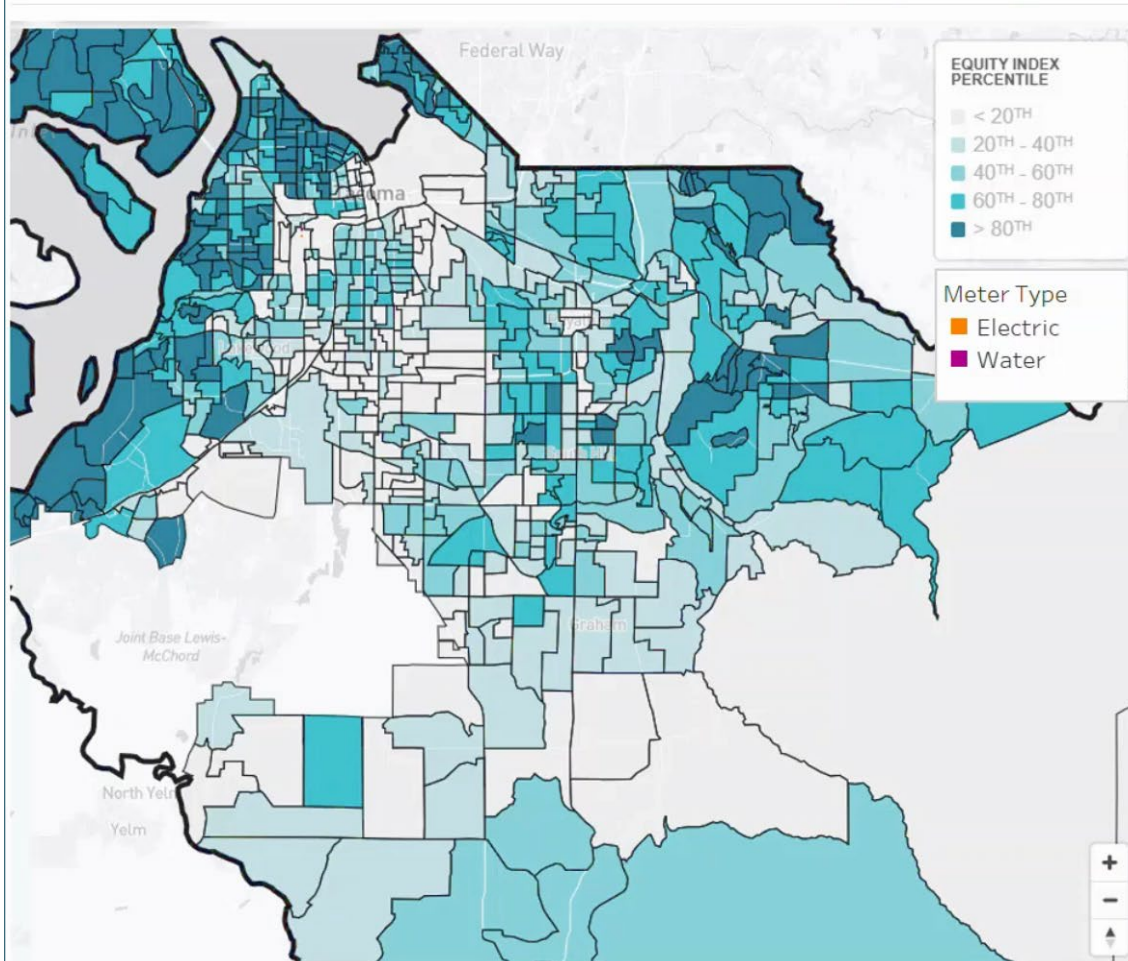


We successfully followed our deployment plan, balancing efficiency with inventory as we navigated the challenges supply chain issues presented.

Meter Deployment Strategy

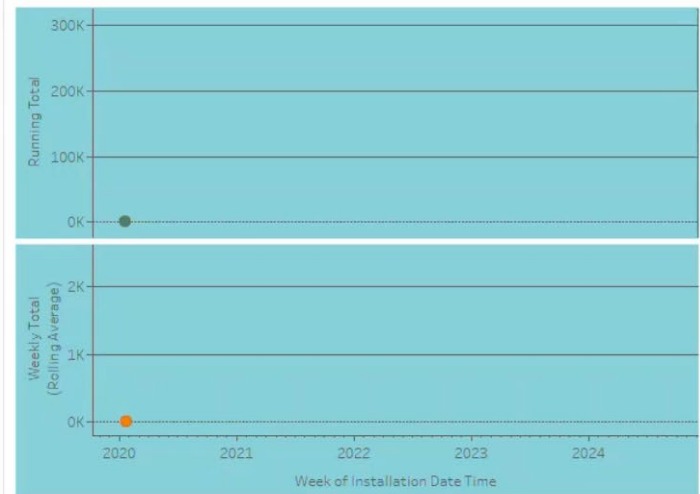


AMI Saturation



September 20, 2020

Sept. 2020: Go Live and IDA Begins.



Week of Installation Date Time

< September 20, 2020

0



Customer Engagement - Communications

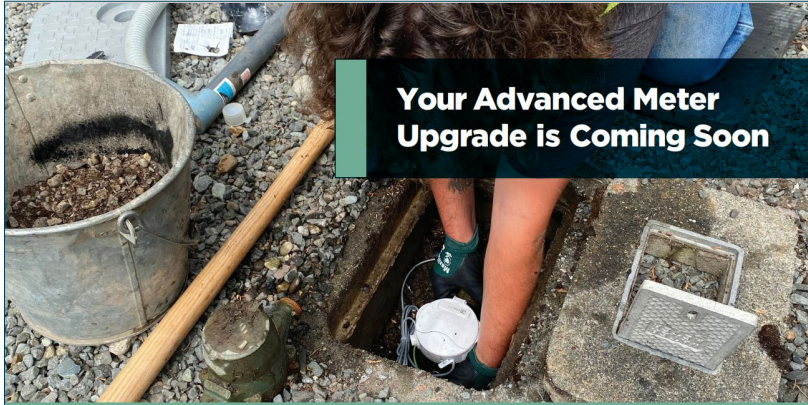


Communications **before** meter installation:

Customer Touch Points	Communication
14 days before install:	Postcard
7 days before install:	Autodial
48 hours before install:	Autodial & Door Hanger

Communications **throughout** program timeline:

- About **1 million communication pieces** mailed to customers
- About **650k calls** made to customers
- Communication materials available in **multiple languages**



Your Advanced Meter Upgrade is Coming Soon

Conozca más acerca de la instalación de su medidor avanzado en MyTPU.org/AdvancedMeters/SP.

Получить информацию об установке счетчика можно здесь: MyTPU.org/AdvancedMeters/RU.

다음 웹사이트에서 곧 설치될 미터기에 대해 알아보세요. MyTPU.org/AdvancedMeters/KOR.

សូមស្វែងយល់ព័ត៌មានអំពីការដំឡើងម៉ែត្រសម្រាប់ការប្រើប្រាស់ប្រព័ន្ធគ្រប់ភាសា។ MyTPU.org/AdvancedMeters/KM.

Tìm hiểu về cách cài đặt đồng hồ đo điện/nước sắp tới của quý vị tại MyTPU.org/AdvancedMeters/VIET.

RES: W 14, 08/21

TACOMA PUBLIC UTILITIES

Your Advanced Meter Upgrade is Complete

We successfully upgraded your electric and/or water meter(s) today.

- ☐ **We upgraded your electric meter:**
We interrupted your power service during installation, so you may need to reset your clocks.
- ☐ **We upgraded your water meter:**
Your water is now back in service and safe to drink. We recommend running your cold water from your bathtub or outside faucet for a couple of minutes to clear any air or discoloration you might experience.

If you have questions or concerns, call **855-701-2135** for assistance.

Benefits
Your advanced meter allows for faster responses to outages and gives you access to your power and/or water usage information online through MyAccounts. If you aren't already registered, you can sign up at MyTPU.org/MyAccount. Once the upgrade is complete, you will receive information about moving to monthly billing. Stay informed by visiting MyTPU.org/AdvancedMeters and signing up for our monthly email newsletter.

Your meter was installed by: _____

TACOMA PUBLIC UTILITIES

Advanced Meter Project

The Tacoma Public Utilities (TPU) Advanced Meter Project will provide you with greater control, choice, and convenience. Starting in mid 2020, TPU will begin upgrading to its electric and water meters with modern digital technology that brings many new customer benefits over time, including monthly billing, remote electric service reconnection, more options to control your costs, improved reliability through faster outage and leak detection, and more flexible payment options in a safe and secure way.

TPU has been a trusted service provider in the region for more than 125 years and will continue to provide you with the reliable, affordable, and environmentally-responsible service you expect by replacing and upgrading aging meters. With technology that is used in more than 75 million households nationwide, the advanced meter project enables a shift to a modern digital utility, making operations more efficient and helping the environment through reduced carbon emissions.

Your benefits over time

Your Control, Choice, and Convenience
Access more usage data anytime to manage your use and costs.

Monthly Billing
Advanced meters will allow a switch to monthly utility bills, which most people prefer.

Earlier Move In, Out, and Reconnection
Remote turn on and off of electric service saves you time.

Faster Outage and Leak Detection
Locating and fixing issues helps us restore service to you sooner.

Improved Operational Efficiency
Better information about our systems helps us manage costs.

Automated Meter Reading
More accurate, timely bills based on real-time data.

Enhanced Personal Privacy
No need for regular physical access to read your meter.

Expanded Ways to Save
Providing data about your use increases your ability to save money, water, and energy.

Flexible Payment Options
More options over time include prepay for electric service and custom due dates.

Reduced Environmental Impact
Fewer vehicle miles traveled for meter reading, less fuel burned, and outage detection lowers our carbon footprint.

MyTPU.org/AdvancedMeters

TACOMA PUBLIC UTILITIES

Facts about Advanced Meters and Radio Frequency Emissions

Your concerns about radio frequency (RF) emissions are important. The intent of the information below is to help you better understand advanced meters and provide reassurance about the health and safety questions often associated with them.

How do advanced meters work?
Advanced meters measure your usage throughout the day just like your current meter. The meters transmit data via RF to us up to twenty four times per day. The meters emit RF only when they transmit data, which is typically less than one minute per day.

Radio Frequency (RF) Exposure Values (in microWatts)
(based on average usage)



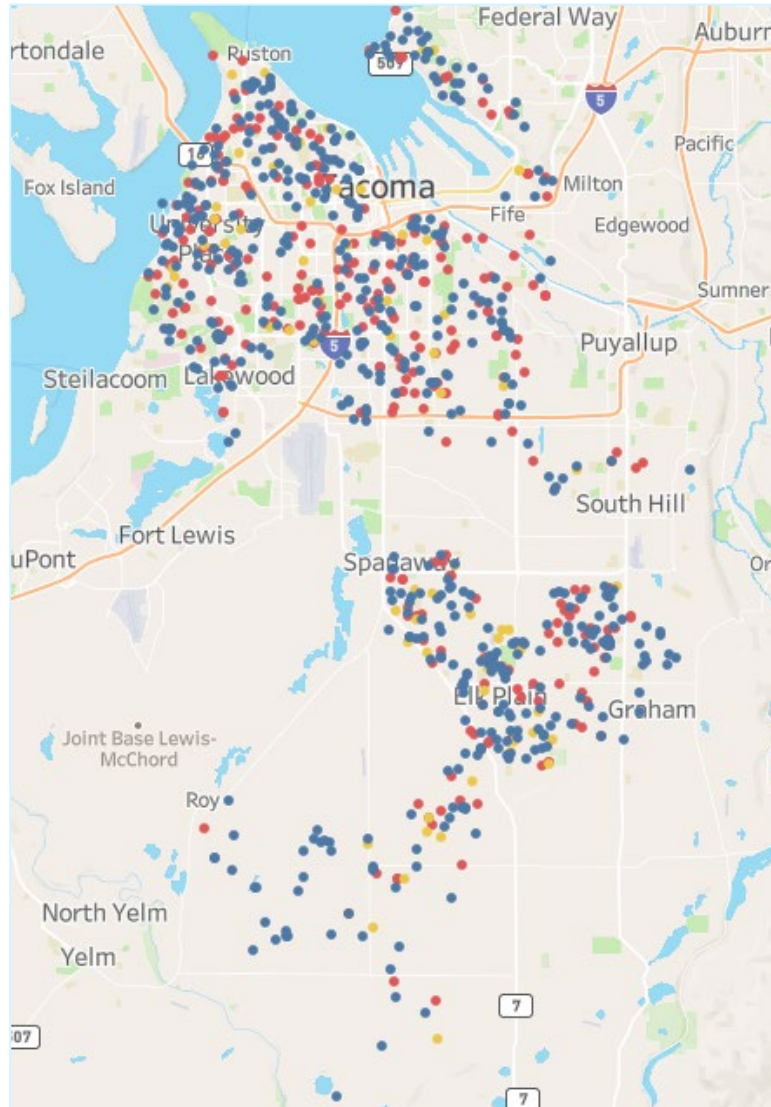
Scientific Research about Advanced Meters and Health

• A study by Washington State University determined the amount of energy absorbed from advanced meter radio frequency is substantially less than the Federal Communications Commission (FCC) safety guidelines, even when a person stands close to a meter.

continued on reverse >

MyTPU.org/AdvancedMeters

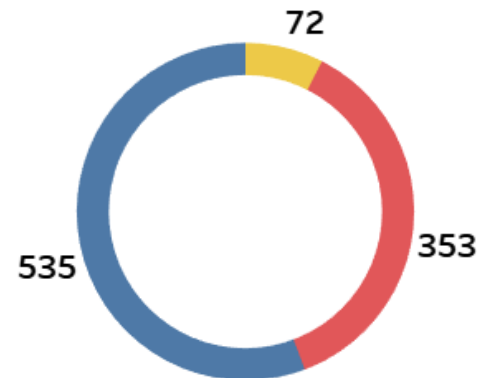
Customer Engagement – Opt-Outs



Status

(Click to highlight. Click again to deselect.)

- Active
- In Process
- Cancelled * See Dashboard Info



Opt Out KPIs

(Percent of Total AMI installations)

Active or In Process (<0.5%)	0.32%
Total Inquiries (<1%)	0.50%

Unanticipated Global Events



1. COVID-19 Pandemic
2. Meter Supply Chain Disruptions
3. Program Staff Turnover



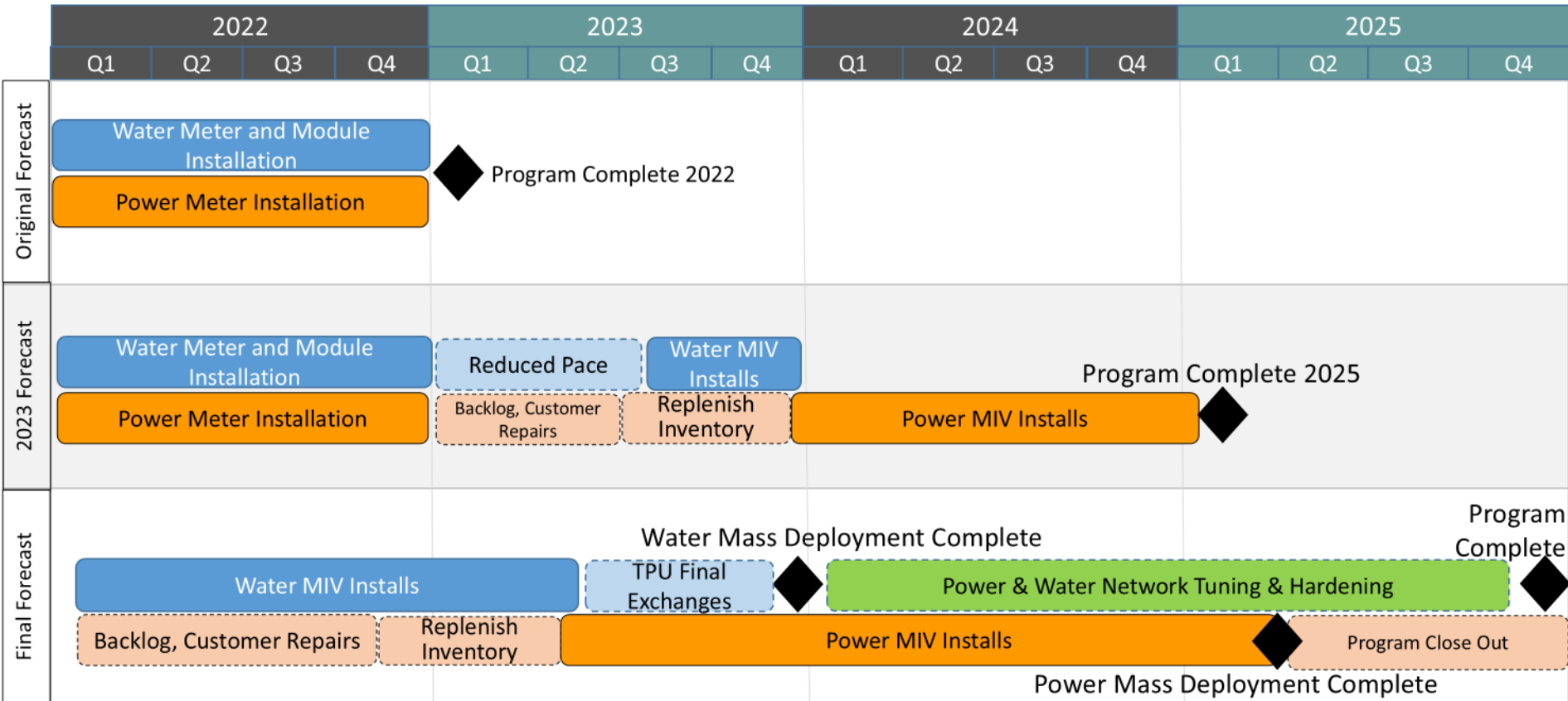
Program Impacts

- Schedule extension
- Potential cost increase
- Staff turnover
- Customer communications plan modifications
- Resolution and agreement updates

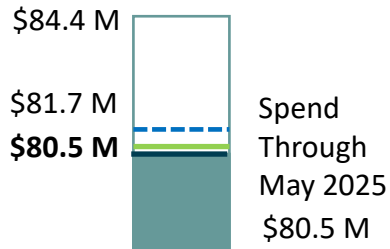
Mitigation Strategy

- Agile, optimized meter deployment planning
- Detailed inventory management
- Hired when needed, others filled in/partnered coverage where possible, scope delimited
- Deliver customer benefits as soon as possible
- Pursue least cost alternatives

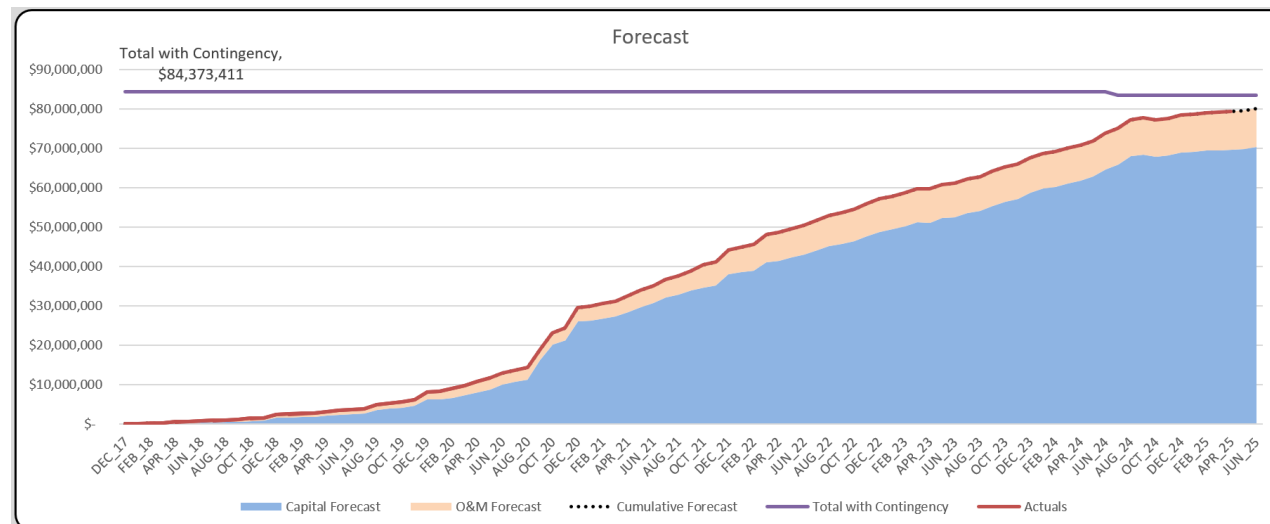
MIV Deployment Schedule Update



AMI Program Budget Overview



AMI Program Budget History	Milestones	Forecast	Total Budget
Current - May 2025	Q1-2025	\$80.3	\$80.5
Re-baseline Stage Gate	Q4-2023	\$82.8	\$84.4
Supply Chain Stage Gate	Q2-2022	\$85.2	\$85.5
Start of Mass Deployment	Q2-2021	\$80.8	\$81.7
Baseline Business Case	Q1-2020	\$75.0	\$81.7



Customer Benefits Delivered



- Automated Meter Reading
- Enhanced Personal Privacy



- Easier Move-In & Move-Out
- Remote Reconnect/Disconnect for Electric



- Abnormal Consumption Notifications
- Emergency Water Leak Notifications



- Monthly Billing



- PrePay for Electric (Deferred until all five COT Services are enabled)



- Expanded Ways to Save: Detailed Usage Data on Web Portal



- Enhanced Customer Web Portal



- Selectable Bill Due Date



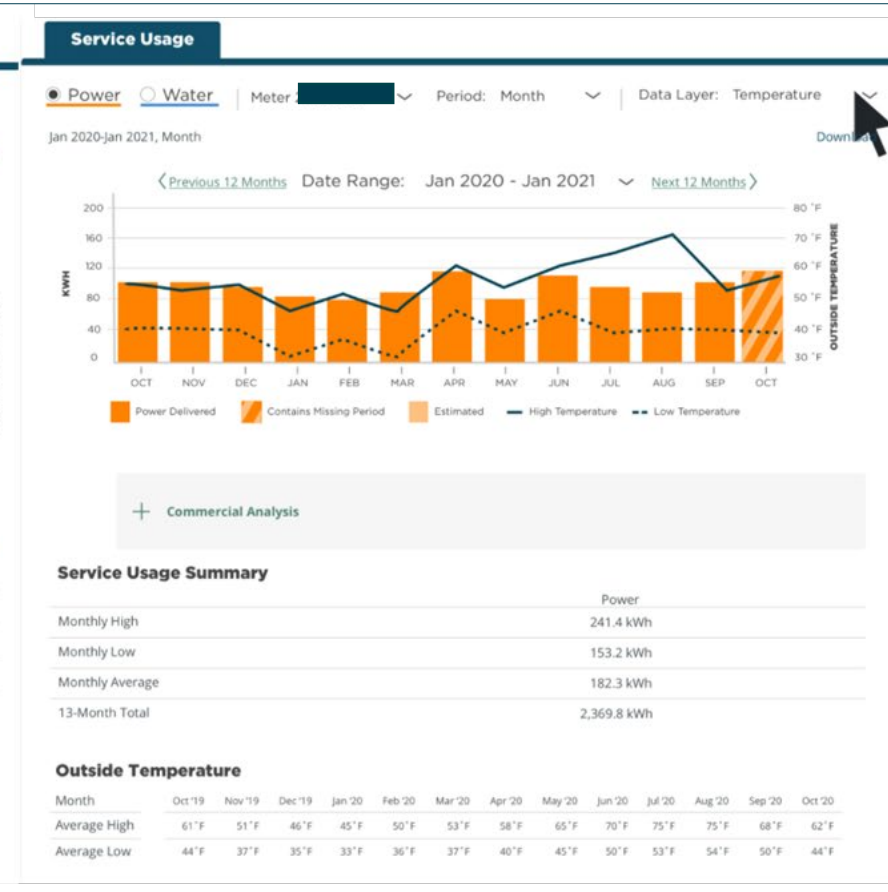
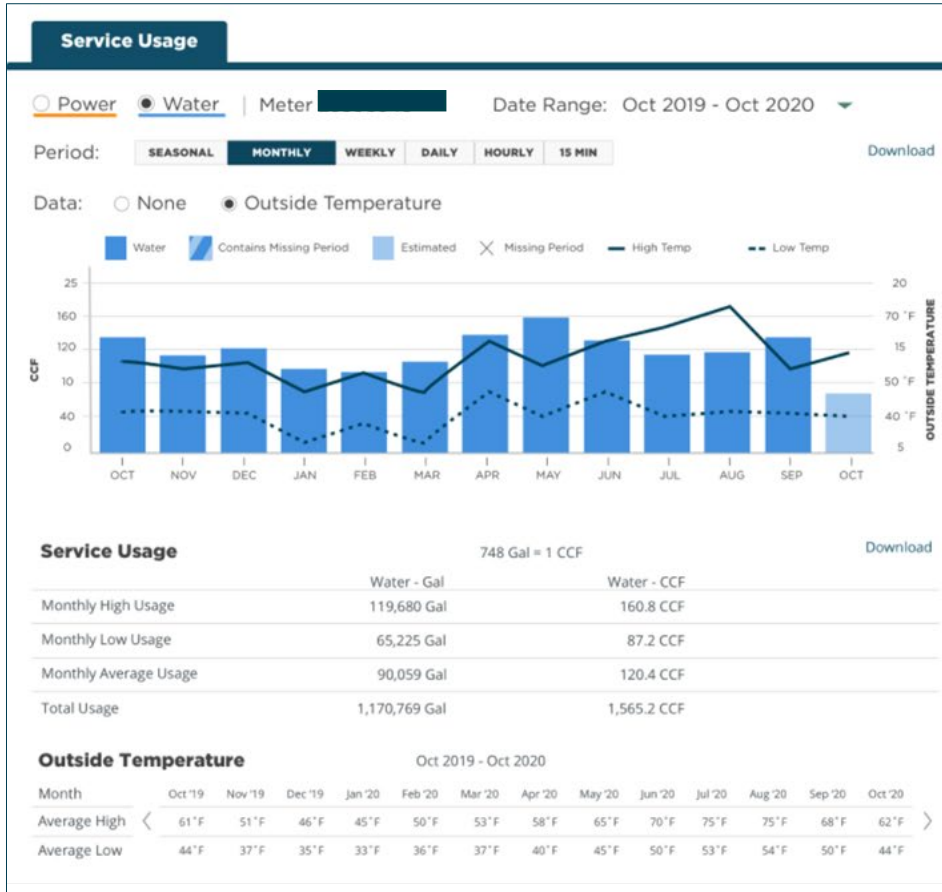
- Enhanced Customer Outage Notifications

Operations Benefits (Business Case)



Quantified Benefits forecast over 20 years	KPI Status		KPI Description
Labor Reduced & Avoided		On Target	Meter Readers - Reduce 20 positions; Avoided 20 Call Center - Avoided 4 Network & Security - Avoided 7
Reduce Outage		On Target	Reduce 5 minutes
Meter Replacement		Monitoring	Reduction in meters purchased for maintenance
Avoided Truck Rolls		Monitoring	Reduction in number of trips related to dunning and service disconnects/reconnects
Asset Management		Measure, Optimize	Reduction in transformers purchased for maintenance & related staffing
Reduced Write-Offs		Measure, Evaluate	Reduction in annual dollars
Reduced Energy Losses			Increased # of tampers
Leak Forgiveness			Reduction in annual dollars

Use Case: Customer Self-Serve Usage Data



Available for All Customers

- Hourly, daily, and monthly usage information via MyAccount, made available with more frequent, automated meter reads.
- 15 min. and/or 5-minute interval data available for electric customers and select water customers.
- Detailed usage data increases a customer's ability to save money, water, and energy.

Use Case: Leak Tracking & Notifications



Continuous Usage Customer Communications - Totals



Communication Type	All Time	Last Year	Last Month	This Year	This Month	
Water Leak Letter Sent	48,006	13,247	2,264	13,504	336	Mailed Leak Notification
Water Continuous Usage MyAcct Alert Sent	641	232	81	391	3	MyAccount Leak Notification
Water High Flow Alert	1,844	715	103	315	7	Phone/Mail High Flow Notification
Water High Flow MyAcct Alert Sent	2	0	0	1	0	MyAccount High Flow Notification
Leak Alert Notifications Updated	6,396	3,943	185	1,162	14	New MyAccount Signups
Leak Alert Notifications Ended	60	35	3	12	0	Canceled MyAccount
High Usage Notification	954	332	119	622	0	Description
Water Leak Cust. Contacted or Due Diligence Done	3,784	664	2	43	0	Description
Water Leak Do Not Contact Customer	76	0	1	6	0	Do Not Notify

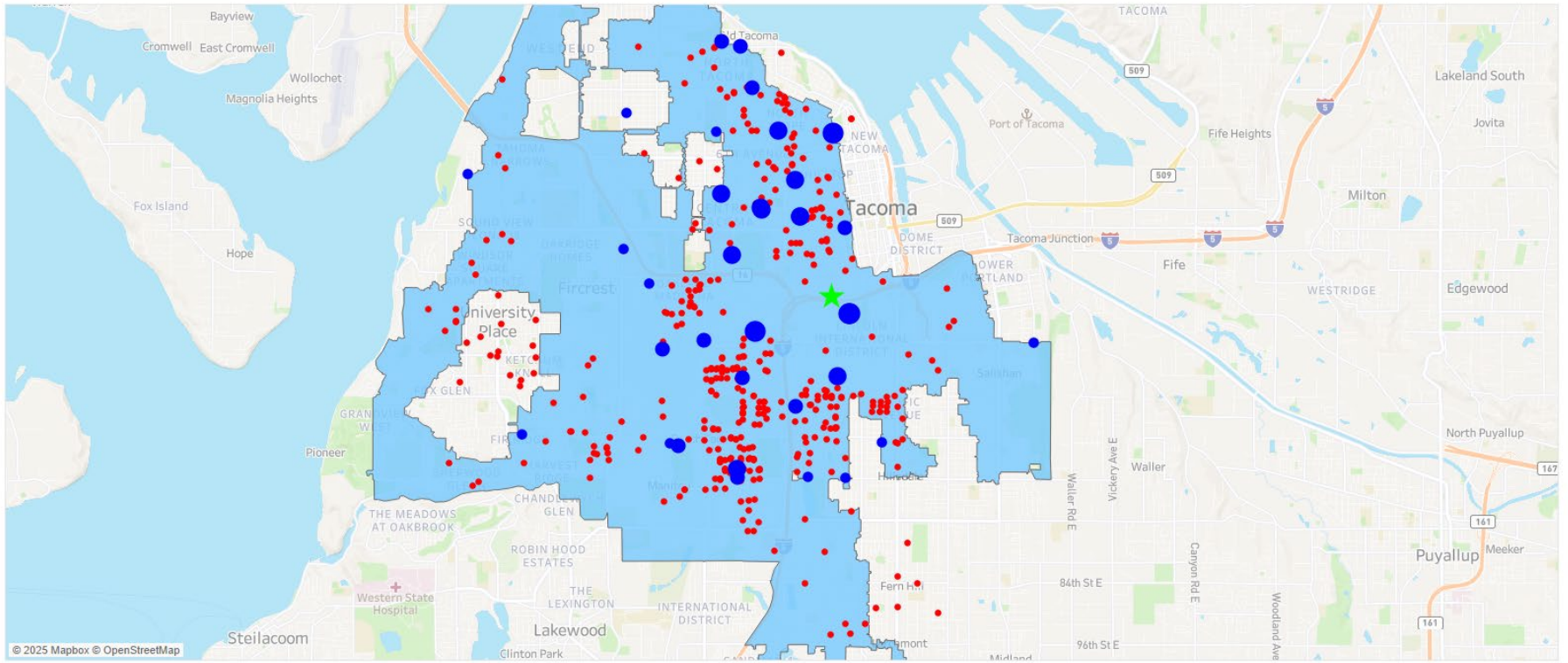
Communication Triggered By
☒ (All)
☐ BATCH_DFLT
☐ TPU Staff

Water Leak Tracking	Before AMI	With AMI	Impact
Notifications to customers	60 – 120 days (average)	1 – 7 days (average)	Save water, time, and money

Use Case: Customer Calls & Pressure Drops



Water Quality Calls vs. Pressure Drops during November 2024 Main Break
Pressures Reported by SmartWater Devices Utilizing the AMI Network



Purpose: Correlation between the magnitude of pressures decrease in the distribution system to the volume of water quality complaints.

Shaded blue: The primary pressure zone effected by the event.

Green star: Location of the main break.

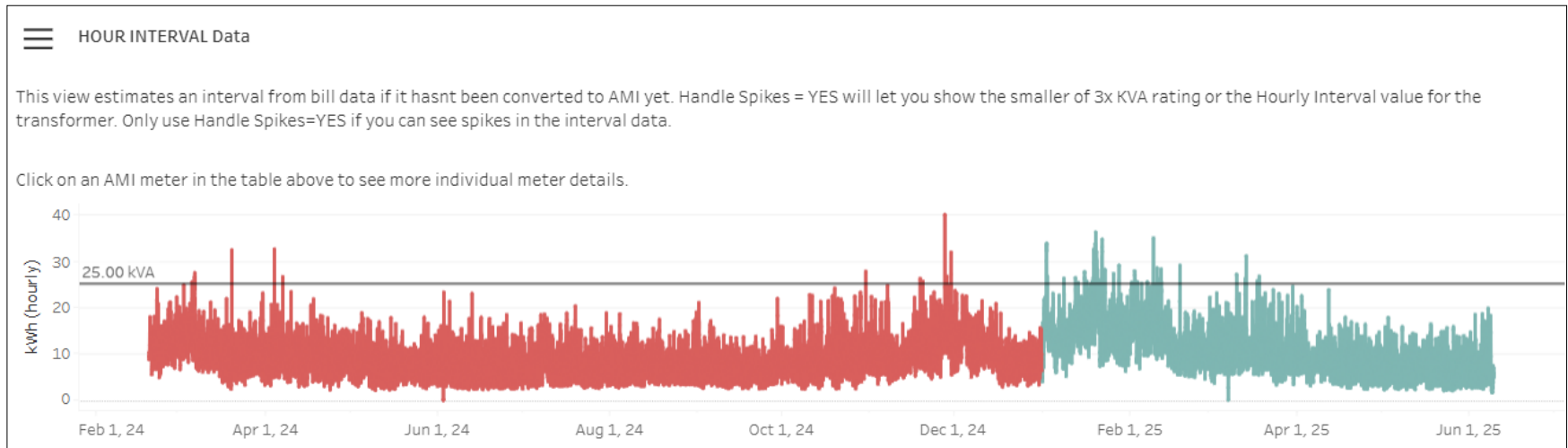
Red circle: Customer water quality related calls received in the days following Nov. 2024 main break.

Blue circle: Pressure sensors showing drops in pressure.

Use Case: Power Asset Management



Installation	Installation Rate Category	Address	⌘+ Device	AMI Meter	Device Valid From	Device Valid To	Max Demand at Peak	Max Interval	% of Max Peak
Grand Total							40 kW	105.4	100.00%
700219053	EL_R_SUP		CT W, ..	Y	11/20/2023	12/31/9999	6 kW	10.7	14.18%
700219109	EL_R_NSUP		CT W, ..	Y	4/25/2023	12/31/9999	3 kW	27.2	6.30%
	EL_R_SUP		CT W, ..	Y	4/25/2023	12/31/9999	3 kW	27.2	6.30%
700219139	EL_R_SUP		CT W, ..	Y	11/20/2023	12/31/9999	5 kW	5.9	11.74%
700219175	EL_R_SUP		CT W, ..	Y	11/20/2023	12/31/9999	8 kW	7.6	18.92%
700219197	EL_R_SUP		CT W, ..	Y	11/20/2023	12/31/9999	19 kW	19.5	48.73%
700524952	EL_R_SUPG		CT W, ..	Y	4/25/2023	12/31/9999	0 kW	7.4	0.13%



- Interval reporting for a single transformer to see loading across all meters associated with the specific transformer.
- Provides historical consumption data of any of the associated meters (and customers) attached to a specific transformer.
- Alerts staff of which customers are contributing to an overload (if one exists).

This helps TPU determine quickly and accurately if another customer could be connected to this existing transformer. Moving from the previous monthly interval data to AMI data has enabled Power to better optimize the number of customers served on any given transformer.

Closing Overview



Scope:

Deploy Advanced Meter Technologies

(Meters, Network, Meter Data Management Systems)

Schedule:

2017 – 2025 (Revised)

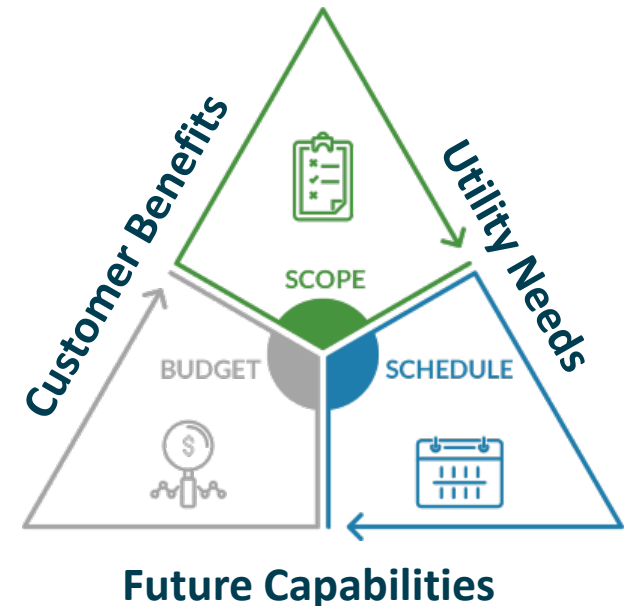
2017 – 2022 (Original)

Budget:

\$80.5M – (Current)

\$82M - \$84M (Re-baseline 2023)

\$81.7M (Original 2020)



Closing Activities (In Progress):

- Final meters to exchange – Power Meter Shop
- Financial and documentation closeout (e.g., release retainage to vendors)
- Communications Network refinements (e.g., install final base stations)

Program Success Factors



Focused on customer impact and benefits



Priority #1 Strategic Initiative



Active and engaged leadership at all levels



Dedicated resources to support the program



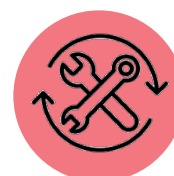
Communications (policy makes, community, employees)



Governance Framework (clear, accepted, followed)



Collaboration across divisions and organization



Enable system reliability and functionalities

Looking to the Future



Utility Modernization Strategy & Roadmap – Coming Soon

- Maximize investments in AMI system
- Facilitate alignment of organizational roadmaps
- Alignment with industries (utility, energy, water, rail, customer expectations)

City of Tacoma Technology Road Map

Utility Modernization Program
(Business Technology Roadmap)

TPU Technology Road Map (UTS)

Tacoma Power Technology Initiatives

- Grid Mod Program
- Section Technology Roadmaps
- Capital / A&R Technology Efforts

Tacoma Rail Technology Initiatives

- Smart Rail
- Technology Roadmaps
- Capital / A&R Technology Efforts

Tacoma Water Technology Initiatives

- Smart Water
- Functional Technology Roadmaps
- Capital / A&R Technology Efforts

Customer Experience Technology Initiatives

- CX Technology Roadmaps
- Capital / A&R Technology Efforts

Appendix



- Budget: May 2025 Financial Report
- Quantified Benefits (In Dollars)

Budget: May 2025 Financial Report



Category	Feb 2020 Business Case	August 2023 Rebaseline	May 2025
Electric Meter Deployment	\$ 26,059,039	\$ 28,609,461	\$ 26,887,693
Water Meter Deployment	\$ 21,363,073	\$ 21,216,279	\$ 19,986,951
Comm Network Deployment	\$ 3,280,816	\$ 3,575,634	\$ 3,396,564
System Integration	\$ 8,891,422	\$ 8,951,503	\$ 8,951,503
Capital Internal Labor	\$ 2,043,167	\$ 6,397,443	\$ 6,235,788
Prof Services	\$ 3,788,946	\$ 5,131,212	\$ 6,092,191
O&M Costs (Operations & Project)	\$ 9,491,736	\$ 8,241,879	\$ 8,496,125
Customer Engagement Portal	\$ 250,000	\$ 250,000	\$ 279,178
Total	\$ 75,168,199	\$ 82,373,411	\$ 80,325,993
Contingency	\$ 6,597,244	\$ 2,000,000	\$ 200,000
Total + Contingency	\$ 81,765,443	\$ 84,373,411	\$ 80,525,993

- **A final financial report with budget vs. actual expenditures will be available once final invoicing is processed.**
- **Financial Prudence**
 - Partnership with vendors
 - Restructure contracts for flexibility
 - Monitored and evaluated program regularly (stage-gates with leadership and program team)
 - Pursued and awarded grants (\$2M Water Grant)
 - Adjusted schedule and deployment strategy to navigate unanticipated events (supply chain, COVID)

Quantified Benefits (\$\$)



Quantified Benefits	KPI Status	Forecasted 20-year benefit
Labor Reduced & Avoided	 On Target	\$70.1M
Reduce Outage	 On Target	\$0.02M
Meter Replacement	 Monitoring	\$10.8M
Avoided Truck Rolls	 Monitoring	\$3.2M
Asset Management	 Measure, Optimize	\$6.7M
Reduced Write-Offs	 Measure, Evaluate	\$4.4M
Reduced Energy Losses		\$3.2M
Leak Forgiveness		\$1.8M

Benefit	Quantified Benefits forecast over 20 years	Percentage %
On Target	\$70.2 M	70%
Monitoring	\$14.0 M	14%
Measure, Evaluate, Optimize	\$16.1 M	16%
Total Benefits	\$100.2 M	100%