CITY OF EUREKA CALIFORNIA

WATER METER UPGRADE PROJECT UPDATE

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Deputy Director of Public Works – Field Operations

3/24/25

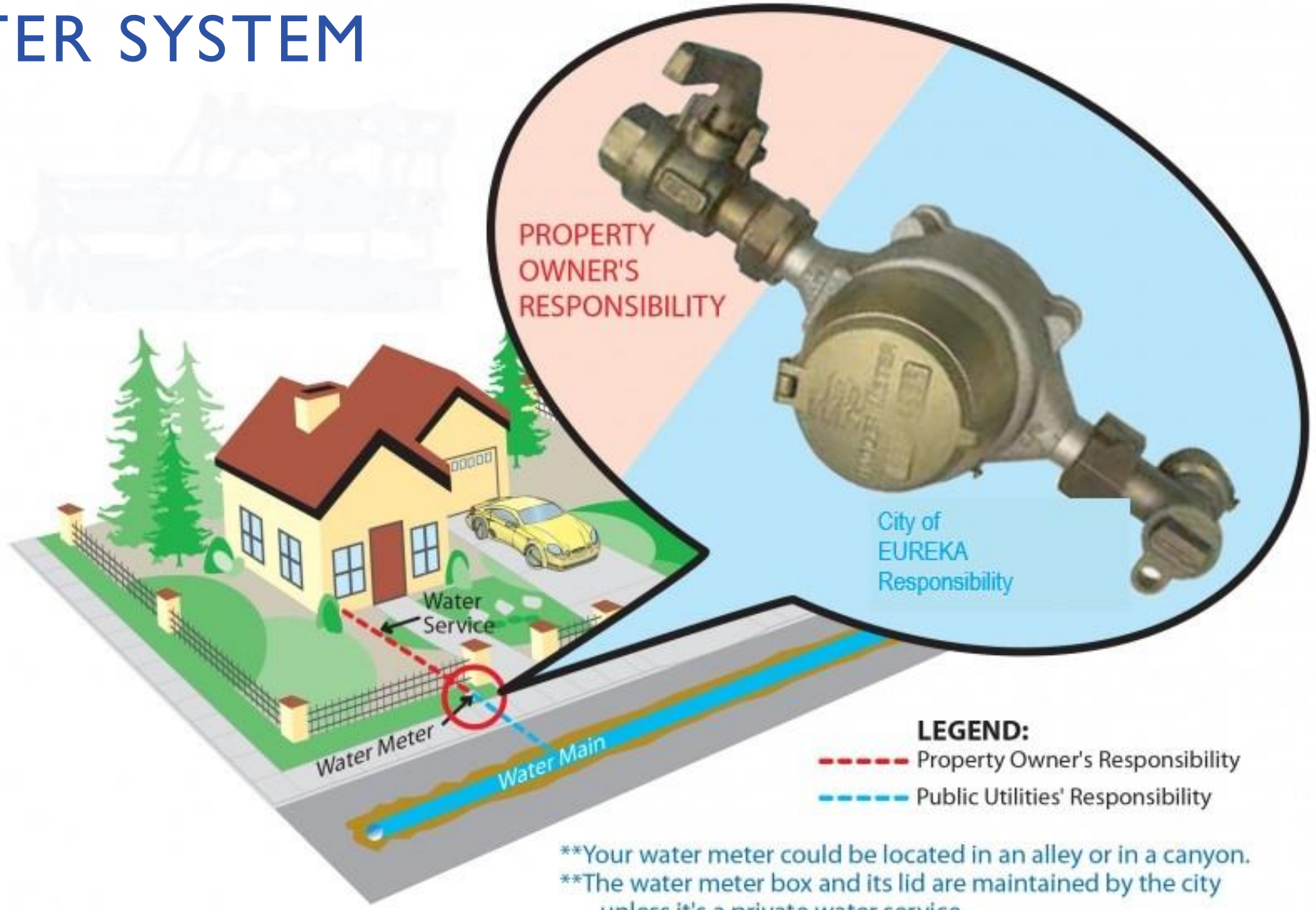
Overview

- Background and system overview
- Challenges/Solutions
- Project Costs
- Next steps

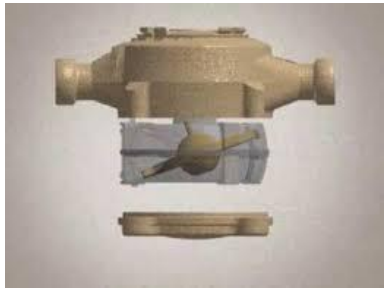
BACKGROUND

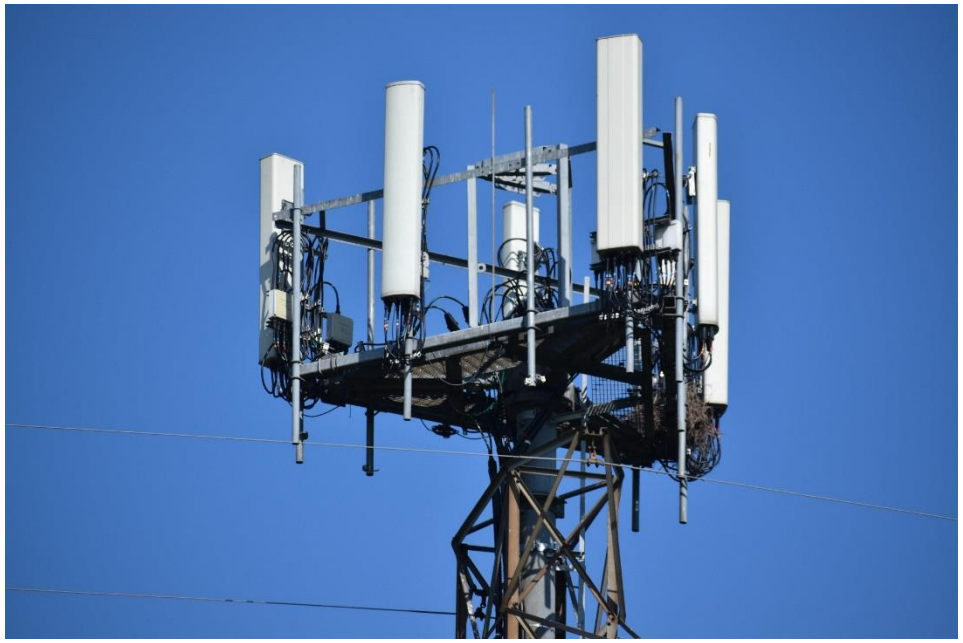
01

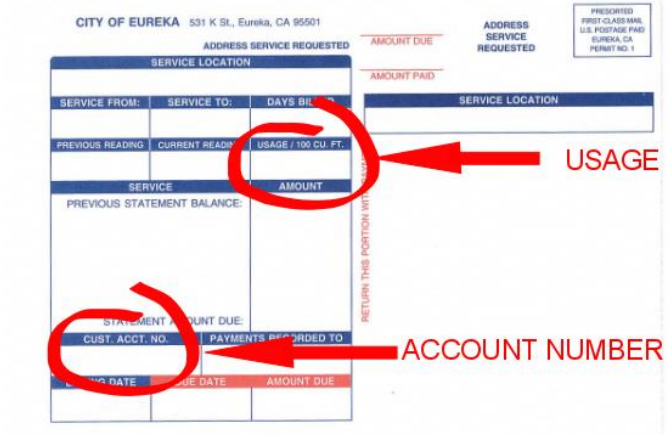
THE METER SYSTEM



THE METERING SYSTEM







tyler technologies

METER READING SYSTEM HISTORY

- Everything new in 2006-07 (10,200 meters)
  - Went from a manual system to radio reads from a vehicle
  - Able to read through metal lids
  - Estimated 20 year battery life. Started dying in 2020-2021
- 2022 began testing cellular equipment (propagation study)
- Summer of 2022, the number of dead meters began to increase sharply along with time spent reading meters manually
- Forecasting showed that without action, we would be reading a full 25% of our meters manually by June of 2023
- Reviewed options and chose cellular with Council approval

OPTIONS FOR EQUIPMENT REPLACEMENT

- Bid out to contractors
  - Initial quote over $6M
    - Approximately 50% labor
    - Not including box replacements
    - Data QA/QC issues

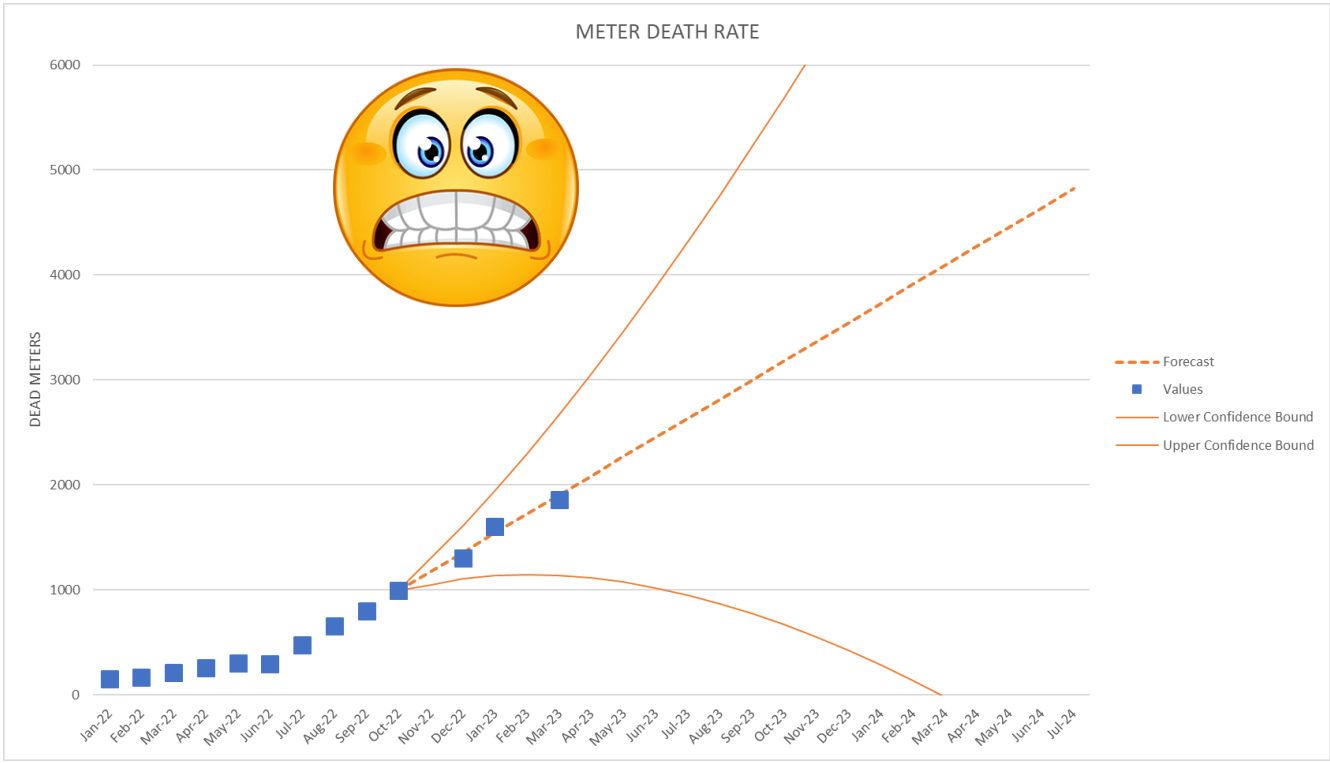
- Do the work In-House
  - Estimated hard costs of $3.6M
  - Staffing/capacity
  - Opportunity to correct existing issues and control data quality (QA/QC)

CHALLENGES/SOLUTIONS 02

CHALLENGE

Staffing

- Meter reading went from 1 person 8hrs/mo to 4 people multiple days
- Losing 200 meters/mo
- Needed to stop reading meters entirely to reallocate staff to swapping equipment



SOLUTION

Estimated Billing

- Allowed reallocation of staff from reading to swapping meters
- Nightmare for customers and billing team

Read Group D	Meter Reading	KVA Reading	Read Type
=	=	=	A
2/23/2024	44,883		Handheld
1/24/2024	44,573		Handheld
12/19/2023	44,472		Snow Billing
11/27/2023	44,914		Estimated
10/23/2023	44,241		Handheld
9/29/2023	43,568		Estimated
8/23/2023	43,438		Handheld
7/24/2023	43,308		Estimated
6/28/2023	42,644		Handheld
5/24/2023	41,980		Estimated
4/24/2023	41,588		Handheld
3/24/2023	41,196		Estimated
2/24/2023	40,604		Handheld
1/23/2023	40,012		Handheld

CHALLENGE

Cellular equipment wont transmit through concrete or metal lids (10K lids needed to be retrofitted or replaced)

- Mishmash of sizes, styles and homemade units
- Box replacement costly ($1500ea)
- Estimated 3500 total

SOLUTION

Nicor lid inserts

- Tested materials (reinforced polymer)
- Multiple sizes available

2250 Plasma cut metal lids with inserts

- Awarded lid cutting to BT Metals
- Cut in batches
- Easy transport
- $150 fix for a $1500 problem
- Total savings of >$3M

CHALLENGE

Data acquisition and transfer

- Accuracy (100,000+ data points)
  - Small errors can cause big problems
- Consistency (QA/QC)
- Opportunity to cleanup existing errors

	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	ServiceAddressNumber	190949051	MeterNumber	MeterRemoteReadId	OldMeterEndRead	DateSwapped	RegularScale	NumberOfDials	NewMeterBeginRead	MeterGroup	MeterSize	MeterMake	MeterNote	MeterType	MeterSerialNumber	Latitude	Longitude	RemoteReadType	DatePurcha
9094	0403-209635	07156006	240681004	133097153	204	12102024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240681004	40.80556974	-124.1500239	.001	12102024
9095	0702-402776	07077040	240680728	132919132	967	12172024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240680728	40.80214925	-124.1466925	.001	12172024
9096	0802-406090	02238318R	240680814	132919342	1498	12092024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240680814	40.79670823	-124.1414239	.001	12092024
9097	0802-406108	03238319R	240680818	132919169	940	12092024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240680818	40.79694825	-124.1414272	.001	12092024
9098	0802-407916	07076735	240679953	133096553	1176	12062024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679953	40.77957736	-124.141749	.001	12062024
9099	0802-407924	07076815	240679955	133098054	446	12062024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679955	40.77956399	-124.1416389	.001	12062024
9100	0802-407932	07076813	240679950	133096719	1367	12062024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679950	40.77956807	-124.1415508	.001	12062024
9101	0802-407940	07076784	240679959	133096639	695	12062024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679959	40.77964494	-124.1414424	.001	12062024
9102	0802-407957	07076797	240679952	133097867	523	12062024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679952	40.77966186	-124.1414194	.001	12062024
9103	0802-407973	07077268	240679951	133097801	859	12062024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679951	40.77976665	-124.1413143	.001	12062024
9104	0802-412106	07061315	240679954	133096544	714	12062024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679954	40.77989923	-124.1412398	.001	12062024
9105	0802-411835	07061065	240679962	133096565	734	12062024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679962	40.77992721	-124.1415891	.001	12062024
9106	0802-408303	15382138	240681022	132921399	211	12082024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240681022	40.78163838	-124.141951	.001	12082024
9107	0802-422048	01125353R	232071423	132682662	1233	12132024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	232071423	40.78177916	-124.1438841	.001	12132024
9108	0602-308502	07156496	240680775	132905015	378	12092024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240680775	40.79162134	-124.1490407	.001	12092024
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9111	1001-507178	07147070	240679719	133036132	608	12162024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240679719	40.78089593	-124.1623777	.001	12162024
9112	0802-407304	07076771	240680822	132917439	947	12092024	1	9	000000000	W	5/8-3/4	BADGER-DISK		ORION CELLUL	240680822	40.78253498	-124.1397321	.001	12092024
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SOLUTION

Mobile GIS System

- Ipad/ArcGIS
- Utilize barcodes & scanners
- Limited manual data entry
- Store photos
- QA/QC built in

CHALLENGE

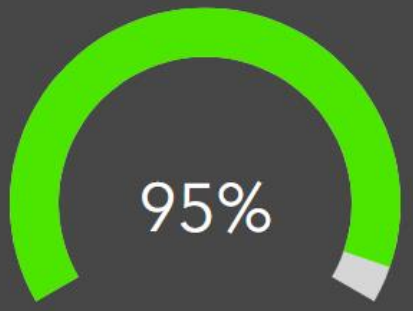
Transparency & Project Tracking

- Needed to be able to view and access data for troubleshooting
- Tracking progress
- Single point contact for schedules

March
2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2 FIELD SWAPS Zones 6-9	3 Print 1-5	4	5 Load Routes 6-9 MMS Post Processing	6 MMS UPLOAD Zones 6-9	7 FIELD SWAPS Zones 1-5	8
9	10	11	12	13	14	15
16	17 Print 6-9	18	19	20	21	22
23	24 MMS Post Processing	25 MMS UPLOAD Zones 1-5	26 Load Routes 1-5	27 FIELD SWAPS Zones 6-9	28	29
30	31	1 Print 1-5	2	3	4	5

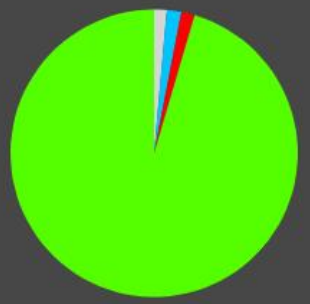
Project Completion Status



Registers Swapped

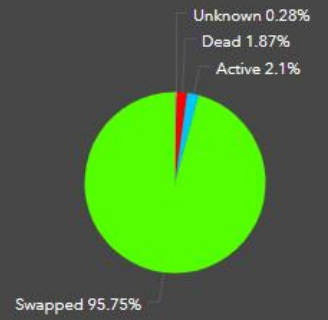
9,827

Register Lifecycle Status



Unknown	145	Active	168
Dead	156	Swapped	9,827

Read Zone 1-5



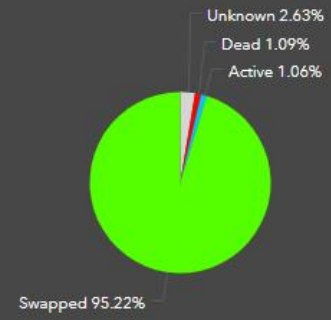
Swapped

5,430

Dead

106

Read Zone 6-9



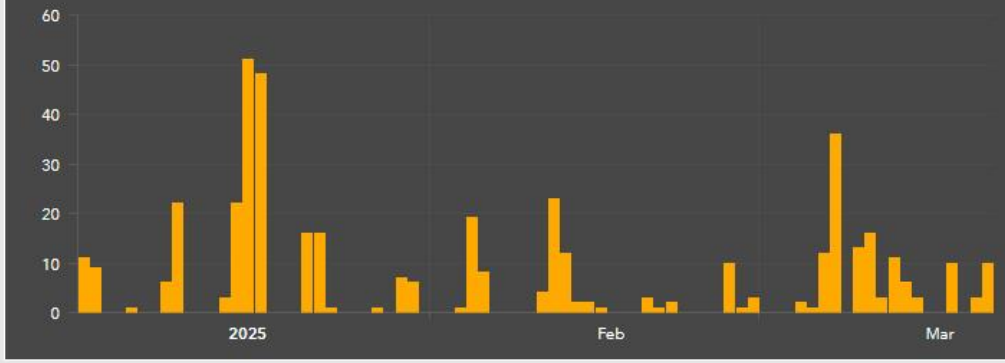
Swapped

4,387

Dead

50

Registers Swapped by Day

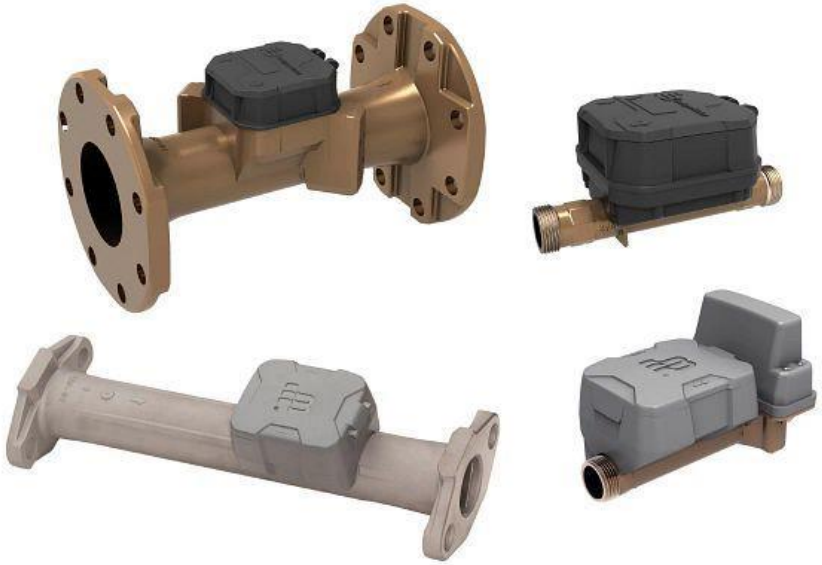


CHALLENGE

- Compound Meter Changeouts
  - Billed as two separate services
  - Accuracy / Revenue
  - Consistency / Clarity

SOLUTION

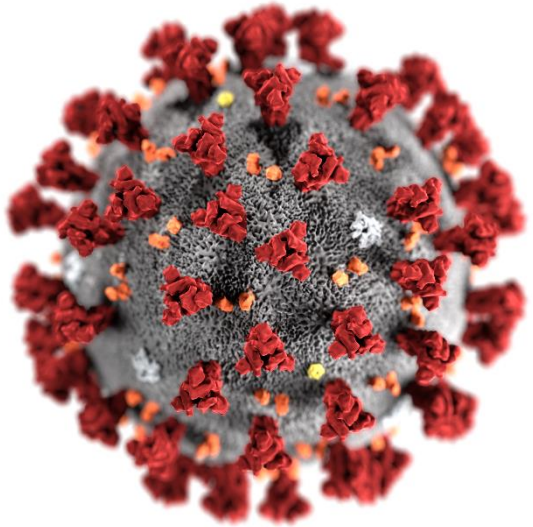
- Replace with single register ultrasonics
  - Much more accurate
  - Billing clarity
  - Pressure sensors (monitoring pressure spikes)



CHALLENGE

COVID Supply Chain Issues

- Problems getting lids and electronics (endpoints unavailable)
- Long lead times
- Partial order completions



SOLUTION

Order ALL equipment at once

- Assumed equipment would trickle in
- Entire order was filled at once
- Cellular billing starts 90 days post delivery ($5K)

OTHER CHALLENGES

- E-waste & battery recycling
  - Batteries cost $2.60 to recycle ($26K total)
- Incode Tech Support
  - Initial process was difficult to get up and running
  - Ran into a few hurdles (the joys of Incode)
- Server crashes, ransomware and other technical glitches
- Utility Billing issues
  - Opportunity to bridge the gap between field and finance
- Other routine maintenance on hold
  - Valve exercise program etc

COSTS / SAVINGS

03

Projected Costs

- Contractor estimate + equipment cost of >$6M (not including meter box replacements)
- Estimated cost of meter box replacement = $1.2M (assumes 800 at $1600)
- **Total cost in excess of $7M**

Actual Costs to Date

TOTAL SAVINGS = $3.5M

- Equipment = $3M (includes large meters)
- Labor = $0 (in house)
  - $100K OT combined FY 24 and 25 (includes normal OT as well)
- Total Cost to Date = $3.1M
- Estimated remaining cost = $100K-$200K (If we replace boxes in house)
- **Estimated Total Project Cost = < $3.5M**

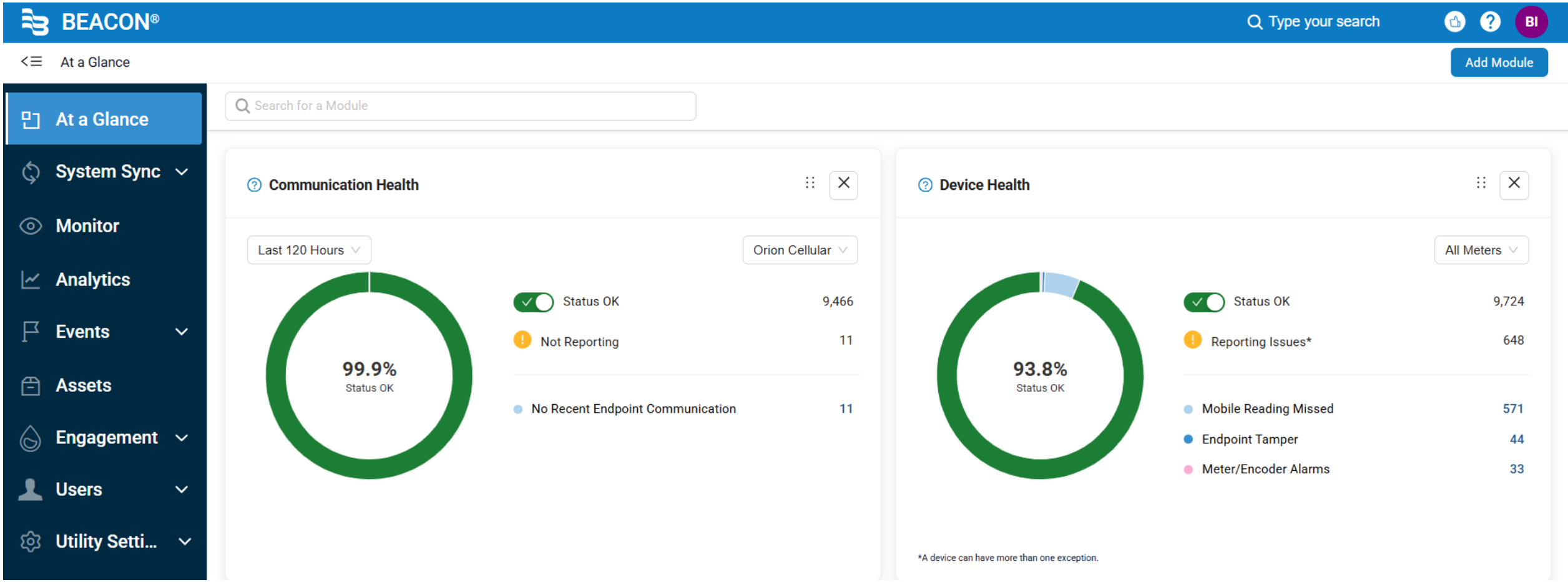
BENEFITS

04

Benefits of the AMR System

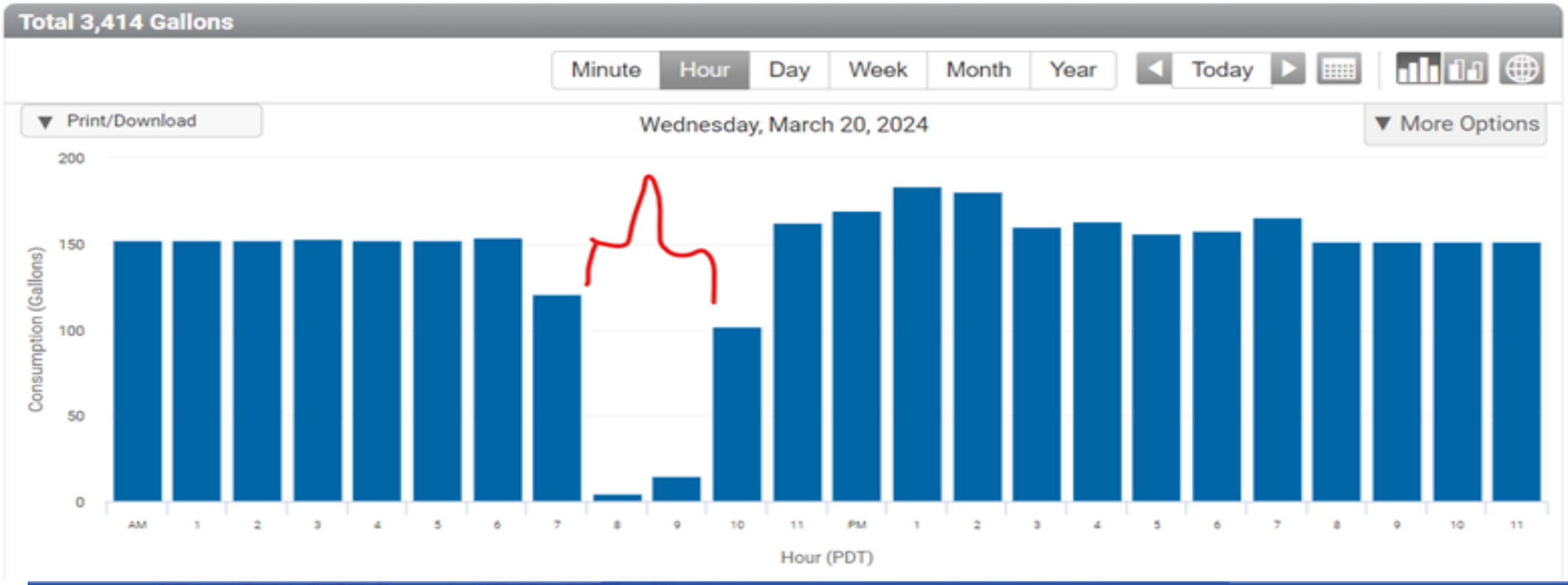
- **Timely Consumption Data.** Allows customers to view and manage their usage by providing water consumption data in 15-minute, hourly, daily, monthly and yearly intervals.
- **Consumer Empowerment.** Promotes customer awareness of leaks and water consumption behaviors, empowering consumers to actively engage in water conservation and leak prevention efforts.
- **Enhanced Customer Service.** Increases transparency with timely consumption data and early alerts for potential leaks, improving the customer experience while also reducing calls to the utility, resolution time and high bill adjustments
- **Efficiency**
  - Instantaneous reads
  - Lower staff costs
  - No equipment/vehicle costs
- **Troubleshooting.** Easily identify meter problems (hung meters, tampers etc)
- **Backflow data**
- **Pressure sensors**

Beacon / EyeOnWater



Beacon / EyeOnWater

Helping our customers detect and diagnose leaks



NEXT STEPS

05

Next Steps

- Meter box replacements
  - In-House vs Contractor
  - Time consuming and expensive ($100K materials + $1M labor)
- Beacon EyeOnWater Rollout
  - Multipronged/Coordinated
- Additional billing data QC
- Rate update (FY28) to cover cellular fees

Next Steps…METER BODIES

Meter bodies were tested for accuracy and found to be within industry standards…for now

- They will need to be replaced eventually
- Current cost >$1M
- May be possible to rebuild in house
- Plumbing issues
- Recommend that we replace them over time rather than all at once to spread out the capital costs
- Budget and staffing

SPECIAL THANKS!

QUESTIONS?