



# NECO

Smart Solutions, Water Powered

## *“AMR-AMI – How Do We Get Started”*

**Is it Time to Automate your Water Meter Reading  
Technology?**

**Ray Schwarz  
NECO  
May 18, 2018**

# AMR/AMI Terminology

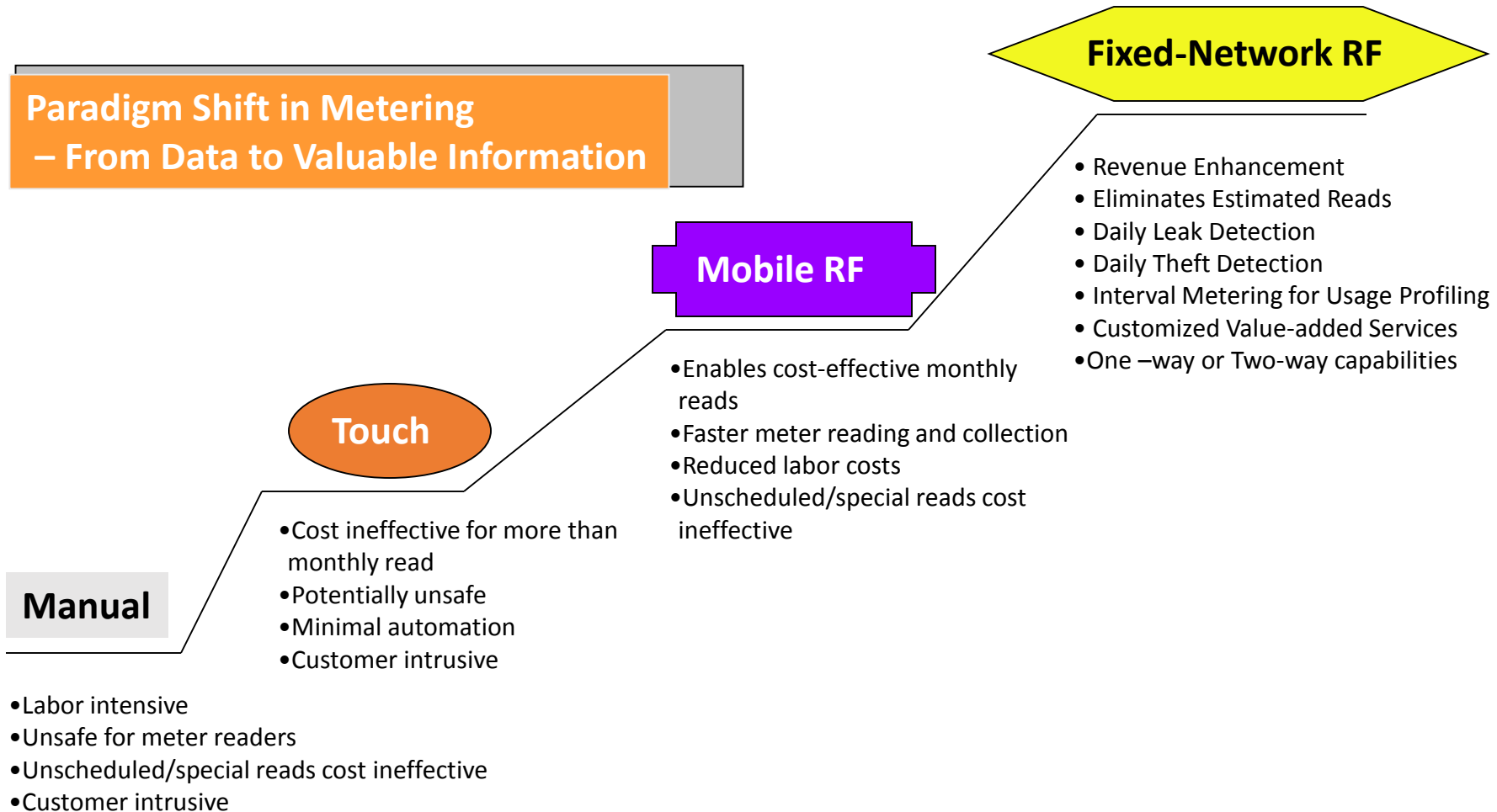
- **AMR** – (Automatic Meter Reading) automated process that collects readings from customers' meters without directly accessing the meter and can export reads to a remote central location
- **AMI** (Advanced Metering Infrastructure) automated process that collects readings and ***other data***, typically without going to the meter site, often two-way communication to facilitate data transfer
- **Ancillary devices**
  - Actuators - using the AMI communication network to operate equipment (e.g., customer shut-off valves)
  - Sensors – using AMI communication to process information from monitors other than meters (e.g., leak detectors, water pressure monitoring, water temperature)
- **Intelligent meters** – Reading devices with internal data storage/analysis capabilities to provide information/alerts to supersede or supplement readings
- **Interval Reads** - providing multiple period water usage data at predetermined or remotely configurable time intervals with individual collection transmissions

# AMR-AMI Market Drivers

- Meter reading cost and time
- Meter reading safety and liability insurance
- Hard-to-Read meters
- Aging infrastructure
  - Main maintenance
  - Fire hydrant maintenance
  - Distribution System Tampering
- Customer Service
  - Eliminate estimated reads
  - High water bill complaints
- Increase Cash Flow
  - Shorten billing cycle



# The Evolution of AMR

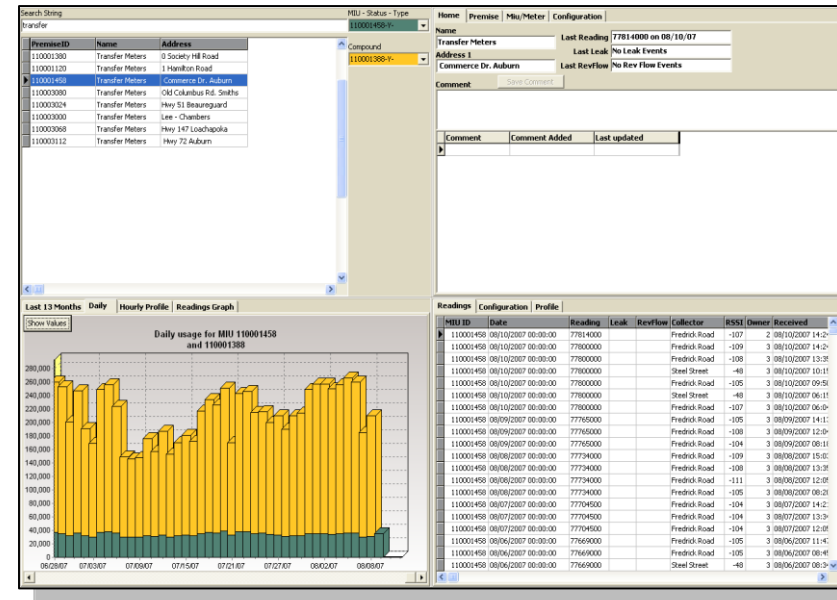
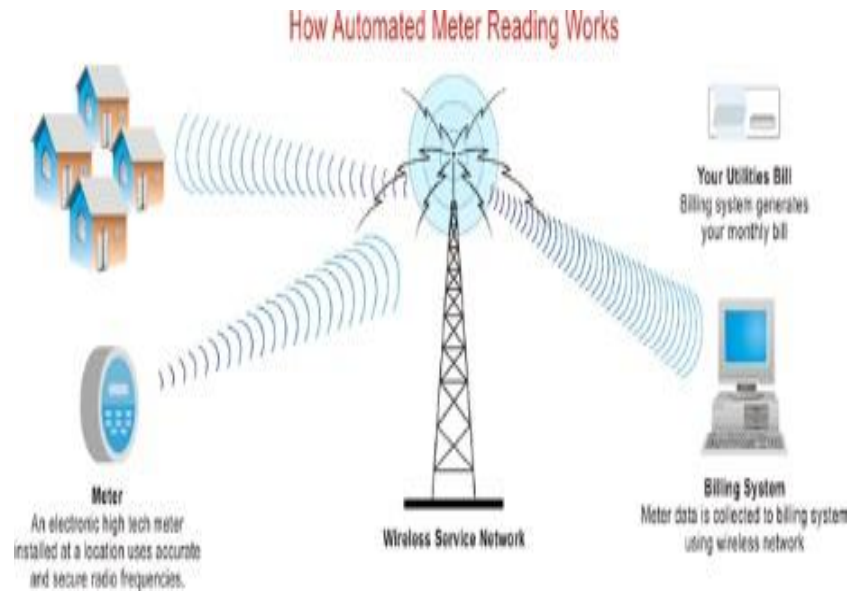


# The Evolution of AMR



# AMI & AMR Provides Two Major Benefits

- Meter Reading Improvement
- Better Data



# Meter Reading Transformation

- High Resolution Water Meters
- Automated RF Reading Technology
- Mobile Reading Technology
- Fixed Network Reading Technology
- Automated Meter Reading Software
- Advanced Daily Reporting Notification
- Customer Monitoring



# Why are we considering an AMI Metering Program

- Questionable accuracy of existing meters
- Increasing Unaccountable Water
- Inability to access meters for reading purposes
- Labor intensive for minimal reading results
- Customer Service
- Meter Reader Safety
- Meter Replacement Drivers





# Planning

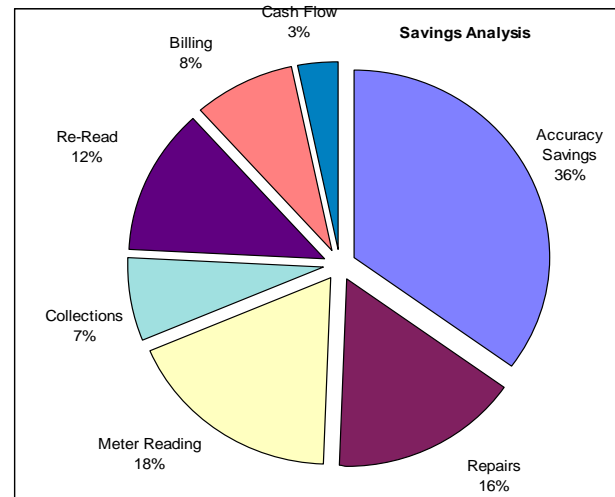
- Develop a Plan
- Evaluate the Meter and Meter Reading Technology
- Evaluate the Staffing concerns
- Look at this project as Capital Improvement Planning for many years

# First Major Step

- Must provide Council/Committee with proof statement that the change-out program is necessary
- Decide to use a consultant or work through the process internally
- Perform a Meter Feasibility Study to provide upfront answers

# Feasibility Study - Macro

- Looked at:
- Existing Practices
- Existing Metering System
- Overview of Existing Technologies
- Cost Assessment
- Customer Service Benefits
- Provided an Implementation Recommendation



## Economic Justification

Increased Accuracy Revenue  
Repair Savings  
Reading Cost Savings  
Re-Read Cost Saving  
Bill Processing Cost Savings  
Improved Cash Flow Savings  
Total Annual Savings

Payback Period

# Feasibility Study - Micro

- *Review*
- Meter Sizes
- Meter Locations
- Meter Age
- Percentage of System by Year
- Current version type
- Water Pumped/Water Billed
- Water/Sewer Revenue

VILLAGE OF HEBRON'S WATER METER COUNT								
Meter Book #	Meter Size							
	0.75"	1"	1.5"	2"	3"	4"	6"	8"
1	148	9	0	1	0	0	0	0
2	121	5	4	6	1	0	1	1
3	153	6	5	3	1	0	0	0
4	120	4	0	3	0	0	0	0
5	103	1	1	1	0	0	0	0
6	25	9	3	17	7	9	1	0
7	45	1	0	0	0	0	0	0
8	39	0	0	0	0	0	0	0
Total	754	35	13	31	9	9	2	1
							Grand Total	854
Meter Sizes	Total Count	Project Spec Count	Meter Type					
			PD	Compound	Turbine	Not Verified		
0.75"	754	768	754	0	0	0		
1"	35	35	37	0	0	0		
1.5"	13	12	6	2	0	4		
2"	31	29	2	17	0	2		
3"	9	7	0	7	2	0		
4"	9	8	0	6	1	2		
6"	2	1	0	2	0	1		
8"	1	0	0	0	0	1		
Spare 0.75"		20						
Total Count	854	880	799	34	3	10		
Visual Inside Reads: (install new remote wire)			196					
Remote Read (replace existing remote wire)			618					
			Pit Meters	47				

# Feasibility Study

- How do I get my information?
- Billing records
- Distribution Database

# Typical Study Findings

- **Estimated Reads** – Growing number of meter bills were based on estimated reads each month
- **Lower Accuracy** - As expected, the older the meter, the lower the accuracy
- **Customer Services Issues** – Incorrect readings, estimates, corrected bills, phone call complaints, long lines in billing office
- **Payback** - Estimated that the technology chosen would take less than 5 years to pay off based on *increased accuracy, reading time savings, fewer re-reads, shorter billing cycles, unaccountable water loss profiling data*

# Meter Accuracy Sampling

- **Meter Accuracy Sampling**
- **Next Step**
- Based on feasibility study, chose to focus on type of meter, meter reading technology, and Automatic Meter Reading type.
- Visited several sites to see installations in progress and/or working systems
- Decide to conduct installation internally or hire an installation contractor
- Touchpad
- Radio Read via Handheld
- Mobile Radio Read – Drive-by
- Fixed Base Radio Read System
- Cell Phone Communication

# Installation & Project Management Plan

- Do we have enough staff to handle the install?
- How long do we want it to take to complete the project?
- Can management handle this project and every day operations?
- Is the office staff prepared for the data input changes?



# Specification Development

- Use the feasibility study as your guideline
- Additional assistance can be provided by vendor specifications and those of other purveyors
- Put it in writing to assure the final product you want

# Specification Development

- Include each component
  - Meter
  - Meter Interface Unit
  - Reading Equipment
  - Installation Requirements
  - Billing Interface
- Consider requiring assessment of your large meters for correct sizing as part of the project

# Public Relations

- Let the people know about the project
- About the potential for changed billing cycles
- Methods
- Mailings
- Local newspaper
- Television
- Phone line
- Posters
- Speak to Service Groups

# Media - Get the word out

**Wright Read is Coming!**

**The City of Fairborn is bringing you the latest technology in water meter reading.**

- No more estimated readings
- Accurate monthly bills
- Early leak detection
- Improved customer service
- Project completion by Fall 2000
- Uses radio technology

**Further Information is Available on the Wright Read Hotline at 754-3070**

## UPDATING OUR SYSTEM

### AUTOMATED RADIO READ WATER METER

**HOW IT WORKS**

**What is AMI?**  
City of Barberton have contracted NECO to install New Water reading system at each service with a new state-of-art RF transmitters. The new Automated Meter Infrastructure (AMI) meter will allow the City to obtain meter readings using Radio-Frequency technology. The reading will be sent directly to the City Customer Service Department. This means you will always be billed from an actual meter reading.

**Where is my Water Meter Transmitter?**  
The vast majority of the water meters are located outside the building, usually along the side wall of your property. City personnel are already marking the curb stops throughout the community to better assist NECO installers when they began replacing the meters

**BENEFITS**

More accurate water bills, fewer estimated meter readings

Everyone will have the same meter transmitters

AMI RF Meter transmitters will not require City to visit property each month to read meter.

Reading Data will be monitoring for potential water leaks to offer notification to minimize unnecessary water usage.

Final bills can be obtained immediately

**WHY** New Water Meter Transmitters are needed.

The New AMI RF technology to provide reliable reading data.

City will be able to read Water with out the need to visit property each month to obtain meter reading

The new AMI System will send RF reading from you property to the Billing Office.

**WHEN** The Residential Meter Replacement will be begin in October 2017.

The City will inform residents that the installers will be working in the area.

**COST** Is there any cost to me to replace the meter transmitters?

**No cost** for the water meter transmitters or the installation. The City has scheduled to have all of the residential meter replaced as part of the project. Starting in October 2017.

# Leave Behinds

## How to read your meter:

### How to Read Your New Meter

Your new meter has a built in radio frequency interface unit. It captures readings every hour and transmits them to the City's data collectors. This allows for more accurate and timely readings.

- The display will appear by shining a very bright flashlight on the meter register.
- The Flow Indicator icon indicates the presence, absence and/or flow of water through the meter.
- The leak icon indicates that leak may be detected; it will provide data on the amount water.
- The 9-digit display includes decimal points; Readings are obtained by reading the dig from left to right.

### Understanding Your New Meter

**LCD DISPLAY**  
Nine-digit LCD displays the meter reading in billing units of measure: U.S. gallons & cubic feet

**LEAK INDICATOR**  
Displays a possible leak

**OFF** No leak indicated

**Flashing** Intermittent leak indicates that water has been used for at least 50 of the 96 15-minute intervals during the previous 24-hour period

**ON CONTINUOUSLY** Indicates water use for at least 96 15-minute intervals

### EMERGENCIES

Thank you for participating in the City of Elyria's Water Meter Replacement Program

Your new meter(s) will provide years of accurate and reliable readings.

This state-of-the-art system will eliminate estimated readings and provide important water data for our community.

There are no charges for our response and we can address your concerns quickly.

Don't worry if there is condensation around your new meter(s). This is expected.

If you experience a consistent drip or leak during normal business hours (M-F 8am-4:30pm), call:

**NECO Project Manager Mike Jensen**  
513-441-8340  
**NECO** 1-800-624-6975

If you have a meter leak outside of normal business hours call:

Non-Emergency Elyria Police Department at 440-323-3302 and ask them to page the on-call City of Elyria water team member

**Thank you for participating in the City of Elyria's Water Meter Replacement Program!**

## In case of emergencies:

### Your new meter should last for many years.

A small amount of condensation around your water meter is expected immediately after installation.



If you are experiencing a consistent leak or drip, or if the **Leak Indicator** is visible, please call:



We are on-call 24-hours a day, 7 days a week!

**Monday-Friday**  
8:00am-4:30pm  
Elyria Public Utility Office  
(440) 326-1570

For service after normal business hours, call the Elyria Police Dispatch at (440) 323-3302

### RATE

Indicates cubic feet or GPM (Gallons Per Minute) used. The 9-digit number reflects the amount of water used in cubic feet. The GPM indicates the number of gallons used per minute when a home's fixture is in use. The GPM will display 0.00 when no fixtures are in use.



The LCD display is visible with a bright flashlight (minimum 90 lumens)

### FLOW INDICATOR

Indicates the presence, absence and/or direction of flow of water through the meter.

### LEAK INDICATOR

Indicates a leak may be present.

OFF: No leak indicated  
FLASHING: Intermittent leak; needs attention  
ON: Ongoing leak; needs attention



# Follow up: Installers place door hangers on homes that have not made appointments.

2<sup>nd</sup> notice

**SORRY WE MISSED YOU!**

**URGENT ACTION NEEDED TO AVOID SERVICE INTERRUPTION.**

A New Water Meter Reading System is Coming to Elyria.

**REQUIRED** for ALL Elyria businesses and Elyria residences.

There is no cost for installation.

**SCHEDULE YOUR APPOINTMENT FOR YOUR NEW METER READING SYSTEM**

**ELYRIA**  
Making History Now and Then  
1914-2014

**Call: 800-624-6975**

**REQUIRED** for ALL Elyria businesses and Elyria residences.

Installation Generally Takes Less Than An Hour!

Schedule an appointment and professional installers will handle the rest!

[necowater.com/schedule](http://necowater.com/schedule)

Call: 800-624-6975

[appointment@necowater.com](mailto:appointment@necowater.com)

An adult 18 years or older must be present at the time of installation.

QUESTIONS: City of Elyria  
440-326-1440  
[cityofelyria.org/watermeter](http://cityofelyria.org/watermeter)

**NECO ELYRIA**  
NEW METER REPLACEMENT

3<sup>rd</sup> notice

**WE HAVE TRIED TO REACH YOU AND NEED YOUR RESPONSE TO AVOID SERVICE INTERRUPTION**

**ELYRIA**  
Making History Now and Then  
1914-2014

**Call: 800-624-6975**  
Installation Takes Less Than An Hour!

**AVOID SERVICE INTERRUPTION**

**Schedule your new water meter reading system installation TODAY!**

[necowater.com/schedule](http://necowater.com/schedule)

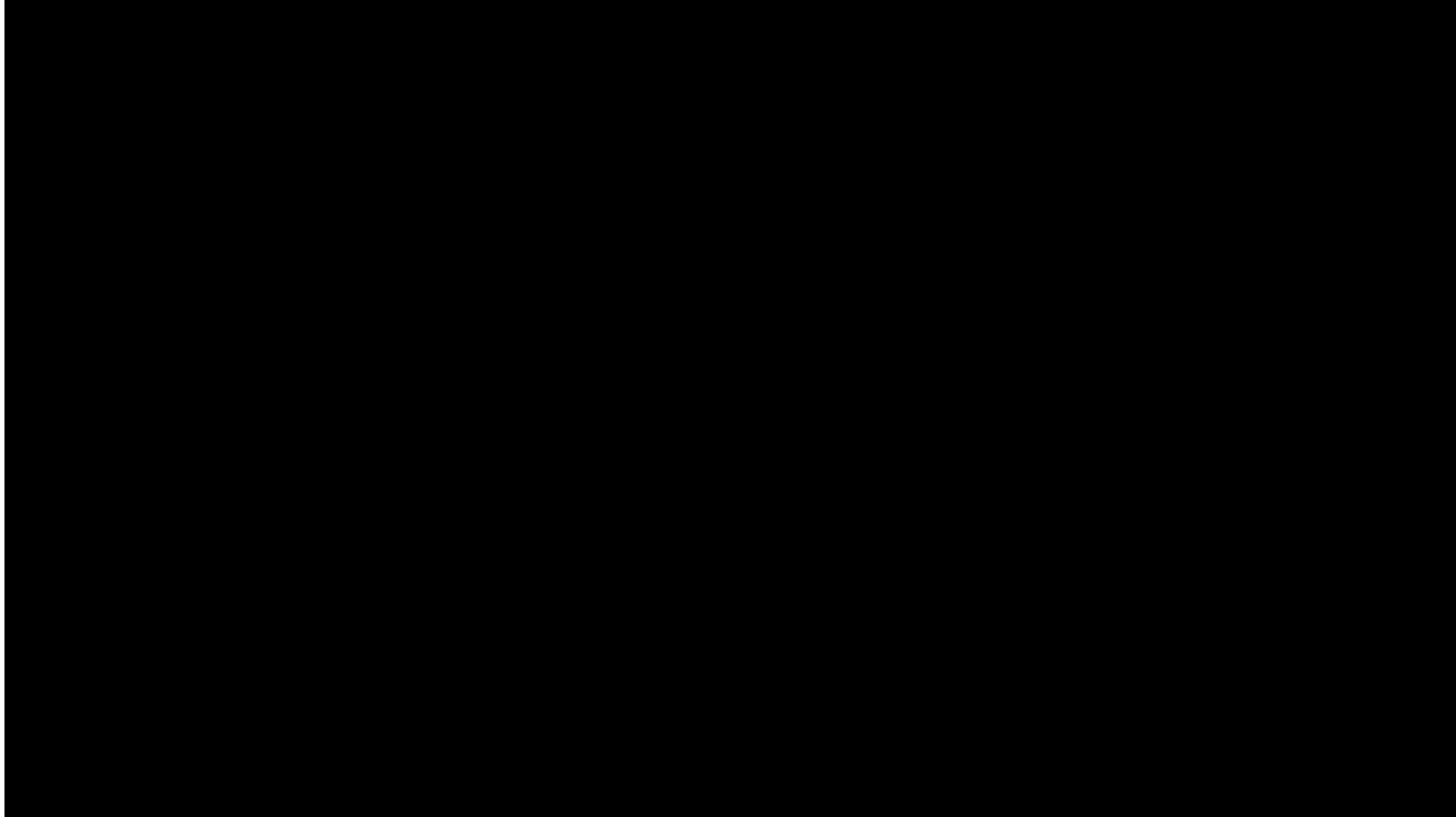
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**NECO ELYRIA**  
NEW METER REPLACEMENT

# City of Elyria Meter Replacement Video



# The Paperwork

- Develop workable forms for
  - First, second, and final contact notices
  - Master List Database
  - Installation forms
  - Week progress reporting
  - Waivers



# Educate City Personnel

- Have as many of your people as possible trained in the installation process by the installation company
- Advise your Council/Committee of the process – use their homes as guinea pigs
- Advise police department and provide them with pictures of installers and vehicle descriptions

ALL BUSINESSES AND RESIDENCES WILL BE EQUIPPED WITH A STATE-OF-THE-ART METER READING SYSTEM THAT WILL:

- Provide accurate readings for consistent billing.
- Eliminate estimated usage reports.
- Help identify leaks, water main breaks and other issues in real time.
- Reduce or eliminate the need for on-site readings.

Current water meters are over 20 years old and can no longer accurately transmit water use.

**In most cases, installation takes less than an hour!**

**ALL Elyria City water meters will be replaced by mid 2019 by NECO, an experienced, family-owned business in Ohio.**

**This is required** for all Elyria businesses and residences. Scheduling is easy:

- [necowater.com/schedule](http://necowater.com/schedule)
- Call: 800-624-6975
- [appointment@necowater.com](mailto:appointment@necowater.com)

**NECO ELYRIA**  
WATER METER REPLACEMENT

QUESTIONS: City of Elyria | 440-326-1440 | [cityofelyria.org/watermeter](http://cityofelyria.org/watermeter)

# Check Your Ordinances

- Who is responsible for cost of meter?
- Do you have rules and regulations in place that define plumbing responsibilities?
- Do you have an ordinance in place that requires that the meter be accessible?

# Meeting of the Minds

- Know who is in charge on both sides
- Make sure everyone understands all aspects of the specifications
- Develop an installation standard
- Determine the implementation schedule
- Make sure your billing department is an integral part of process if it is a separate department
- Inform Mayor, Director, Council understand that this is a process to getting inside many homes and interacting with many home owners to upgrade Meter and Billing System

# Installation Problems

- Meter access
- Can't get to the meter
- Touch the water line and it may break
- Meter pit filled with water
- Meter pit filled with dirt
- Pits in poor condition
- General plumbing
- Inaccurate data

# When is it Over?

- Need to define in your specifications and discussions with the contractor when their obligation is over. There will be people they can't address!
- Vacancies
- Refusals
- No Response

# Be Prepared

- Have your personnel trained to address problem areas
- Additional hours in both maintenance and billing department
- Be flexible for scheduling purposes – weekends and overtime
- Determine non compliance actions
- Budget for annual maintenance cost

# Non Compliance Actions

- If Customer does not comply take action
- Add a surcharge to their bill
- Overestimate bills
- Discontinue service until they comply
- Install an outside meter pit with new system

# Overall Recommendations

- Do your research
- Put it in writing
- Learn from others
- Be prepared
- Sell it as more than just income enhancement
- Take a stress management class!



# How to Contact me

- Ray Schwarz – Sales Manager
- NECO
- 330 283-3828
- [rschwarz@necowater.com](mailto:rschwarz@necowater.com)

