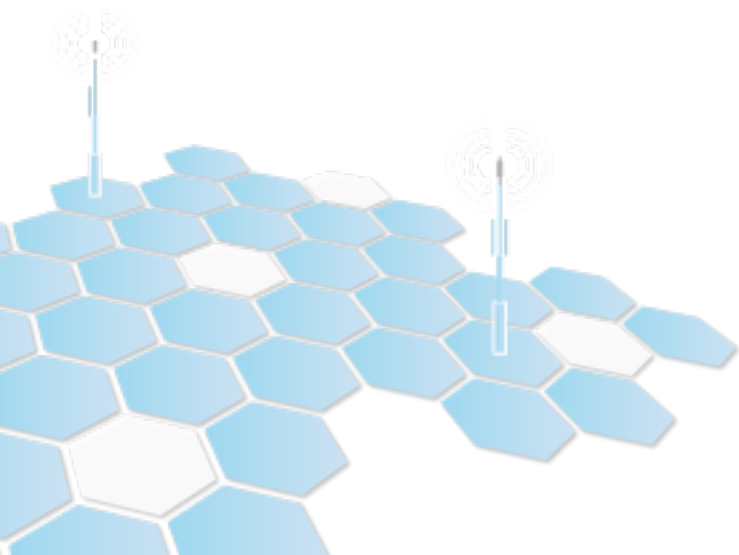


# Advanced Metering Infrastructure Development Program

Progress Report  
August 11, 2016



2.2. -1

# Agenda

- TritonAMI
- AMI 101
- Approach
  - Features function workshop
  - Priority checklist
  - Infrastructure study
  - Financial analysis
- Next Steps
- Questions and Discussion

# Triton

- Meter data management is our core business:
  - AMI Consultants
  - Developers / Software engineers
- Product Neutral
- Implemented every major make and model AMR/AMI system in electric, water and gas Utilities
- Assisted over 20 Water Utilities AMI upgrade
- Water conservation experts
- Pioneered AMI web portals

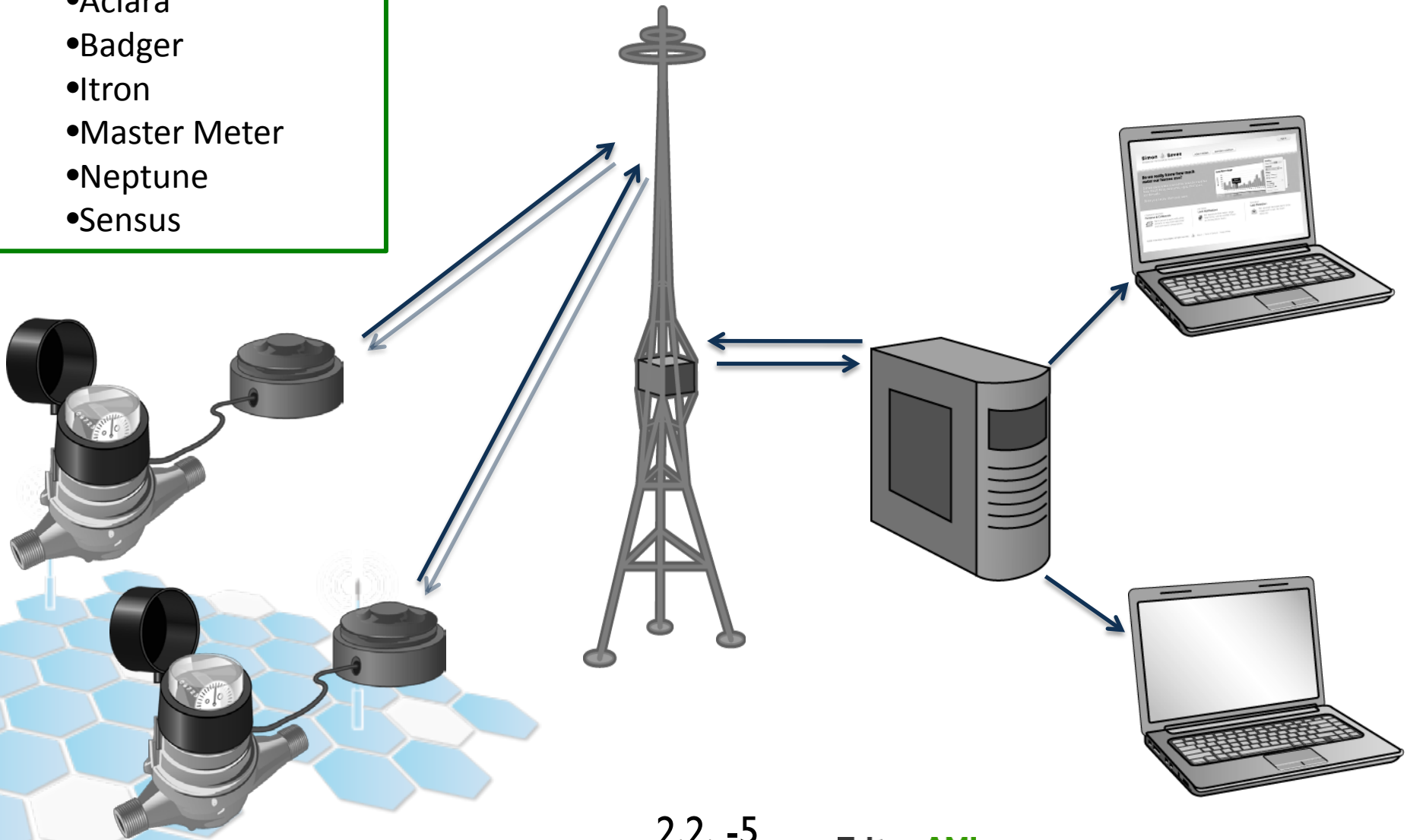
## Most recent AMI clients in CA:

- EBMUD
- San Francisco
- Hayward
- Beverly Hills
- Norco
- Padre Dam
- Las Virgenes



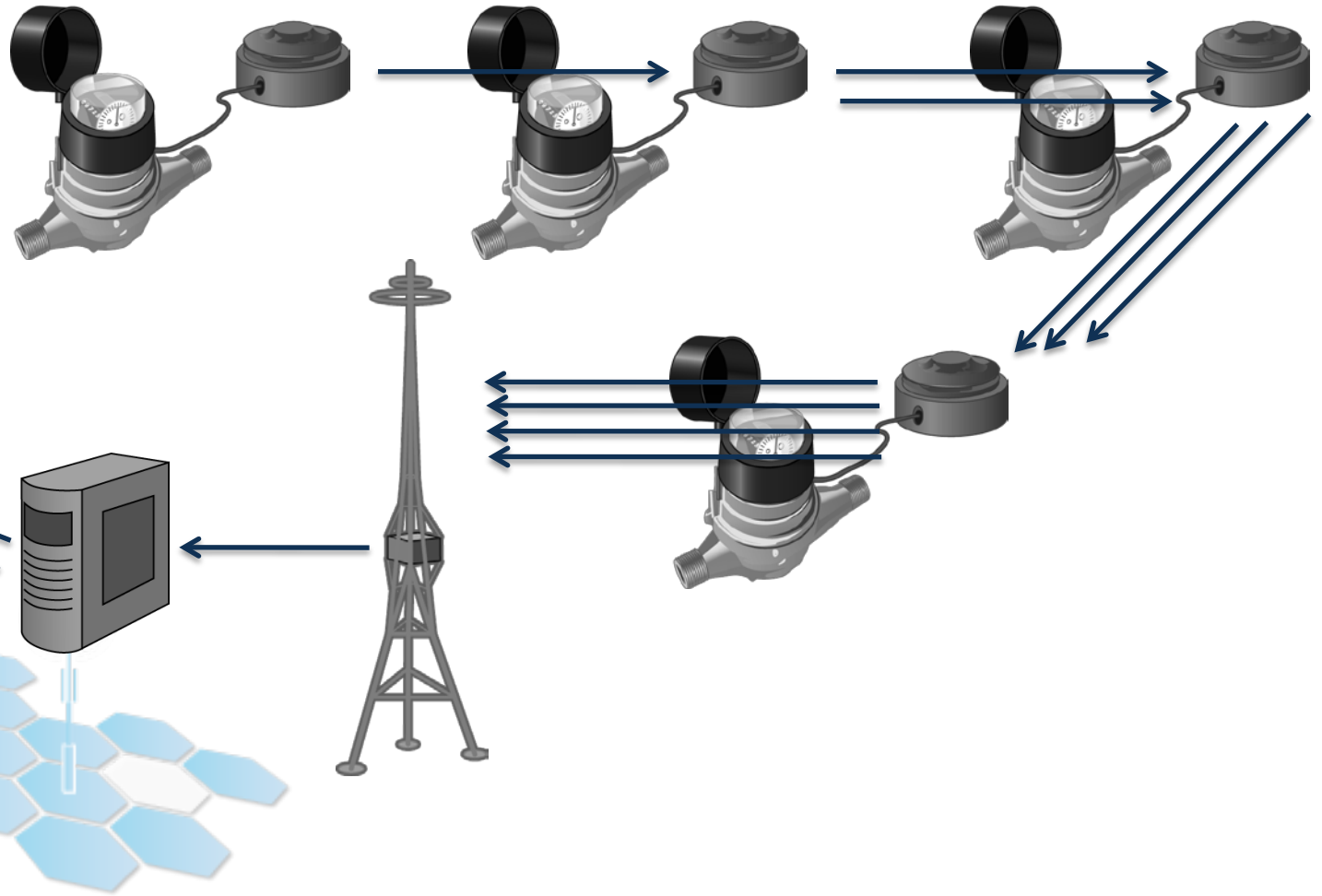
# AMI: STAR NETWORKS

- Aclara
- Badger
- Itron
- Master Meter
- Neptune
- Sensus



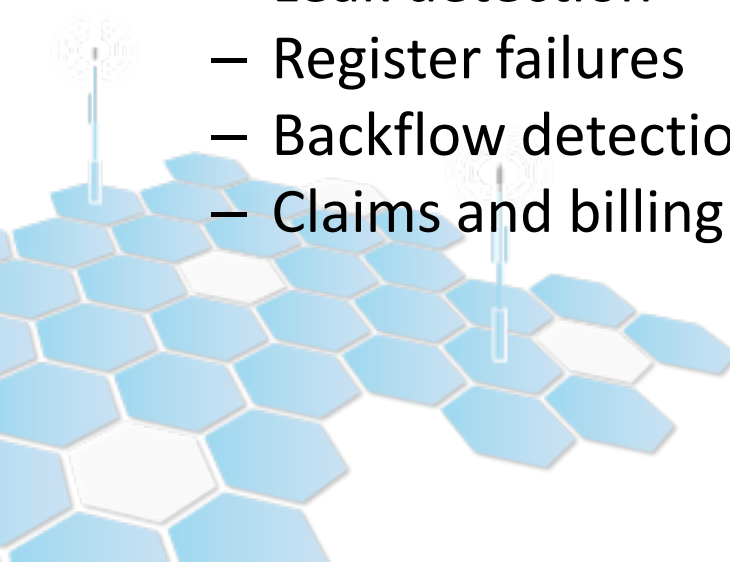
# AMI: MESH Networks

- Datamatic
- Zenner
- Mueller



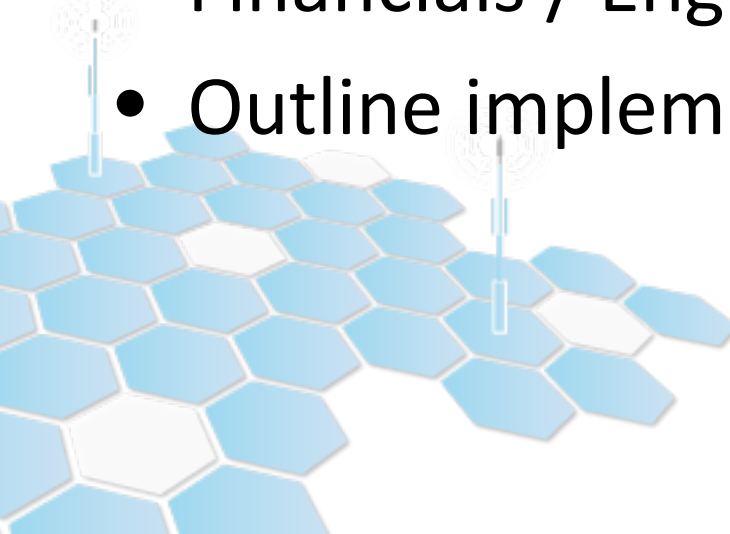
# Non-Monetary Benefits of AMI replacements

- Improved customer service
  - Timely information on water use
  - Assist in water budgeting
- Reduction in safety hazards
- Improved management tools
  - Tampering or Theft notification
  - Leak detection
  - Register failures
  - Backflow detection
  - Claims and billing dispute resolution



# Triton's Approach

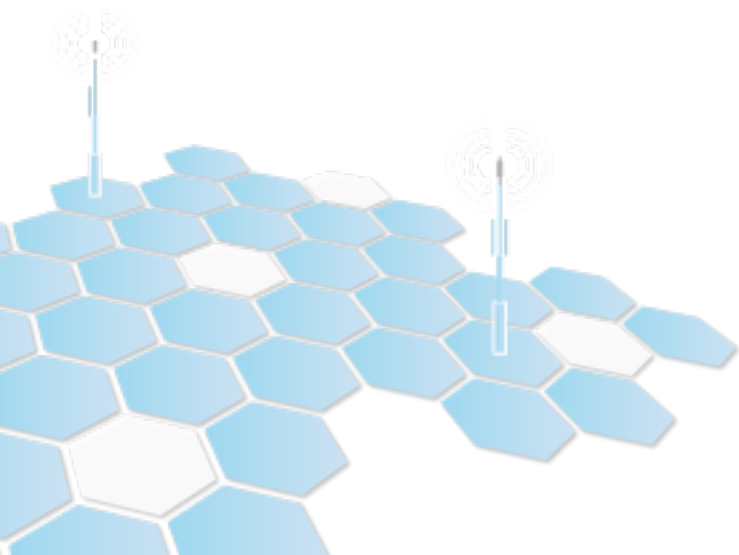
- Informal RFI
- AMI vendor workshop
- Identify priority features and functionality
- Infrastructure report
- Financials / Engineering estimate
- Outline implementation approach





# AMI vendor RFI

- 7 Major water AMI vendors
- 5 responded to RFI
- Consolidated features and functions into matrix



# Features and functions workshop

**TritonAMI**

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QUESTION	ACLARA	DATAMATIC	ITRON	MUELLER	NEPTUNE
Manufacturer Name	Aclara Technologies LLC (Aclara)	Datamatic, Ltd. 3600 K Avenue, Plano, Texas 75074	Itron, Inc.	Mueller Systems, LLC	Neptune
Contact	Craig Collins Sales Director Email: ccollins@aclara.com Phone: (512) 966-0139 Address: 100 Lakeview Drive Rockdale, Texas 76567	Noah Dew, Datamatic Regional Sales Manager- 214 592 2876; email: ndew@datamatic.com	Tracy Wright, Area Manager	Cory Sides, Systems Specialist-SE District 704.682.3193 csides@muellersystems.com	Hunter A located in Phone: 3
AMI System Name	Aclara STAR Fixed Network	MOSAIC	ChoiceConnect 100	Mi.Net	ARB Utili System
Meter Register Type	Aclara is not a meter manufacturer we strictly provide the data that is generated by the utility's meter of choice.	MOSAIC supports encoded, pulse, and direct read meters.	Itron does not manufacture water meters in North America	The Translator Absolute Encoder Register is a mechanically driven odometer which utilizes positional sensing of the number wheels to provide an electronic reading of the odometer at each interrogation.	E-Coder S
Installation	When installing water Meter Transmission Units (MTUs), or any radio frequency AMR/AMI unit in pits, vaults or below-grade areas, sufficient signal strength must be obtained for optimum RF signal propagation. The preferred method of installing an RF device	For pulse and encoded meters there are two or three wires, respectively,	Itron's Encoder Receiver Transmitter (ERT) is typically	Mueller Systems offers a variety of methods for installing transmitters underneath the meter pit lid. These are: 1) Integral Mount - The Mi.Node Transmitter is factory mounted and shipped connected to the Translator Register. This eliminates exposed wiring in the pit and is the recommended solution for shallow meter boxes. The meter is installed using the same process as a m	

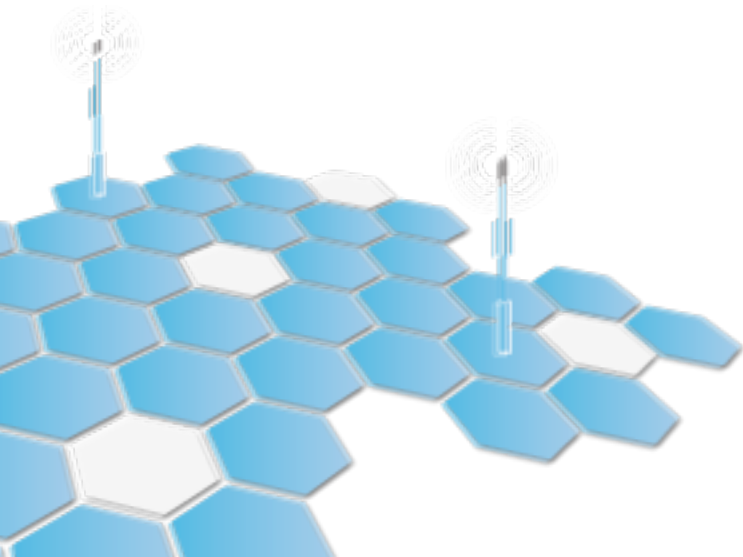
# Discovering the District's priorities

- 100% of services covered
- Price
- Limited-to no infrastructure was preferred
- Customer side leak detection
- Water Consumer engagement web-service

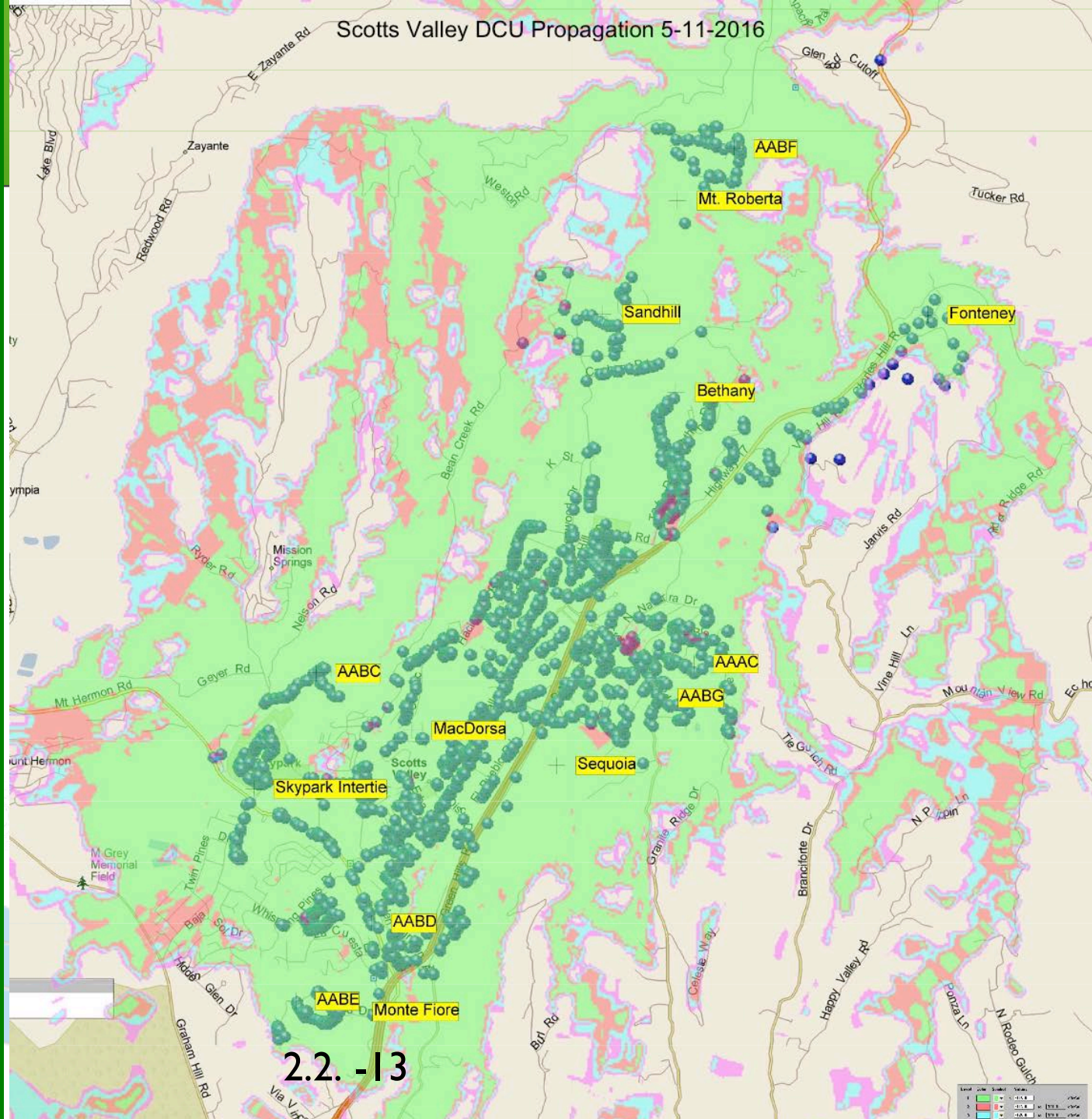


# Infrastructure report: prop study

- 4 vendors provided propagation studies
- Where infrastructure will be located
- How many collectors and repeaters are necessary
- What % reception will be obtained

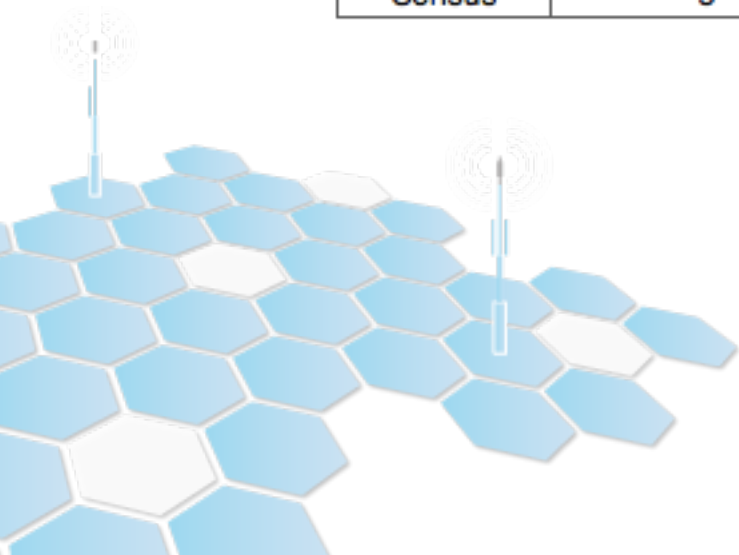


# Sample propagation study



# Infrastructure report: Summary

<b>AMI Vendor</b>	<b>Total Collectors and Repeaters</b>	<b>Qty on District-owned sites</b>	<b>Qty on Non-district owned sites</b>	<b>% of Services covered by a Fixed Network</b>
Aclara	14	8	6	98.5%
Mueller	19	18	1	100%
Neptune	9	0	9	99.1%
Badger	0	0	0	100%
Sensus	5	5	0	98.7%



# Life cycle cost

## LIFE CYCLE COST

Advanced Meter Infrastructure

Using contract labor

AMI	Estimated Project Cost	10 Year Maintenance Cost	Net Life Cycle Cost
Aclara	\$1,348,564	\$1,158,826	\$2,507,390
Badger	\$1,044,518	\$677,351	\$1,721,869
Mueller	\$1,012,269	\$887,384	\$1,899,653
Sensus	\$1,516,307	\$1,286,416	\$2,802,723

## LIFE CYCLE COST

Advanced Meter Infrastructure

Using Temp labor

AMI	Estimated Project Cost	10 Year Maintenance Cost	Net Life Cycle Cost
Aclara	\$1,217,043	\$1,158,826	\$2,375,869
Badger	\$912,997	\$677,351	\$1,590,349
Mueller	\$880,748	\$887,384	\$1,768,132
Sensus	\$1,384,786	\$1,286,416	\$2,671,202

# Next steps

- Receive Board input today
- Define implementation approach
- Provide financing plan
- Procurement

