1. Agenda Packet

   Documents:

   FEBRUARY 27, 2018 AGENDA PACKET.PDF

2. Meeting Materials

   Photos will be POSTED ON FLICKR.

   Documents:

   ADVANCED METERING FEASIBILITY STUDY.PDF
   MARCH 2018 CALENDAR.PDF

AGENDA
CITY OF LENOIR
COMMITTEE OF THE WHOLE
801 WEST AVENUE,
FEBRUARY 27, 2018
8:30 A.M.

I. CALL TO ORDER

II. CITIZEN COMMENT

III. COMMITTEE ITEMS

A. Public Utilities/Public Works

1. Presentation; Meter/Sys Project – Public Utilities Director Radford Thomas

2. Update; OSHA Inspection – Public Works Director Charles Beck

IV. Community Development

A. Lenoir Tourism Development Authority: The Lenoir Tourism Development Authority met on Thursday, January 25. Minutes of the meeting will be submitted at a later date. Donna Bean, Finance Director, will present an update of current activities.

B. Lenoir Business Advisory Board: The Lenoir Business Advisory Board cancelled its meeting of Thursday, February 8. Minutes of the January 11 meeting are submitted as information. Kaylynn Horn, Economic Development Director, will present a report of current activities.

C. Planning Board: The Planning Board is scheduled to meet on Monday, February 26. Planning Director Jenny Wheelock will present a report of the meeting.

D. Parks & Recreation Advisory Board: Parks & Recreation Advisory Board's met on Monday, February 19. Minutes of the meeting are submitted as information. Kenny Story, Recreation Director, will present a report of current activities.

1. Declaration of Covenants, Conditions and Restrictions; Lenoir Optimist Park Property: City Staff recommends approval of a proposed Declaration of Covenants, Conditions and Restrictions Agreement for the Lenoir Optimist Park property per the Parks and Recreation Trust Fund Grant Agreement (PARTF). The property is located at 701 Mulberry Street.

V. FINANCE & ADMINISTRATION

A. Financial Update – Finance Director Donna Bean

B. Update; Public Communications – Public Information Officer Joshua Harris

VI. PUBLIC SAFETY

A. Update; Police Department – Police Chief Scott Brown

B. Update; Fire Department - Fire Chief Ken Briscoe

VII. OTHER

A. March Calendar

VIII. ADJOURN

Lenoir Business Advisory Board Meeting
Meeting Minutes
1/11/2018

Meeting Attendance

Board Members PRESENT	**Board Members** ABSENT	**Ex-Officio Members** PRESENT	**Ex-Officio Members** ABSENT
1. Mark Transou	1. John Moore	1. Scott Hildebran	1. Ike Perkins
2. Grey Scheer	2. Barbara Weiller	2. Joe Gibbons	2. Crissy Thomas
3. Byron Grayson			
4. Glenda Wilson			
5. Matt Underwood			
6. Dana Clark			
7. Terese Almquist			
8. Sean Williams			
9. Kimmie Rogers			
10. Tim Biddix			
11. Patrick Longano			
12.			
13.			
14.			

Staff Members PRESENT
1. Kaylynn Horn 3. Jackie Sigmon
2. Kyle Case

Mark Transou established a quorum and called the meeting to order**.**

Mark introduced Kyle Case the new Main Street Program Coordinator for the City of Lenoir.

Approval of Minutes

- Upon a motion from Dana Clark, seconded by Matt Underwood the October 12, 2017 minutes were unanimously approved.

Report from Grants Committee

- Dana Clark said there was nothing new to report.

Main Street Committee Update

- Matt Underwood reported that Kaylynn Horn had submitted the annual report for the City's Main Street certification.
- Matt announced the Main Street Conference in Clayton, North Carolina would be March 13-15 for those interested in attending. There was a brief discussion that the TDA may be able to help with funding some of the conference fees.
- Glenda Wilson gave a recap on Promotion Events in the downtown:
    - Mad Hatter's Pumpkin Patch Parade had record attendance with events for children on every quad.

- Smoking in the Foothills had great participation but the numbers were down this year. Kaylynn said there would be some changes next year as Main Street becomes more involved with the festival.
- Light up Lenoir had 60 trees that were decorated by various groups. Cookies and hot chocolate were provided for the participants by volunteers and donations.
- Terese Almquist said even with the snowy weather Breakfast with Santa had over 80 kids and adults attend.
- Kaylynn Horn said even though the location of the Christmas film changed multiple times they still had over 100 attend the movie at 1841.
- It was reported the Christmas Parade was a great success!

Matt Underwood announced Joshua Harris had replaced Kaye Reynolds as the Public Information Officer.

Kyle Case said he would be working on the monthly newsletter for the downtown and recommended that if you had not subscribed you could through the Downtown Lenoir website or Facebook page.

Matt Underwood said the Explore Caldwell website would be changing to VisitLenoir.com in the near future.

LBAB HAT

- Sean Williams said they had not met but reported he had collected some new data on the housing shortage. Ashley Bolick (WPCOG) shared with him a presentation by the housing task force that included numbers through 2015. This presentation showed a housing shortage for median priced homes and a desperate need for rentals in the area.

Meeting adjourned

Recreation Administrative Offices (828)757-2165 - Fax (828)758-1315
Martin **L**uther **K**ing Center (828)757-2170
Lenoir **A**quatic & **F**itness **C**enter (828)757-2196
Mulberry **R**ecreation **C**enter (828)757-2165
www.cityoflenoir.com/parks

Recreation Advisory Board Meeting
Minutes
Monday, February 19, 2018

The Recreation Advisory Board met at the Martin Luther King, Jr. Center at 6:00pm.
Members present for this meeting were: Scott Barnett, Michael Dineen, Erik Rabinowitz, James Robertson, and Rick Pierce.
Staff members present were: Kenny Story, Maria Swanson, Mayor Joe Gibbons, and City Manager Scott Hildebran.
City Residents present were: Ray and Betsy Williams.
Absences included: Joel Kincaid, Lemuel Patterson, and Crissy Thomas, Ex-Officio.

Members were welcomed by Scott Barnett
Minutes from the October 16, 2017 meeting were reviewed. Motion made to approve minutes made by Rabinowitz, seconded by Robertson. Motion Carried.

Director's Report

- Fall Basketball ended the season on February 13th. There was good participation this year with 27 teams. There were still some issues with sportsmanship of some parents. All were addressed with meetings with parents involved, coaches and officials. It was proposed for next year the children read the conduct code to parents out loud before each game. This has been done in other organizations with positive results.
- The Wresting season had great participation with 37 children. This number exceeds the other organizations we work with such as Hickory, Hudson and Morganton. Due to the growth of our program, we are looking to possibly align with other larger organizations next year to allow our kids more opportunities to compete in matches.
- Spring Baseball and Softball registration is under way and will run through March 10th
- Updates at LAFC: New lane lines are in … Emergency phone line issues have been resolved with some wiring updates.
- MLK Center: Great turnout for the MLK Day Breakfast on January, 15th. Black History Month activities have included a Jazz Show with Rosa Russ and Terence Young, Movie night featuring "Marshall", and Blood Drive and they are wrapping up with the Quiz Bowl on Thursday evening at 6pm
- Rentals at all the P&R facilities have been good.

New Business

- City Residents Ray and Betsy Williams from Highland Ave, Lenoir came to speak to the board about their desires and wishes for a Dog Park in Lenoir. They currently use the park in Hudson and would like us to consider the possibility of a dog park in Lenoir. They feel a dog park would attract people to the area. Several years ago, Mr. Williams had prepared a proposal containing plans and estimated cost for a park. He again presented this to the board for review. The main concerns are: location of the park, who would control and enforce rules once opened, who would be responsible for maintenance, would it be fee based or

free (if fee based who would collect the fees). It was suggested by the Williams' to look into donations from Animal groups and Lowes (who donated materials and assisted with the Hudson park). Mayor Gibbons voiced he was open to the idea and a dog park has been proposed for the area in the past but those plans had fallen through. The board voiced they would continue to look into the possibilities available for a dog park and thanked the Williams' for coming to speak for the dog community.

- Jonas Brown the student representative on the board will be stepping down due to school demands and preparing for college. Board members are to get recommendations for another student rep and give those names to Kenny Story for the board to review at upcoming meetings.
- Mulberry Rec Skate Park will be brought up at the Council meeting on February 20th to change the signage to allow the park to be open unstaffed. Signage will inform users to use protective gear of helmet, knee and elbow pads and to skate at their own risk. The hope for this change is to increase activity at the park. Update on council decision will be reported at next meeting. It was also suggested to look into getting some new and updated amenities for the skate park. Tony Hawk Foundation has a quick 1 page grant application.
- West End Community Center is in the process of being sold to another local organization in the community. The building will remain as a community building under the guidance of the new owners.

Old Business

- JE Broyhill Park update: The renovation is moving along despite some weather delays. Crews are waiting for a break in the weather to complete the basketball court, disc golf and bathrooms. The picnic tables and playground are already being used on a regular basis. It was ask if there were plans to make the park accessible from the Koinonia Apartments and church parking lot. It was brought to a board members attention by a disc golf player that the disc golf may be more beneficial in another location. The player felt the current planned location was too small and would not allow the space to create a challenging course. It was proposed to look at some land near Wilson Park and along the Greenway which could provide a more challenging course to attract disc golf players. It was suggested to hold off on the disc golf at JE Broyhill and explore other possible locations.
- Mulberry/Optimist Park Update: Fencing and dugouts have be completer as well as new lighting on Field #1 at Mulberry Rec Center which are all part of the PARTF Grant.
- Land Plot Request: The board still wants a list of land owned by the city for use for master and overall planning of additional areas to place recreational activities.
- The board needs to update the Recreational Master Plan. The plan is approximately 10 years old and will need to be updated to help in our pursuit of future grants. Members feel this can be done in-house.
- The Old Lenoir High School facility was brought up and what parts does the City own. What are the long term plans and goals for this location? In the future, would like to explore what parts of the facility can be saved and renovated.

There being no further business to discuss, the meeting was adjourned at 7:50pm

The next advisory board meeting will be held at the Mulberry Recreation Center on Monday, March 19, 2018

Minutes submitted by: Maria Swanson

CITY OF LENOIR

COUNCIL ACTION FORM

I. Agenda Item:
Parks and Recreation Trust Fund Grant. Declaration of Covenants, Conditions and Restrictions to the property deed at 701 Mulberry Street SW. This property being Lenoir Optimist Park.

II. Background Information:
This is part of the N.C. Parks and Recreation Trust Fund Project Agreement ("Grant Agreement"). See attached the Declaration of Covenants, Conditions and Restrictions for the property.

III. Staff Recommendation:
Staff recommends approving the Declaration of Covenants, Conditions and Restrictions.

IV. Reviewed by:

City Attorney:

Finance Director:

Public Works/Public Utilities Director:

Planning Director:

Recreation Director: Kenny Story

STATE OF NORTH CAROLINA **DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS**

COUNTY OF CALDWELL

THIS DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS FOR _____ ("Declaration") is made this ____ day of _____, 2018 by the City of Lenoir, North Carolina, a North Carolina municipal corporation, whose address is Post Office Box 958, Lenoir, North Carolina 28645(hereinafter the "City Declarant").

WITNESSETH:

A. City Declarant is the owner and developer of certain real estate in Caldwell County, North Carolina, and more particularly described that December 28, 2015, deed from the Lenoir Optimist Club, Inc. to the Declarant, recorded in Book 1866, pages 476-478, Caldwell County Registry (the "Property"); and

B. City Declarant is developing the Property with state public assistance for public recreational use as part of the City of Lenoir Recreation Department and is utilizing a N.C. Parks and Recreation Trust Fund ("PARTF") Project grant pursuant to an project agreement with the North Carolina Department of Parks and Recreation (the "Department") to partially fund the costs of the said project; and

C. As part of the N.C. Parks and Recreation Trust Fund Project Agreement ("Grant Agreement") the City Declarant is required to dedicate the Property as a recreation site for the use and benefit of the public as more specifically stated and set forth below.

THEREFORE, the Declarant hereby declares that all of the Property is and shall be held, encumbered, used, occupied and improved, subject to the following covenants, conditions and restrictions, all of which are established and agreed upon for the purpose of the development of the Property for public recreational use and to comply with above requirements of the Grant Agree. All of these restrictions shall run with the land and shall be binding upon the City Declarant as declarant and any parties having or acquiring any right, title or interest, legal or equitable in and to the Property or any part or parts thereof subject to such restrictions.

PROPERTY SUBJECT TO THIS DECLARATION: the Property, each portion thereof, and all Dwelling Units thereon shall be held, transferred, sold, conveyed, leased, mortgaged and occupied subject to the terms, provisions, covenants and conditions of this Declaration.

DECLARATION OF DEDICATION: the Property shall be, and is, hereby declared to be dedicated in perpetuity as a recreational site for the use and benefit of the public and, pursuant to a contractual requirement with PARTF, the property may not be converted to other than public recreational use whether by transfer, sale or in any other manner without approval of the North Carolina Department of Natural and Cultural Resources.

IN WITNESS WHEREOF, City Declarant has caused this instrument to be executed as of the day and year first above written.

CITY OF LENOIR,
A North Carolina Municipal Corporation

BY: _____
(SEAL)
Joseph L. Gibbons, Mayor

ATTEST:

_____
Shirley M. Cannon, City Clerk

NORTH CAROLINA
CALDWELL COUNTY

I, _____,
a Notary Public of the County and State aforesaid, certify that Shirley Cannon personally appeared before me this day and acknowledged that she is City Clerk for the City of Lenoir, a N. C. municipal corporation, and that by authority duly given and as the act of the corporation, the foregoing instrument was signed in its name by Joseph L. Gibbons as its Mayor, sealed with its corporate seal and attested by _____, as its City Clerk.

Witness my hand and official stamp or seal, this _____ day of _____, 2018.

My commission expires: _____

_____
Notary Public

City of Lenoir
Financial Summary
As of January 31, 2018

General Fund					
	2017-2018 Budget	1/31/2018	% of Budget	Change from Previous Year	1/31/2017
Total Revenue	$ 16,605,509.00	$ 12,910,748.10	78%	$ 58,913.10	$ 12,851,835.00
Expenditures	$ 16,605,509.00	$ 9,482,196.83	57%	$ 190,328.83	$ 9,291,868.00
Over/Under	$ -	$ 3,428,551.27		$ (131,415.73)	$ 3,559,967.00

Downtown District					
	2017-2018 Budget	1/31/2018	% of Budget	Change from Previous Year	1/31/2017
Revenues	$ 183,827.00	$ 1,503.70	1%	$ 70.70	$ 1,433.00
Expenditures	$ 183,827.00	$ 114,239.15	62%	$ 13,490.15	$ 100,749.00
Over/Under	$ -	$ (112,735.45)		$ (13,419.45)	$ (99,316.00)

Water/Sewer Fund					
	2017-2018 Budget	1/31/2018	% of Budget	Change from Previous Year	1/31/2017
Revenues	$ 8,239,307.00	$ 6,298,907.63	76%	$ 1,222,428.63	$ 5,076,479.00
Expenditures	$ 8,239,307.00	$ 3,545,323.80	43%	$ (370,060.20)	$ 3,915,384.00
Over/Under	$ -	$ 2,753,583.83		$ 1,592,488.83	$ 1,161,095.00

Tax Collections					
		Collections As Of 1/31/18***	Percentage of Change	Change from Previous Year	Collections As Of 1/31/17
Ad Valorem Tax Collection - % of Budget		103%			102%
Sales Tax (January Deposits with adjustment for HB97)		$ 1,885,282.24	3.28%	$ 59,863.83	$ 1,825,418.41
Sales Tax (January Deposits without adjustment for HB97)		$ 1,772,597.83	3.13%	$ 53,812.87	$ 1,718,784.96
Sales Tax adjustment for HB97					
	2017- 2018 Budget	Collections As Of 1/31/18***	Percentage Collected YTD		
Sales Tax adjustment for HB97	$ 215,000.00	$ 112,684.41	52.41%		

***6 months collections

March 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6 3:30 p.m. Reception Charles Beck/Ken Briscoe (City/County Chambers) 6:00 p.m. City Council	7 9:00 a.m. Staff Mtg.	8 3:00 p.m. Tourism Dev. Authority (City Hall) 6:00 p.m. Lenoir Bus. Adv. Brd. (City Hall)	9	10
11 Daylight Savings Time Begins NLC Conference Begins	12 11:45 a.m. City/County Services Committee	13 8:00 a.m. EDC	14 NLC Conference Ends	15	16	17
18	19 6:00 p.m. Recreation Advisory Board (Mulberry Rec. Center)	20 6:00 p.m. City Council	21 9:00 a.m. Staff Mtg.	22	23	24
25	26 5:30 p.m. Planning Brd. 6:00 p.m. Employee Recognition Banquet (J.E. Broy. Civic Cntr.)	27 8:30 a.m. Committee of the Whole	28 Noon - Foothills Regional Airport Auth.	29	30 Good Friday! City Offices Closed	31
		Notes for April				

City of Lenoir
P.O. Box 958
Lenoir, N.C. 28645
www.cityoflenoir.com
757-2200 / 757-2162 fax

Joseph L. Gibbons, Mayor
Scott E. Hildebran, City Manager
Shirley M. Cannon, City Clerk

City of Lenoir

Advanced Metering Feasibility Study

Initial Findings and Data Validation Review

February 14, 2018

MeterSYS

Project Background – Drivers of Evaluation

- The cost of maintaining and repairing aging infrastructure continues to increase for the City
- The current meter change-out program is demanding on staff and operational budgets
- City goal of creating long-term roadmap for sustainable metering investment
- Strained resources with compressed reading/billing window and AMR/manual metering environment
- Reduce Non-Revenue Water (NRW) loss and improve conservation efforts
- Increase read accuracy and revenue capture at meter
- Consider alternatives to AMR related to finance, operational efficiencies, and enhanced customer service

Advanced Metering Feasibility Project Goals

- Evaluate current state operations including CapEx/OpEx implications, business processes, infrastructure, and systems for metering and billing workflows
- Determine requirements for meter data management, billing solutions, and effective reporting functionalities
- Present advanced metering options and functionalities, including estimated capital and operational costs of ownership
- Evaluate opportunities to enhance customer service and public communication/engagement
- Outline implementation scenarios and develop, in cooperation with the City project team, a roadmap for future metering technologies

AMI Feasibility Project - Progress to Date

Project Team Kick-off	**September 6, 2017**
Information Request and Data Collection	**September – December 2017**
Onsite Observations, Interviews, and Shadowing Key staff and sub-team meetings scheduled with Q&A Sessions, field observations; job shadowing for CS staff	**October 11 – October 12, 2017**
Request for Propagation Studies Design options received from vendors compiled and presented	**Issued: November 24, 2017** **Study Complete: January 18, 2018**
Financial Modeling and Future State Planning Periodic calls with City project team for progression update and data collection/validation	**December 2017 – February 2018**

MeterSYS

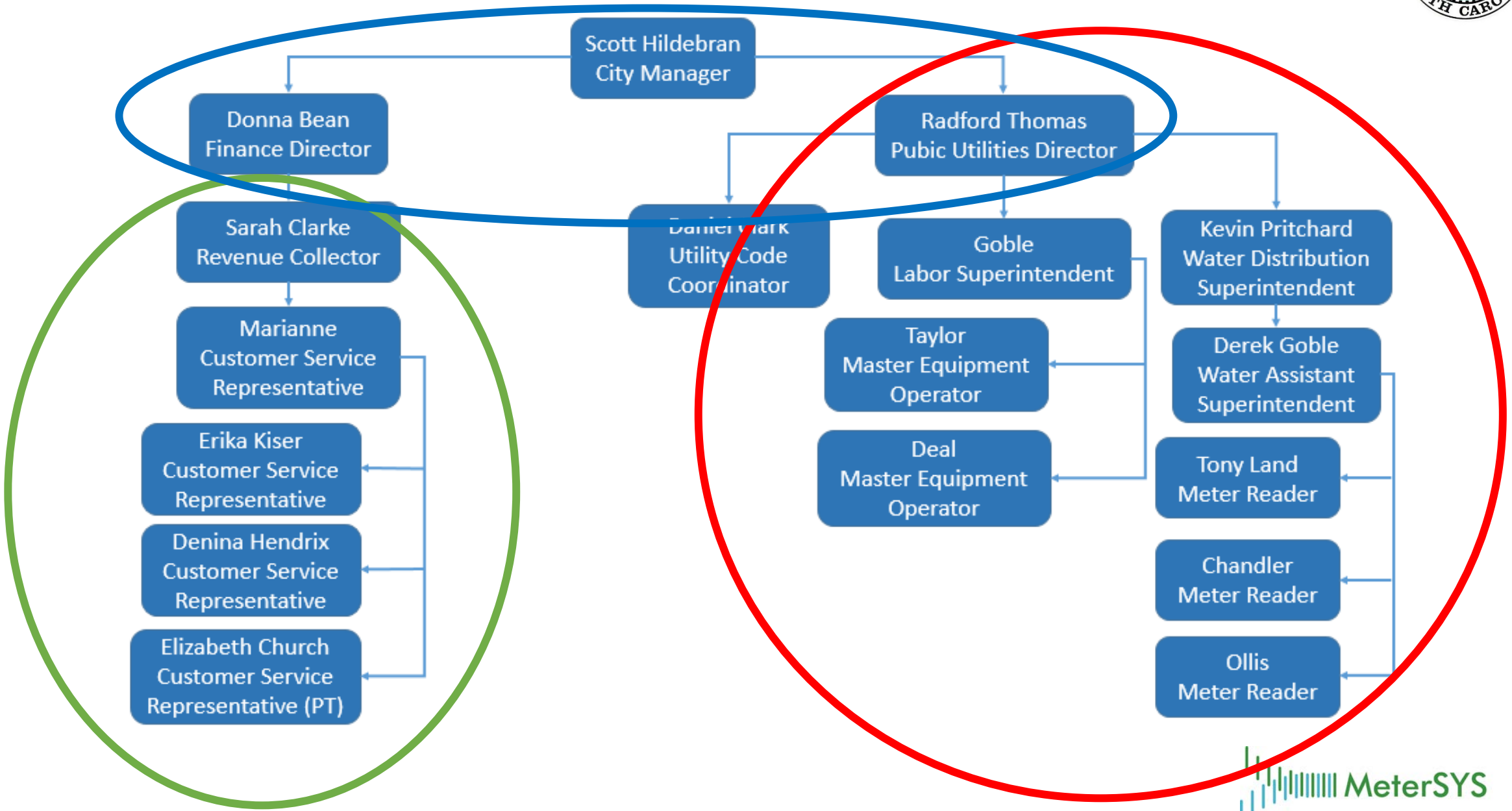
Building the Case for Change

- Current operational challenges will be reduced or resolved through metering automation
- Data and feedback from observations/interviews have been evaluated and are presented to help build the case for change
- Feasibility model results identify the financial obligations and the cost/benefit of multiple scenarios
- Variety of future state options with costs, risks, and recommendations are considered

Today's session is intended to:

- Validate key findings and review initial current state analysis results
- Discuss design options from the propagation study
- Identify key analysis elements for leadership

Draft Finance and Public Utilities Organizational Chart



MeterSYS

Meter Reading/Billing Calendar Overview

Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5
Begin Read Cycle 1				Finish Read Cycle 1
8	9	10	11	12
Begin Read Cycle 2 Complete Cycle 1 rereads	Disconnect Day	Bill for Cycle 1		Finish Read Cycle 2
15	16	17	18	19
Begin Read Cycle 3 Complete Cycle 2 rereads	Disconnect Day	Bill for Cycle 2		Finish Read Cycle 3
22	23	24	25	26
Begin Read Cycle 4 Complete Cycle 3 rereads	Disconnect Day	Bill for Cycle 3		Finish Read Cycle 4
29	30	31	1	2
Complete Cycle 4 rereads	Disconnect Day	Bill for Cycle 4		
5	6	7	8	9
	Disconnect Day Cycle 1 bills due			

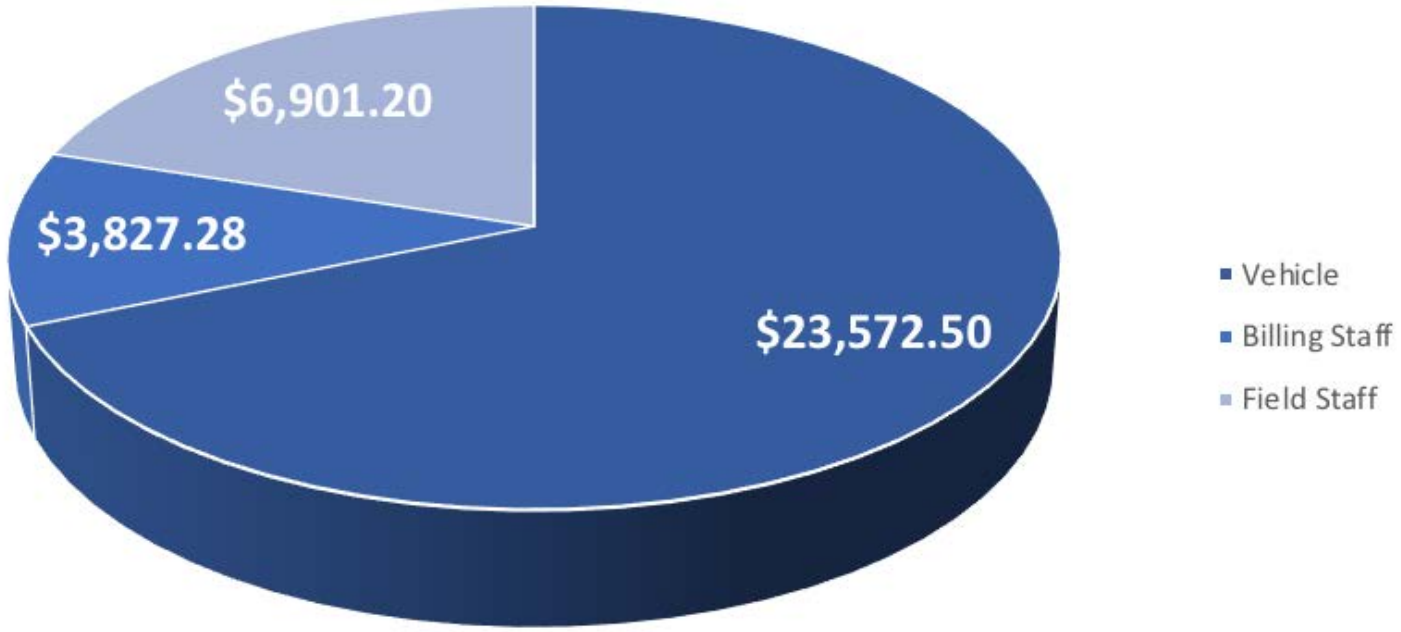
- Read 10 books/week
- 2,300 – 2,700 meters per cycle
- 2 MR – 5 books per MR
- 1 MR responsible for drive-by and C&I meters only

- 1 book per cycle converted to AMR
- ~3-4,000 AMR Badgers in system

- Takes 1-2 days to complete disconnects and re-reads
- Eligible for disconnect 45 days past due

MeterSYS

Current Cost of Service Disconnects



- Billing Staff (MG) 4 hours per week
- Field Staff (TL) 7 hours per week
- Fleet Vehicle 407 at 25% cost
- Total current cost of disconnects:

$34,300.98

*The equivalent of **76** remote disconnect meters ($450/each)*

Work Order Process Flow

Repair/Replace WO Process Flow

MR notes meter issue during read cycle in Read Center (i.e. stopped meter, broken lid)

RC runs report by type

Run comment report in Read Center

RC prints and manually checks report for meter work; highlights stopped meters as high priority

RC hands off report to Water Dist. Superintendent

Water Dist. Superintendent assigns work orders to C&D guys

C&D guys complete work orders w/service info and turn in to RC end of day

RC updates customer acct info and close work orders

Check Inactive WO Process Flow

Run customer account report by cycle in ICS

RC prints and manually checks for usage on inactive accounts

RC screenshots customer acct in ICS to use as work order to lock, pull, or place rock on meter

RC hands off work orders to Water Dist. Superintendent

RC sends Meter Tech out to confirm meter off

Re-read WO Flow

Run Hi/Lo report by cycle in ICS

Reads are in; RC prints and manually look for re-read accts and highlights those

Meter Tech picks up report, completes re-reads, and hands off to RC

RC = Revenue Collector
MR = Meter Reader

MeterSYS

Customer Service/Billing

Public Works

CSR spends 3-5 hours per week creating disconnect list

Note accounts with payment plan or extension; these accounts are not cut-off

Run cycle report on Monday

Review report manually to select accounts eligible for cut-off

Create cut-off eligibility list with necessary account information

If customer pays after-hours, reconnect fee is still added, but customer removed from disconnect list

CSR creates recheck list based on high bill amount owed, partial pay, and repeat offenders

CSR enters last read in note section of account

Meter reader picks up list and completes disconnects each Tuesday

List with read at time of disconnect turned into CSR for records

Meter Reader picks up recheck list and confirms accounts are still off 7 days after disconnect with no payment

- ~168 disconnects/month
- 10-15% of disconnects a month are re-checked
- ~80% of disconnect list are repeat offenders

MeterSYS

Current State Data Validation

- Limited asset management system
  - Meter ID, date of install, replacement schedule
- KPIs and SOPs
  - Informal policies and procedures; manual heavy processes
- Manual work order management
  - Not fully leveraging systems and reporting
- Legacy software
  - Limited system capabilities and reporting features
- Inherited data and system limitations

Current versus Future State – Metering

Current Operational State - Hybrid	Future Operational State - AMI	AMI Goals Achieved
• Installed ~4,000 Badger AMR meters in the past 3-4 years • 1 book per cycle converted; system is now 30% AMR	• Potential to retrofit recent installs to capture full remaining useful life of meters • Full conversion to AMI so no dual read environment	• Improve operational efficiency • Leverage technology for functionality • Improve read accuracy
• Resource strain due to tight reading/billing window	• Automation of reads frees up staff for other tasks	• Improve operational efficiency • Streamline operations
• Lack of data governance and entry standardization creates inconsistencies	• Start with “clean slate” for meter data through replacement program	• Improve operational efficiency
• Lack of designation of vacant/inactive accounts leads to repeat site visits for re-reads and zero read validation	• Identify strategy for vacant accounts; account start/stop date; pull meter; soft disconnect	• Improve operational efficiency • Leverage technology for functionality
• Multi-day turn-around on services	• On-demand reads and alerts/alarms allow for repeat visits and improved WOM	• Enhance customer service • Improve operational efficiency

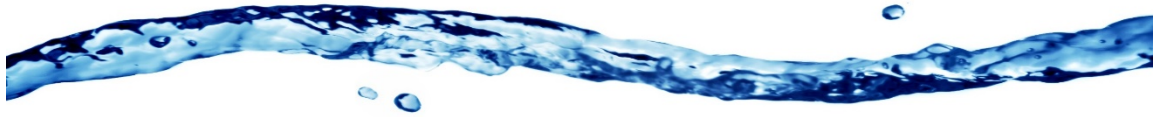
MeterSYS

Current versus Future State – Customer Service

Current Operational State - Hybrid	Future Operational State - AMI	AMI Goals Achieved
• Limited controls for leak management or customer consumption disputes	• Leak alerts for reduced response and cost of leak; reduction of "questionable" leak adjustments	• Enhance customer service • Optimize utility revenue
• Manually check for re-reads, confirmed off disconnects, zero reads, inactive accounts, etc.	• Remote disconnect meters for repeat offenders • Soft disconnect option for vacant accounts • Real-time read for move ins/outs	• Enhance customer service • Optimize utility revenue • Leverage technology for functionality • Improve operational efficiency
• Customer account management involves manual reviews • Lack of data and reporting	• Automated and streamlined customer account management • Robust data trending and reporting options	• Enhance customer service • Leverage technology for functionality • Improve operational efficiency
• Customers already utilizing self-service and online payment channels	• Customer portal will enhance customer account management	• Enhance customer service • Leverage technology for functionality

MeterSYS

Network Planning: Propagation Analysis



Network Options

- **Cellular Networks-** lower CapEx, higher OpEx, and shorter useful life (10 years); 3rd party network controls
- **Traditional Fixed Network**- higher CapEx, lower OpEx, and up to 20 years useful life. Utility maintains control of network
- **Hybrid AMR/AMI**- mix of traditional AMI, cellular AMI, and/or cellular with AMR based costs, density, topography, and operational needs
- **NaaS**- emerging trend in industry for full outsource of AMI network to vendor supported by service fee

AMI Propagation Study Overview

- MeterSYS compiled data, including GIS maps of meters and tank locations from the City, into propagation analysis packet and issued to vendors
- Vendors solicited: Aclara, Badger, Itron, Master Meter, Mueller, Neptune, Sensus
- Prop studies show the potential design based on factors like topography, RF noise/interference, and the capability of the network to communicate based on assumptions made by each vendor
- Network analysis is a vital planning initiative for determining solution viability and CapEx/OpEx implications

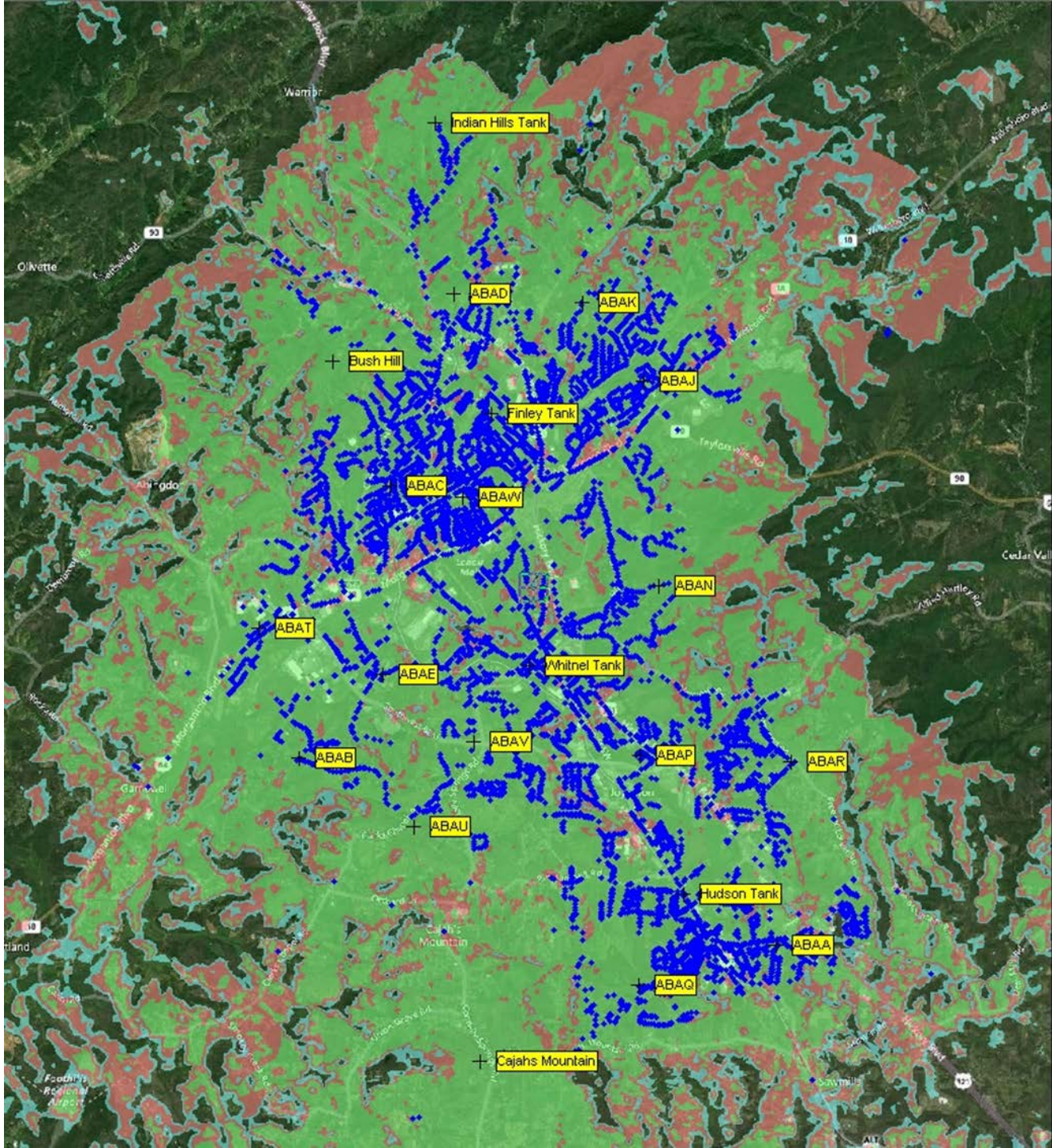
Network Designs – Propagation Results

Vendor	System & Frequency	Collector Design	Integration Details
Aclara	Traditional AMI; Licensed 450-470 MHz	21 DCU's on Water Tanks and Substations	Network and software by Aclara; meter type open
Badger	Hybrid Cellular	4 Gateway Transceivers serving 3,000 Fixed Network EPs; 10,929 cellular EPs	Third-party cellular network; software and meter by Badger
Itron	Traditional AMI; Unlicensed 902-928 MHz band	12 CGR 1240s	Network and software by Itron, and meter type open
Master Meter	Traditional AMI; Licensed 450-470 MHz	3 Base Stations; 24 Repeaters	Network, software, and meter by Master Meter
Mueller Systems	Traditional AMI; Unlicensed 900 MHz band	16 XR Collectors; 41 DCXR Repeaters	Network, software, and meter by Mueller
Neptune	Traditional AMI; Unlicensed 910-920 MHz	Did not submit	Network, software, and meter by Neptune
Sensus	Traditional AMI; Licensed 433 or 868 MHz	4 M400B Base Stations	Network, software, and meter by Sensus

Aclara Preliminary Results Review

DCU Site Type	DCU Count	Antenna Height
Customer Sites	6	Varied
Aclara Proposed	15	30’
Total DCUs	21	

Predicted Redundancy	MTU Coverage	Overall Coverage
Single	0.6%	99.4%
Double	7.2%	98.8%
Triple	91.6%	91.6%

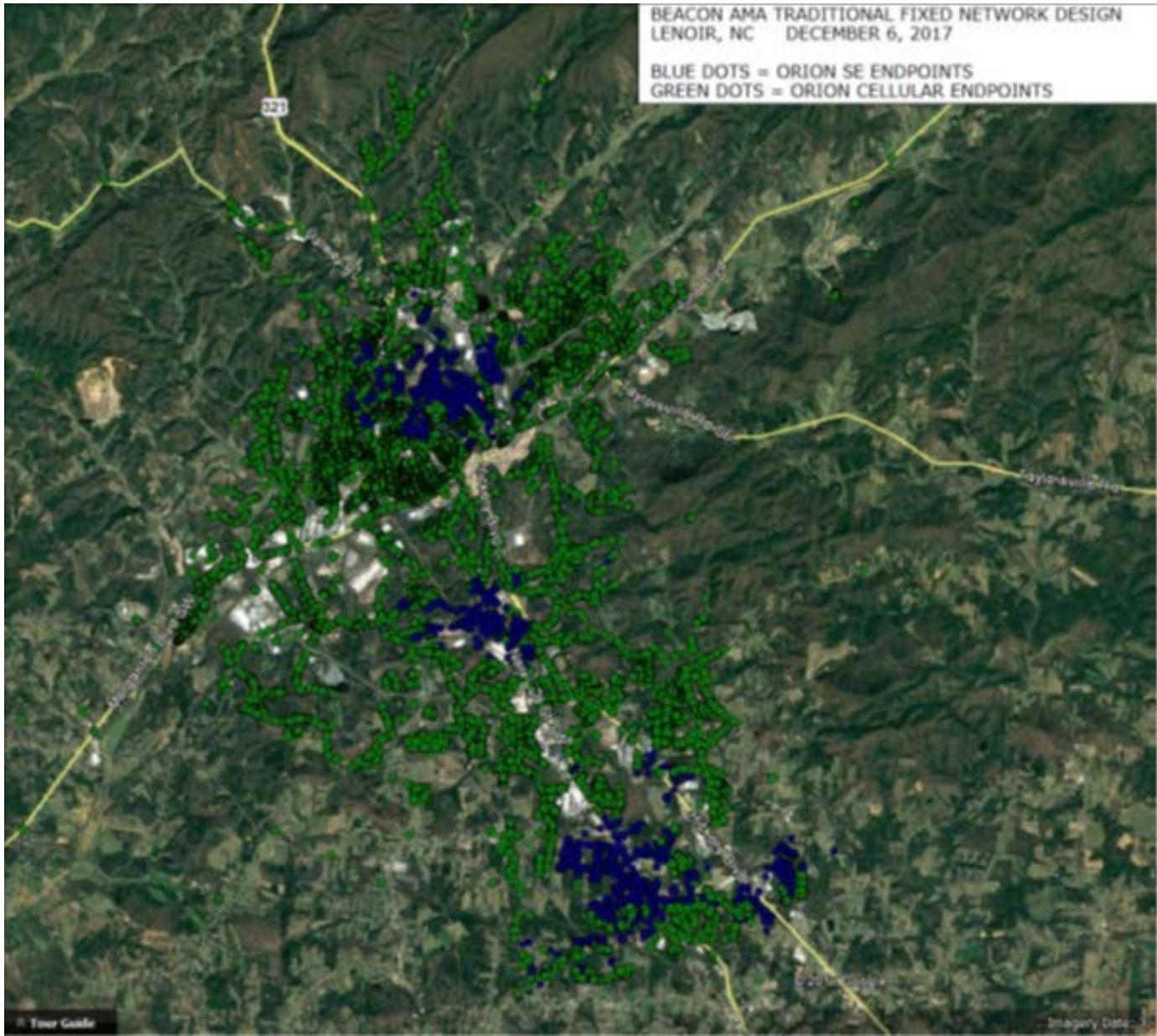


Preliminary Results Review- Coverage

Gateway Location	Mounted Height
Hudson Storage Tank	147’
Finley Ground Tank	57’
Whitnel Ground Tank	41’
Pole Kirkland Ave	30’

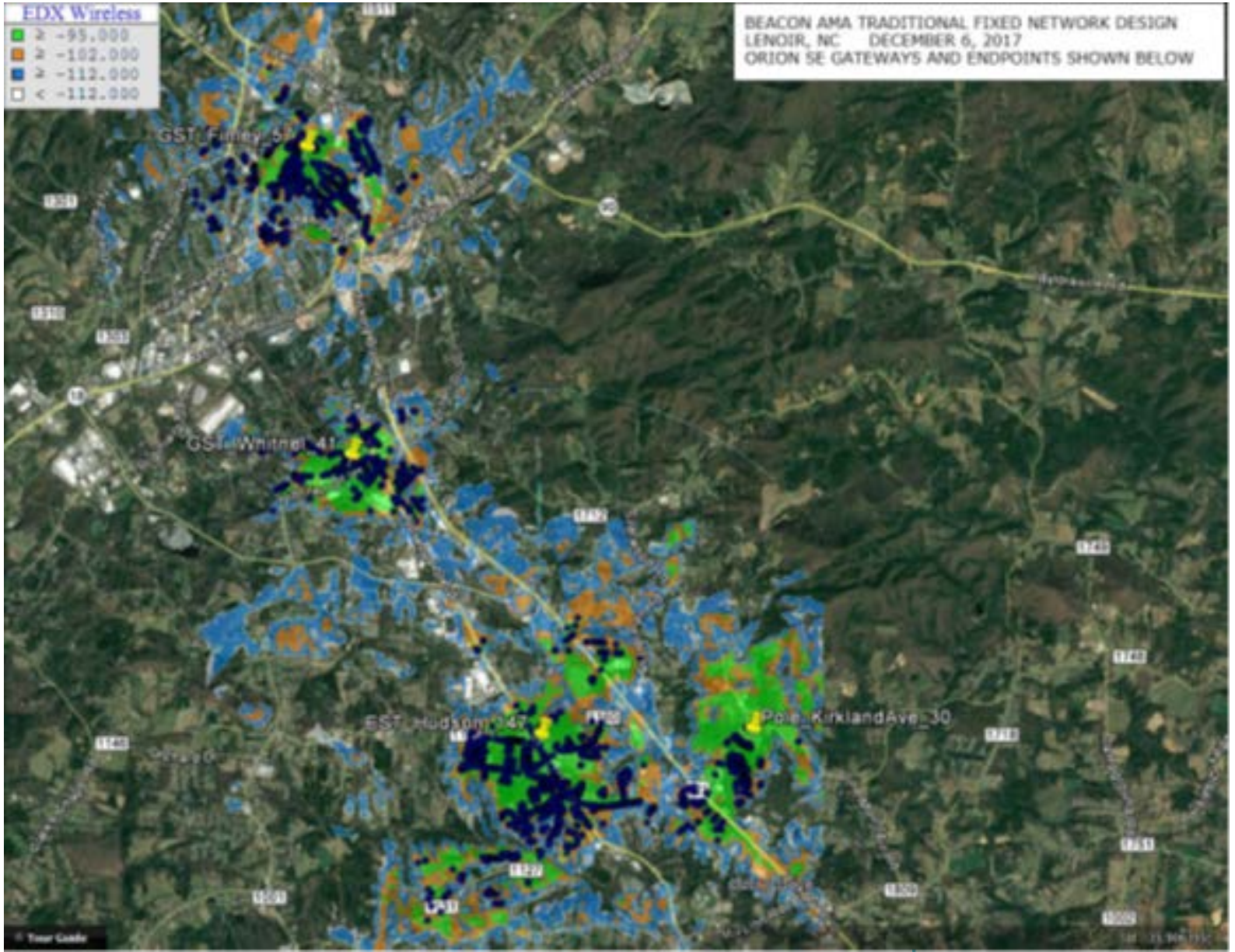
Endpoint Type	13,929
ORION SE	3,000
ORION CELLULAR LTE	10,929

78.5% of meters would report on cellular network



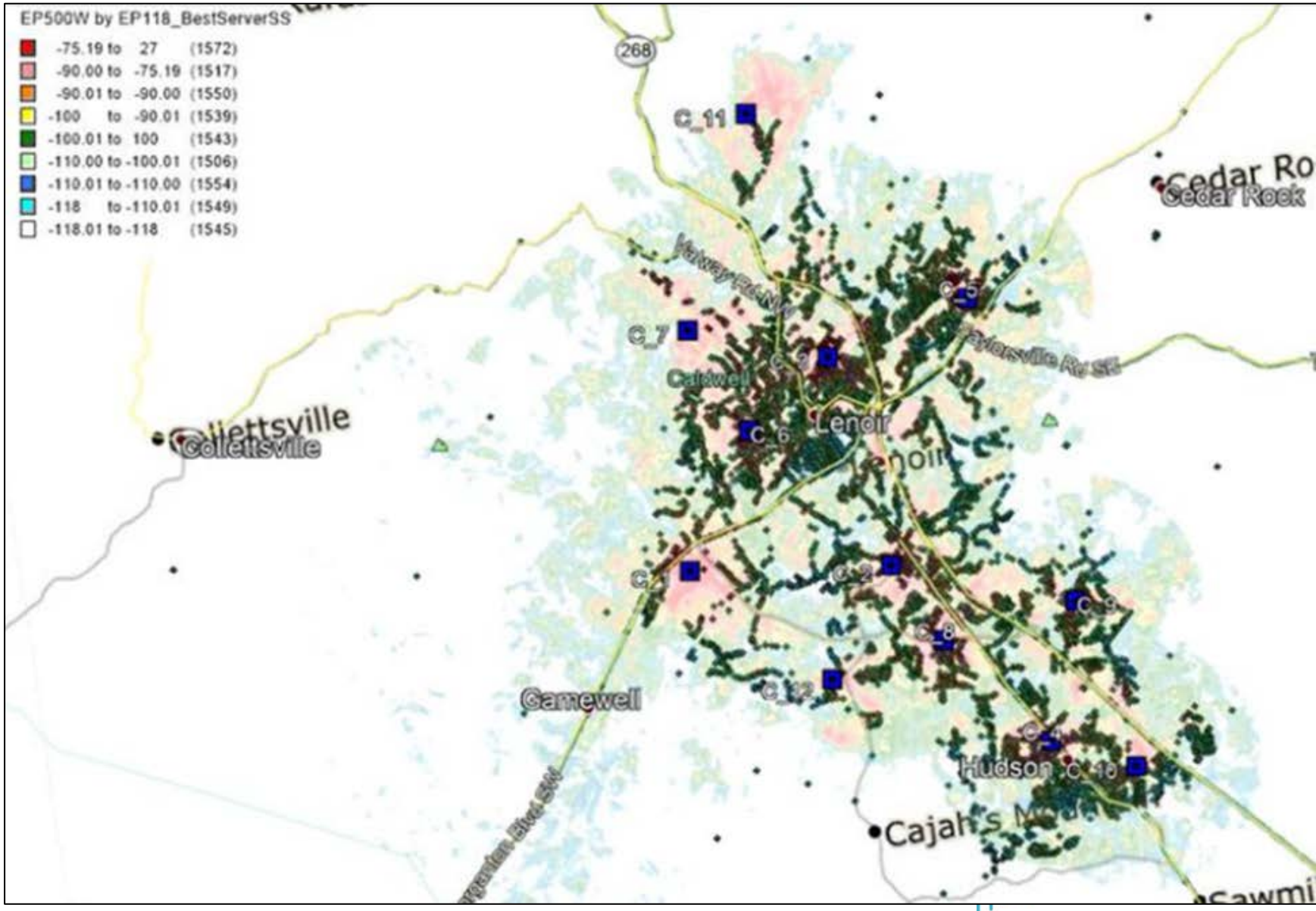
Preliminary Results Review- RF Signal Strength

Color Code	RF Signal Strength
Green	Best (98.5% confidence in coverage)
Orange	Fair
Blue	Marginal
White	No RF Signal Received



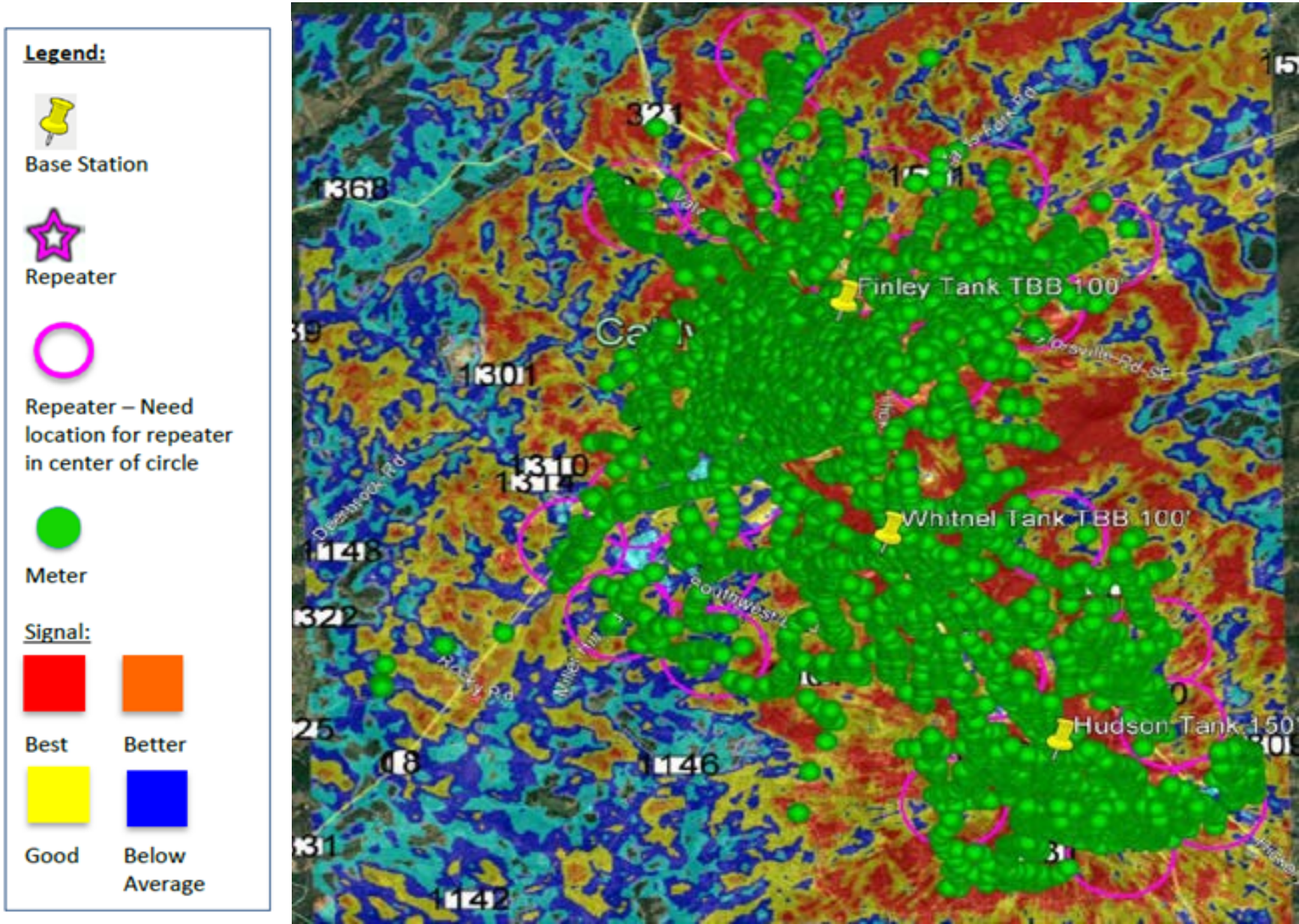
Preliminary Results Review

- 12 CGRs
- 1,145 EPs per CGR
- 13,739 meters covered for 2-way read capability
- 54 meters unable to geocode
- 136 meters not covered
- 70% Network Redundancy



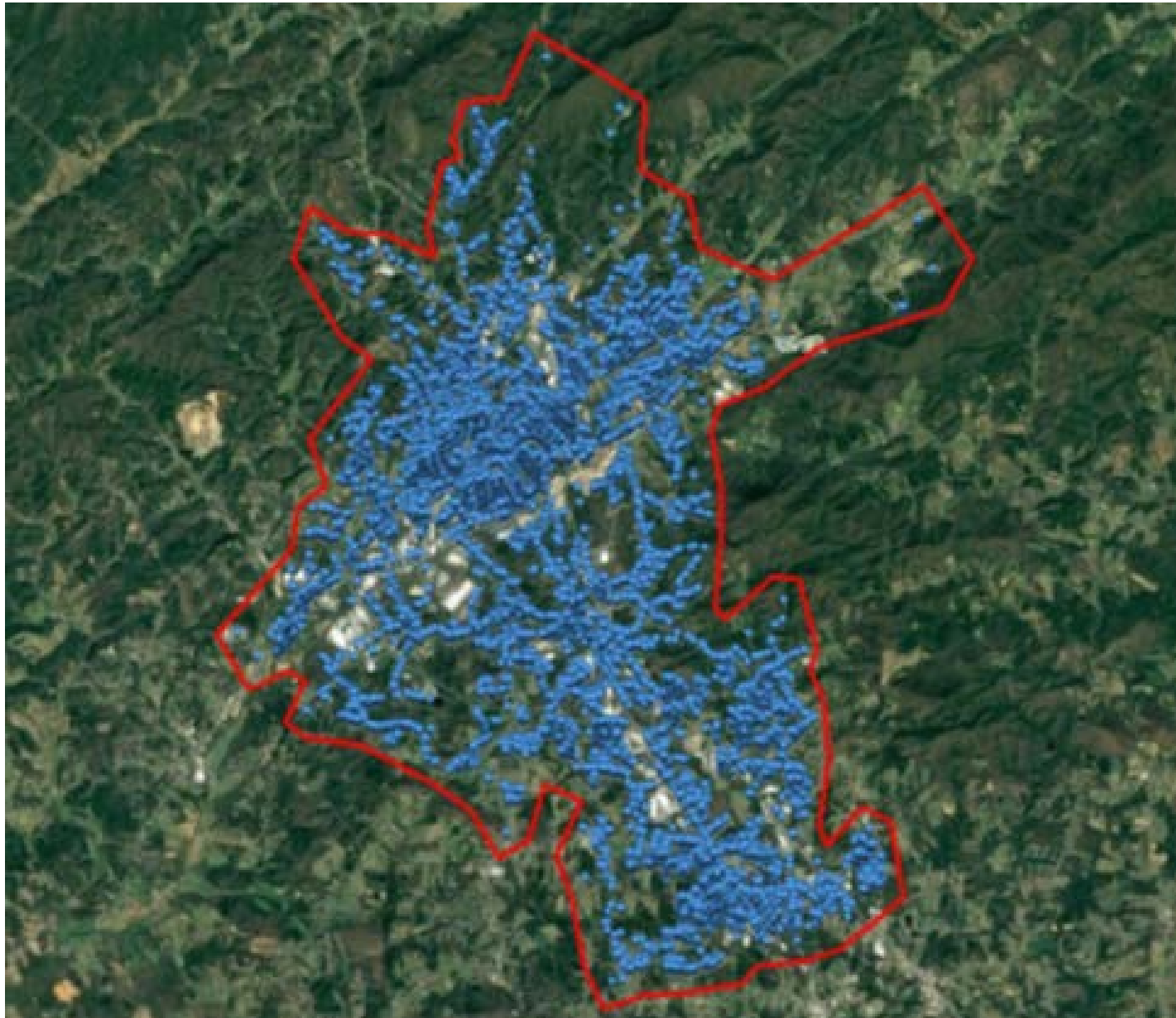
Preliminary Results Review

- 3 base stations mounted on existing infrastructure
- 24 repeaters mounted on poles



Preliminary Results Review

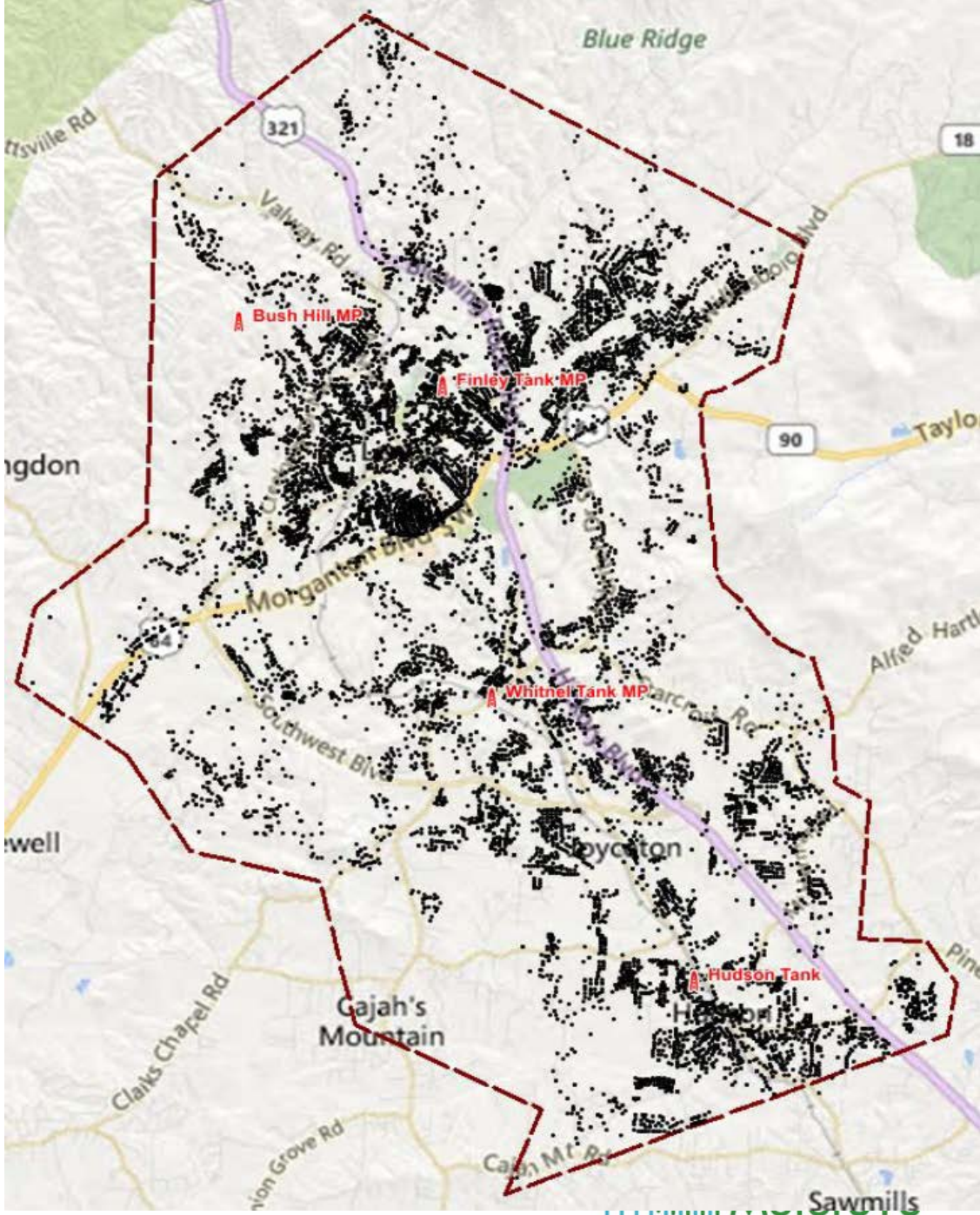
- 16 XR Mi.Hub Collectors
  - 7 on Water Tanks
  - 9 on Proposed Locations
- 41 DCXR Repeaters (on 10’ Poles)
- 850 meters covered per collector with repeaters; 700 meters covered w/o repeaters
- 13,805 meters geo-located (100%)
- 100% of meters covered by proposed design for two-way read capability



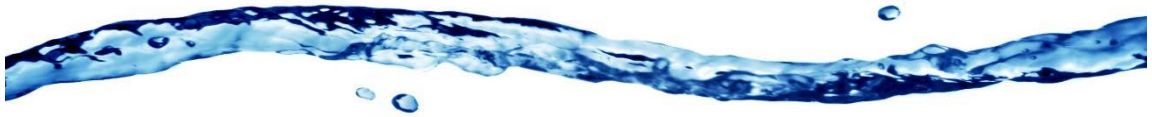
Preliminary Results Review

Collector Location	Estimated # of EP Covered
1. Bush Hill	6,386
2. Finley Tank	7,679
3. Hudson Tank	4,836
4. Whitnel Tank	8,016

- 13,884 meters geo-located
- 845 meters not geo-located
- 13,276 meters covered
- 239 meters not covered by proposed design. Installation of R100 Repeater if desired by utility.



Financial Model Results



Advanced Metering Financial Modeling Assumptions and Inputs

Annual Growth Rate

Meters	0.25%
Benefits	4.0%
OpEx	6.0%
Labor	2.5%
Consumption	1.0%

Water Meters

Residential	9,183
Commercial/Industrial	408
Governmental	9,591

Total Water Meter Lids/Enclosures

Composite	8,632
Cast Iron	863
Concrete	86
Other	-

Meter Reading
Service Orders- Re-reads, Customer Complaints, Disconnect/Reconnect Service
Repair and Replacement
Stopped Meters, Register Issues, Replacements
Service Termination and Restoration
Disconnect / Reconnect Cost
Verify No Service
Customer Service, Account Management, New Accounts, Account Closure
Customer Service Billing Exception and Payment Processing
Customer Service Account Delinquency Management
Account Delinquency Aged Collection
Revenue Capture from Water Meters
Wastewater Revenue Recovery
Theft and Meter Tampering
Meter Scrap Value
Fleet Costs (Meter Reading)
Annual Meter Replacement Budget (New Meters Included in CAPEX)

City of Lenoir Metering and Billing Key Business Processes

Process Number	Business Process
1.1	Initial Meter Reads (AMR)
1.2	Initial Meter Reads (Manual/Direct)
2.1	Service Orders- Re-reads
2.2	Service Orders- Disconnect/Reconnect Service
2.3	Service Orders - Second Disconnect
2.4	Service Orders - Check for Inactive Accounts
2.5	Service Orders-Customer Complaints
2.6	Verify No Service
3.1	Troubleshooting and Repair/Replacement
3.2	Meter Replacement- Replacement Program
4.1	Customer Service Account Management-Setup and Maintenance
4.2	Customer Service Billing Exception
4.3	Customer Service Billing and Presentment
4.4	Customer Service Payment Processing/Collections
4.5	Customer Service Work Order Management
4.6	Customer Service Account Delinquency Management
5.1	Theft and Meter Tampering
6.1	Asset Management Activities
7.1	Water Loss and Conservation

MeterSYS

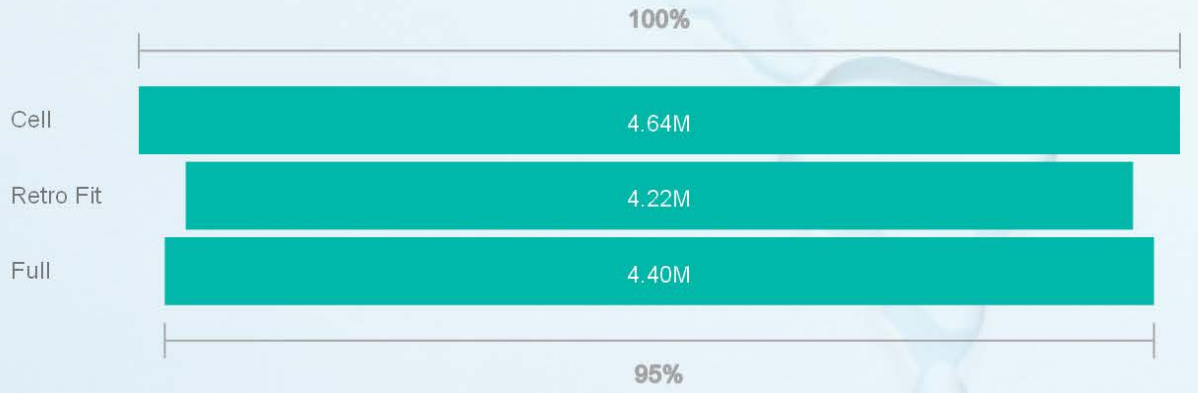
Resource Allocations

Metering Fey Processes Resource Allocation Table

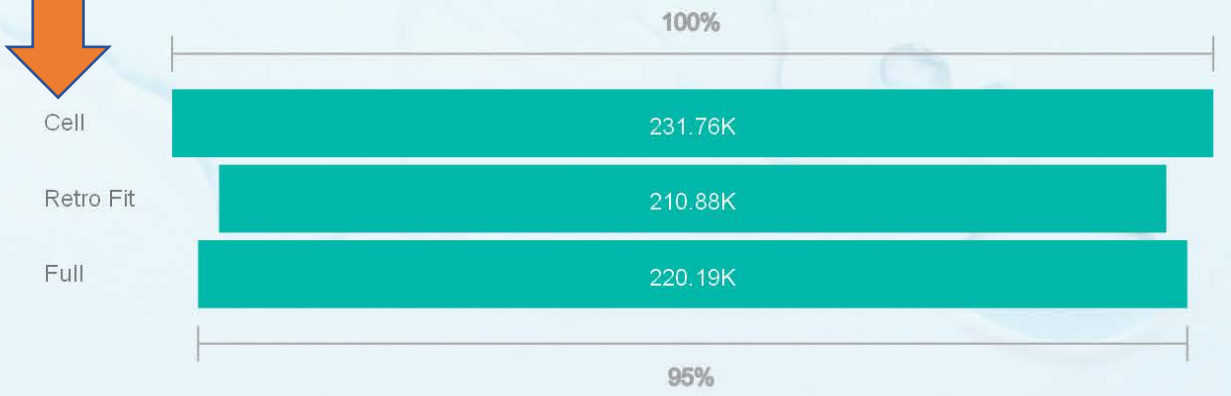
Job Title	Initial Meter Reads (AMR)	Initial Meter Reads (Manual/Direct)	Service Orders- Re-reads	Service Orders- Disconnect/Reconnect Service	Service Order- Second Disconnect	Service Orders- Check for Inactive Accounts	Service Orders- Customer Complaints
Initial Meter Reads (AMR)	% of Time (Avg/Yr)	% of Time (Avg/Yr)	% of Time (Avg/Yr)	% of Time (Avg/Yr)	% of Time (Avg/Yr)	% of Time (Avg/Yr)	% of Time (Avg/Yr)
Public Utilities Director	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%
Water Assistant Superintendent	2.5%	0.0%	0.0%	2.5%	0.0%	0.0%	2.5%
Water Distribution Superintendent	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%
Utility Code Coordinator	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Labor Superintendent	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Master Equipment Operator	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Master Equipment Operator	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Meter Reader	5.0%	50.0%	10.0%	5.0%	2.5%	2.5%	2.0%

CapEx/OpEx Comparison- Cellular, Retro-fit, Full Replace

Total Capital Expenditure



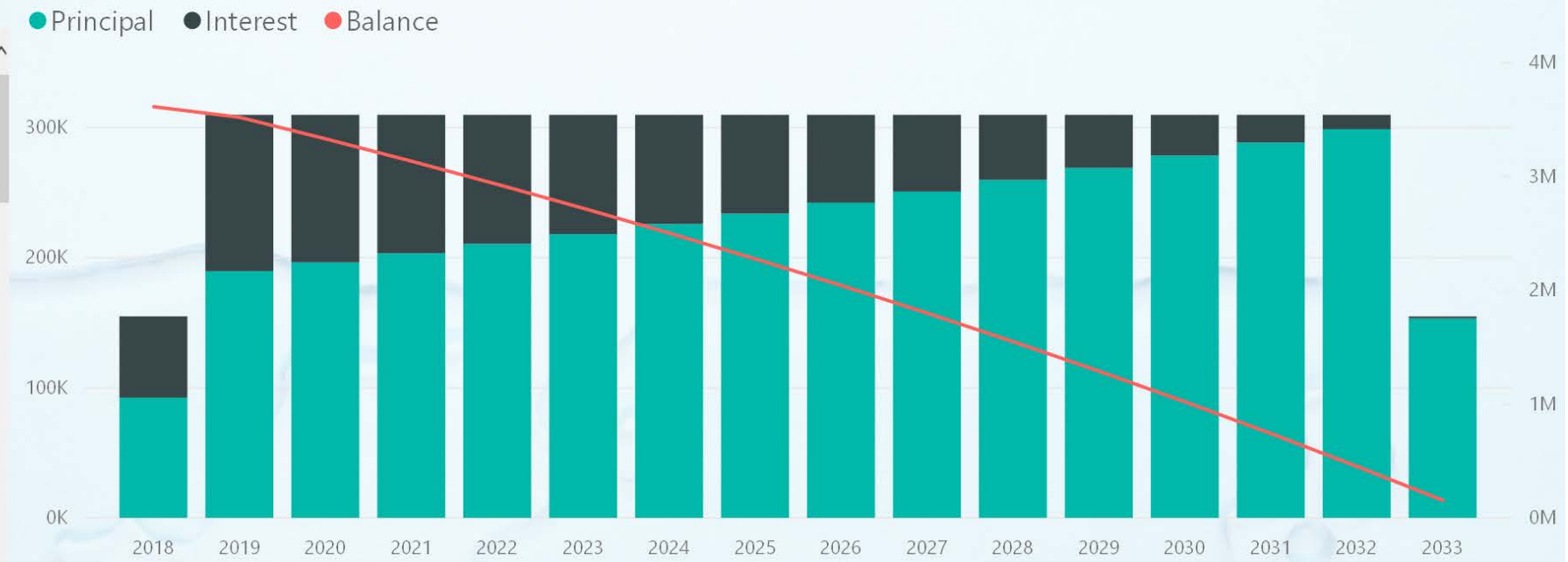
Yearly Average Operational



AMI Amortization- Cellular

Amortization

Year	Month	PRINCIPAL	INTEREST	BEGINNING BALANCE
2018	July	15,287.13	10,535.39	3,612,134.86
2018	August	15,331.72	10,490.81	3,596,847.73
2018	September	15,376.43	10,446.09	3,581,516.02
2018	October	15,421.28	10,401.24	3,566,139.59
2018	November	15,466.26	10,356.26	3,550,718.30
2018	December	15,511.37	10,311.15	3,535,252.04
2019	January	15,556.61	10,265.91	3,519,740.68
2019	February	15,601.98	10,220.54	3,504,184.06
2019	March	15,647.49	10,175.03	3,488,582.08
2019	April	15,693.13	10,129.39	3,472,934.59
2019	May	15,738.90	10,083.62	3,457,241.46
2019	June	15,784.81	10,037.72	3,441,502.56
2019	July	15,830.84	9,991.68	3,425,717.75
2019	August	15,877.02	9,945.50	3,409,886.91
2019	September	15,923.33	9,899.20	3,394,009.89
2019	October	15,969.77	9,852.75	3,378,086.56
2019	November	16,016.35	9,806.17	3,362,116.80
2019	December	16,063.06	9,759.46	3,346,100.45
2020	January	16,109.91	9,712.61	3,330,037.39
2020	February	16,156.90	9,665.62	3,313,927.47
2020	March	16,204.02	9,618.50	3,297,770.57
2020	April	16,251.29	9,571.24	3,281,566.55
2020	May	16,298.69	9,523.84	3,265,315.26
2020	June	16,346.22	9,476.30	3,249,016.58
2020	July	16,393.90	9,428.62	3,232,670.36
2020	August	16,441.72	9,380.81	3,216,276.46
Total		**3,612,059.77**	**1,035,919.01**	

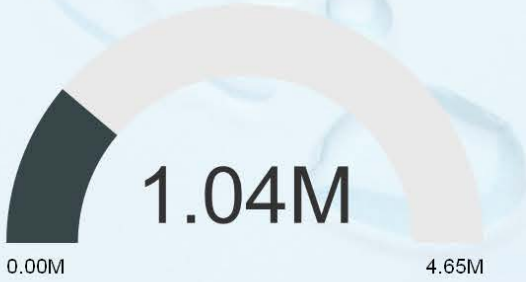


Principal

4.65M

TOTAL PAYMENT

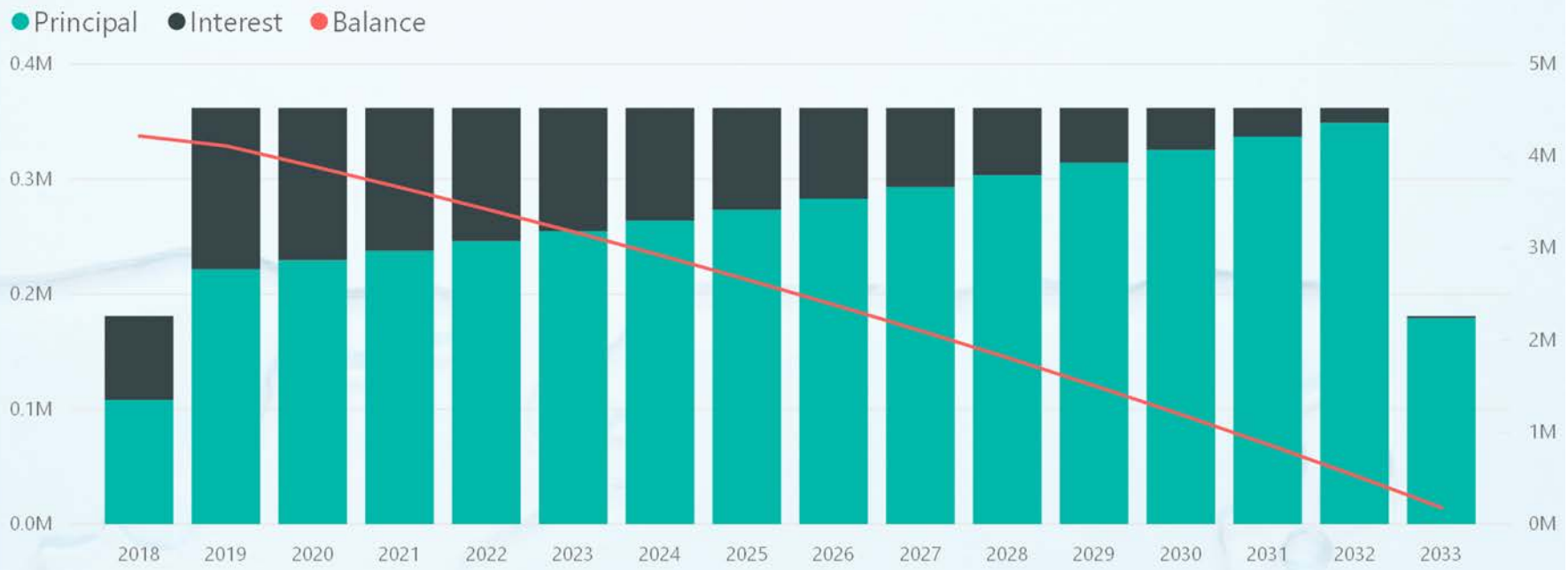
Interest



AMI Amortization- Retro-fit

Amortization

Year	Month	PRINCIPAL	INTEREST	BEGINNING BALANCE
2018	July	17,849.14	12,301.05	4,217,502.25
2018	August	17,901.20	12,248.99	4,199,653.11
2018	September	17,953.41	12,196.78	4,181,751.92
2018	October	18,005.77	12,144.41	4,163,798.50
2018	November	18,058.29	12,091.90	4,145,792.73
2018	December	18,110.96	12,039.23	4,127,734.44
2019	January	18,163.79	11,986.40	4,109,623.48
2019	February	18,216.76	11,933.42	4,091,459.69
2019	March	18,269.90	11,880.29	4,073,242.93
2019	April	18,323.18	11,827.00	4,054,973.03
2019	May	18,376.63	11,773.56	4,036,649.85
2019	June	18,430.22	11,719.96	4,018,273.22
2019	July	18,483.98	11,666.21	3,999,843.00
2019	August	18,537.89	11,612.30	3,981,359.02
2019	September	18,591.96	11,558.23	3,962,821.13
2019	October	18,646.19	11,504.00	3,944,229.17
2019	November	18,700.57	11,449.62	3,925,582.99
2019	December	18,755.11	11,395.07	3,906,882.42
2020	January	18,809.82	11,340.37	3,888,127.30
2020	February	18,864.68	11,285.51	3,869,317.49
2020	March	18,919.70	11,230.49	3,850,452.81
2020	April	18,974.88	11,175.30	3,831,533.11
2020	May	19,030.23	11,119.96	3,812,558.23
2020	June	19,085.73	11,064.46	3,793,528.00
2020	July	19,141.40	11,008.79	3,774,442.27
2020	August	19,197.23	10,952.96	3,755,300.87
Total		4,217,414.57	1,209,531.46	



Principal

5.43M

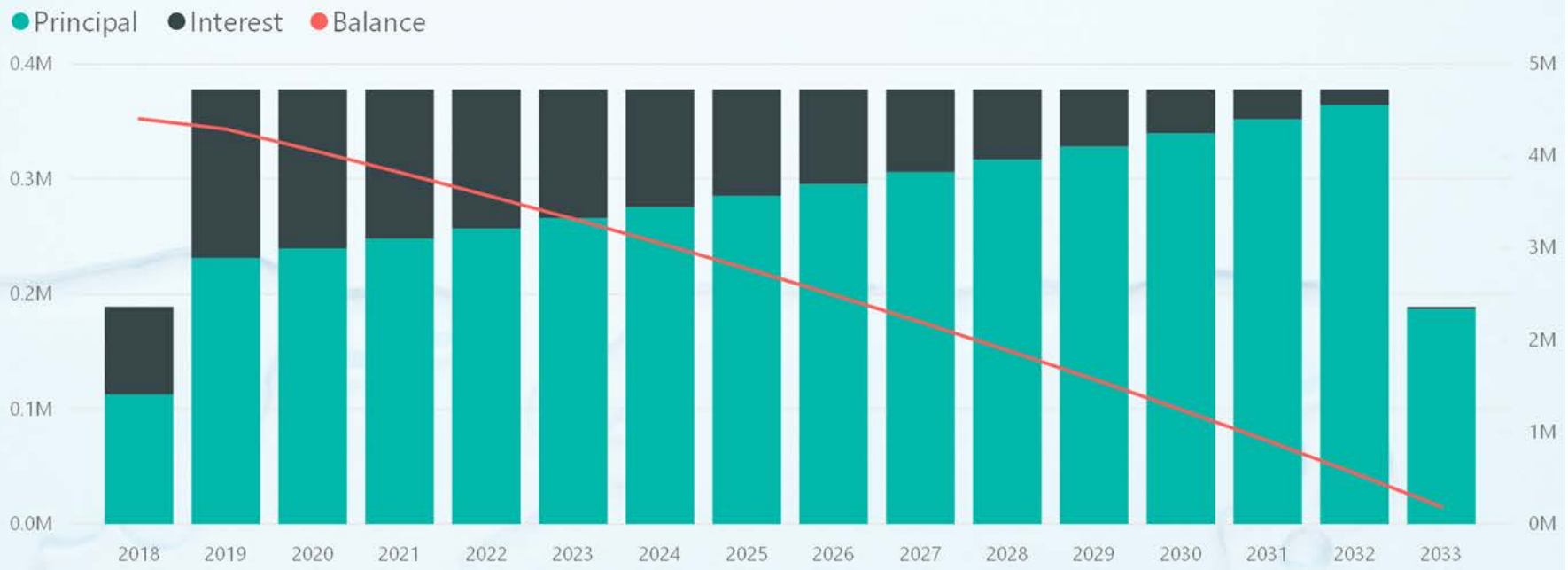
TOTAL PAYMENT

Interest

AMI Amortization- Full Replace

Amortization

Year	Month	PRINCIPAL	INTEREST	BEGINNING BALANCE
2018	July	18,637.91	12,844.64	4,403,877.25
2018	August	18,692.27	12,790.28	4,385,239.35
2018	September	18,746.79	12,735.76	4,366,547.08
2018	October	18,801.47	12,681.08	4,347,800.29
2018	November	18,856.30	12,626.25	4,328,998.82
2018	December	18,911.30	12,571.25	4,310,142.52
2019	January	18,966.46	12,516.09	4,291,231.22
2019	February	19,021.78	12,460.77	4,272,264.76
2019	March	19,077.26	12,405.29	4,253,242.99
2019	April	19,132.90	12,349.65	4,234,165.73
2019	May	19,188.70	12,293.85	4,215,032.83
2019	June	19,244.67	12,237.88	4,195,844.12
2019	July	19,300.80	12,181.75	4,176,599.45
2019	August	19,357.10	12,125.45	4,157,298.65
2019	September	19,413.55	12,069.00	4,137,941.56
2019	October	19,470.18	12,012.37	4,118,528.00
2019	November	19,526.96	11,955.59	4,099,057.83
2019	December	19,583.92	11,898.63	4,079,530.86
2020	January	19,641.04	11,841.51	4,059,946.94
2020	February	19,698.32	11,784.23	4,040,305.91
2020	March	19,755.78	11,726.77	4,020,607.58
2020	April	19,813.40	11,669.15	4,000,851.81
2020	May	19,871.19	11,611.36	3,981,038.41
2020	June	19,929.15	11,553.40	3,961,167.22
2020	July	19,987.27	11,495.28	3,941,238.07
2020	August	20,045.57	11,436.98	3,921,250.80
Total		4,403,785.70	1,262,981.68	



Principal

5.67M

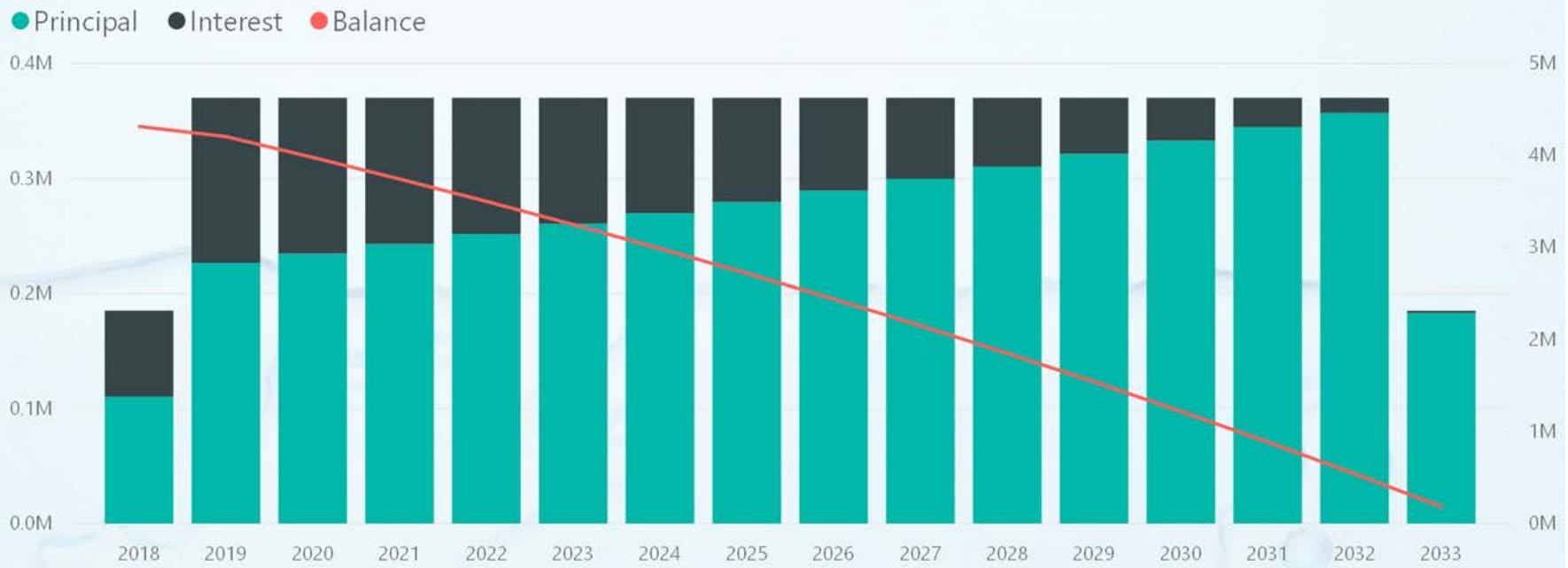
TOTAL PAYMENT

Interest

AMR Amortization

Amortization

Year	Month	PRINCIPAL	INTEREST	BEGINNING BALANCE
2018	July	18,257.48	12,582.47	4,313,988.02
2018	August	18,310.73	12,529.21	4,295,730.54
2018	September	18,364.14	12,475.81	4,277,419.80
2018	October	18,417.70	12,422.25	4,259,055.66
2018	November	18,471.42	12,368.53	4,240,637.96
2018	December	18,525.29	12,314.65	4,222,166.54
2019	January	18,579.33	12,260.62	4,203,641.25
2019	February	18,633.52	12,206.43	4,185,061.92
2019	March	18,687.86	12,152.08	4,166,428.40
2019	April	18,742.37	12,097.58	4,147,740.54
2019	May	18,797.04	12,042.91	4,128,998.17
2019	June	18,851.86	11,988.09	4,110,201.13
2019	July	18,906.85	11,933.10	4,091,349.27
2019	August	18,961.99	11,877.96	4,072,442.43
2019	September	19,017.30	11,822.65	4,053,480.44
2019	October	19,072.76	11,767.18	4,034,463.14
2019	November	19,128.39	11,711.56	4,015,390.38
2019	December	19,184.18	11,655.76	3,996,261.99
2020	January	19,240.14	11,599.81	3,977,077.80
2020	February	19,296.25	11,543.69	3,957,837.67
2020	March	19,352.53	11,487.41	3,938,541.41
2020	April	19,408.98	11,430.97	3,919,188.88
2020	May	19,465.59	11,374.36	3,899,779.90
2020	June	19,522.36	11,317.58	3,880,314.31
2020	July	19,579.30	11,260.64	3,860,791.95
2020	August	19,636.41	11,203.54	3,841,212.64
Total		4,313,898.33	1,237,202.47	



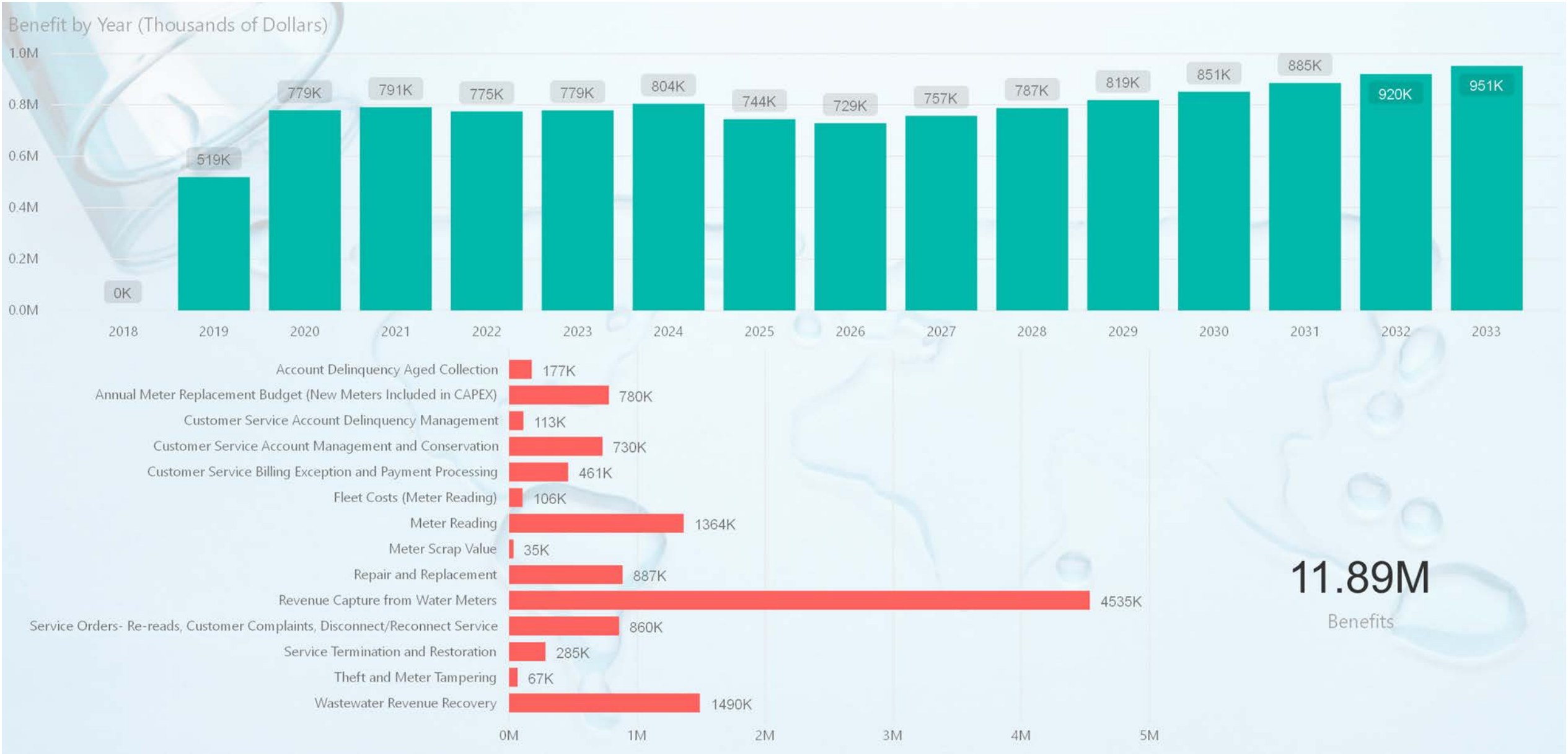
Principal

5.55M

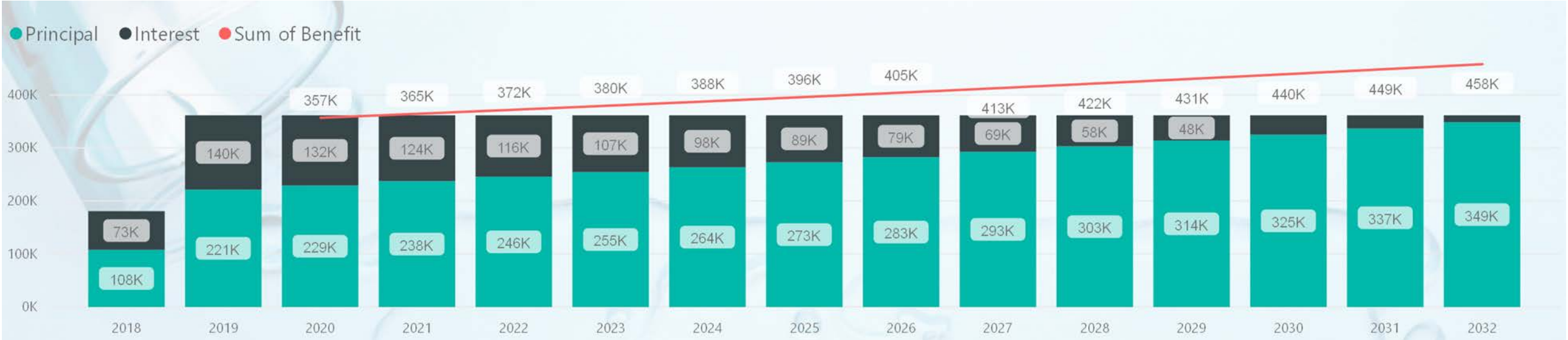
TOTAL PAYMENT

Interest

AMI Total Benefits- All Options



AMI Direct Benefit Value- Retro-fit



Direct Revenue and Cost Reductions (AMI)

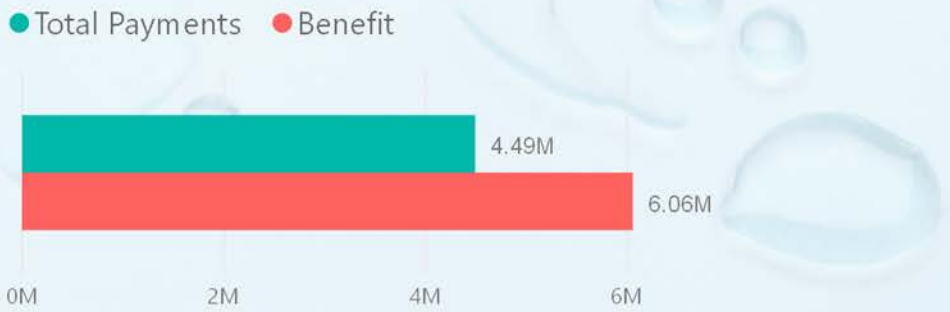
Meter Replacement
Fleet
Theft
Water Revenue Recovery
Delinquency Management
Water Loss

Direct Benefit Value- Cellular

Does not reflect Network OpEx of $100k Year 1 or $1.1M Replacement in Year 11

Direct Revenue and Cost Reductions (AMI)

Meter Replacement
Fleet
Theft
Water Revenue Recovery
Delinquency Management
Water Loss



Financial Metrics Comparisons- Cell, Retro-fit, Full Replace

Cellular

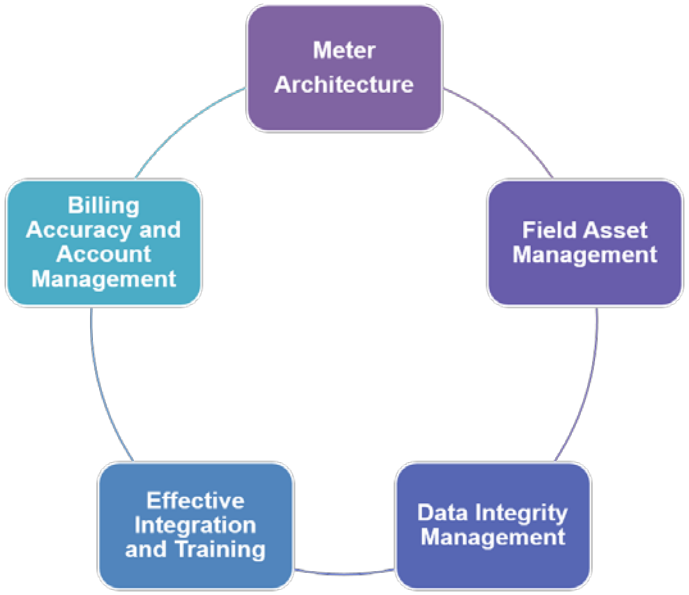
Financial Metrics
NPV $4,187
IRR 19.7%
ROI 78.1%
Payback Period (Years) 8
Total CapEx During Deployment (000's) $3,612

Full Replace

NPV $4,895
IRR 18.2%
ROI 107.0%
Payback Period (Years) 9
Total CapEx During Deployment (000's)
$4,404

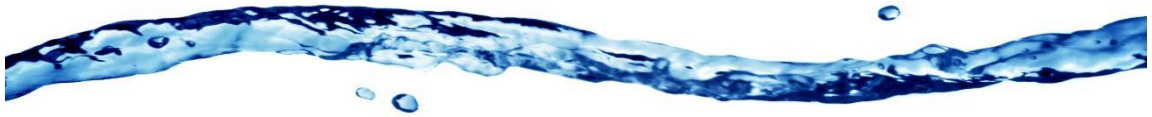
Retro-fit

Financial Metrics
NPV $5,035
IRR 19.3%
ROI 112.3%
Payback Period (Years) 8
Total CapEx During Deployment (000's) $4,218



MeterSYS

Findings and Recommendations



Key Findings – Current State Issues

Limited historical data on meter age impacts ability to strategically plan for replacement due to end of useful life

Variation of meter size, type, and age across system- lack of standardization presents variation in useful life predictions and capital planning

Dual AMR and manual read system creates hybrid environment for billing and readings; informal and manual business processes across multiple functions

Oldest meter in system 51 years old (ncwater.org 2016 water supply plan). Replacement of aged infrastructure internally is difficult to schedule/prioritize

System settings, thresholds, and reporting features are not tailored to system and are not effective, necessitating manual review and potential redesign

Slow system growth yet increasing operational costs require greater efficiencies and increased application of technology through automation

Solution Comparison- AMR and AMI

No Action

Pros

- Familiarity; No change required

Cons

- Missing asset and account data
- Limited reporting capabilities
- Hybrid read environment
- High costs and time consuming repeat site visits
- Limited proactive maintenance
- Financial exposure due to asset degradation
- Disconnects time-consuming and demanding on staff with repeat customers

AMR

Pros

- Improved accuracy due to meter change out
- Improved route sequence design
- Lower capital costs vs AMI
- Reduced read time

Cons

- Monthly read
- Limited data and trending ability
- Limited systems interface

AMI

Pros

- Improved accuracy due to meter change out
- Significant reduction in manual labor
- Near real-time read data
- Customer usage profiling
- Alerts and alarms
- Additional functionality (leak detection, pressure mgmt.)

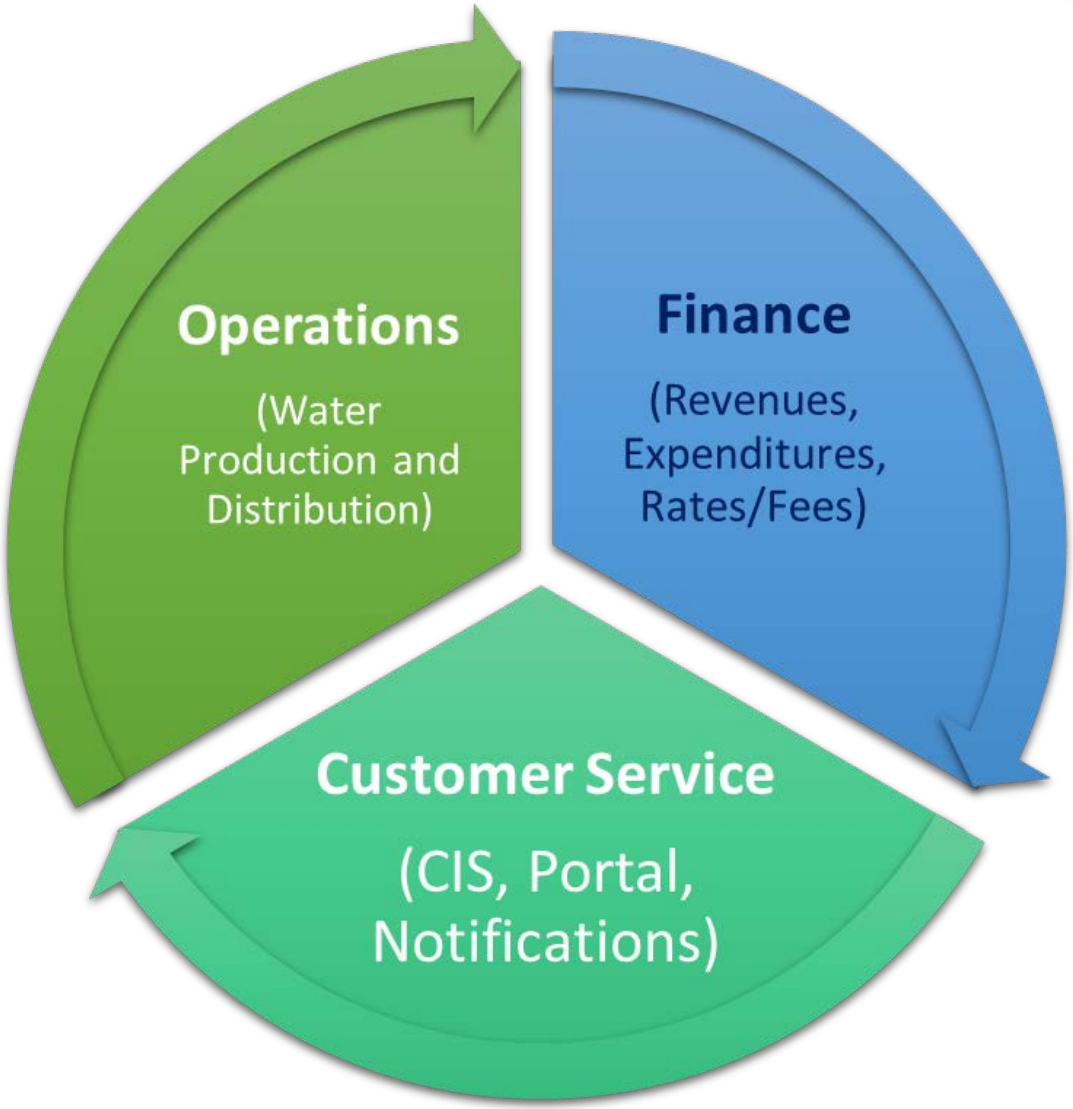
Cons

- Significant change management required
- Staff and policy changes recommended

MeterSYS

Advanced Metering Project Goals

- Improve customer service
- Reduce aged assets and standardize equipment
- Improve read accuracy
- Optimize utility revenue
- Improve operational efficiencies
- Leverage technology for expanded functionalities
- Streamline operations across system
- Enhance CIS functionalities



Key Findings – Future State Opportunities

Payback period is estimated to be 8 years for DCF Analysis for retro-fit implementation

Automation and standardization of meters will reduce read labor costs; multiple re-reads and work orders alleviated through on-demand reads

Significant internal and external communication and education will be required to gain project support and confidence

City should revisit policies to identify opportunities to leverage AMI features and functionality

City will gain improved customer service (leak detection, consumption monitoring, customer portal, real-time troubleshooting) and will reduce manual work

City should revisit settings in Harris ICS or potential utilization study

MeterSYS

AMI Value for the City of Lenoir

- AMR is 30 year technology and doesn't provide as many ancillary benefits
- AMI will reduce greenhouse emissions from reduction of manual meter reading
- AMI allows for improved customer experience with direct, almost real-time access to consumption data
- AMI provides a platform for future technology (i.e. distribution leak detection, smart-city platforms, SCADA-lite functionalities
- AMI is safe, secure, and reliable technology

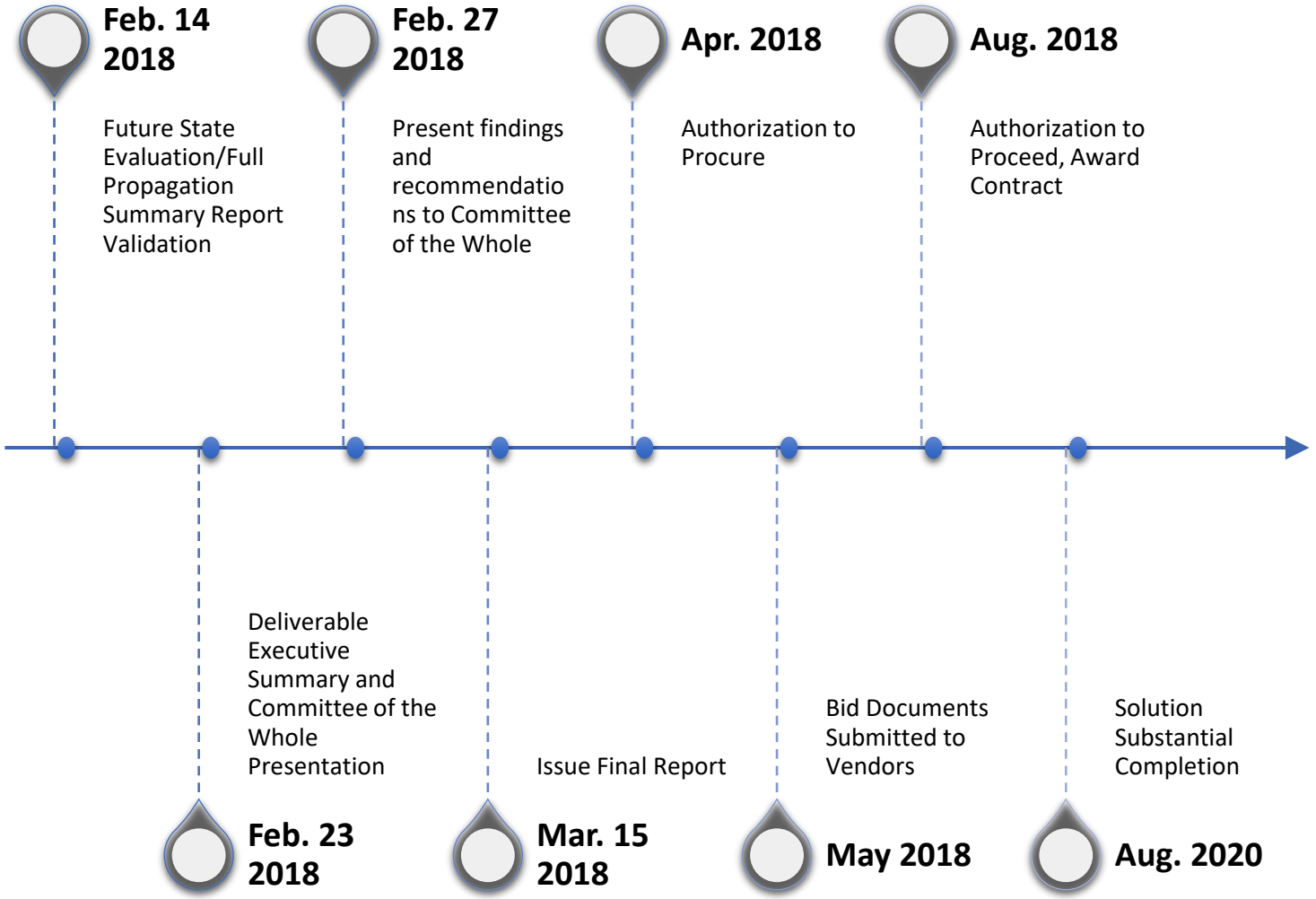
MeterSYS

AMI Recommended Solution Requirements

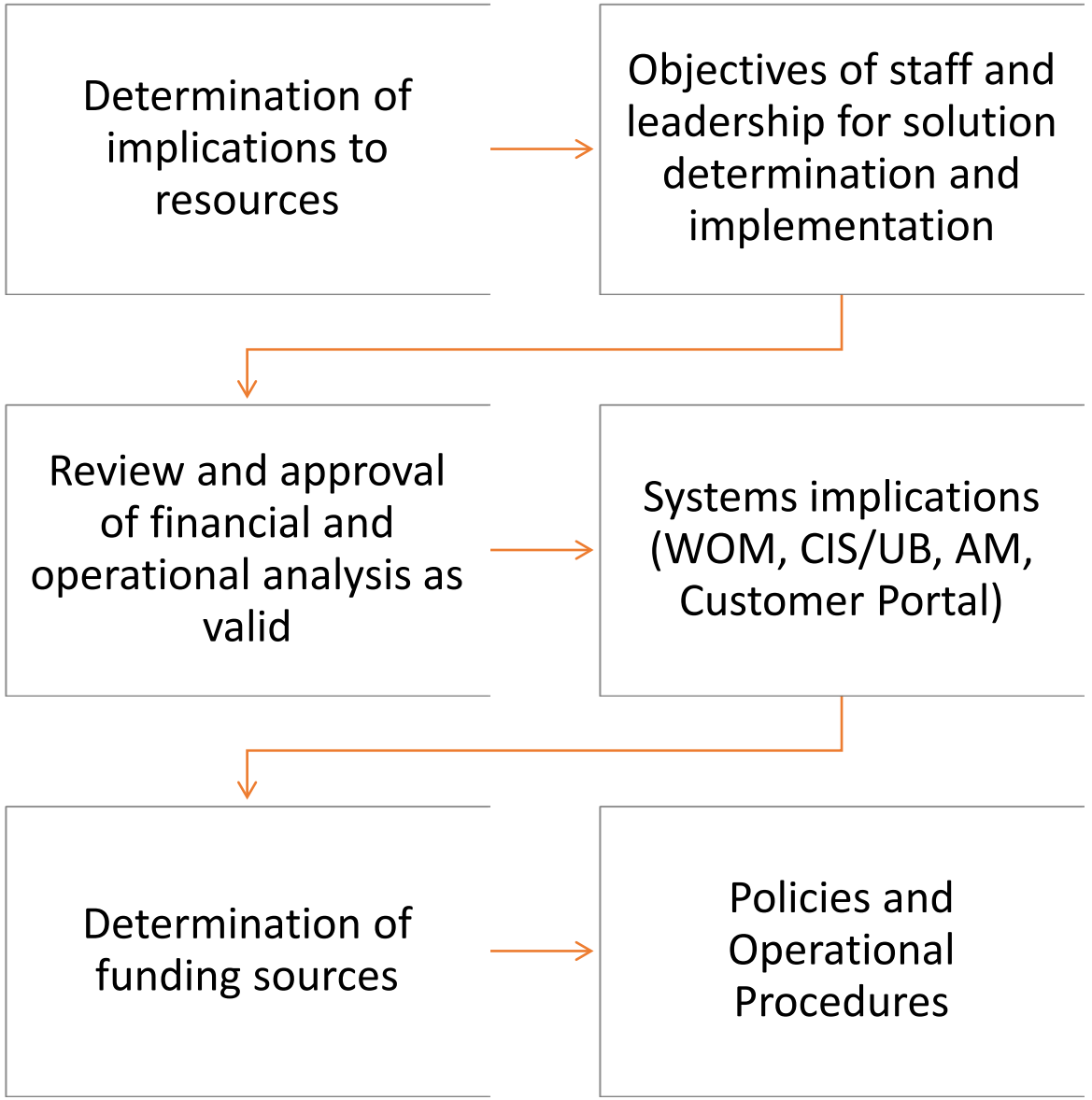
- Remote Disconnect Meter
- Integrated Meter/Endpoint
- Minimized Collector Count
- MDMS and Customer Portal
- Future Technology and System Expandability
- Installation Qualifications
- Equipment Specs/Warranty
- Vendor Qualifications/References
- Pricing Summary

Upcoming Milestones

Draft Solution Selection and Implementation Timeline



Operational and Financial Implications Review



Roundtable

Advanced Metering Comparison

Functionality	AMR	AMI
Read Accuracy	AWWA Compliant	AWWA Compliant
Communications	One-way	Two-way
Data Interval	Monthly	Hourly
Remote On-demand Read	No	Yes
Customer Leak Detection	No	Yes
Remote Service Disconnection	No	Yes
Distribution Pressure/Leak Detection	No	Yes
Consumption Analytics	Limited	Advanced
Customer Portal Access	No	Yes
Customer Responsiveness	Reactive	Proactive
Alerts and Alarms	Limited	Advanced
District Metering Areas (DMA)	No	Yes
Pressure and Temperature Monitoring	No	Yes
Smart City/IoT Compatible	No	Yes

MeterSYS

March 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6 3:30 p.m. Reception Charles Beck/Ken Briscoe (City/County Chambers) 6:00 p.m. City Council	7 9:00 a.m. Staff Mtg.	8 3:00 p.m. Tourism Dev. Authority (City Hall) 6:00 p.m. Lenoir Bus. Adv. Brd. (City Hall)	9	10
11 Daylight Savings Time Begins NLC Conference Begins	12 11:45 a.m. City/County Services Committee	13 8:00 a.m. EDC	14 NLC Conference Ends	15	16	17
18	19 6:00 p.m. Recreation Advisory Board (Mulberry Rec. Center)	20 6:00 p.m. City Council	21 9:00 a.m. Staff Mtg.	22	23	24
25	26 5:30 p.m. Planning Brd. 6:00 p.m. Employee Recognition Banquet (J.E. Broy. Civic Cntr.)	27 8:30 a.m. Committee of the Whole	28 Noon - Foothills Regional Airport Auth.	29	30 Good Friday! City Offices Closed	31
		Notes for April				

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Shirley M. Cannon, City Clerk