Naperville

Public Utilities Advisory Board

Water AMI Business Case Presentation

April 15, 2019

Presentation Overview

- Introduction of West Monroe Partners
- Assumptions recommended from previous meeting
- Business Case Financials and Implementation Plan
- Preliminary funding options
- Action items
- Next steps

West Monroe is a business and technology consulting firm headquartered in Chicago, Illinois, with a dedicated Energy & Utilities practice.

West Monroe Partners is large enough to tackle our clients' toughest challenges

and nimble enough to adapt to unique requirements with custom solutions

Established in 2002

West Monroe is a full-service business and technology consulting firm.

People

Over 1,200 consultants confident enough to engage in constructive debate and understand that it's okay to disagree.

Organization

We are 100% employee owned. We answer to our people and our clients only.

Community

We are dedicated to improving the communities where we live and work, which is why we donate 1% of our time, talent, and treasure to support organizations with similar values and goals.

Dedicated Utilities Practice

90+ industry professionals that are passionate about advancing the industry through the application of new technologies.

BUSINESS CASE ASSUMPTIONS RECOMMENDED FOR APPROVAL

Scenario Selection Assumptions

- Assumes one business case with fixed and variable costs over 20 years
- Model assumes 20-year battery life
- Model represents four network design options
- Across all scenarios: develop and implement a robust community outreach program

Timeline Assumptions

- Business case assumes year 1 begins immediately in 2020
  - Note: random failure is modeled at 1% for years 1-10 and 2% for years 11-20
- Baseline costs assume termination of contracted meter reading in 2021
- Naperville will utilize contractors to perform AMI/AMR reading device (endpoint) installations during a one-year period through both a mass deployment effort and via day-to-day operations (e.g. accelerated meter replacement program, new business/home, etc.)
- The IT development and system integration work will be performed over two releases, focusing efforts on the most critical functionality first (meter exchange, billing) and other functionality in a second release (customer portal, data analytics)

Data Assumptions

- All 45,000 endpoints will be converted to AMI/AMR with the option for an opt-out program
- West Monroe applies inflation to all expenses over the 20-year business case period

Business Case Financial Scenarios

Five scenarios were evaluated:

1. Baseline scenario - Continue with manual reading utilizing in-house staff
2. AMI – Utilize existing Elster Network
3. AMI – Point-to-Multipoint High network
4. AMI – Point-to-Multipoint Low network
5. AMR

AMI Customer Benefits and Sustainability

1. **IMPROVED CUSTOMER SERVICE**

Transitioning to AMI will reduce the volume of estimated bills and help Naperville provide customers with proactive leak notifications, consumption alerts, and better usage data in near-real time.

2. **IMPROVED SUSTAINABILITY IN OPERATIONS**

Fewer truck rolls – attributed to AMI deployment – will reduce Naperville's greenhouse gas emissions. 95% of mileage (or approximately 86 tons of CO_2e over the life of the program) associated with meter reading activity is expected to be eliminated via AMI.

3. **IMPROVED CUSTOMER LEAK DETECTION**

Hourly interval data from water meters, analytics, and a customer portal/mobile application could proactively identify leaks and notify account holders – reducing the risk of water waste & catastrophic damage.

4. **IMPROVED CONSERVATION OPPORTUNITIES**

Hourly interval data can be used for empowering customers to make their own choices regarding consumption reduction and resource conservation.

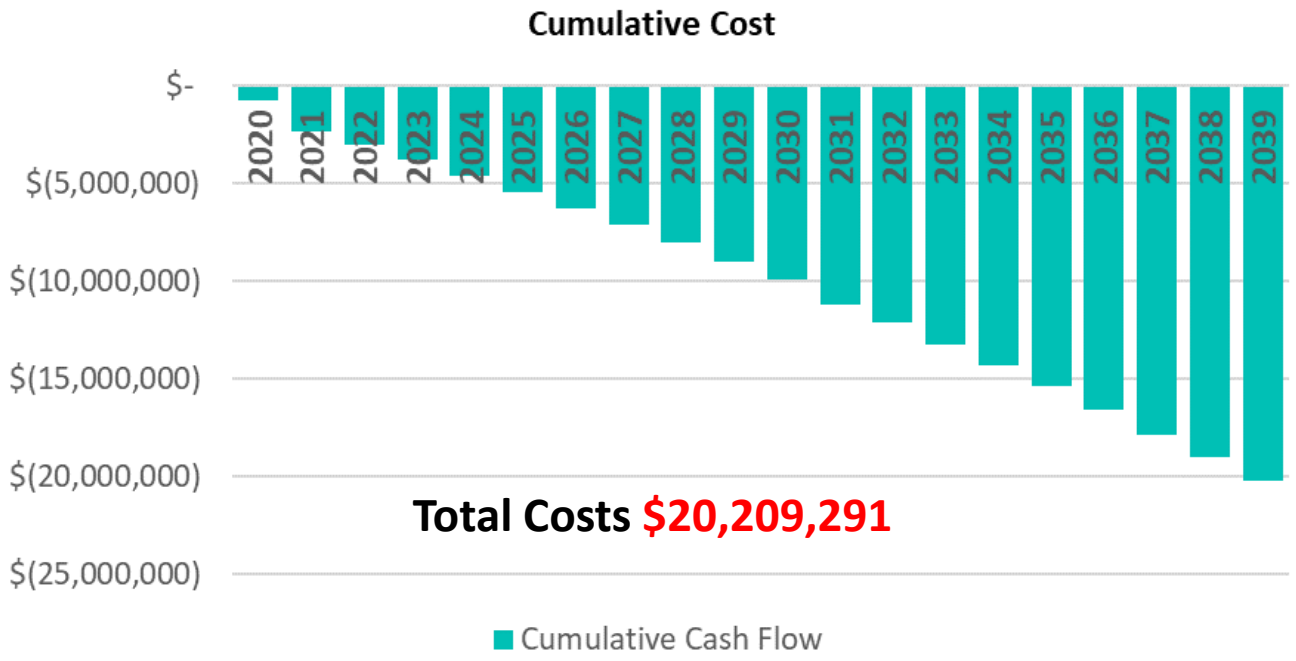
5. **IMPROVED SAFETY – FOR STAFF & CUSTOMERS**

Transitioning to AMI will reduce safety risks that meter readers encounter in the field. Additionally, reduction in driving miles associated with AMI will reduce the likelihood of car accidents – making roads safer for both customers and Naperville staff.

Baseline: Manual Meter Reading

Cost Summary for In-House Meter Reading (No associated benefits or savings)

Assessing the impacts of continuing manual meter reading without deployment of AMI or AMR.



Note: Alexander's Inc. requested contract release in 2018 due to staffing issues and the inability to obtain monthly reads for the entire meter population (leading to estimation). Alexander's Inc. is expected to terminate its contract in 2021.

Overview of AMI/AMR Scenarios

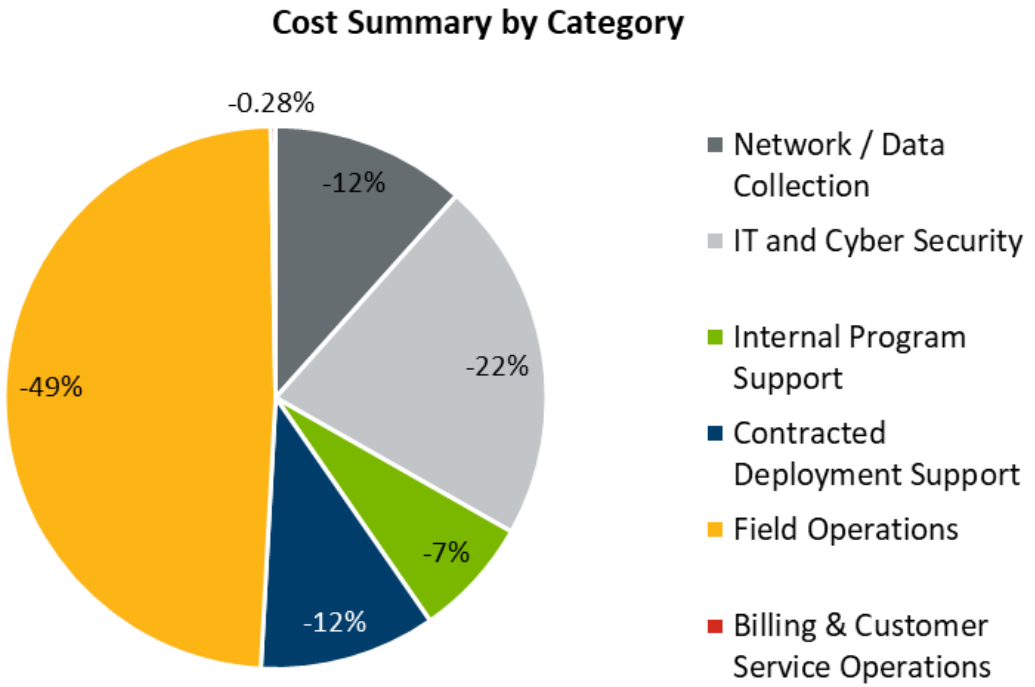
KEY CONSIDERATIONS

Naperville faces ongoing challenges with the water meter reading contract and is working to reduce the volume of estimated bills. In lieu of developing an in-house meter reading program, Naperville is evaluating the viability of an automated reading system. The following are four network designs under consideration.

1	2	3	4
NAPERVILLE NETWORK	**PtMP – Low Site**	**PtMP – High Site**	**MOBILE RADIO**
Naperville utilizes the existing DPU-E AMI network, requiring incremental build	**Naperville builds a new, point to multipoint (PtMP) AMI network**	**Naperville builds a new, point to multipoint (PtMP) AMI network**	**Naperville leverages a mobile collector, forgoing need for a fixed network**
◆Existing electric AMI footprint could allow efficiencies for an accelerated AMI rollout and decreased capital investment ◆Water AMI endpoints relay consumption data via electric endpoints and data collectors	◆Upfront investment in network infrastructure requires low site mounting for data collectors (~30 ft. high, oftentimes street lights) ◆Approximately one data collector is required per square mile ◆Water AMI endpoints relay consumption data via one or more data collectors	◆Upfront investment in network infrastructure requires high site mounting for base stations (~150-190 ft. high) ◆Approximately six base stations would be required ◆Water AMI endpoints relay consumption data via one or more base stations	◆Upfront investment in infrastructure is low, as there are no mounted network devices ◆Technology/processes already exist for approx. 1.6k Naperville endpoints ◆Meter reads are gathered via mobile collection once per month

Option 1: AMI – Naperville Network

Total Cost Summary for Full AMI Deployment (1 year deployment)



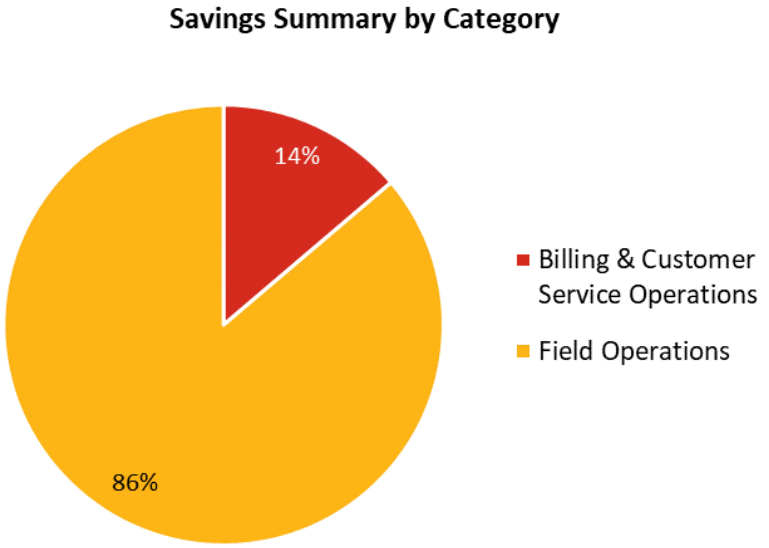
Total Costs ($18,701,416)

- **Network:** network hardware, installation, and maintenance costs incremental to the existing network
- **IT and Cyber Security:** one-time installation costs for software/systems, plus ongoing licensing & hardware costs incremental to the existing network
- **Internal Program Support:** internal field operations, legal, regulatory, and customer service support required during and post-deployment
- **Contracted Deployment Support:** external field operations support (AMI installation)
- **Field Operations:** AMI radio hardware and ongoing maintenance costs incremental to the existing network
- **Billing & Customer Service Operations:** labor to support increase in call volume (deployment only) and costs for program engagement/marketing materials

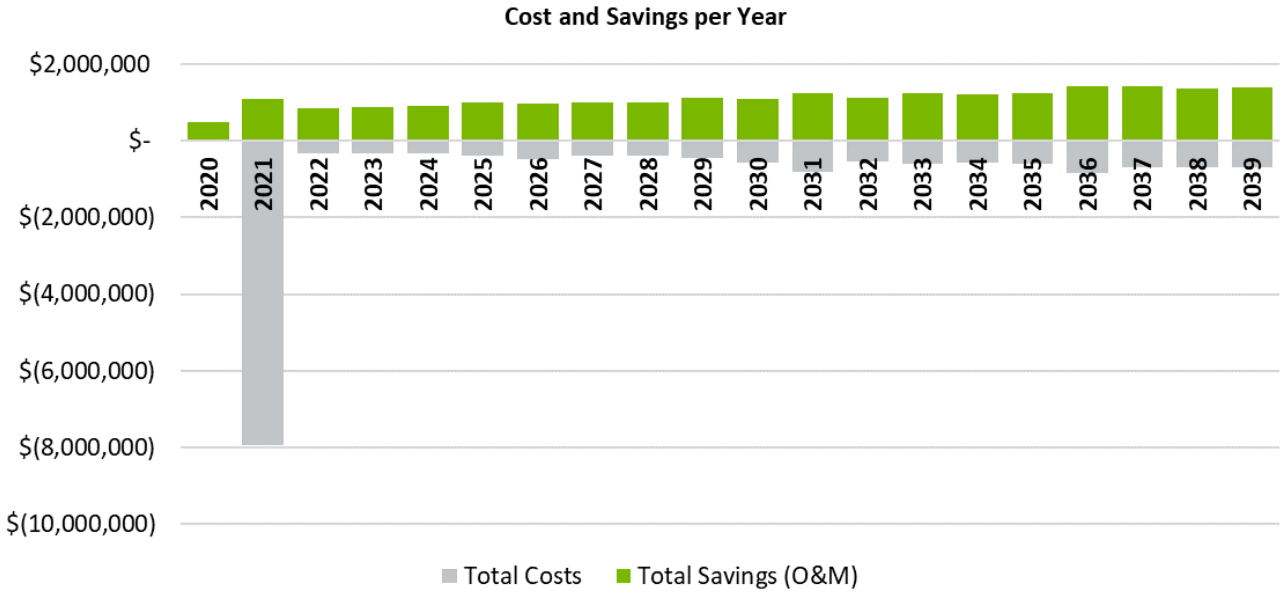
**Graphs represent a useful battery life of 20 years*

Option 1: AMI – Naperville Network

Total Cost Summary for Full AMI Deployment (1 year deployment)



Total Savings $22,017,456

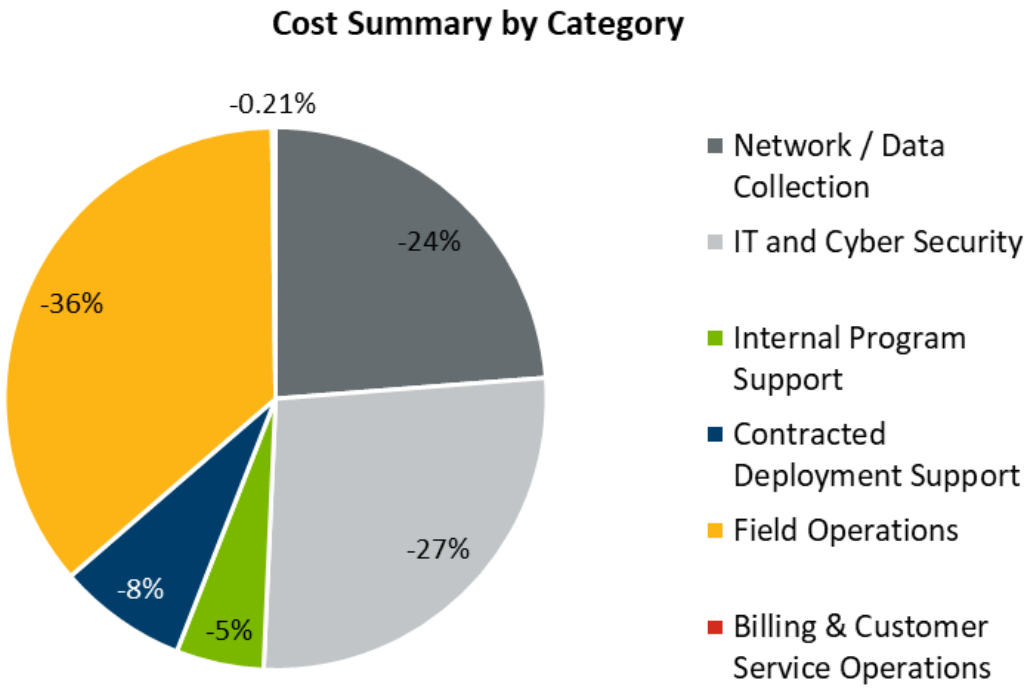


Total Costs ($18,701,416)
Total Savings $22,017,456

**Graphs represent a useful battery life of 20 years*

Option 2: AMI – PtMP (Low Site)

Total Cost Summary for Full AMI Deployment (1 year deployment)



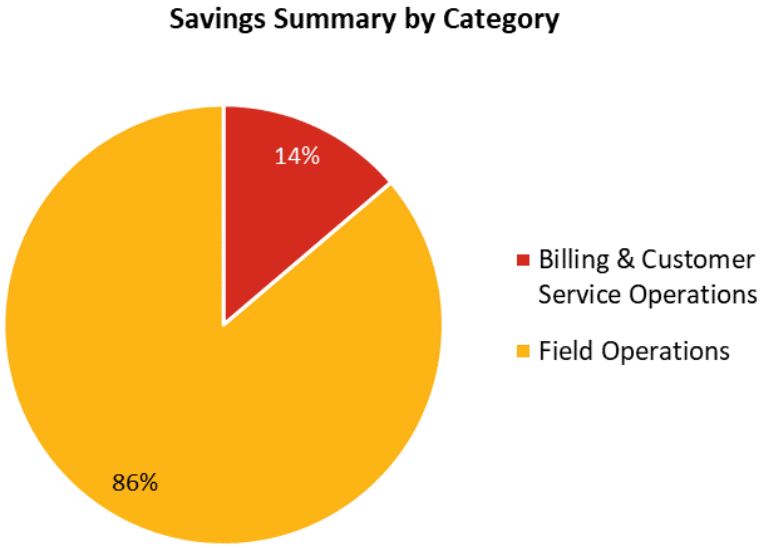
Total Costs ($25,505,116)

- **Network:** network hardware, installation, and maintenance costs
- **IT and Cyber Security:** one-time installation costs for software/systems, plus ongoing licensing & hardware costs
- **Internal Program Support:** internal field operations, legal, regulatory, and customer service support required during and post-deployment
- **Contracted Deployment Support:** external field operations support (AMI installation)
- **Field Operations:** AMI radio hardware and ongoing maintenance costs
- **Billing & Customer Service Operations:** labor to support increase in call volume (deployment only) and costs for program engagement/marketing materials

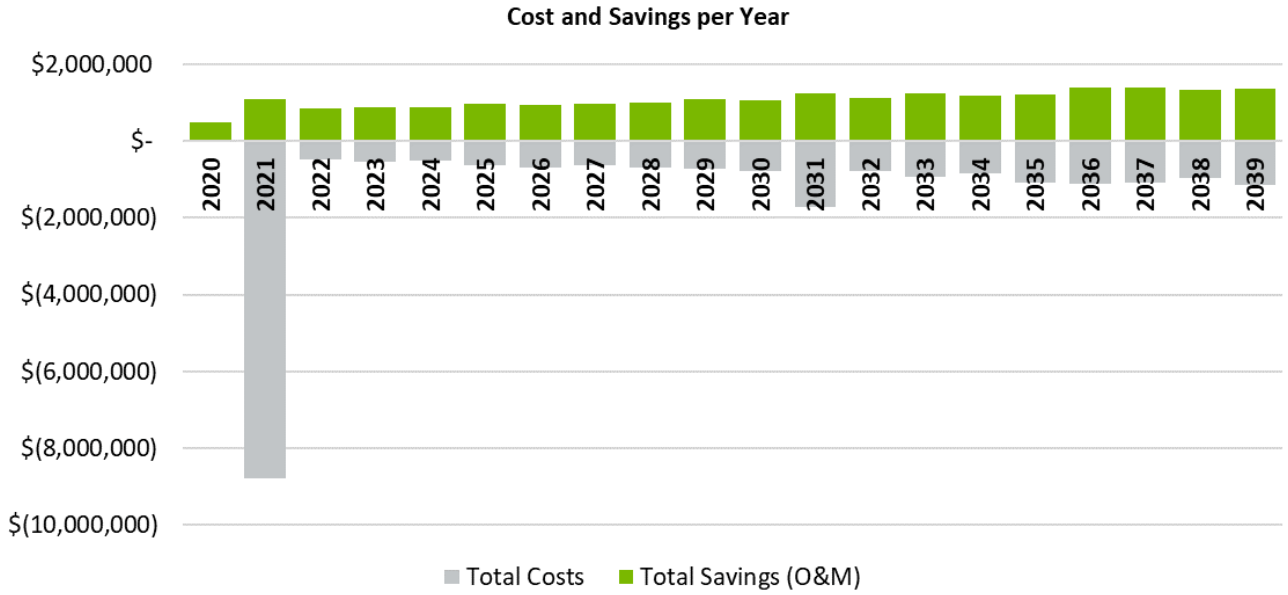
**Graphs represent a useful battery life of 20 years*

Option 2: AMI – PtMP (Low Site)

Total Cost Summary for Full AMI Deployment (1 year deployment)



Total Savings $22,017,456

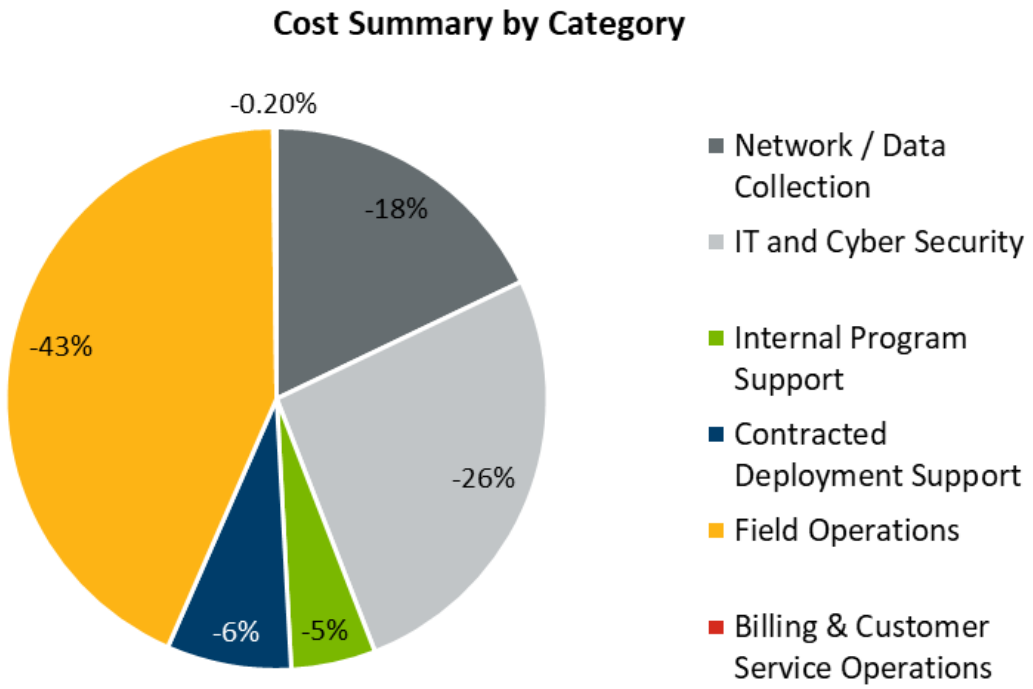


Total Costs ($25,505,116)
Total Savings $22,017,456

**Graphs represent a useful battery life of 20 years*

Option 3: AMI – PtMP (High Site)

Total Cost Summary for Full AMI Deployment (1 year deployment)



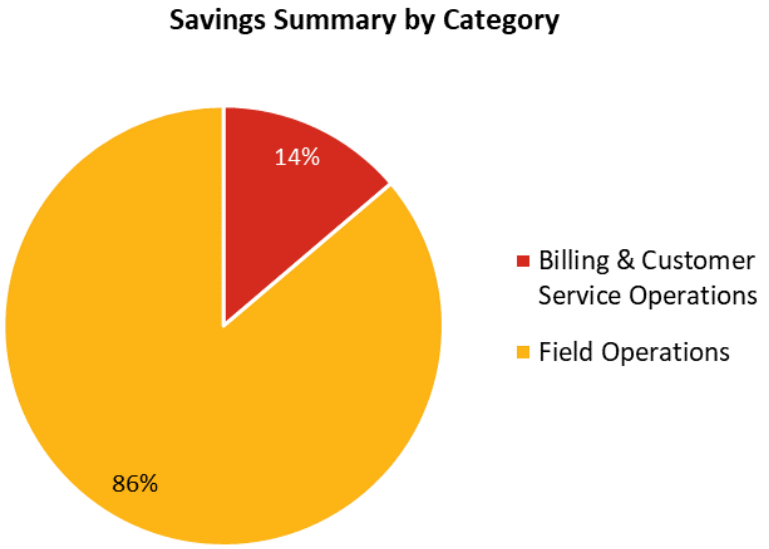
Total Costs ($26,428,607)

- **Network:** network hardware, installation, and maintenance costs
- **IT and Cyber Security:** one-time installation costs for software/systems, plus ongoing licensing & hardware costs
- **Internal Program Support:** internal field operations, legal, regulatory, and customer service support required during and post-deployment
- **Contracted Deployment Support:** external field operations support (AMI installation)
- **Field Operations:** AMI radio hardware and ongoing maintenance costs
- **Billing & Customer Service Operations:** labor to support increase in call volume (deployment only) and costs for program engagement/marketing materials

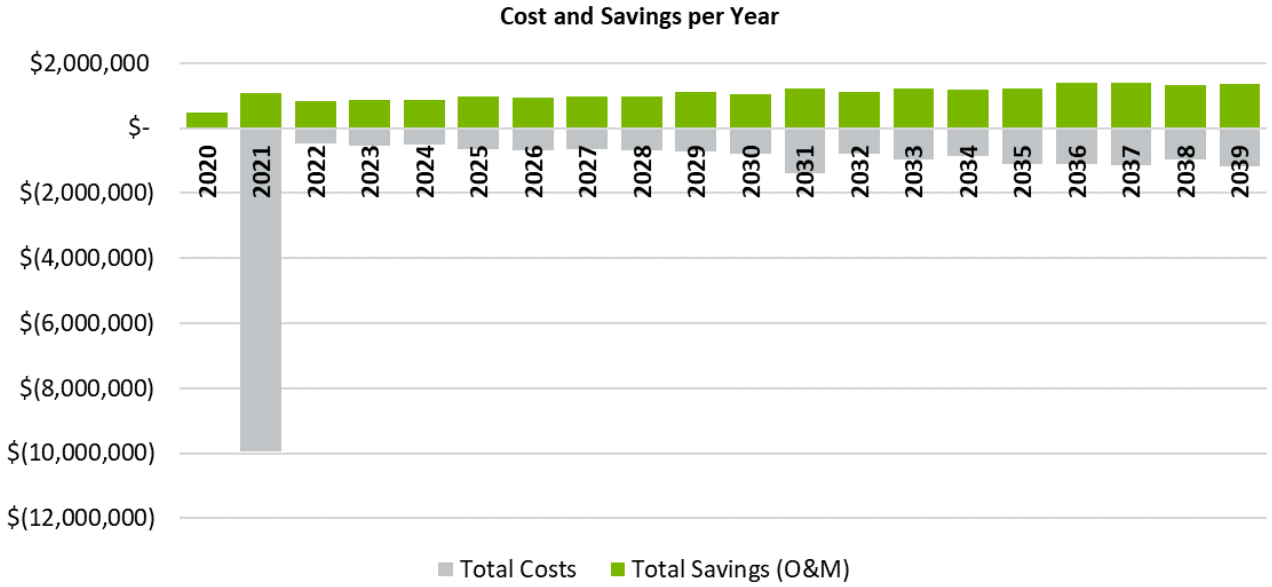
**Graphs represent a useful battery life of 20 years*

Option 3: AMI – PtMP (High Site)

Total Cost Summary for Full AMI Deployment (1 year deployment)



Total Savings $22,017,456

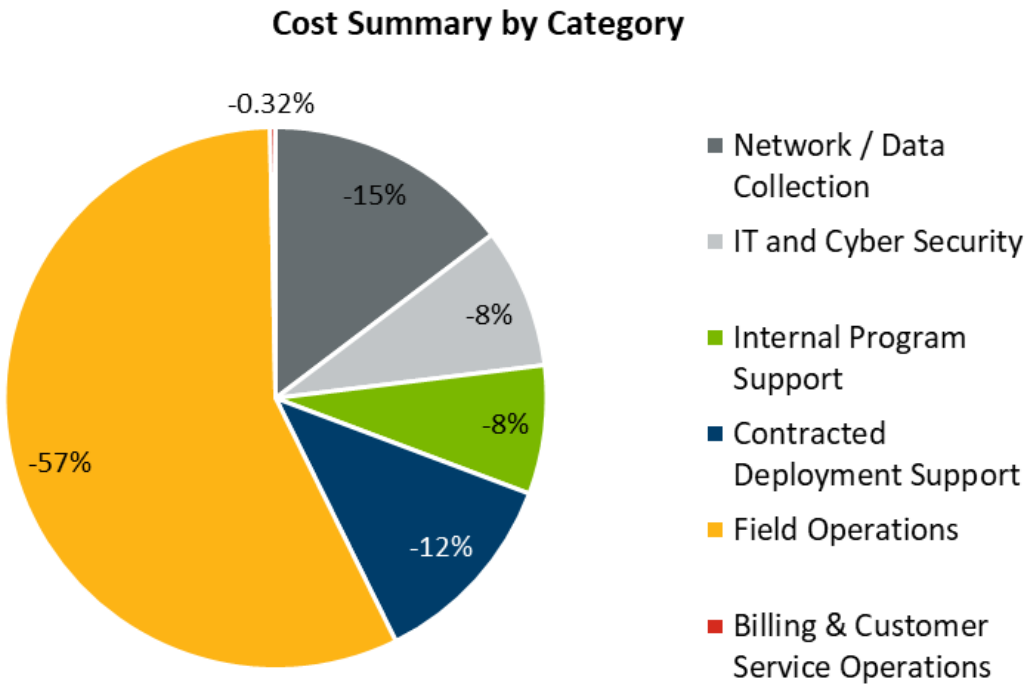


Total Costs ($26,428,607)
Total Savings $22,017,456

**Graphs represent a useful battery life of 20 years*

Option 4: AMR – Mobile

Total Cost Summary for Full AMI Deployment (1 year deployment)



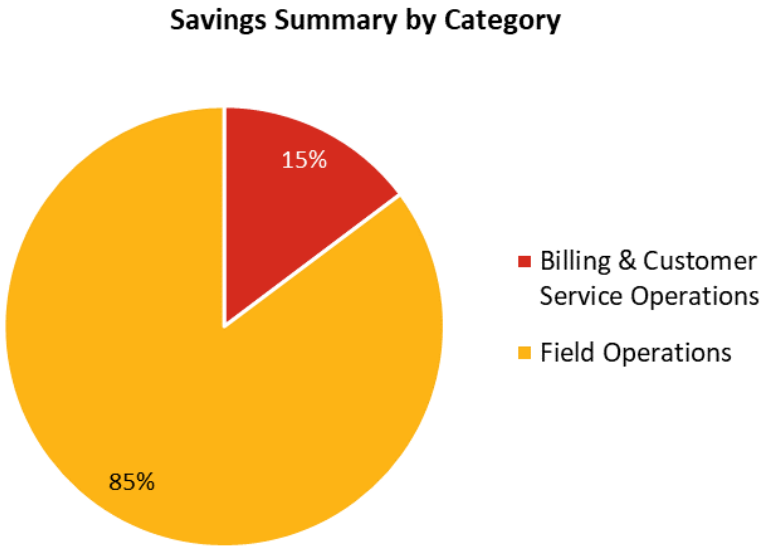
Total Costs ($16,457,029)

- **Network:** mobile collector hardware and maintenance costs
- **IT and Cyber Security:** one-time installation costs for software/systems, plus ongoing licensing & hardware costs
- **Internal Program Support:** internal field operations, legal, regulatory, and customer service support required during and post-deployment
- **Contracted Deployment Support:** external field operations support (AMR installation)
- **Field Operations:** AMR radio hardware and ongoing maintenance costs
- **Billing & Customer Service Operations:** labor to support increase in call volume (deployment only) and costs for program engagement/marketing materials

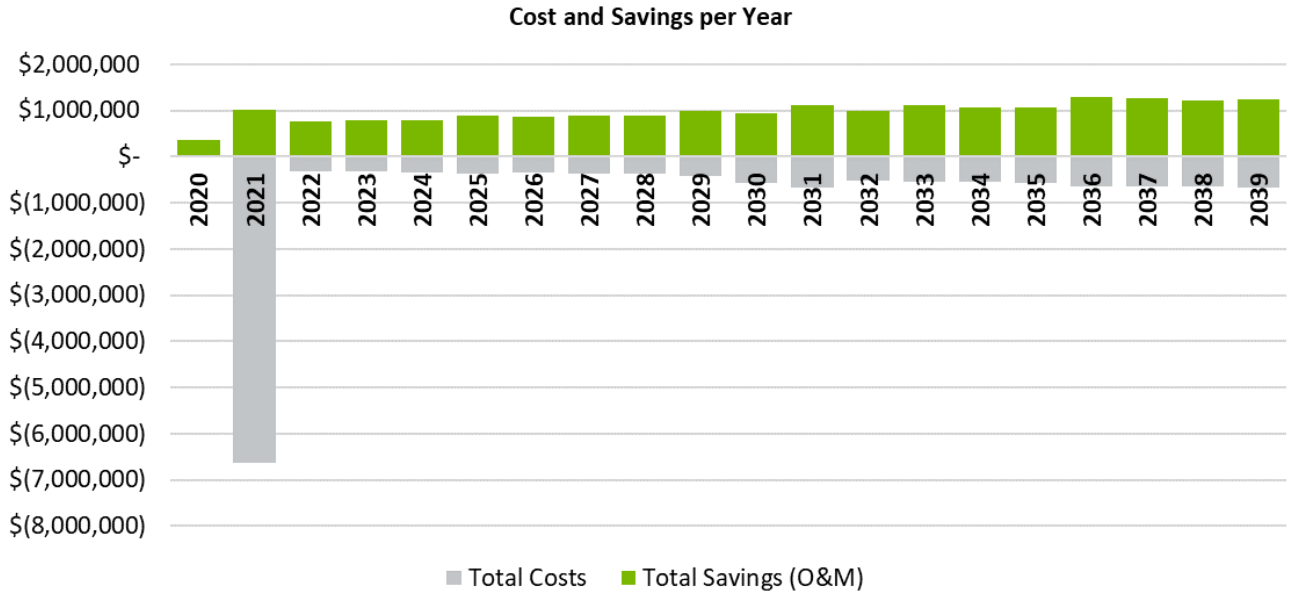
**Graphs represent a useful battery life of 20 years*

Option 4: AMR – Mobile

Total Cost Summary for Full AMI Deployment (1 year deployment)



Total Savings $19,500,940



Total Costs ($16,457,029)
Total Savings $19,500,940

**Graphs represent a useful battery life of 20 years*

Comparative Scenarios

20-year battery life, 1-year deployment

Denotes most financially effective AMI approach
NPV demonstrates comparative discount rates

	Baseline (Manual)	AMI – Naperville Network	AMI – PtMP (Low)	AMI – PtMP (High)	AMR – Mobile
Financial Metrics					
NPV – 3.5% Discount	**-$13,620,957**	**$94,771**	**-$4,398,816**	**-$5,309,787**	**$297,048**
NPV – 2% Discount	**-$16,021,443**	**$1,102,630**	**-$4,121,892**	**-$5,038,907**	**$1,178,630**
ROI	**-100%**	**18%**	**-14%**	**-17%**	**18%**
Deployment Capital	**N/A**	**-$7,741,563**	**-$8,498,911**	**-$9,700,322**	**-$6,521,965**
Capital and O&M Costs					
Network / Data Collection	-$0	-$2,175,088	-$6,062,847	-$4,732,225	-$2,418,681
IT and Cyber Security	-$0	-$4,036,113	-$6,871,062	-$6,919,763	-$1,374,856
Internal Program Support	-$16,854,346	-$1,334,914	-$1,334,914	-$1,334,914	-$1,264,064
Contracted Deployment	-$749,126	-$1,967,505	-$1,967,505	-$1,967,505	-$1,967,505
Field Operations	-$2,605,818	-$9,134,714	-$9,215,707	-$11,421,119	-$9,378,842
Billing & Customer Service	-$0	-$53,082	-$53,082	-$53,082	-$53,082
Total Costs	**-$20,209,291**	**-$18,701,416**	**-$25,505,116**	**-$26,428,607**	**-$16,457,029**
Capital and O&M Savings					
Billing & Customer Service	$0	$2,987,466	$2,987,466	$2,987,466	$2,879,819
Field Operations	$0	$19,029,990	$19,029,990	$19,029,990	$16,621,121
Total Savings	**$0**	**$22,017,456**	**$22,017,456**	**$22,017,456**	**$19,500,940**
NET Costs / Savings (-/+)	**-$20,209,291**	**$3,316,040**	**-$3,487,660**	**-$4,411,151**	**$3,043,911**

Comparative Scenarios

20-year battery life, 1-year deployment

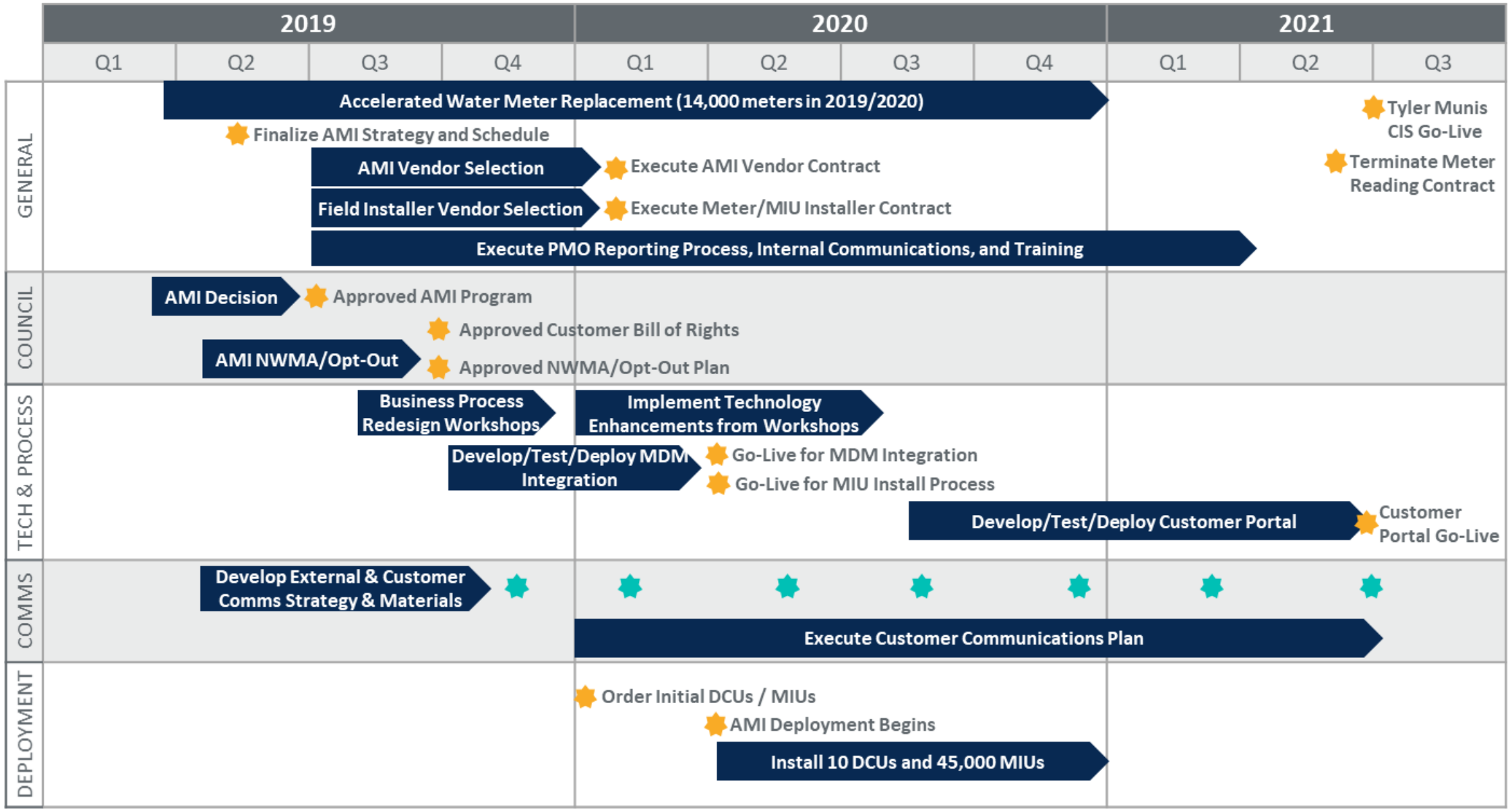
Denotes most financially effective AMI approach
NPV demonstrates comparative discount rates

	Baseline (Manual)	AMI – Naperville Network	AMI – PtMP (Low)	AMI – PtMP (High)	AMR – Mobile
Total 20-Year					
Costs	**-$20,209,291**	**-$18,701,416**	**-$25,505,116**	**-$26,428,607**	**-$16,457,029**
Savings	**$0**	**$22,017,456**	**$22,017,456**	**$22,017,456**	**$19,500,940**
NET Costs / Savings (-/+)	**-$20,209,291**	**$3,316,040**	**-$3,487,660**	**-$4,411,151**	**$3,043,911**
Capital Costs					
2020	-$0	-$7,741,563	-$8,498,911	-$9,700,322	-$6,521,965
2021	-$266,114	-$81,945	-$93,439	-$118,288	-$66,099
Total Deployment Capital	**-$266,114**	**-$7,823,508**	**-$8,592,350**	**-$9,818,610**	**-$6,588,064**
O&M Costs					
2020	-$393,062	-198,391	-$281,467	-$249,452	-$102,765
2021	-$1,279,918	-$244,330	-$398,609	-$365,150	-$251,456
Total Deployment O&M	-$1,672,980	-$442,721	-$680,076	-$614,602	-$354,221
Total Deployment Costs	**-$1,939,094**	**-$8,266,229**	**-$9,272,425**	**-$10,433,212**	**-$6,942,285**

AMI Program Headcount – Deployment & Ongoing Staff

Department	Deployment	Post-Deployment	Baseline Scenario	Responsibilities
Customer Service & Billing Rep	0.5 FTE across 2019 and 2020 (heavier workload in 2020)	0 FTE/year	0 FTE/year	• Create and lead water AMI training for Customer Service/Billing • Develop / update call center scripts based on AMI questions • Update call center staff on AMI deployment progress • Address customer service escalations related to AMI • Troubleshoot AMI billing issues
Field Operations / Project Management / Engineering	1 FTE across 2019 and 2020 (heavier workload in 2020)	0.25 FTE/year	8 FTE/year	• Assist in AMI vendor selection, field deployment vendor selection, and vendor QA/management activities • Assist in propagation studies & network design as needed • Oversee day to day contractor management / deployment • Update meter reading routes/bill cycles (as required) • Maintain network hardware & devices in the field
IT – General / Integrations / Software Maintenance	Naperville Network: 0.5 FTE / Non: 1 FTE across 2019 and 2020 (heavier workload in 2020)	Naperville Network: 0.5 FTE Non: 1 FTE /year	0 FTE/year	• Provide network monitoring & maintenance • Provide incremental deployment & ongoing support for technical AMI hardware (e.g. servers, disaster recovery, log monitoring, technical change management, etc.) • Provide deployment & ongoing support for new water portal and analytics • Develop and support new system integrations with MDMS (if not leveraging existing network)
Program & Change Management/ Training	1 FTE across 2019 and 2020 (spread equally across the 2 years)	0 FTE/year	0 FTE/year	• Manage water AMI program • Lead vendor selection & contracting activities • Create & execute change management plan • Create & execute training plan
Communication / City Management	0.5 FTE across 2019 and 2020 (spread equally across the 2 years)	0 FTE/year	0 FTE/year	• Communications plan and AMI training • Customer Bill of Rights • Support the AMI deployment, including design of an opt-out program, Council memos, vendor selections, and escalated resident inquiries
Legal	0.125 FTE across 2019 and 2020 (heavier workload in 2019)	0 FTE/year	0 FTE/year	• Provide legal guidance and support for opt-out program and Bill of Rights

The AMI program would take approximately 24 months to complete after receiving Council approval



This is the most optimistic implementation plan, optimized by leveraging the existing electric AMI network's infrastructural footprint

Current State

- The current rate structure was established in 2016 and set rates for 2017-2021.
  - Alexander's Inc. contract services through August 2021.
  - Rates account for approximately $421,000 in contract meter reading costs.

- Manual water meter reads have become antiquated throughout the industry and Chicagoland area.

Current State

- AMI allows the City to leverage technology.
  - Rates will no longer be structured to include the annual $400K-$500K for manual reads - reallocation to other needs.
- AMI provides better data for customers to track their water use.
  - Greatest benefit for customers and City is reduction in estimated bills.
- AMI technology has become a standard method for water utilities throughout the area.

AMI	Aurora Downers Grove Elmhurst Evanston Joliet Geneva	Glen Ellyn Glenview Lombard Orland Park Tinley Park
AMR	Batavia Carol Stream Plainfield	Wheaton Winfield
Manual	Lisle	Woodridge

Funding Scenarios – Preliminary Estimated Rate Impact

- All options for future meter reading will result in rate increase
- Business Case options range from $7.7M to $10M.
- Funding scenarios include:
  - Rates – not realistic
  - Cash on Hand - Phosphorus Revenues (Interest: 1.1%)
  - Outside Borrowing (Interest: 3.6%)

	Year 1	Year 2
Projected In-House Reading Costs (O&M)		
Rate Impact	$2.82	$1.33
Potential Impact		
Cash on Hand (5-Year payback)	$3.70 - $4.75	$3.65 - $4.80
Cash on Hand (8-Year payback)	$2.55 - $3.30	$2.55 - $3.50
Borrow (20-Years)	$1.65 - $2.20	$1.65 - $2.30

*Monthly rate impact based off of average monthly bill of $75.70

PUAB Action Items

- Concurrence with the financial assumptions in the business case

- Recommend approval of a meter reading scenario
  - AMI, AMR, Manual
  - Council recommendation: AMI RFP Process

- Provide feedback on funding options for FAB and City Council consideration

Next Steps

- Continue with manual water meter reading
  - Continuing with Alexander's Inc. contract until August 2021
- Financial Advisory Board review of funding scenarios – April 29
- City Council – June 2019
- Staff Tasks
  - Request for Proposal from vendors
  - Update Customer Bill of Rights
  - Water Customer opt-out program
  - Deployment of automated meter reading will allow for integration with the Tyler Utility Billing module (July 2021)
    - Delaying deployment could require an additional $450,000 in additional integration costs