Portland Water Bureau
From Forest to Faucet

Bull Run Treatment Projects | Filtration

Brown AND Caldwell

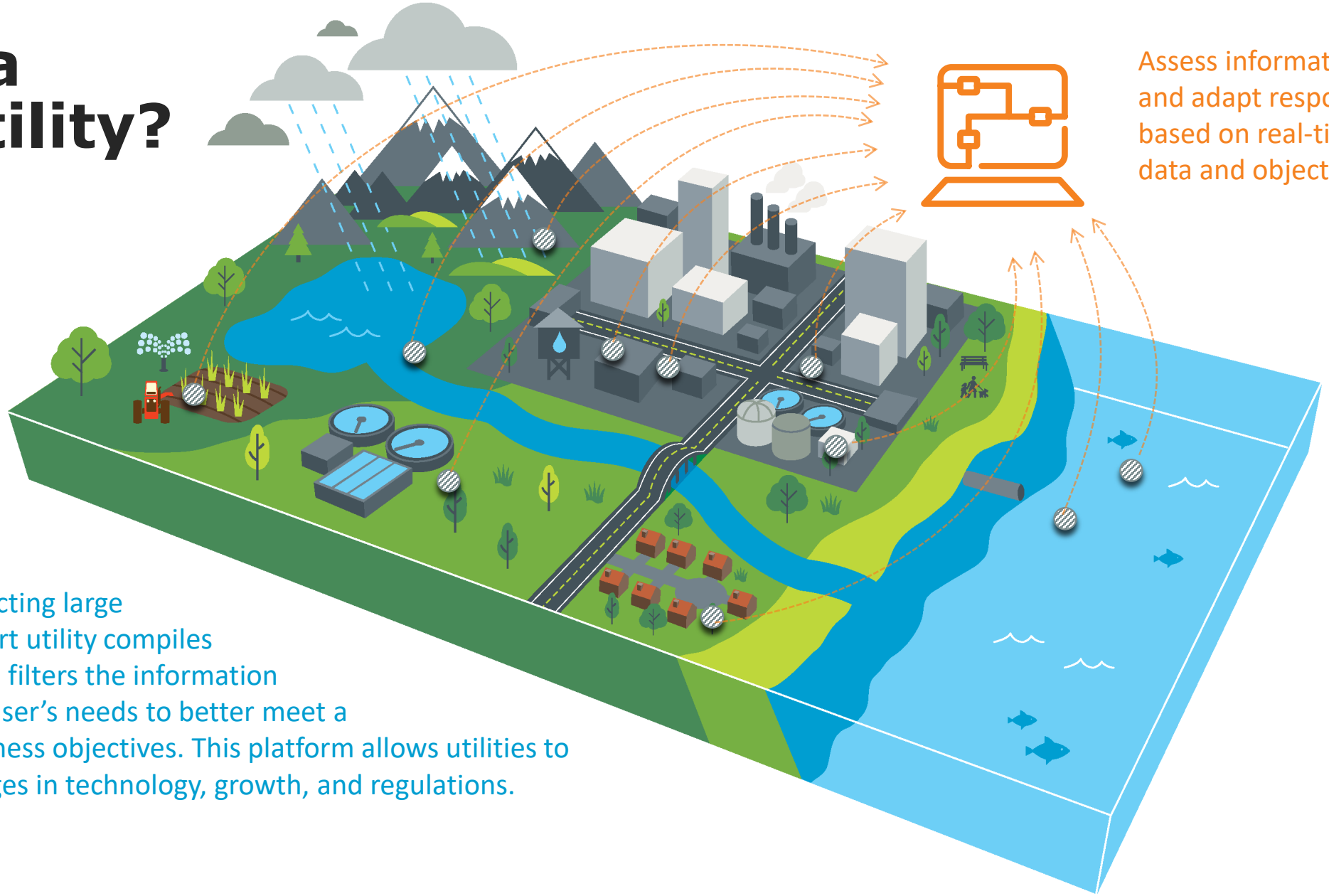
Smart Utility – Preparing your organization with the future state in mind

AWWA-PNWS Conference Presentation | October 28 | 2021

Agenda

1. What is a Smart Utility?
2. Key issues at PWB
3. Planning steps
   - Establish vision
   - Specific use cases
   - Prioritize
   - Roadmap
4. Example Dashboard
5. Closing – Mission Statement
6. Questions

What is a Smart Utility?



Assess information and adapt response based on real-time data and objectives

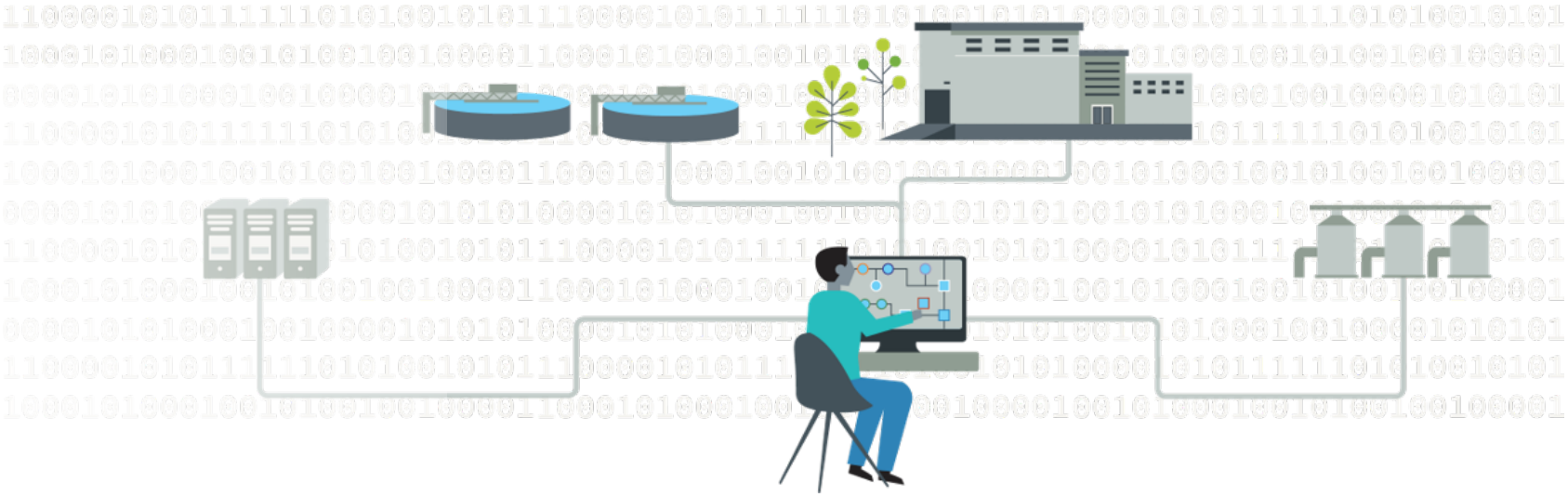
Utilities are already collecting large quantities of data. A smart utility compiles this data, analyzes it, and filters the information based on the individual user's needs to better meet a utility's overarching business objectives. This platform allows utilities to gracefully adapt to changes in technology, growth, and regulations.

Why Smart Utility?

Benefits:

- Optimization – People, processes, systems
- Technology alignment
- Realtime or near real time decision making
- Organizational alignment and interdepartmental communication

Polling Question #1



Why Smart Utility?

Data System Fragmentation

- 49+ Disconnected System
- Segmented Business Process Data
- NO Data Management Standards & Practices
- 500+ Reports produced
- Software functionality not maximized
- HIGH Maintenance costs
- Comprehensive data driven decision making not supported

Key issues at PWB

Need to make efficient and informed decisions around
- Affordability
- Equity
- Stewardship

Lack of real time department levels of service

Information isn't accessible and our data is siloed

Our real time data is increasing by ~20x by 2027

Knowledge is retiring – how do we retain this institutional knowledge

Customer service accessibility

Insufficient or outdate technology

Lack of standards and data management practices

Process Steps

How do we execute the vision?

Smart Utility Roadmap Process

APPLICABLE THROUGHOUT THE PROJECT

Essential Ingredients to a plan = The 4 P's = People, Policies, Pricing and Projects

Task 1: Existing Systems Evaluation

- ✓ What do I currently have to work with?

Task 2: Needs & Deficiencies Evaluation

- ✓ NEEDs → Use Cases
- ✓ USE Cases → Vision
- ✓ GAPS identification

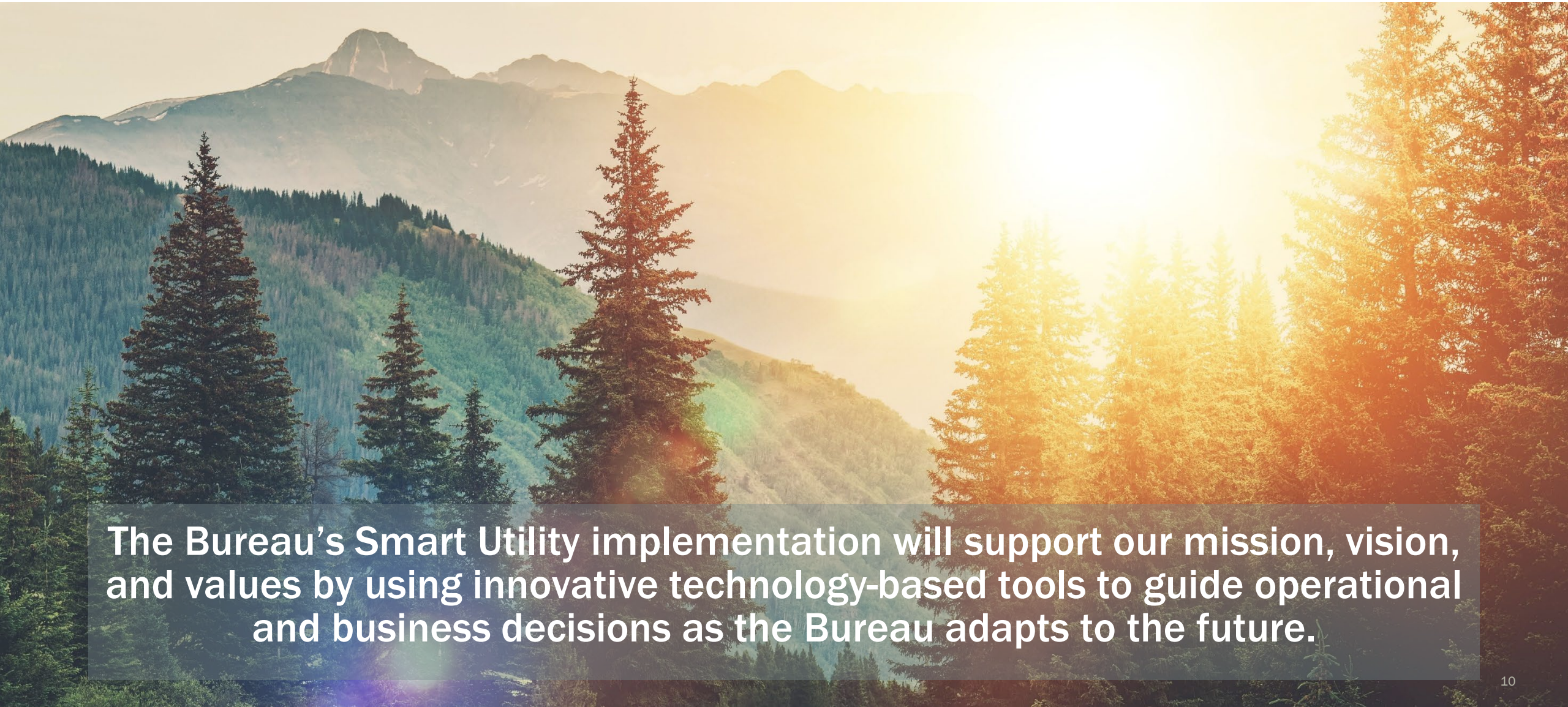
Task 3: Technology Alternatives Evaluation

- ✓ Technology that closes GAPS – aligns with vision and use cases
- ✓ Don't close doors on future efforts

Task 4: Implementation Plan and Master Plan

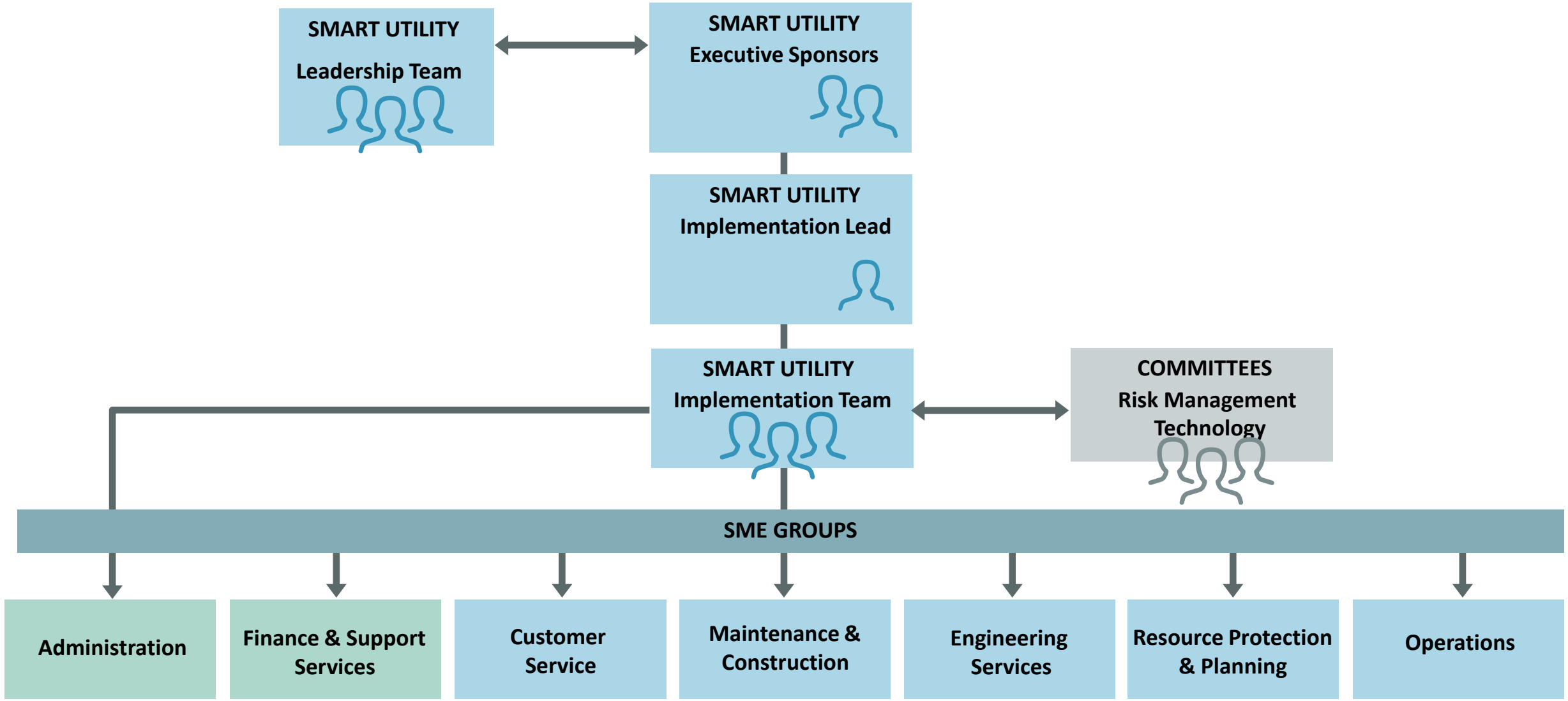
- ✓ Document it
- ✓ Establish people, policies, pricing and projects

PWB’s Smart Utility Vision



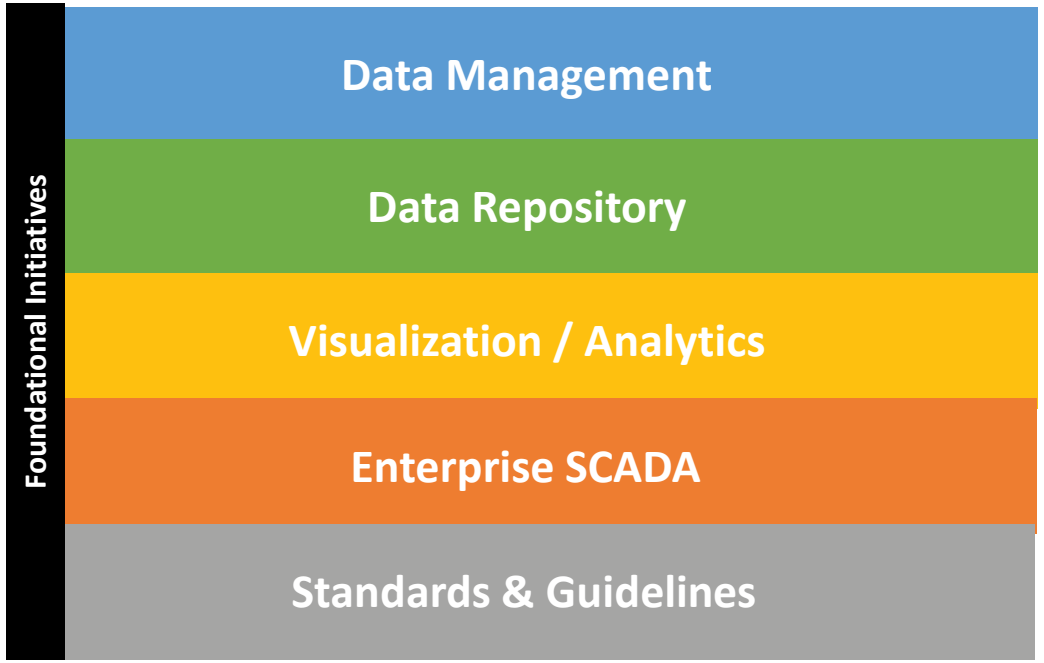
The Bureau’s Smart Utility implementation will support our mission, vision, and values by using innovative technology-based tools to guide operational and business decisions as the Bureau adapts to the future.

Use case stakeholders

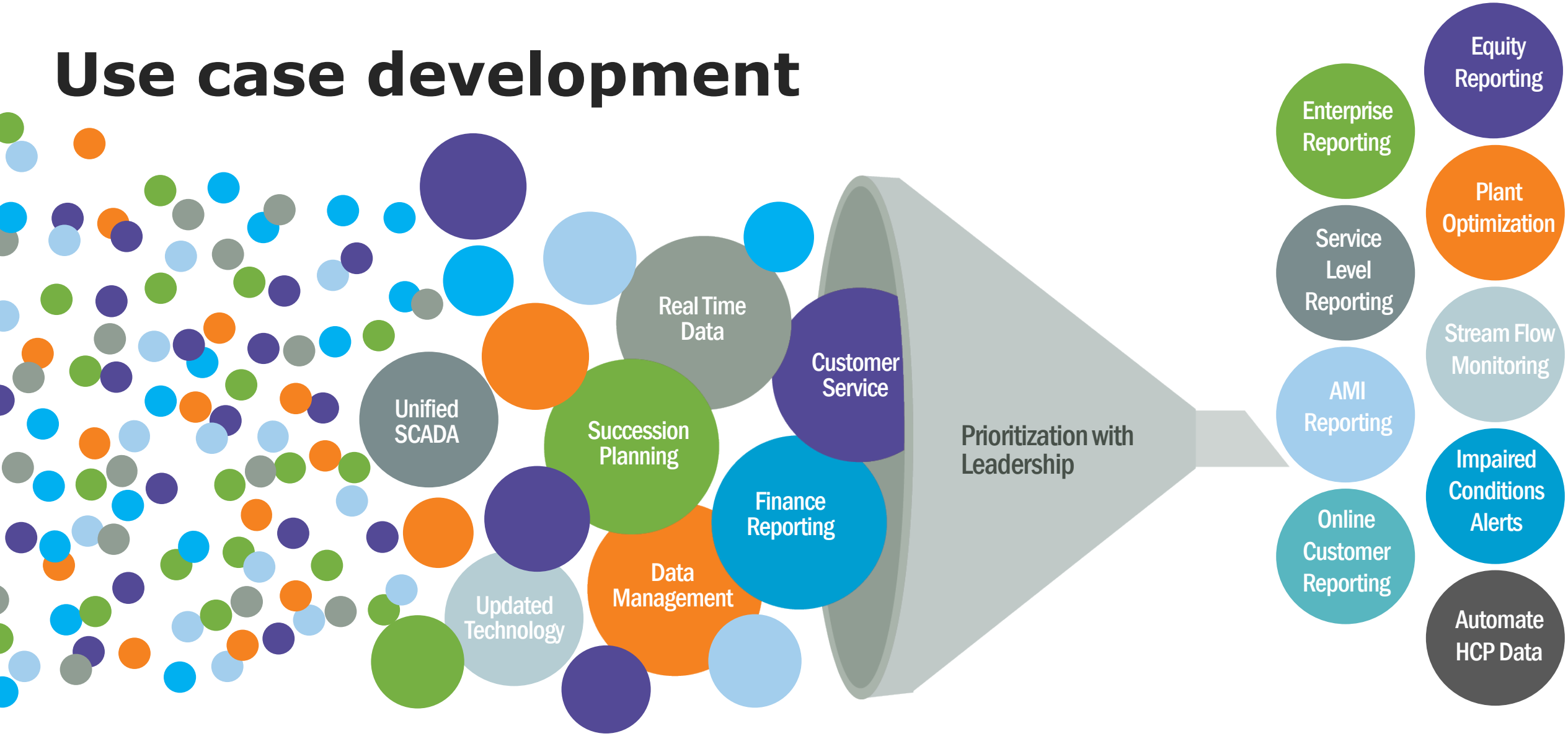


Bureau Overall Smart Utility Framework

Bureau Smart Utility Framework



Use case development



150 Use Cases

80 Use Cases

9 Use Cases

Bureau Overall Smart Utility Framework

Bureau Smart Utility Framework

Foundational Initiatives

- Data Management
- Data Repository
- Visualization / Analytics
- Enterprise SCADA
- Standards & Guidelines

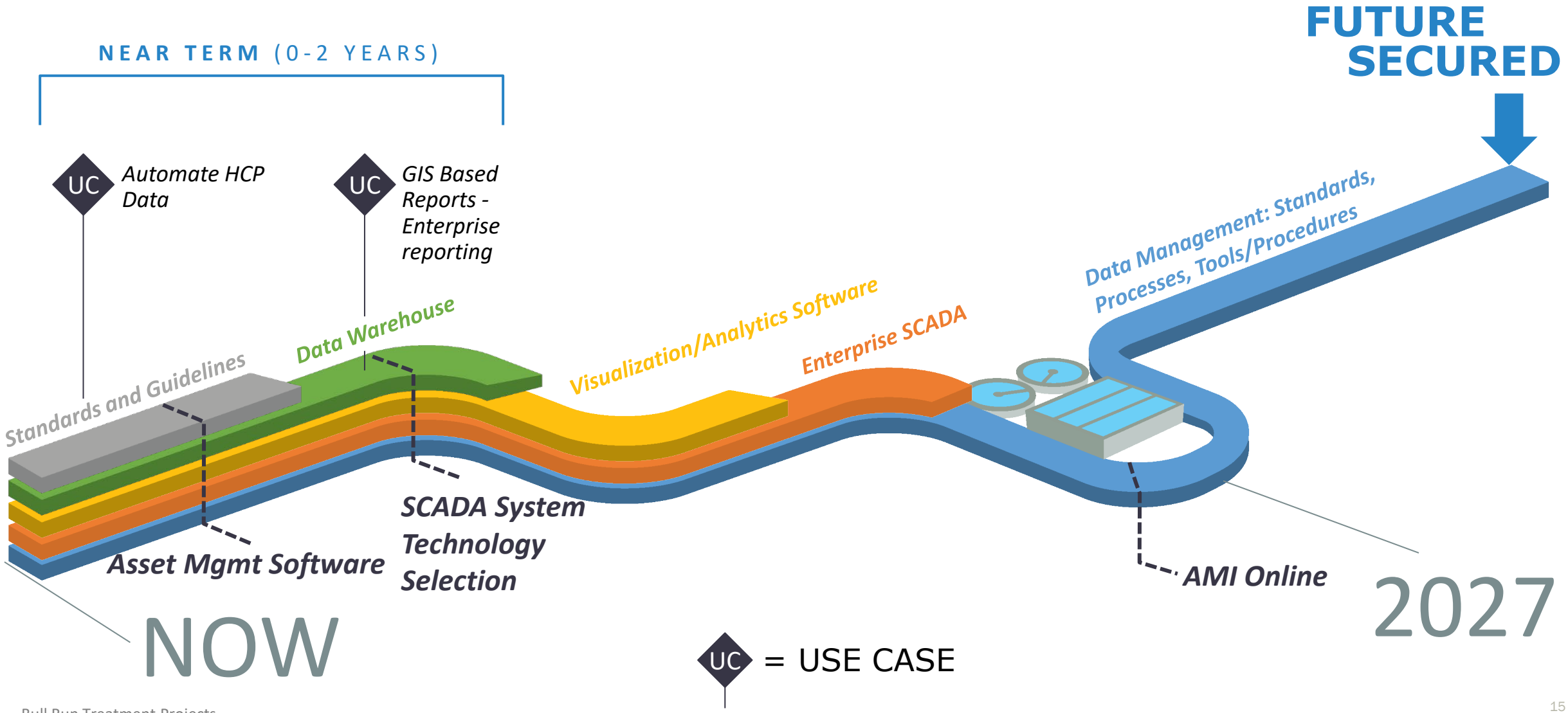
USE CASE Prioritization with leadership

Optimized and informed solutions

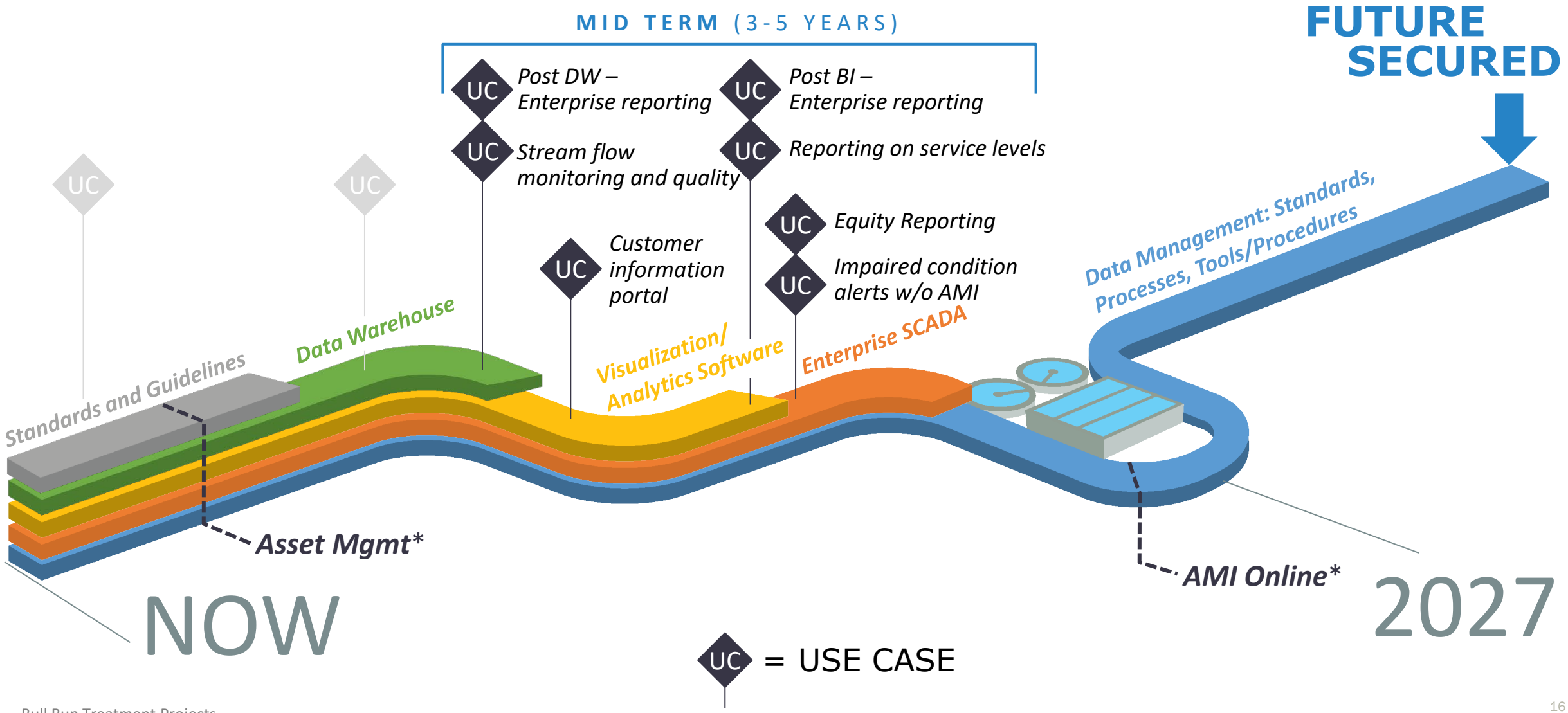
UC

USE CASES (Solutions to the hard problems)	
1	Enterprise reporting
2	Service level reporting
3	AMI reporting
4	Online customer portal
5	Equity reporting
6	Plant Optimization
7	Stream flow monitoring
8	Impaired condition alerts
9	Automate HCP data

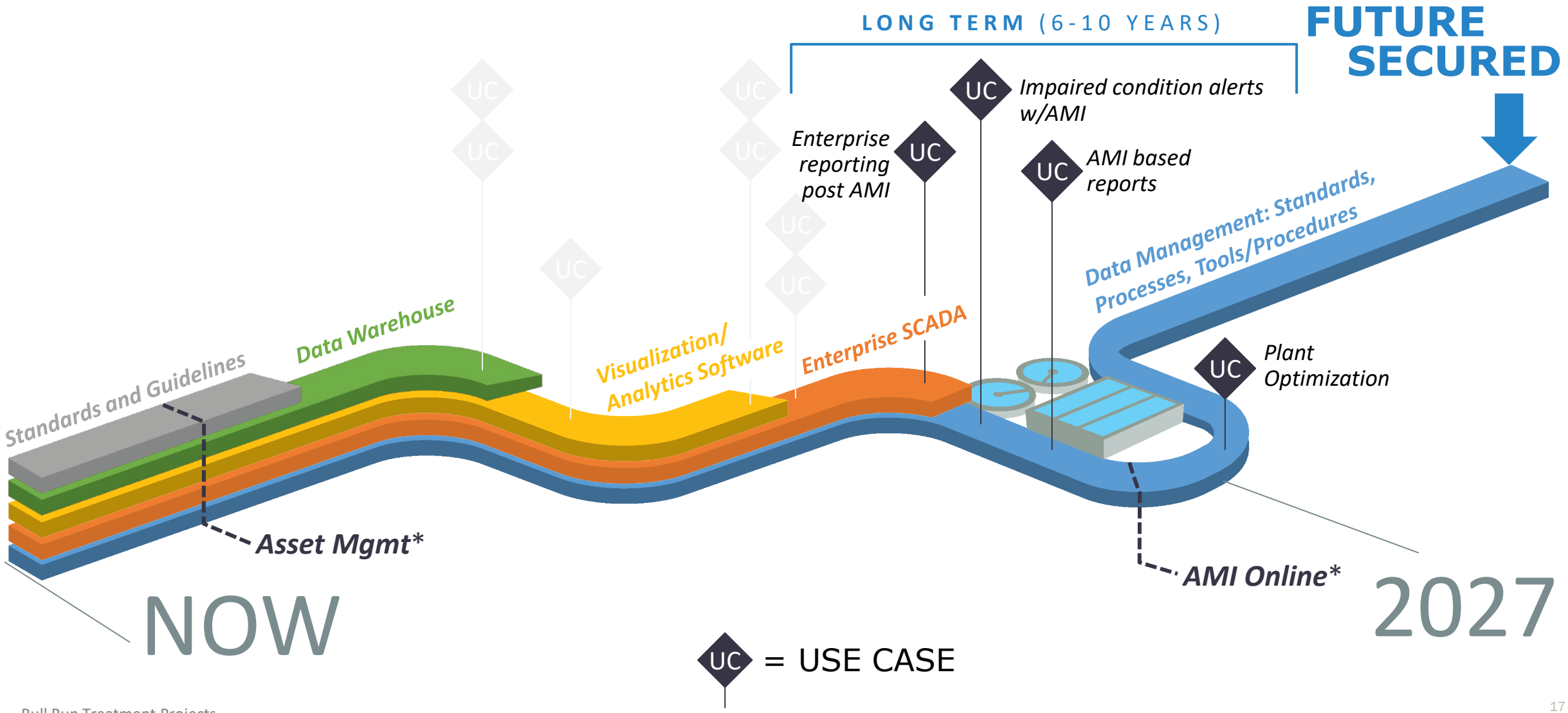
Roadmap to Smart Utility
Implementing foundational initiatives and use cases



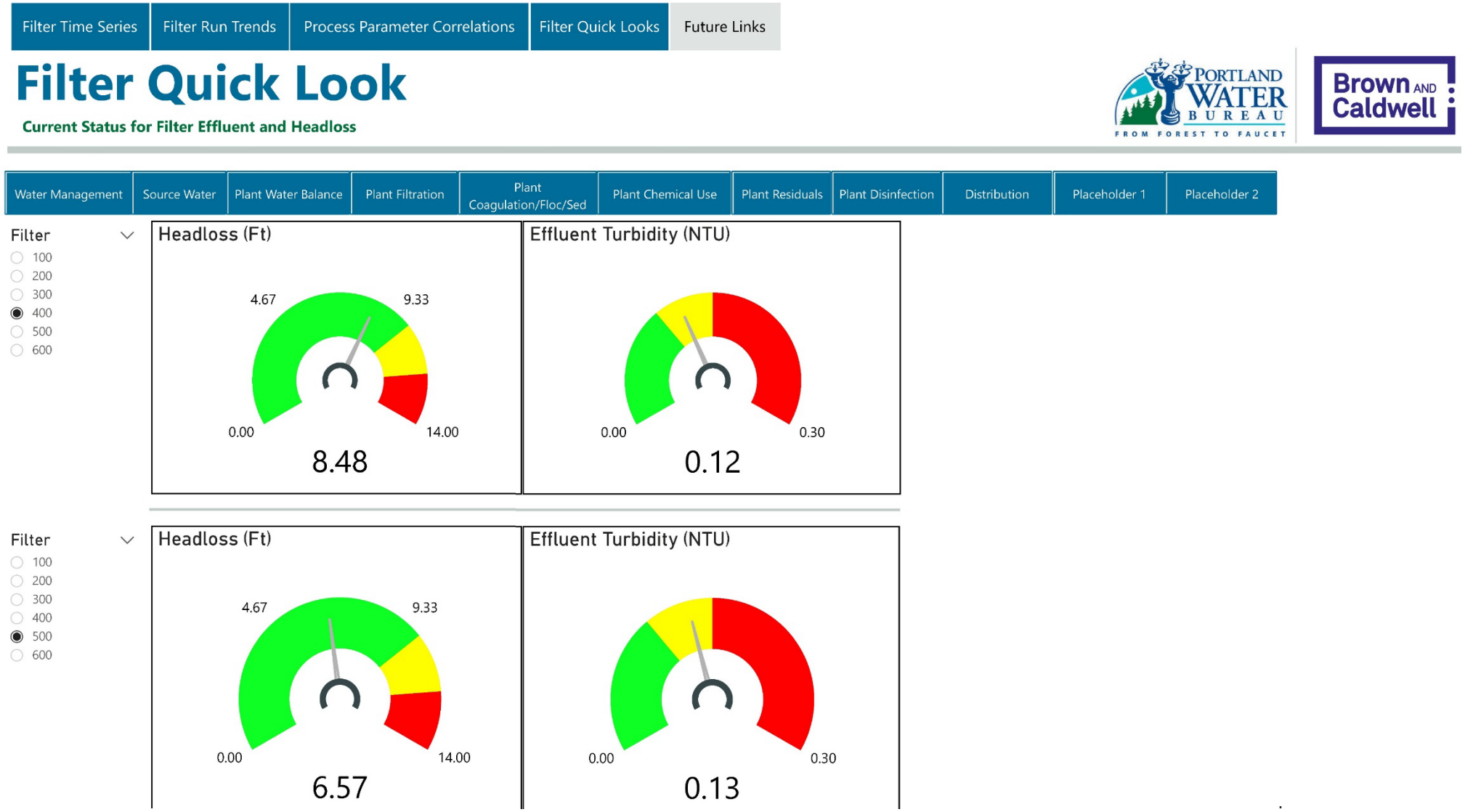
Roadmap to Smart Utility
Implementing foundational initiatives and use cases



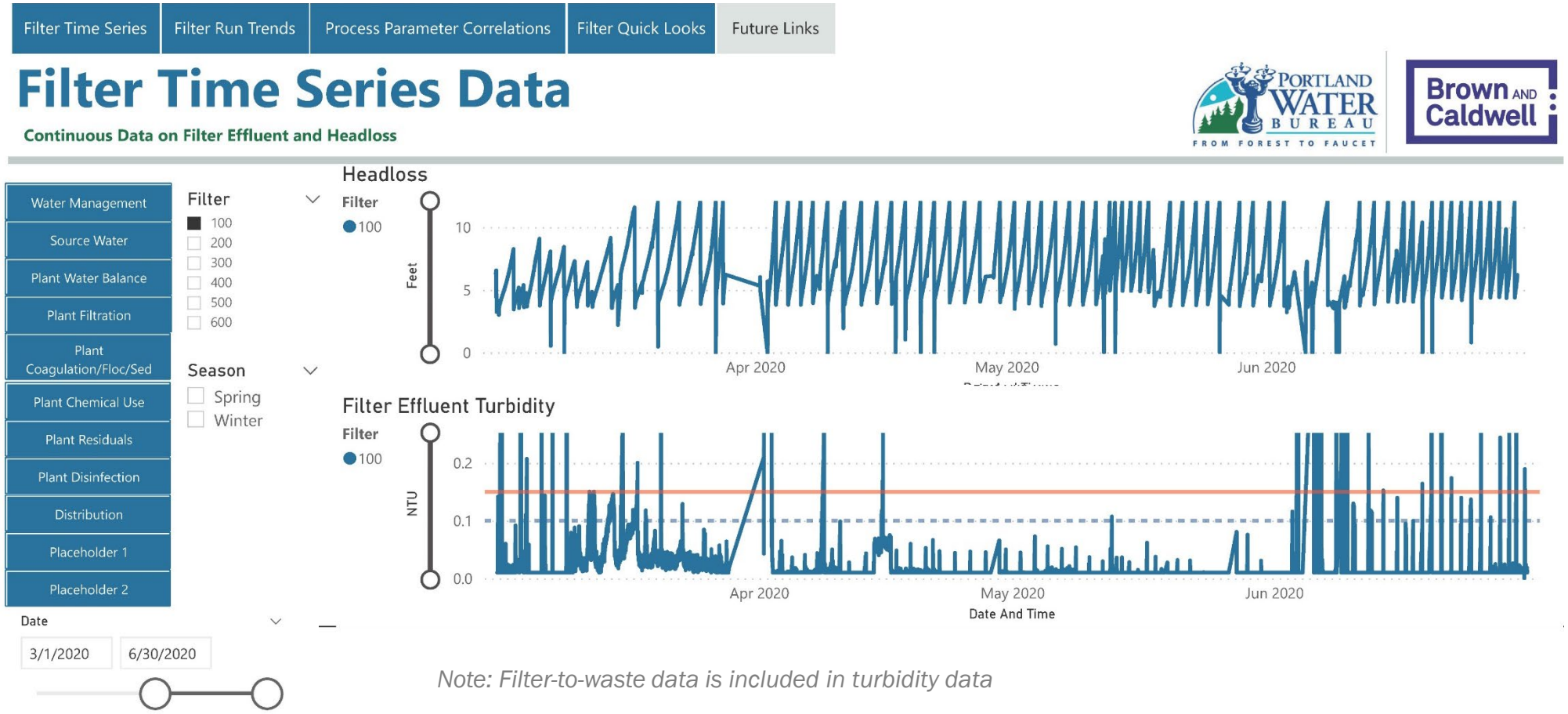
Roadmap to Smart Utility
Implementing foundational initiatives and use cases



Use case- 15 second performance assessment

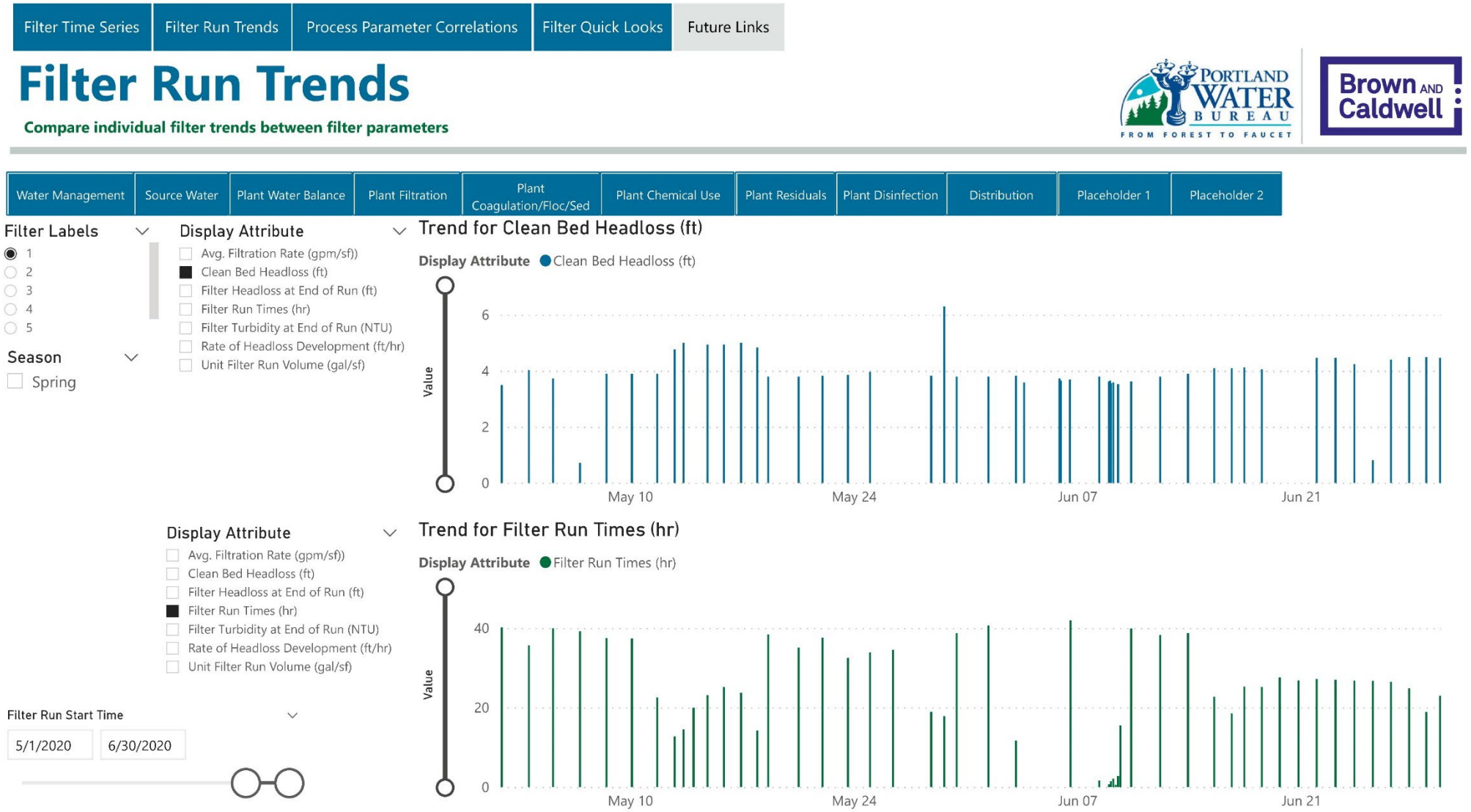


Use case- Filter Optimization

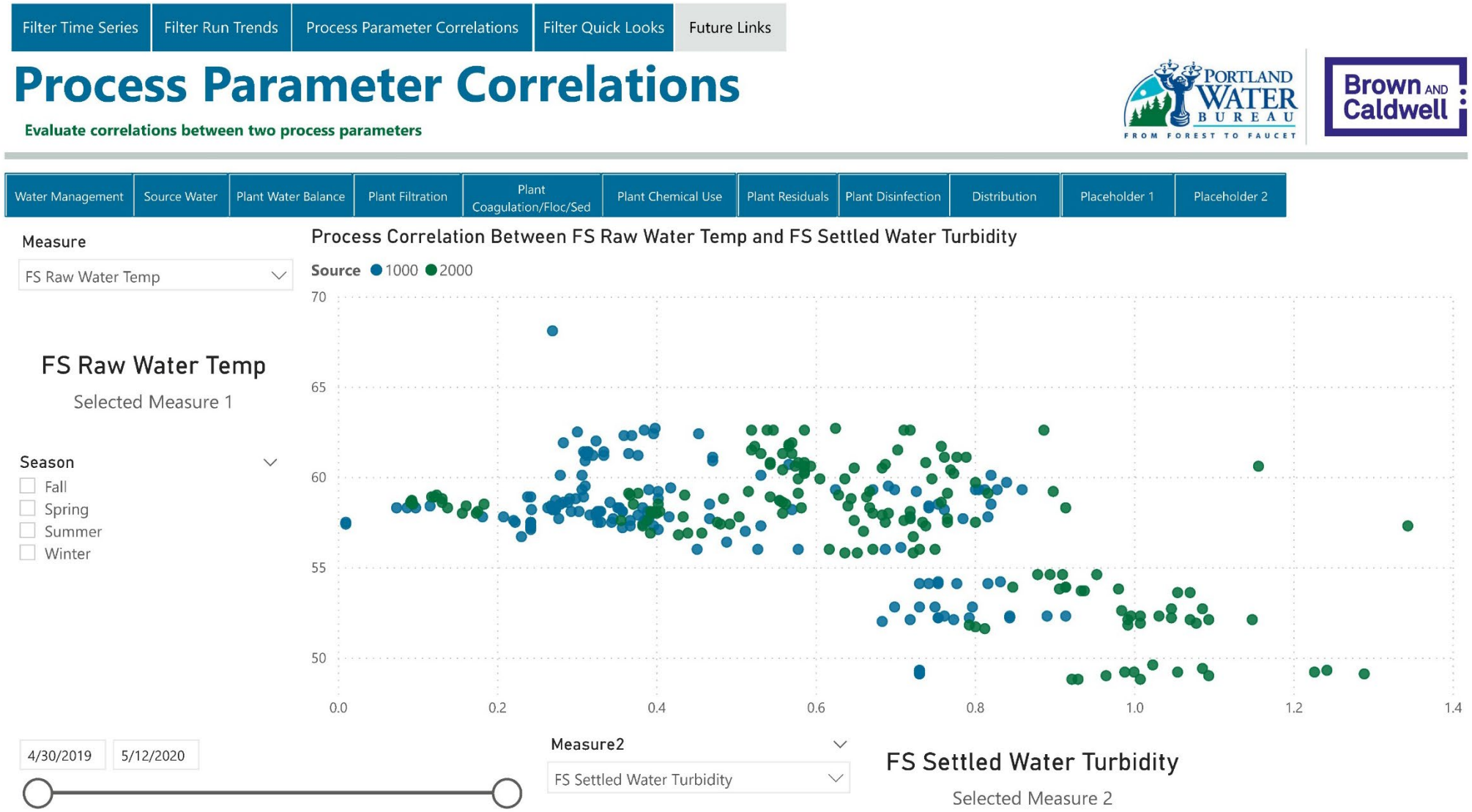


Note: Filter-to-waste data is included in turbidity data

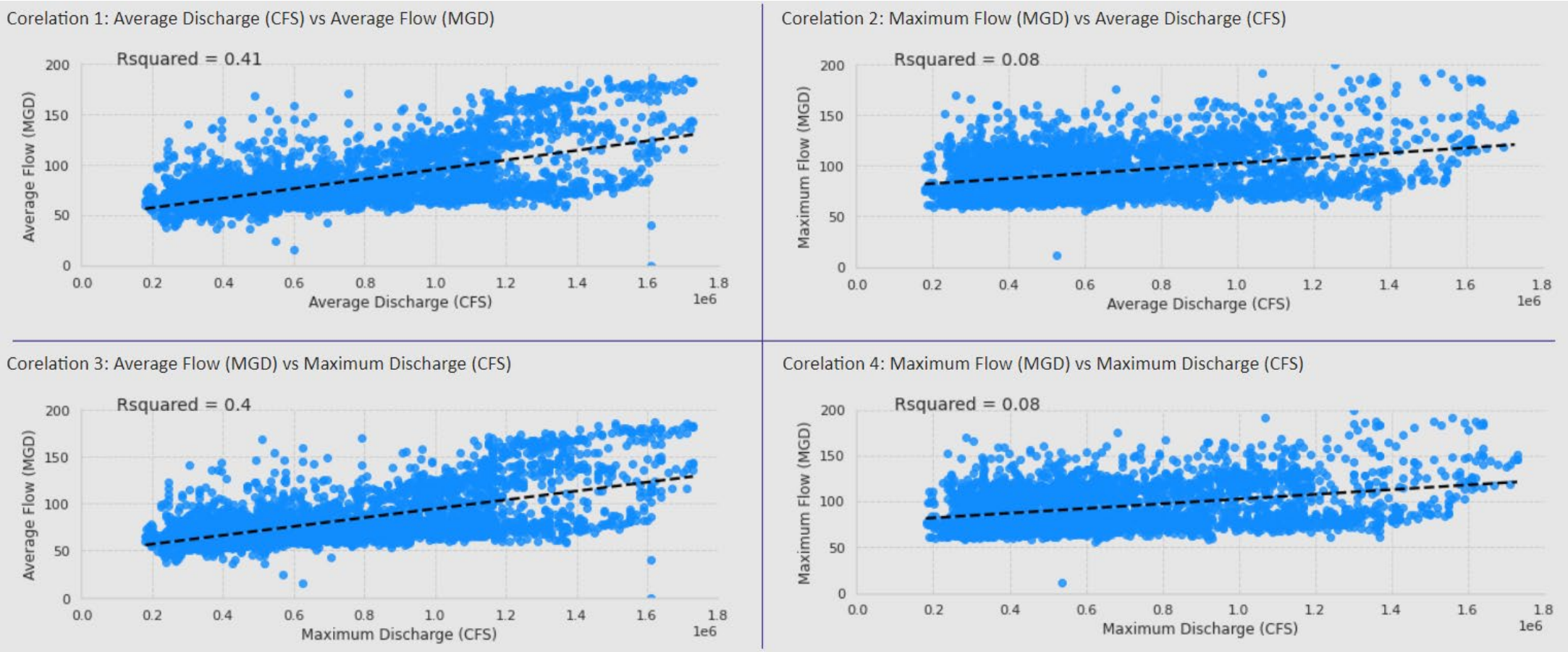
Use case- Filter Optimization



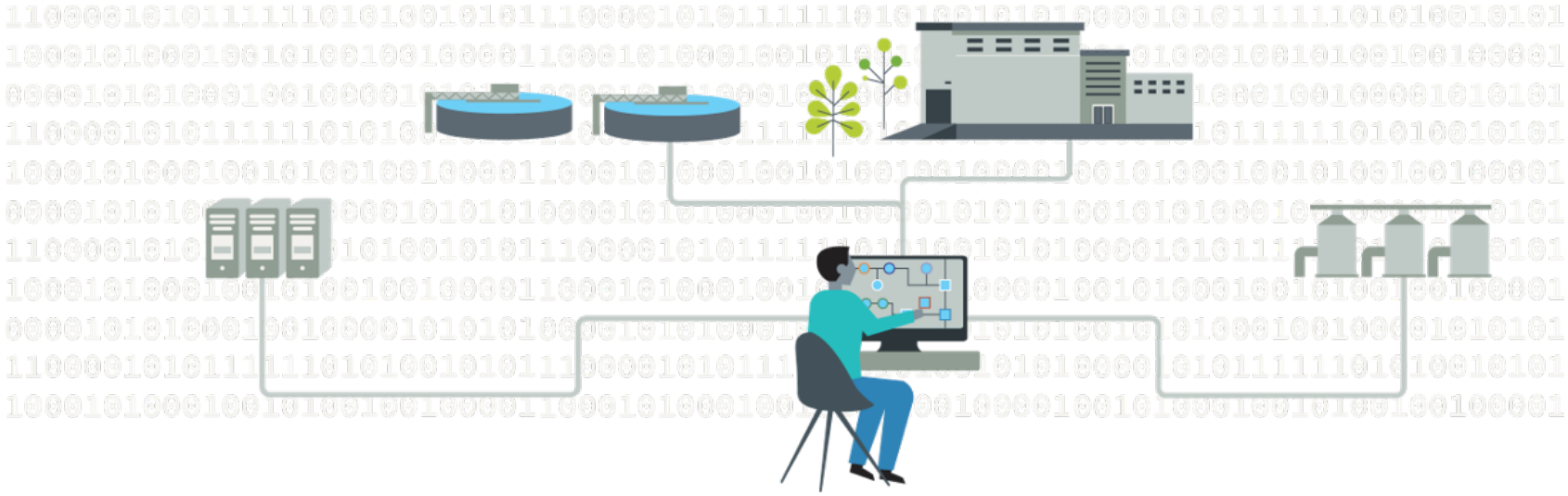
Use case- Filter Optimization



Analytics


Corelation 1: Average Discharge (CFS) vs Average Flow (MGD)
Rsquared = 0.41
Average Flow (MGD)
Average Discharge (CFS)
1e6
Corelation 2: Maximum Flow (MGD) vs Average Discharge (CFS)
Rsquared = 0.08
Maximum Flow (MGD)
Average Discharge (CFS)
1e6
Corelation 3: Average Flow (MGD) vs Maximum Discharge (CFS)
Rsquared = 0.4
Average Flow (MGD)
Maximum Discharge (CFS)
1e6
Corelation 4: Maximum Flow (MGD) vs Maximum Discharge (CFS)
Rsquared = 0.08
Maximum Flow (MGD)
Maximum Discharge (CFS)
1e6

Polling Question #2



What is your utility's biggest barrier to begin a Smart Utility Plan?

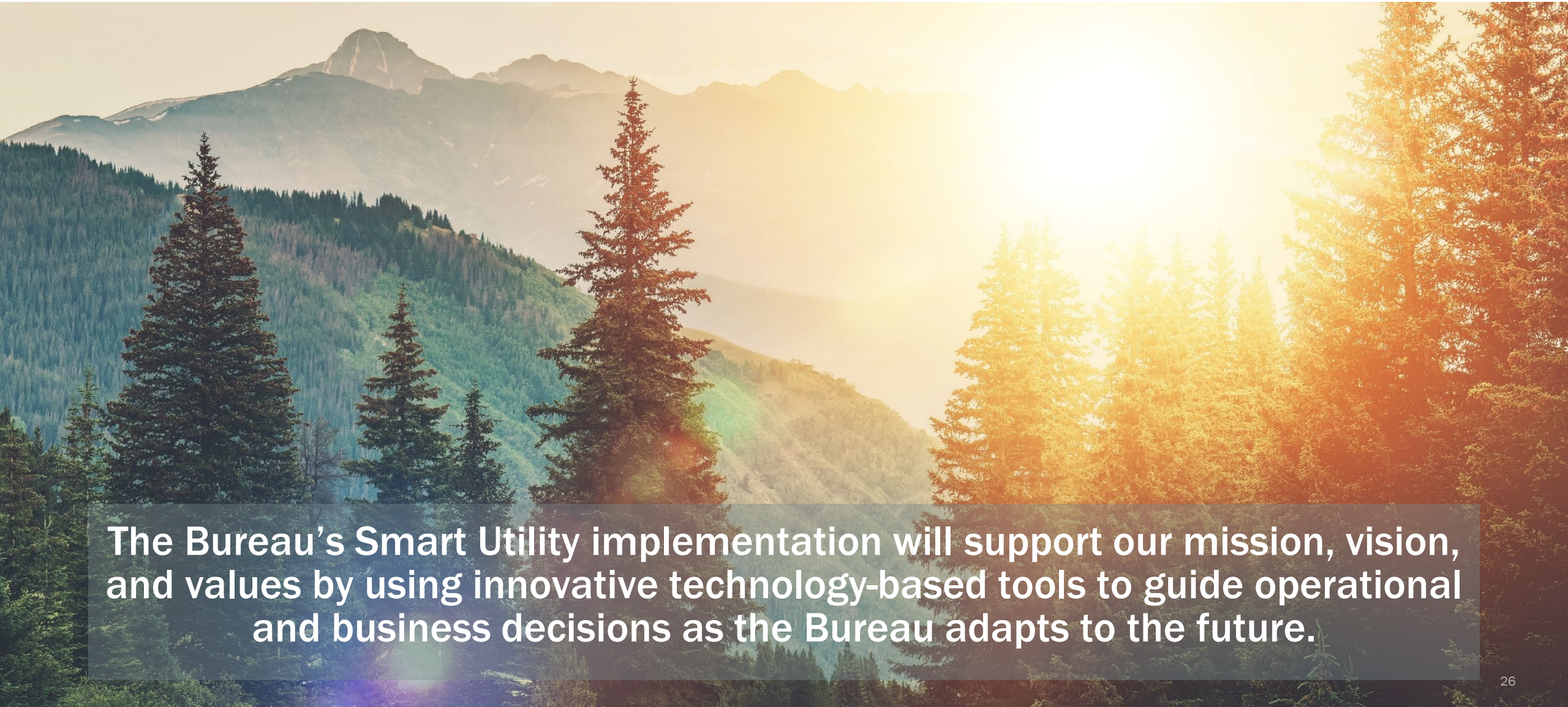
Closing

Takeaways/Lessons Learned

Final thoughts

- You need to be thoughtful and strategic for success
  - Need to think about the end game - early-on discussions
  - There is not unlimited $$, the roadmap helps with that
  - Smart Utility means to PWB- integration of systems, optimization of resources (including people)

PWB’s Smart Utility Vision



The Bureau’s Smart Utility implementation will support our mission, vision, and values by using innovative technology-based tools to guide operational and business decisions as the Bureau adapts to the future.

Portland Water Bureau — From Forest to Faucet

Bull Run Treatment Projects | Filtration

Brown AND Caldwell

Questions?

Chris Wanner, Portland Water Bureau
Chris.wanner@portlandoregon.gov

Kelly Kimball, Brown and Caldwell
kkimball@brwncald.com