2018 PNWS-AWWA Conference

A Vision for the Future on Mercer Island: SCADA Master Planning

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Brian McDaniel, City of Mercer Island

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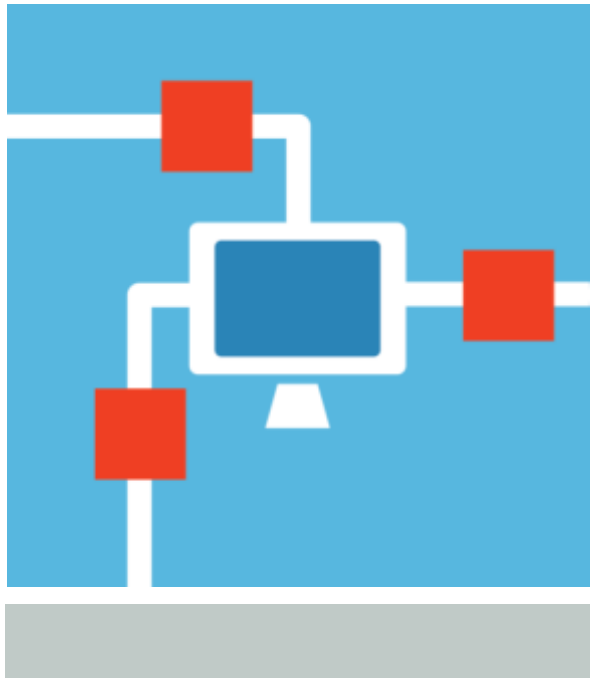
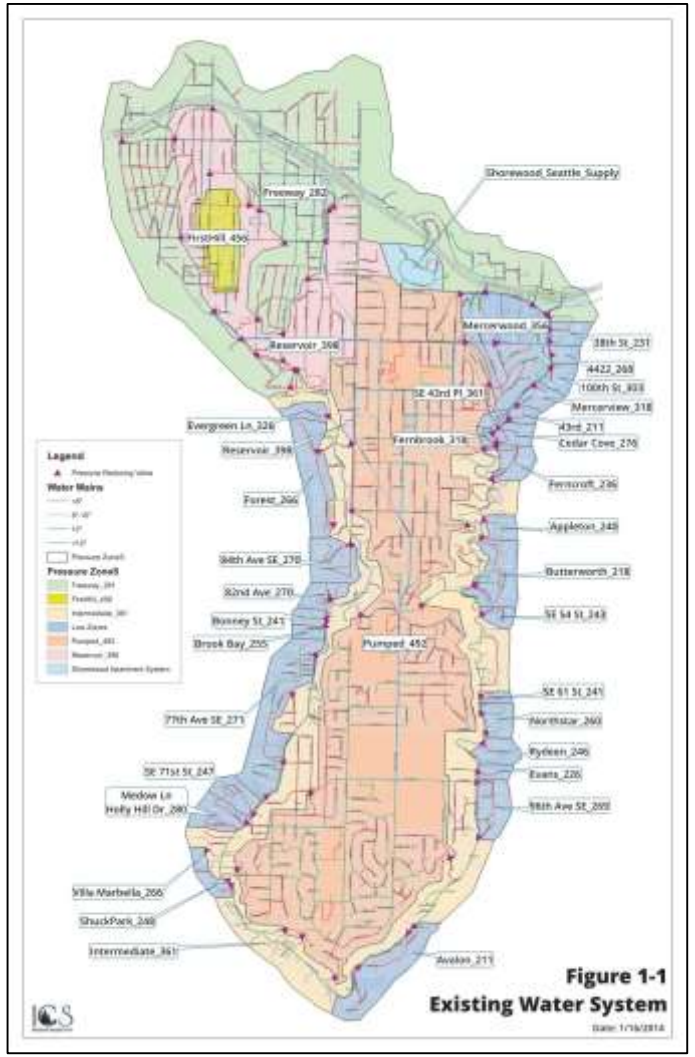


Setting the Stage

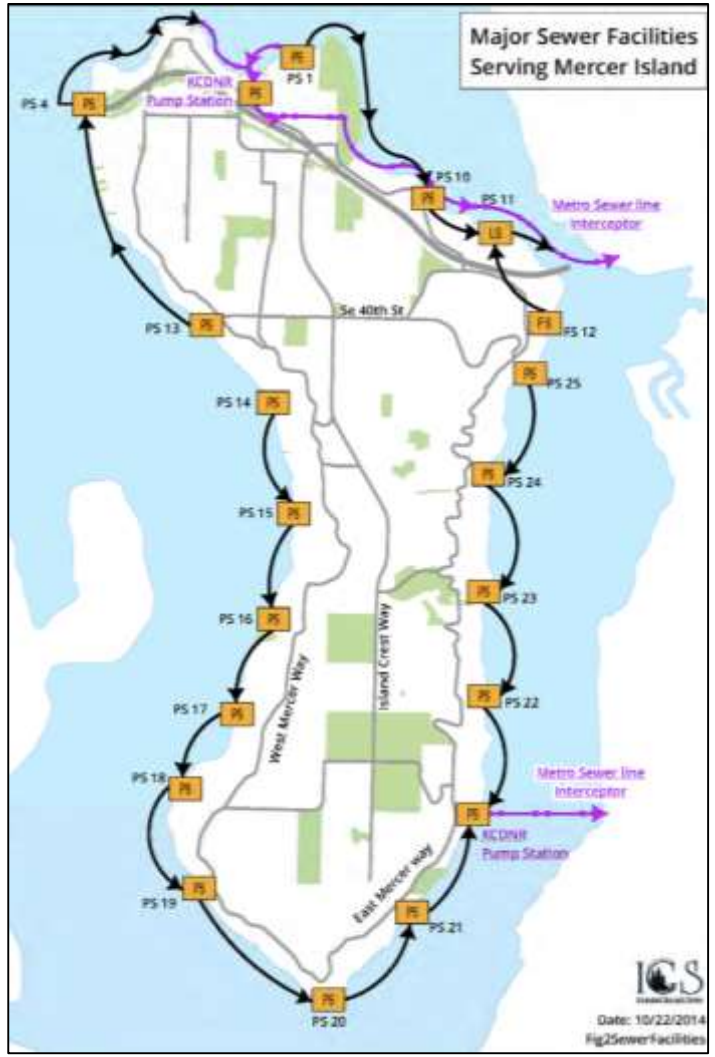
- 2016 – obsolete technology
- Internal evaluation of SCADA system
  - Frequent alarms
  - Reliability issues
  - Poor usability
  - Fragmented SCADA system

City of Mercer Island Water and Sewer Utilities

- Water Utility
  - Receives water from Seattle Public Utilities
- Sewer Utility
  - Lift stations to regional WWTP
- Two SCADA systems operating independently for control and monitoring



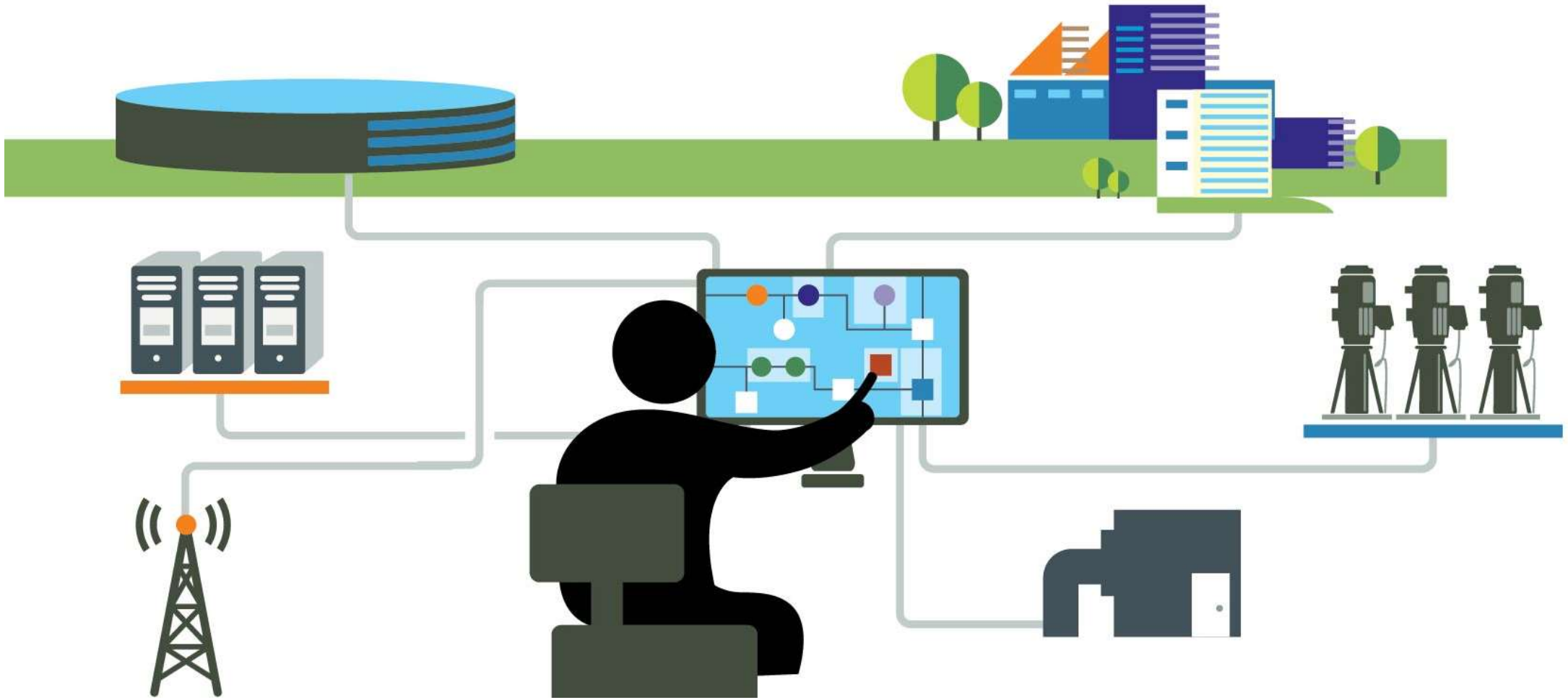
Water



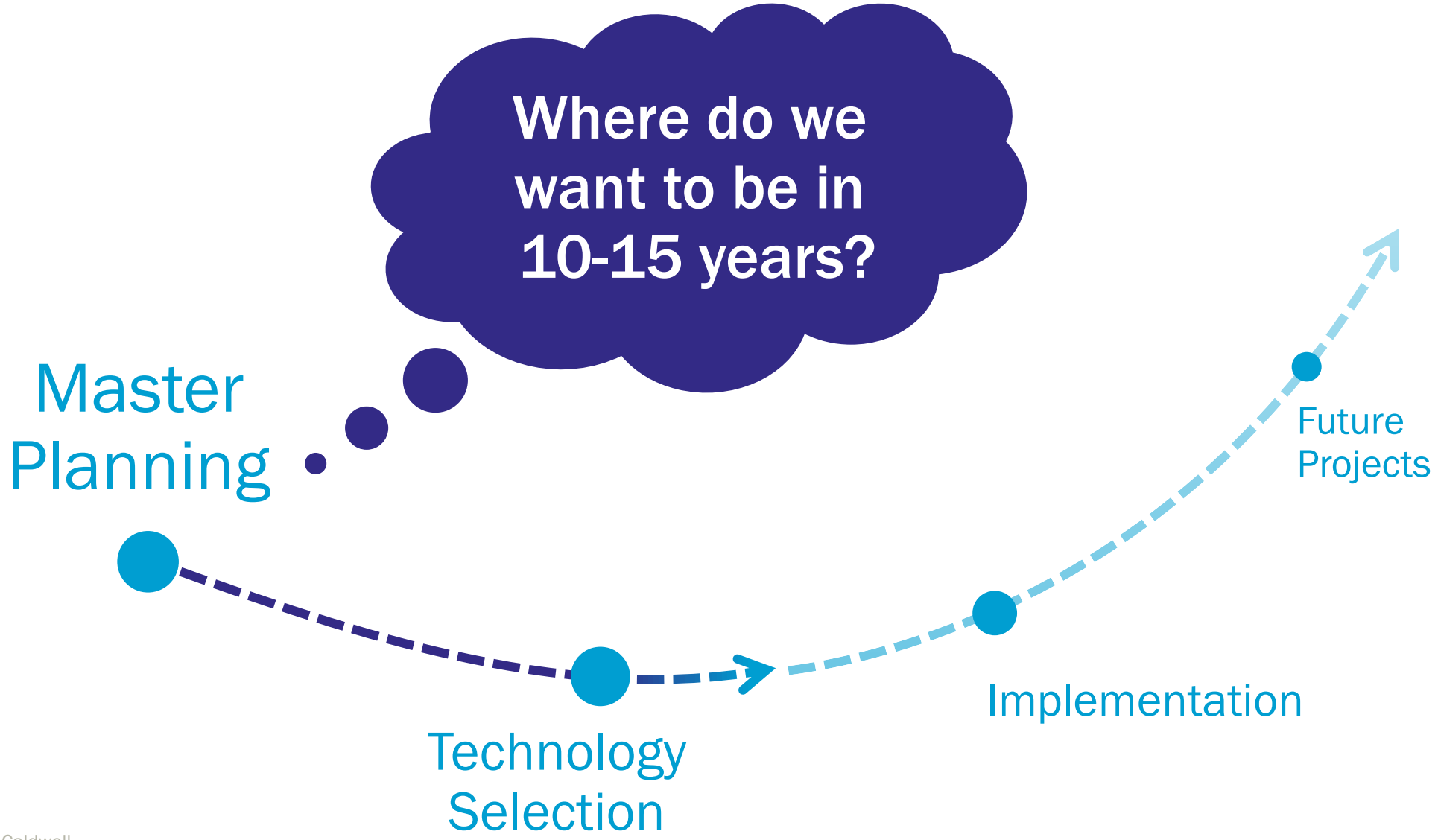
Sewer

SCADA

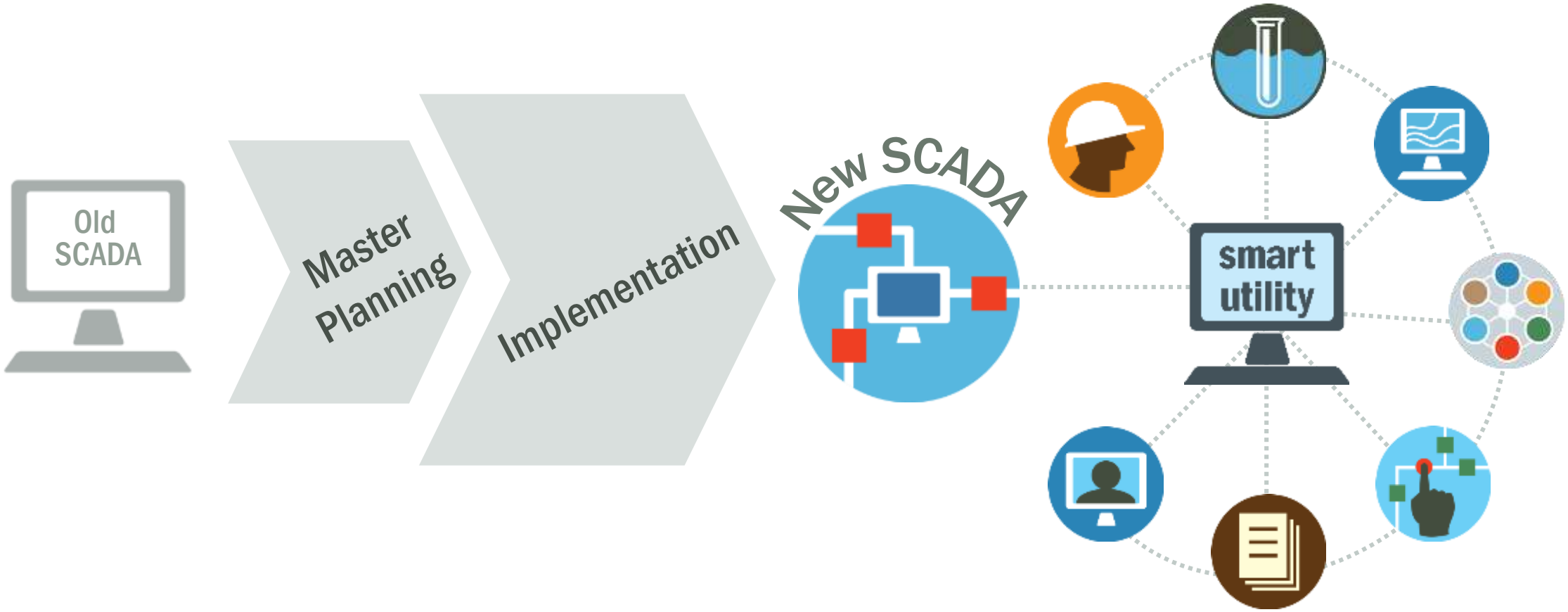
Supervisory Control and Data Acquisition



SCADA Master Planning



Vision for the Future



Approaching a Master Plan when Smart Utility is the Goal

- Key Tasks:
  - ✓ Vision and goals development
  - ✓ Condition assessment
  - ✓ Project prioritization
  - ✓ Technology selection
  - ✓ Implementation planning

Vision and Goals

Brown AND Caldwell

Developing Vision and Goals

- Workshops with Key Stakeholders
  - Operations
  - Engineering
  - Management
  - Finance
  - IT
- Identify SCADA needs and deficiencies
- Discuss industry best practices and trends

“Provide a long-term framework that will improve functionality and reliability for the City’s water and sewer services” *- City of Mercer Island Utilities Vision*

Defining Goals to Meet the Vision

- Implement a Smart Utility
  - *Integrate SCADA with other City business applications*

- Achieve a long-term, reliable SCADA syste*m*
  - *Consider technology life cycle*

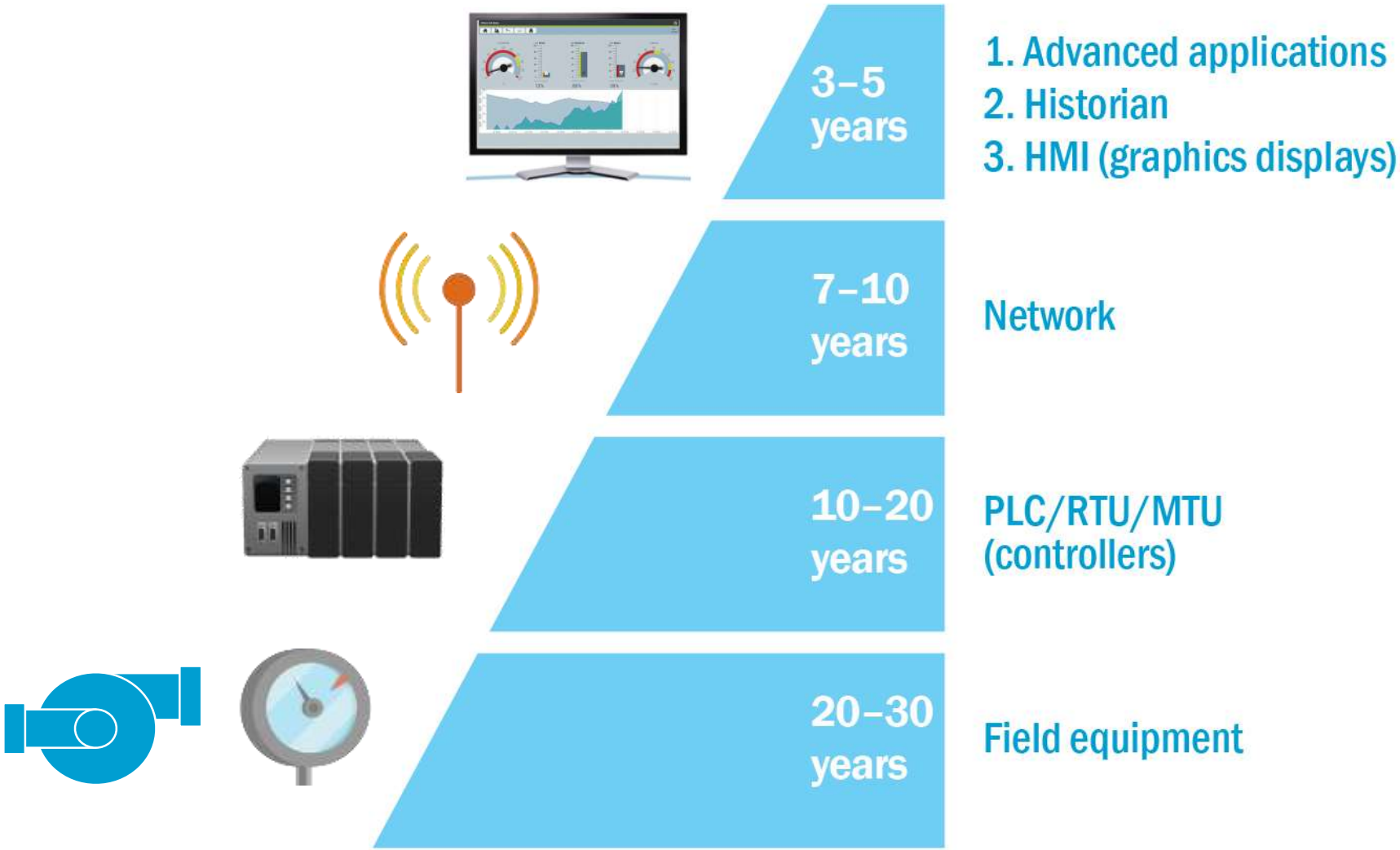
- Improve operational efficiency and knowledge transfer
  - *Enable an efficient workforce*

Condition Assessment

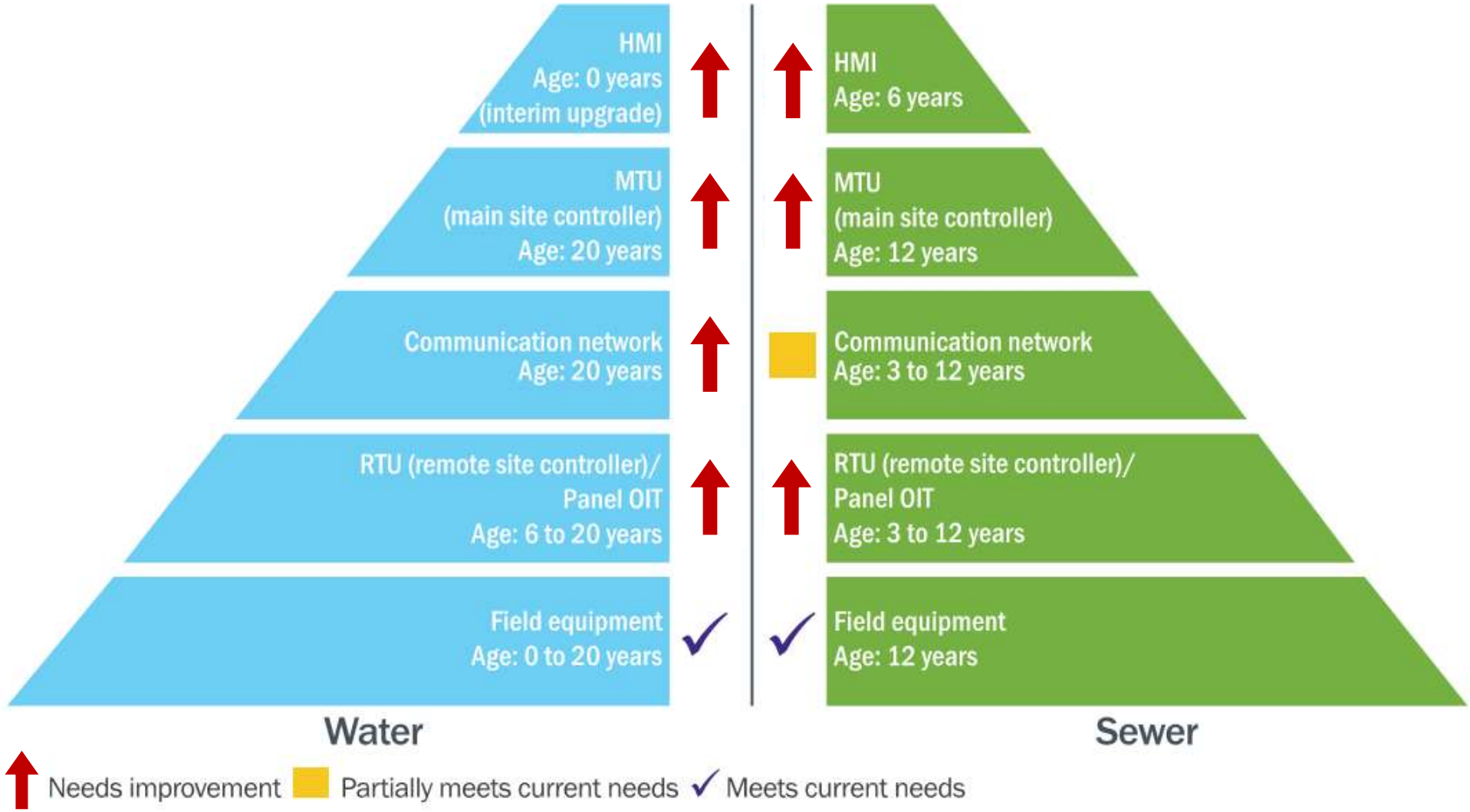
Evaluating Current SCADA System

- Review existing documentation
- Visit sites and collect information

SCADA Component Layers and Life Span



Condition Assessment Results



Project Prioritization

Prioritizing Projects

- Look at recommendations and options for implementation
- Identify:
  - Areas of greatest risk and consequences
  - Greatest value
  - Opportunities for cost savings

Where in the system is hardware or software at most risk of failure?

What are the consequences?

What are the costs to upgrade?

Technology Evaluation and Selection

Brown AND Caldwell

Selecting Technology that Aligns with Goals

- ✓ Long-term value
- ✓ Reliable upgrade path
- ✓ Integration with Smart Utility

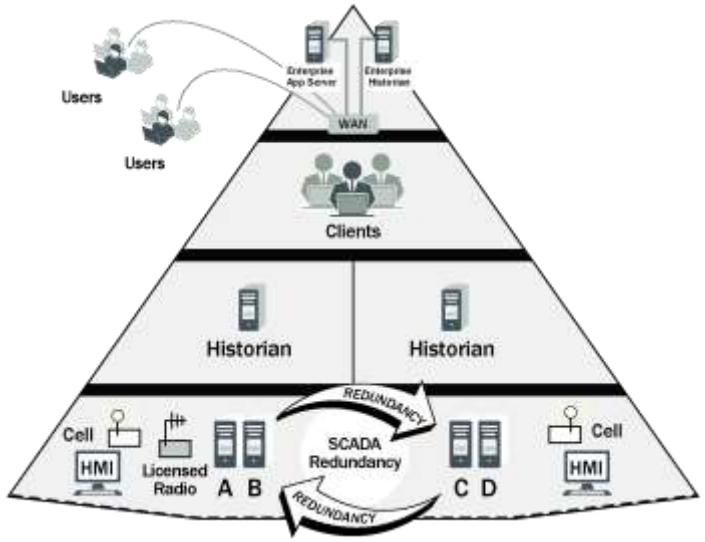
It's easy to pick a new SCADA System

What's difficult is to **pick a new SCADA system that will be useful in 10-15 years and can integrate with other systems**

Key Recommendations and Decisions

Merging Water and Sewer SCADA Systems

- ✓ *Streamlined maintenance, service, training, and spare parts*



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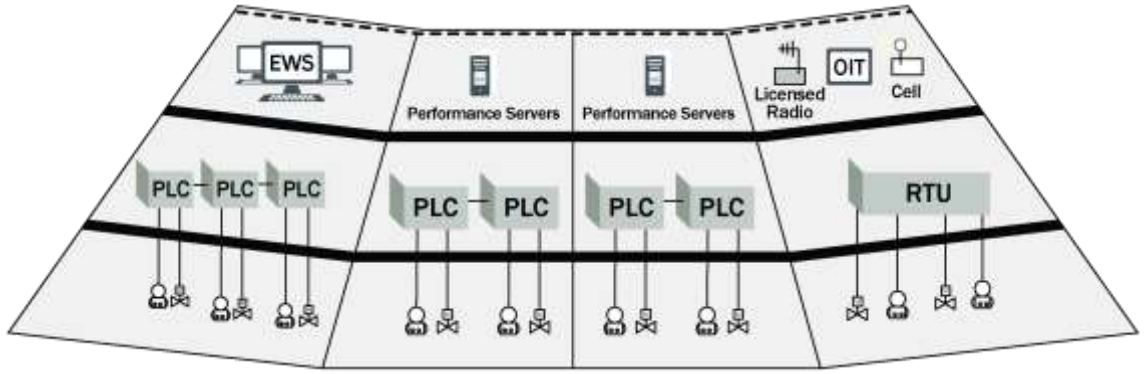
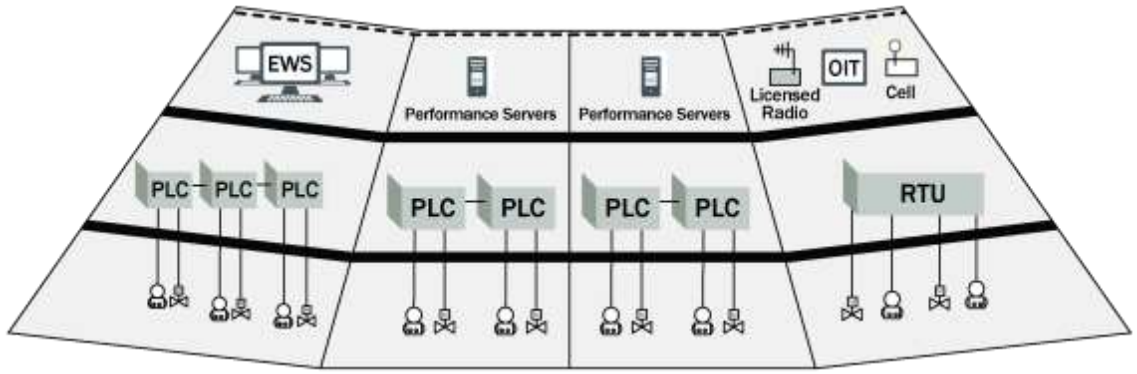
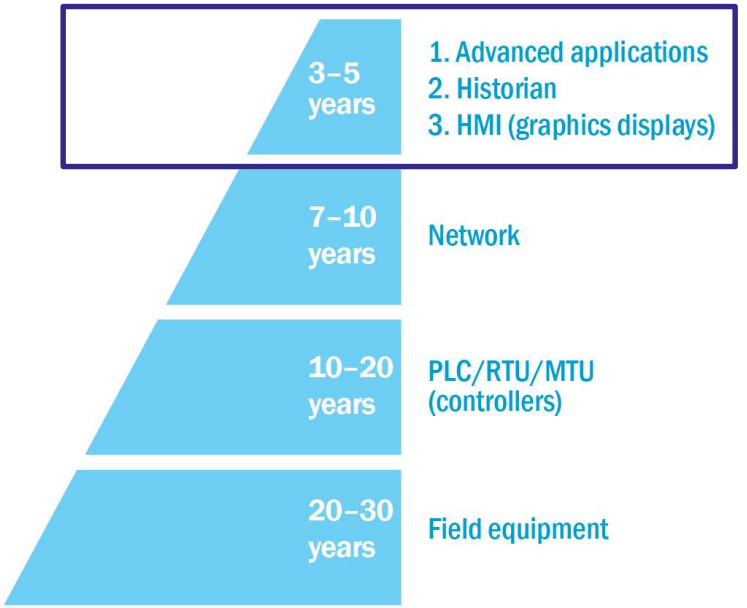


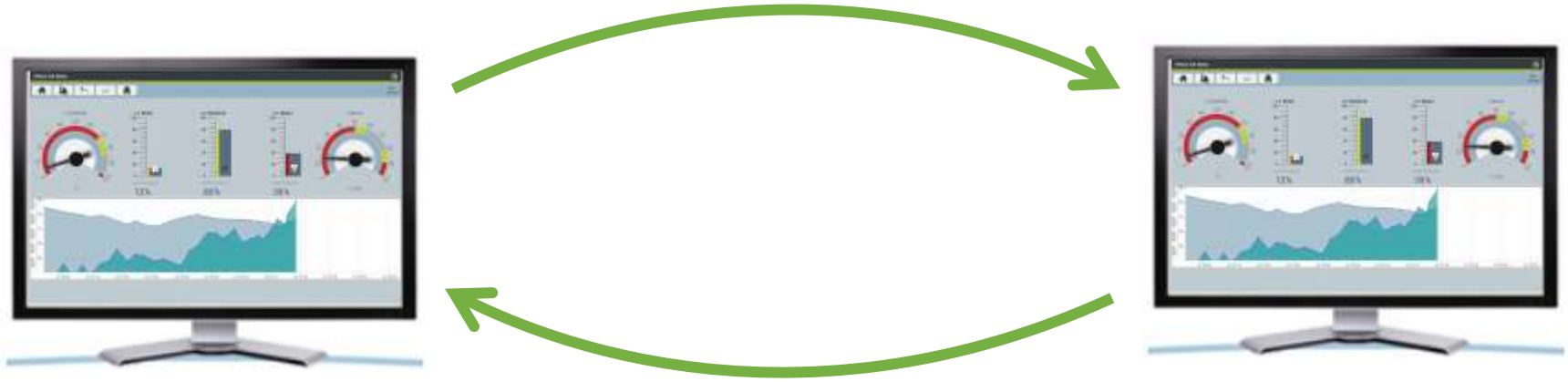
Sewer



Redundancy at HMI Level

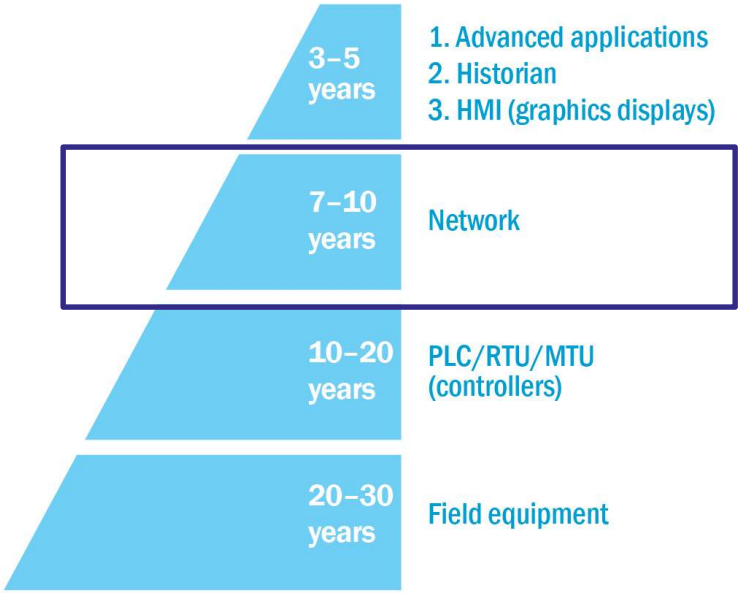
- Recommendation: Hardware/software redundancy in two separate physical locations
- Benefits
  - Improved system reliability
  - Reduced impact of failures

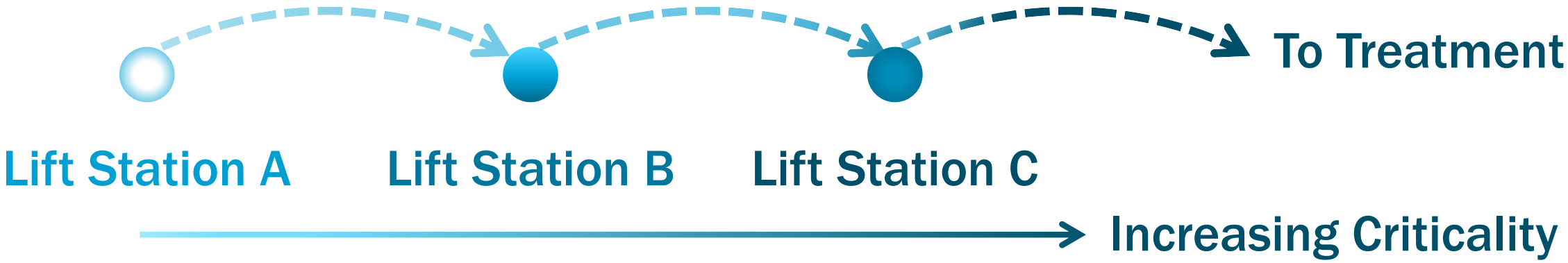




Advanced Operational Strategies

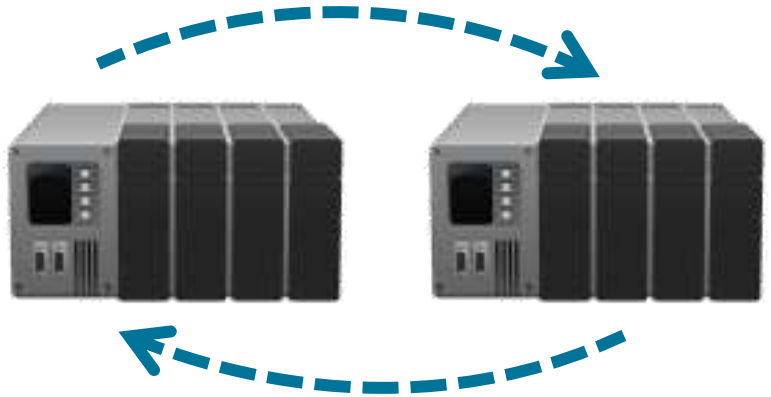
- Lift station criticality
- Recommendation: Implement site-to-site information sharing
- Selecting network communications method that supports the control strategy

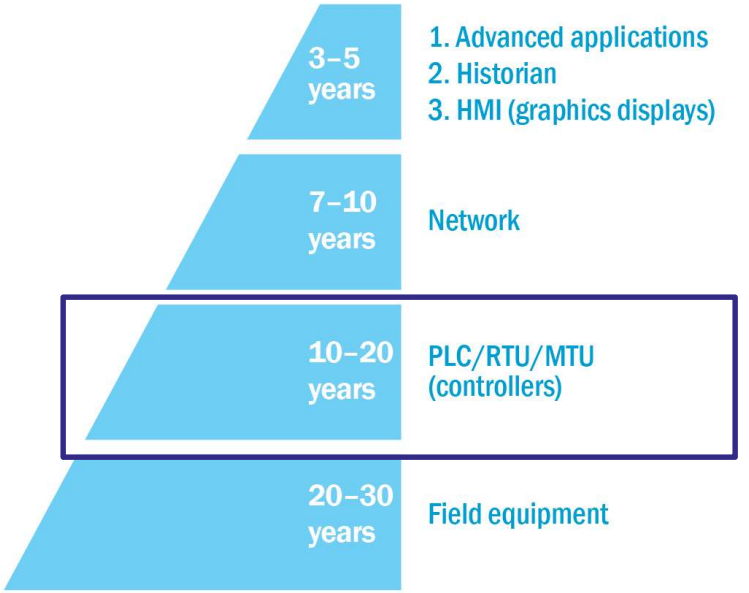




Water Site PLC Redundancy

- Remote Water Site
- Local process control is critical
  - Reservoir level and turnover
  - Booster pump station
  - Chlorine monitoring and injection
- Recommendation: Redundant PLCs (controllers)





Implementation Planning

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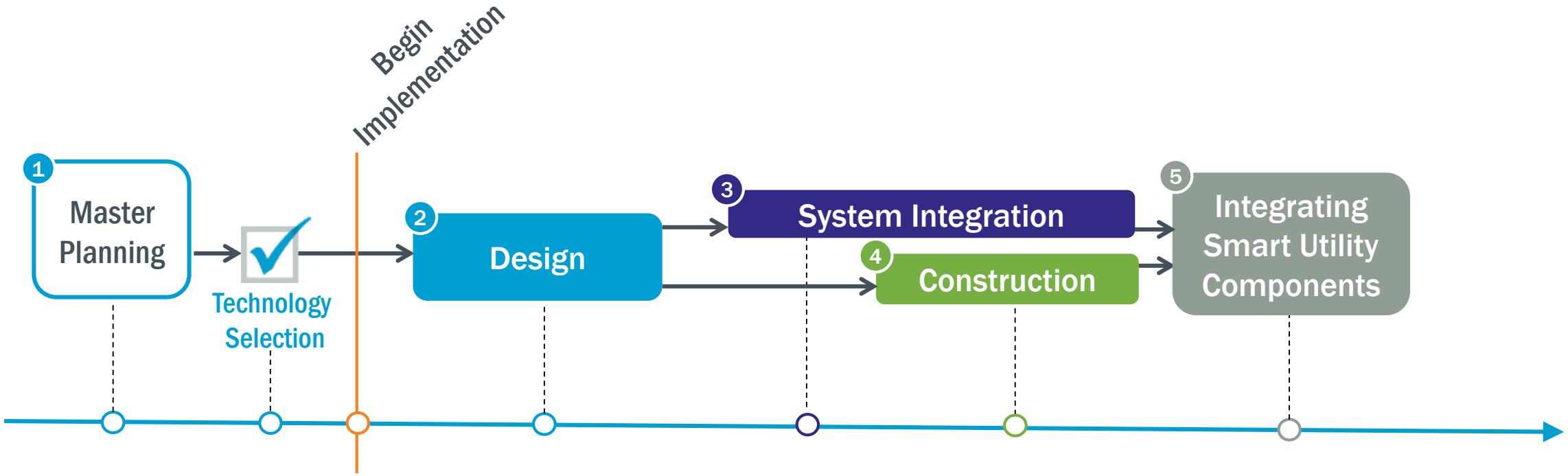
Implementation – Sequence of Events



Roadmap for the Future - Project Outcome

- ✓ Clear direction for next 10-15 years
- ✓ Right technology to support City's vision
- ✓ Sustainable and defendable plan

CLEAR DIRECTION

RIGHT TECHNOLOGY

SUSTAINABLE

Thank you!

Questions?

Brown AND Caldwell