



Water Efficiency and Water Loss Control Program

AWWA Water Audit Methodology

Be SMART! 
Cut WA+er L  ss!

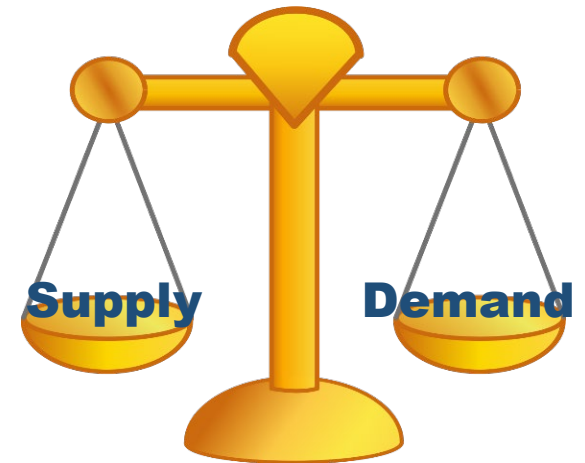
Today's Discussion

- Nationally recognized methodology (FREE AWWA Water Audit)
- Water Loss Control - How it works
- Pilot Programs
- Proposal - State-Wide Program
- Benefits

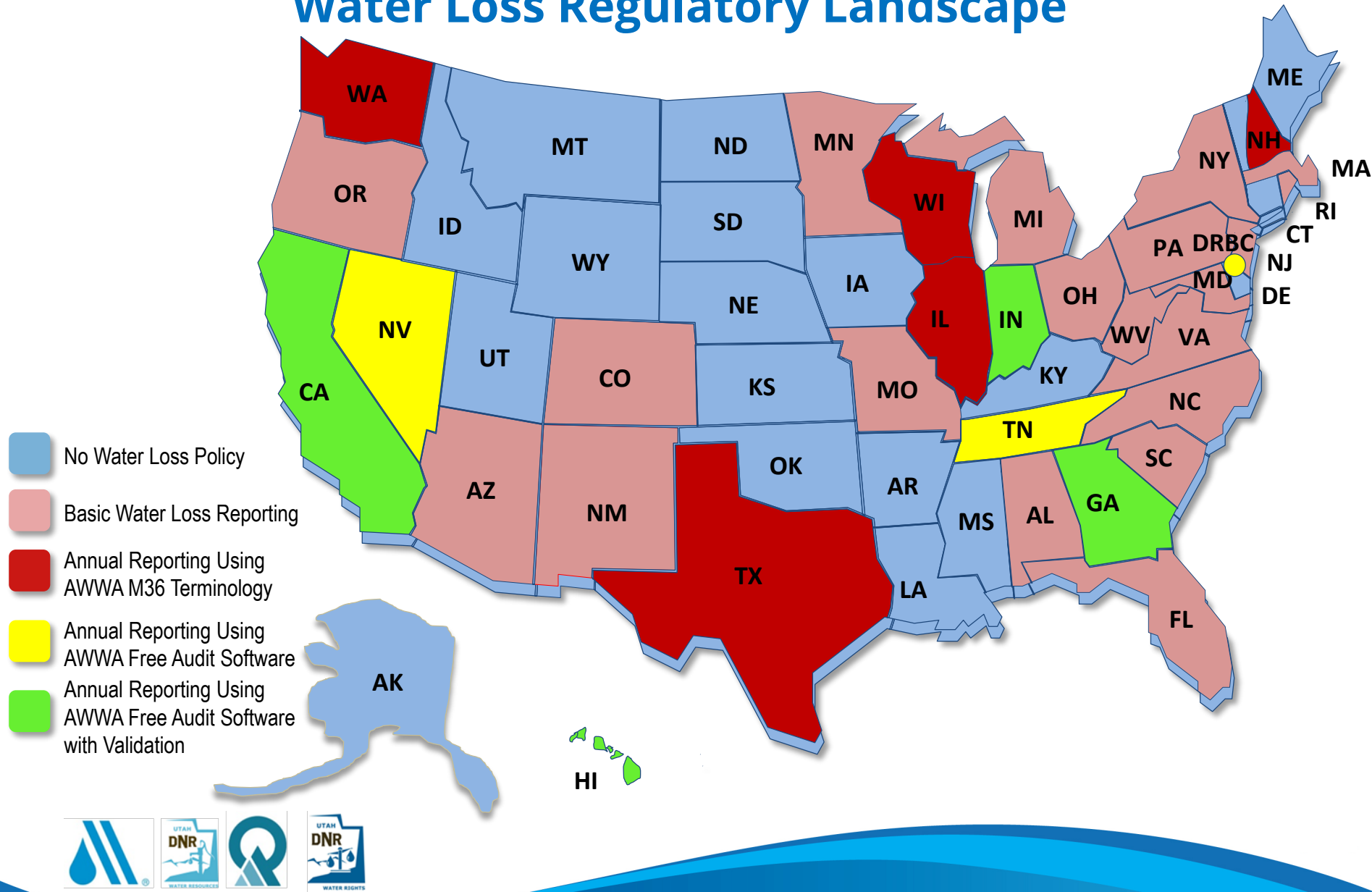


What Does the AWWA Water Audit Methodology Provide?

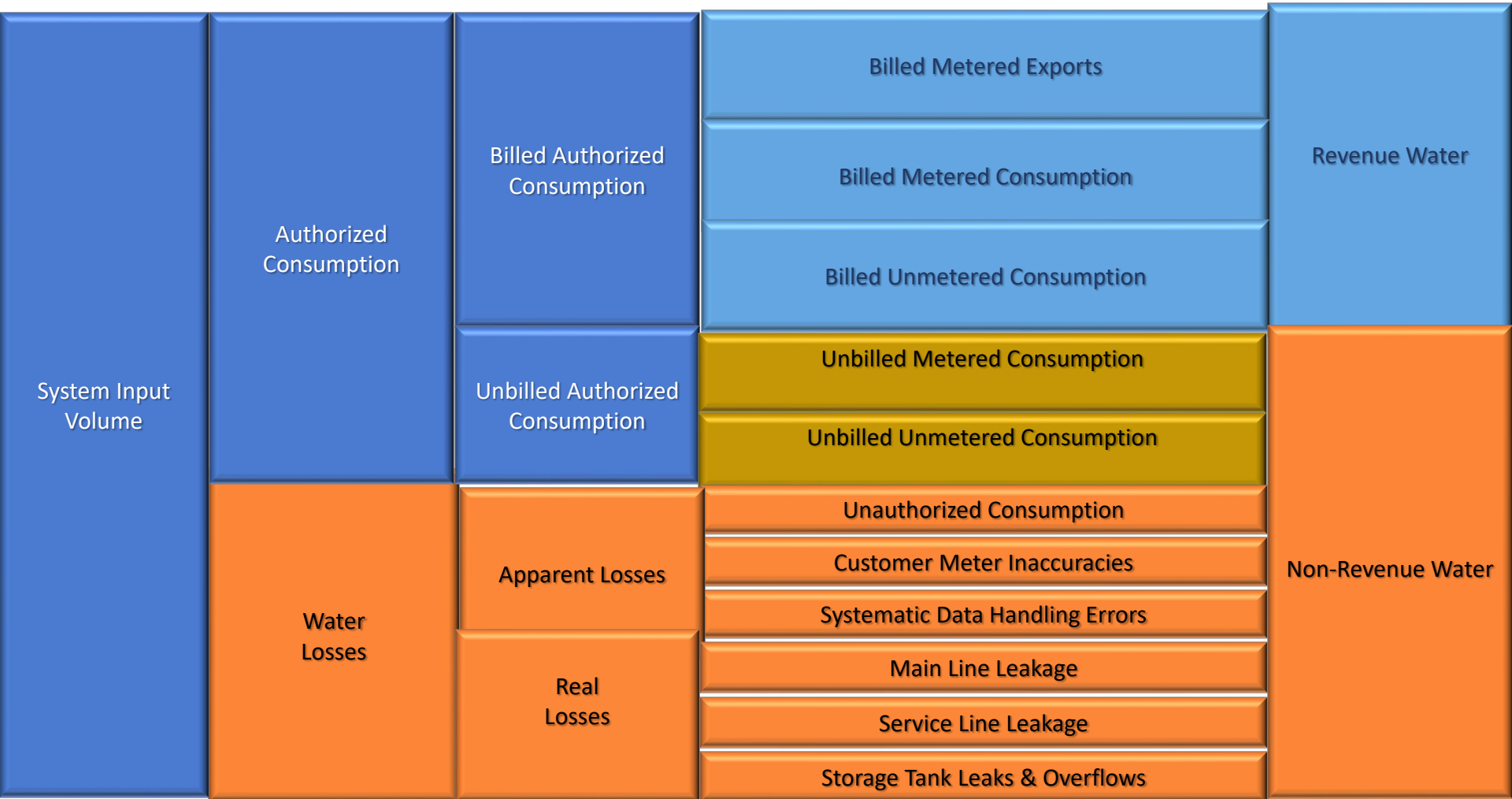
- The industry standard tool for water system accounting
- Water Balance model where all water is accounted for
- Data validation component
- Provides guidance on when and how to engage in water loss control



Water Loss Regulatory Landscape



Central Feature: The Water Balance

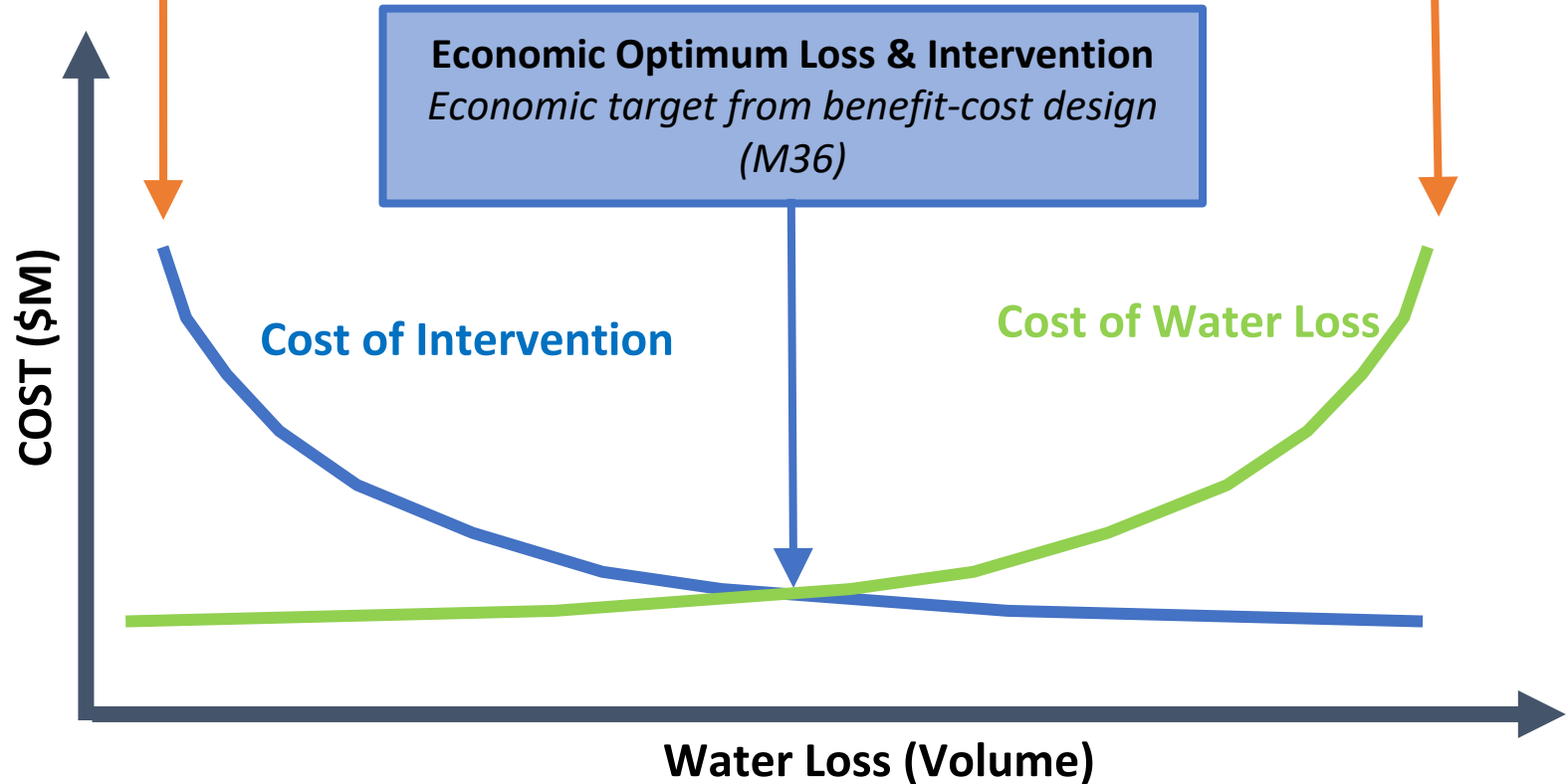


Aggressive Intervention = Over-Spending

Example: replacement of pipes and meters before their optimal useful life

Reactive Intervention = Over-Spending

Example: fixing only leaks that surface, replacing meters only when they stop



Data Validation

- Process of examining water audit inputs
- Improve the water audit's accuracy
- Document the uncertainty
- Level 1 water audit validation = confirms that AWWA Water Audit methodology correctly applied to a utility's specific situation





2016 & 2018 Pilot Programs



Program that Works!

Pilot Program with 12 Utilities



2016 Pilot Program—3 Utilities

Granger Hunter Improvement District
Kearns Improvement District
Orem City



2018 Pilot Program—9 Utilities

Jordan Valley Water Conservancy District
Lehi City Water Department
Murray City
Nibley City
Provo City Water Resources Department
Riverton City
Taylorsville Bennion Improvement District
WaterPro / Draper Irrigation
Weber Basin Water Conservancy District



Purpose

Introduce the
AWWA M36 &
Water Audit
Methodology

Demonstrate
Effectiveness to
Collect Reliable
and Validated
Water Data

Drive Utilities'
Water Loss
Programs from
Audit to Action

Inform Policy
Makers to
Increase the
Adoption of the
Methodology by
Utilities.

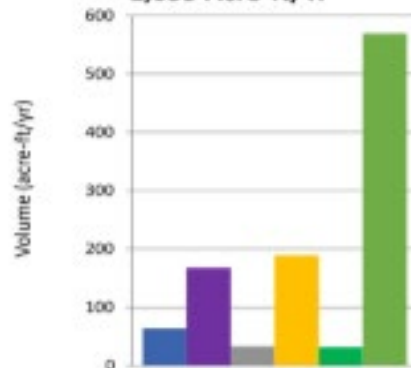


12 Unique Outcomes—2 Examples



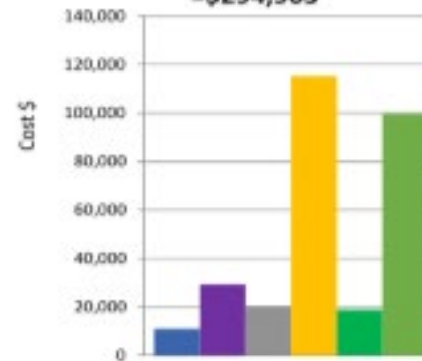
Volume

Total Volume of NRW =
1,055 Acre-ft/Yr



Value

Total Cost of NRW
=\$294,963



Taylorsville-
Bennion I.D.

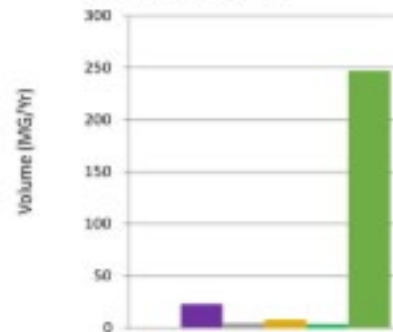


67,000
POPULATION

15,871
CONNECTIONS

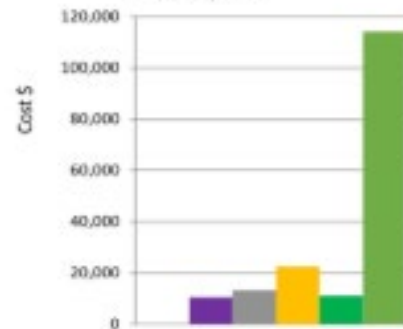
Volume

Total Volume of NRW =
878 Acre-feet/Yr



Value

Total Cost of NRW
=\$171,540



Lehi City

47,400
POPULATION

13,015
CONNECTIONS





Water Audit Reporting Year: Calendar Year 2015

Data Validity Score: 54

Service Connections: 26,900

Miles of Main: 383.4

Average Operating Pressure: 78.0 psi

Apparent Losses per service connection per day 25.88

Real Losses per service connection per day 37.28

Infrastructure Leakage Index 2.10

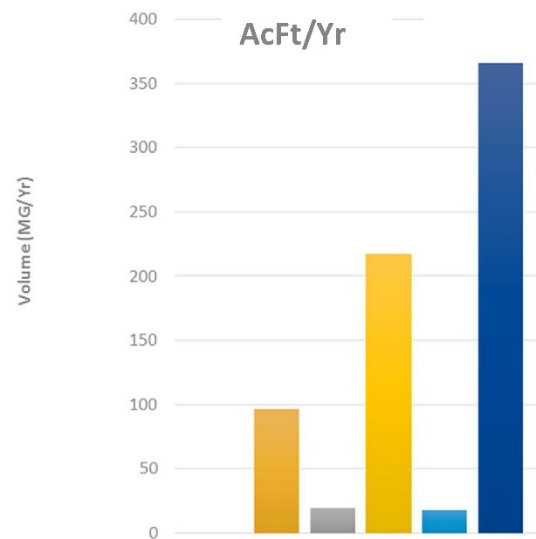
Validity

Level 1 validated DVS score of 54/100. Represents mid-grade reliability, efforts should focus on both data improvement and loss reduction. Priority areas for attention are:

- A. Water Imported
- B. Customer meter inaccuracies
- C. Variable production cost

Volume

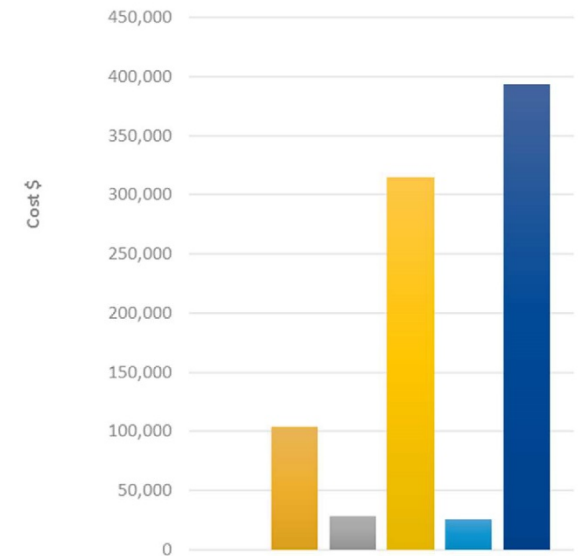
Total Volume of NRW = 2,200



- Unbilled metered
- Unbilled unmetered
- Unauthorized Consumption

Value

Total Cost of NRW = \$865,476



- Cust. Metering inaccuracies
- System data handling errors
- Real losses



Water Audit Reporting Year: Calendar Year 2015

Data Validity Score: 46

Service Connections: 13,770

Miles of Main: 171.2

Average Operating Pressure: 79.0 psi

Apparent Losses per service connection per day 16.99

Real Losses per service connection per day 44.83

Infrastructure Leakage Index 2.61

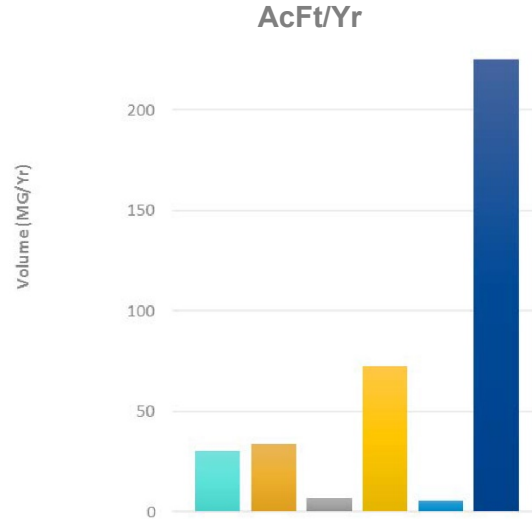
Validity

Level 1 validated DVS score of 46/100 for Water Audit Reporting Calendar Year 2015. The Data Validity Score suggests that priorities should be made to improve the validity before moving to targeted water loss control efforts. Priority areas for attention are:

- Water Imported
- Unbilled metered
- Customer metering inaccuracies

Volume

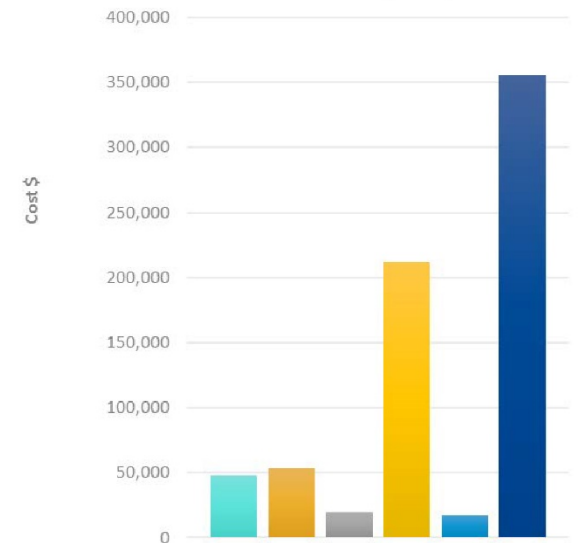
**Total Volume of NRW = 1150
AcFt/Yr**



- Unbilled metered
- Unbilled unmetered
- Unauthorized Consumption

Value

Total Cost of NRW = \$705,304



- Cust. Metering inaccuracies
- System data handling errors
- Real losses



Water Audit Reporting Year: Fiscal Year 2015/16

Data Validity Score: 55

Service Connections: 22,770

Miles of Main: 360.0

Average Operating Pressure: 87.1 psi

Apparent Losses per service connection per day 26.11

Real Losses per service connection per day 66.85

Infrastructure Leakage Index 3.26

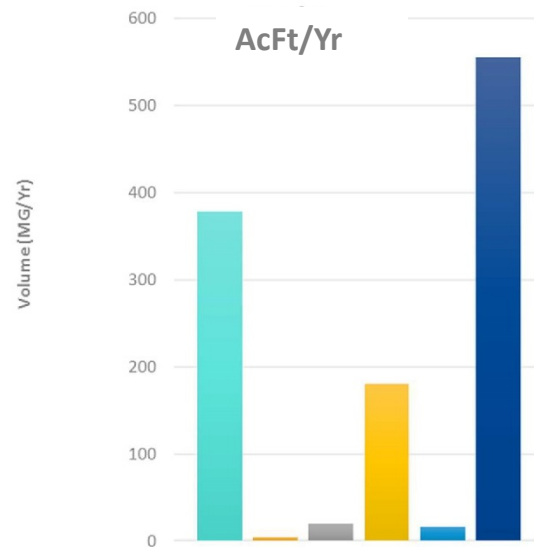
Validity

Level 1 validated DVS score of 55/100. Represents mid-grade reliability, efforts should focus on both data improvement and loss reduction. Priority areas for attention are:

- Water Imported
- Volume from Own Sources
- Billed Metered

Volume

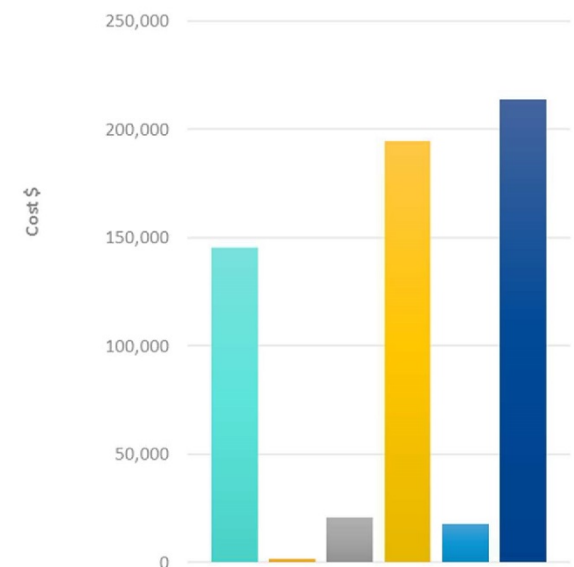
Total Volume of NRW = 3,545



- Unbilled metered
- Unbilled unmetered
- Unauthorized Consumption

Value

Total Cost of NRW = \$595,100



- Cust. Metering inaccuracies
- System data handling errors
- Real losses



Water Audit Reporting Year:

Data Validity Score:

Service Connections:

Miles of Main:

Average Operating Pressure:

Apparent Losses per service connection per day

Real Losses per service connection per day

Infrastructure Leakage Index

Fiscal Year 2016

58

17,224

230.8

100.0 psi

13.16 gallons/connection/day

29.53 gallons/connection/day

1.33

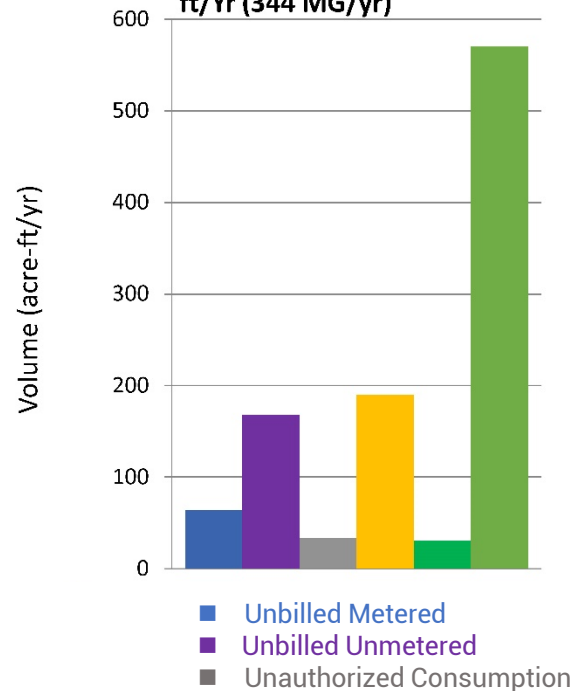
Validity

Level 1 validated DVS score of 58/10 suggests that next steps may be focused simultaneously on **improving data reliability and evaluating cost-effective interventions for water & revenue loss recovery**. Priority areas for attention are:

- Volume from Own Sources
- Water Imported
- Customer Metering Inaccuracies
- Unbilled Unmetered Authorized Consumption
- Billed Metered Authorized Consumption

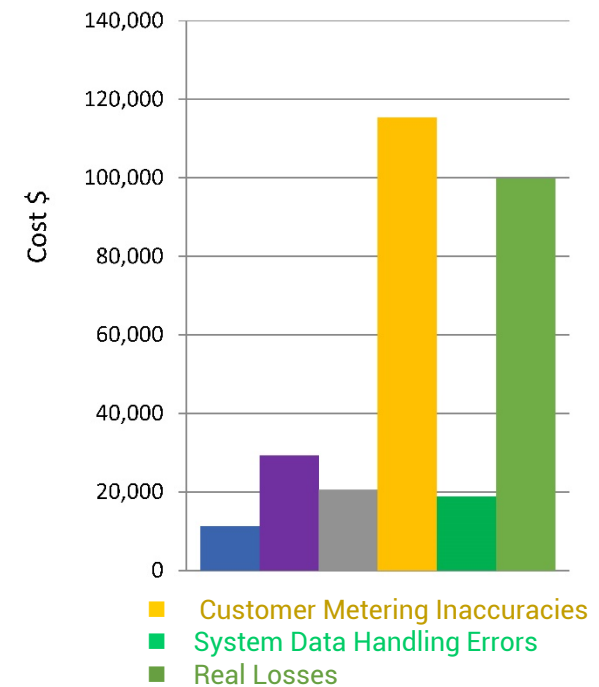
Volume

Total Volume of NRW = 1,055 Acre-ft/Yr (344 MG/yr)



Value

Total Cost of NRW = \$294,963



Proposal: State-Wide, Integrated Program



4 Integrated Recommendations

ENSURE RELIABLE DATA
Provide Technical Assistance
Program for Utilities

01

CONFIRM DATA IS VALID
Develop Level 1 Water Audit
Validation Certification Program

02

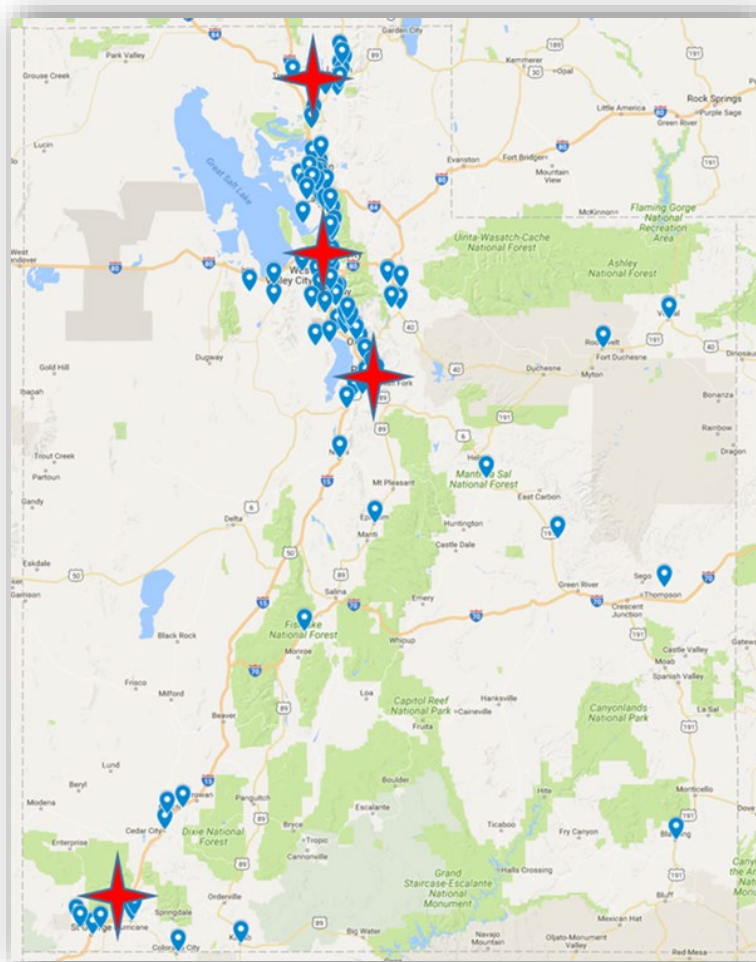
**SUPPORT A STANDARD INPUT
TOOL**
Develop Data Input Module that
Integrates with current Water Use
Data Input

03

**CREATE CONSISTENT
PROCEDURES**
Develop Rules for Data and Water
Audit Submittal

04

Targeted Program



Targeted Program

*104 Utilities in Utah
Serving Populations >3,300*

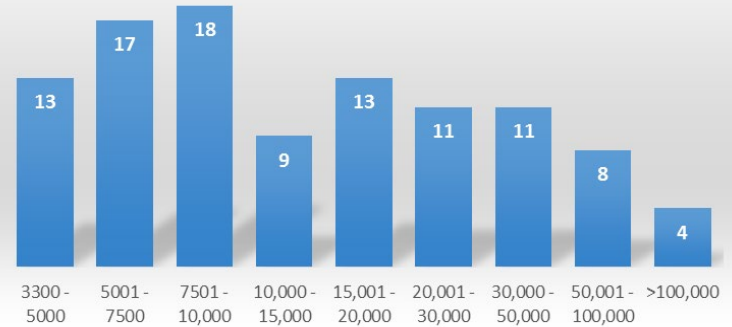


104 Utilities Represent

92%

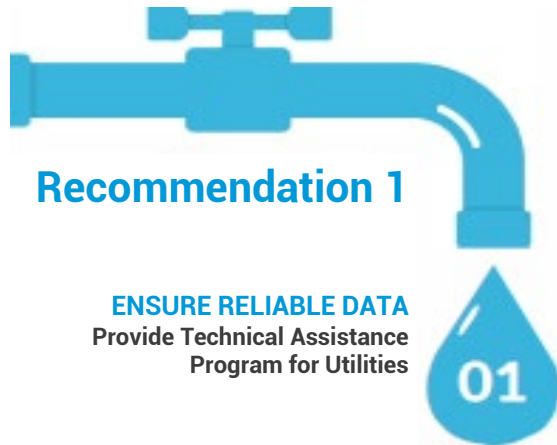
of the Service Population in Utah

Utah Utilities Serving >3,300 Population



Recommendation 1

Provide Technical Assistance Program



Initial Cost: \$850,000 to \$900,000

Objective: Train each utility

- how to properly conduct an audit
- provide tailored action items
- economic justification for water loss control
- Provide level 1 Validation

Recommendation 2

Develop Validation Certification Program



Initial Cost: \$400,000 to \$450,000

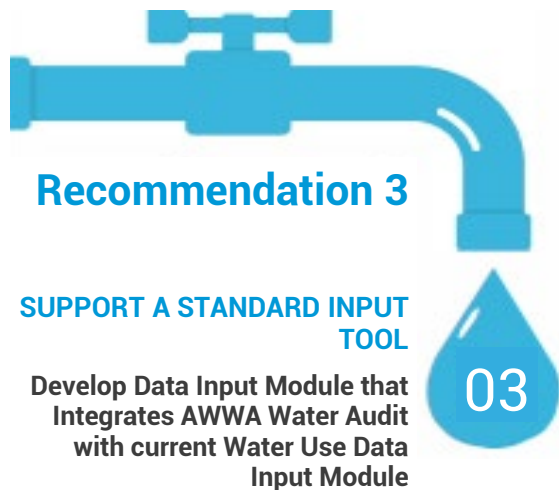
Objective: Develop certificate program:

- Train individuals in validation methods
- Certify individuals to conduct independent validation of audit data



Recommendation 3

Develop Data Input Module



Initial Cost: \$75,000 to \$100,000

Objective: Integrate

- State's water use data input module
- With
- AWWA Free Water Audit Software



Recommendation 4

Develop Rules for Data & Analysis



Initial Cost: \$30,000 to \$50,000

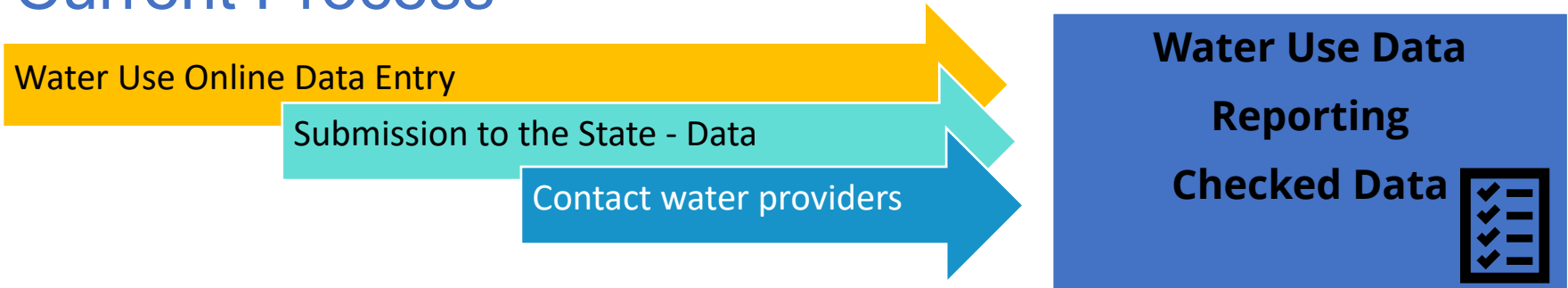
Objective: Develop a coordinated and consistent set of rules

- for Utilities and State Agencies
- for input, storage, extraction and analytics processes

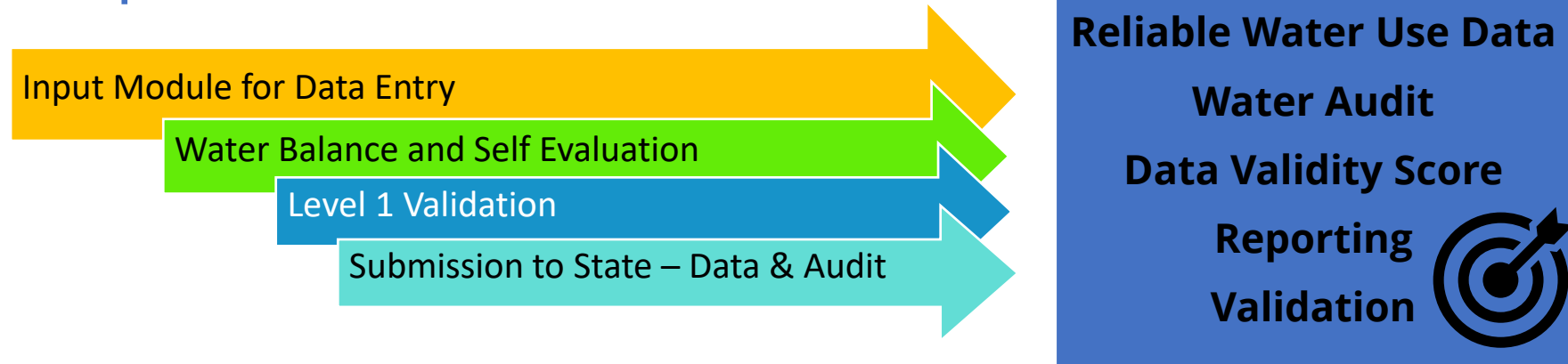


Water Use Data

Current Process



Proposed Process



Four Part Program to Deliver Accurate and Validated Data

Initial Costs: \$1.5M over two years

On-going Annual Cost: \$300,000



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Win-Win-Win-Win

- **DWRe / Water Rights / DDW**
 - Nationally recognized process to collect Reliable Water Use Data
 - Data Validation Process to assess the credibility of data inputs of the water audit.
 - Consumption Estimates provide data for Source Sizing & Infrastructure Capacity
 - Track actual water use improvements.
 - Reduces losses which helps stretch existing supplies
- **Legislature**
 - Data Validation Process shows credibility of water use data
 - Provides Budget Controls by Targeting the Economic Optimum loss and intervention
- **Public**
 - Supply Side Conservation measures stretch existing supplies
 - Cost Controls by targeting the Economic Optimum loss and intervention
- **Utilities**
 - Easy process to develop Reliable and Accurate Water Use Data
 - identify water use improvement plan and track actual improvements.
 - Saves Water by Reducing losses
 - Saves Energy
 - May Increase Revenue
 - Saves money by targeting the Economic Optimum loss and intervention



www.ims-awwa.org/group/WaterLossControl

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American Water Works Association
Intermountain Section

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TRAINING AND EDUCATION: WATER LOSS CONTROL

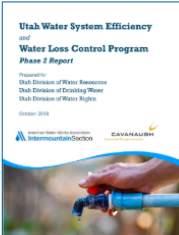
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Water loss control represents the efforts of water utilities to provide accountability in their operation by reliably auditing their water supplies and implementing controls to minimize system losses.

Resources





Utah Water System Efficiency and Water Loss Control Program Phase 2 Report
Prepared by:
Utah Division of Water Resources
Utah Division of Drinking Water
Utah Division of Water Rights
October 2018


[Download Report Here](#)


Report on Phase 2 of the Utah Water System Efficiency and Water Loss Control Pilot Program
The Intermountain Section of the American Water Works Association (Section), in conjunction with the Utah Division of Water Resources (DWRe), Division of Drinking Water (DDW), and Division of Water Rights (DWR) completed the Utah Water Efficiency and Water Loss Control Program (Program) for water utilities to learn how to improve water efficiency within their systems and to control water loss through a water system audit process. This report summarizes the components of the training program, the outcomes for each of the 9 pilot utilities, results regarding utility perceptions of performing a water audit, and recommendations for moving forward with a Statewide program. [Download Report Here](#)


Report on The Utah Water System Efficiency and Water Loss Control Pilot Program

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UPCOMING EVENTS [MORE »](#)

9/9/2019 » 12/5/2019
Student Scholarship Applications Available - Due December 5th

9/9/2019 » 10/25/2019
Leadership Forum 2019-20 Nominations - Due October 25th

9/9/2019 » 10/25/2019
One AWWA Operator Scholarship Applications Available - Due October 25th

9/19/2019
FREE Small Systems Workshop to Achieve/Maintain Compliance with SDWA - St. George



NEWS AWWA NEWS [MORE »](#)

Additional Discussion

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alane@ims-awwa.org
801-712-1619



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