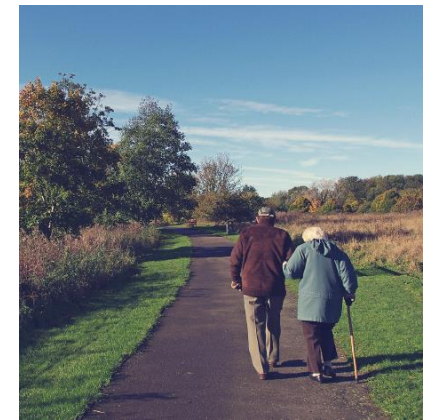
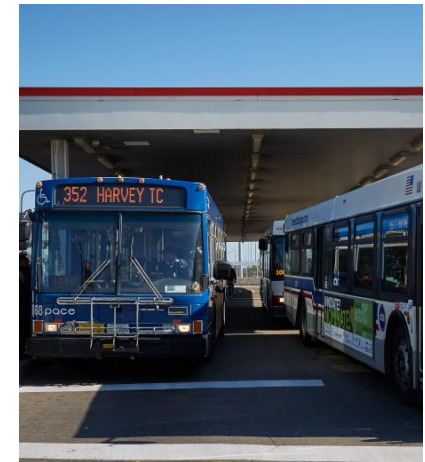


NWPA Water Supply Sustainability Plan: Water loss control strategy

NWPA TAC Meeting
February 27, 2024



Agenda

Strategy overview

- Description
- Implementation approaches
- Case studies
- Current implementation levels

Baseline information

- Target audience
- Baseline water use

Water savings estimates

WSSP strategy road map

- Residential Sector
 - Residential retrofits - Single Family
 - Residential outdoor water use (landscape efficiency) - Single Family
 - Residential development standards (new development)
- Water system
 - **Water loss control**
- Commercial, Industrial and Institutional (CII) Sector

Water loss control strategy

Water loss recap

Apparent losses:

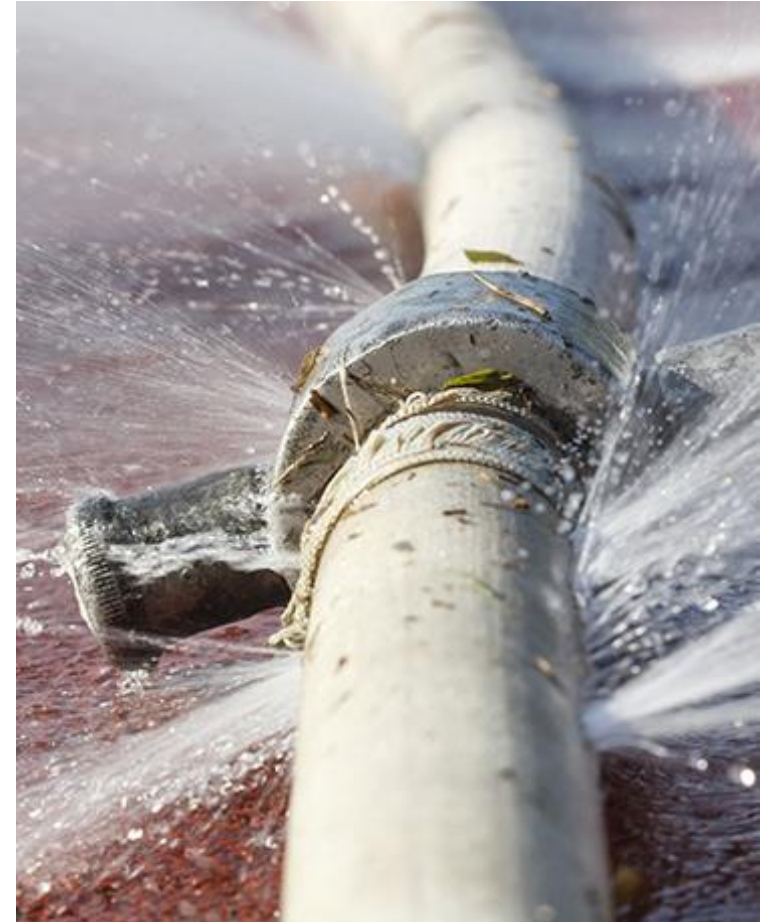
- Billing and meter reading errors
- Unauthorized consumption

Real losses:

- Losses from distribution system
- Leakage and storage tank overflow

Strategy description

Municipal community water suppliers find, measure, and address water losses within their water supply systems to conserve available water supply



Source: AWWA

Benefits of water loss control

- Ensures that utilities don't lose revenue through lost water
- Lessen stress on available water resources and capital expenditures.
- Addresses water conservation at the system level before it reaches its customers

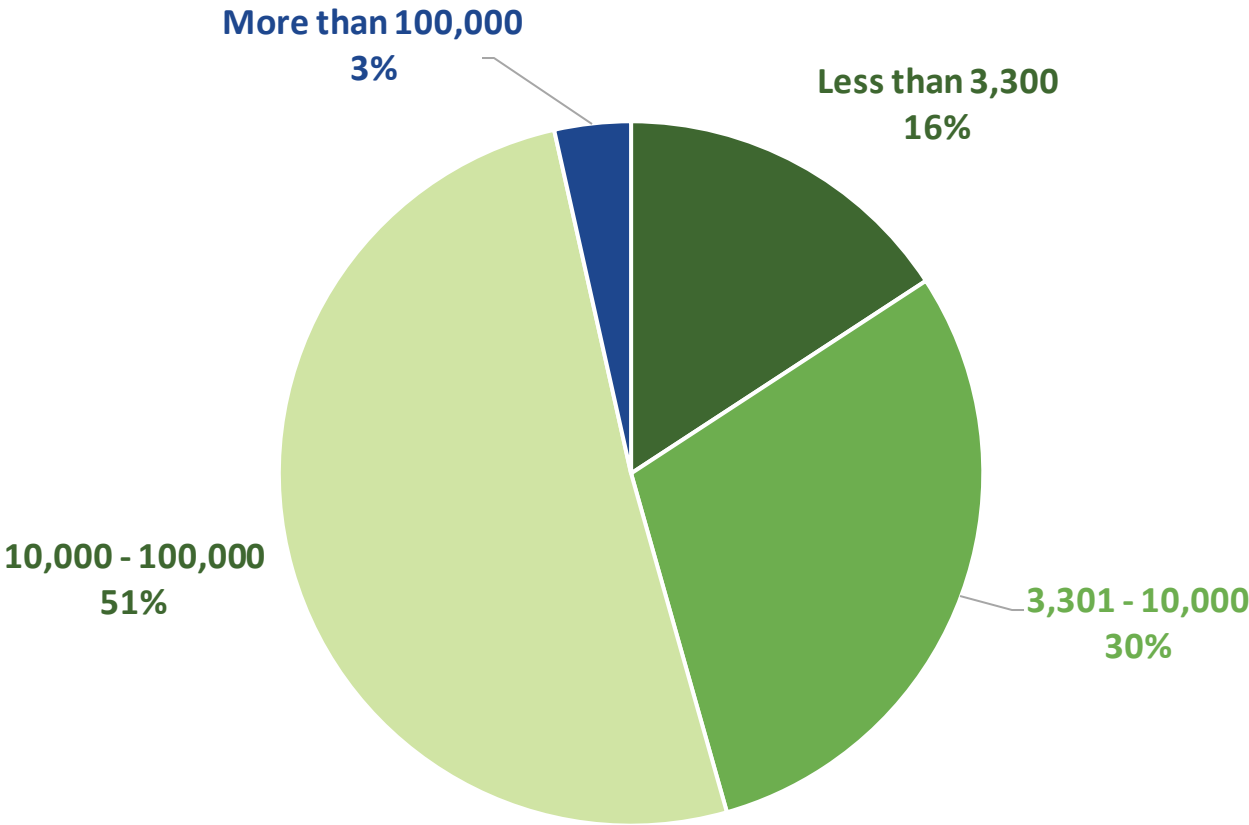
Water loss control measures

Measure	What does the measure address?	Which utility is the measure recommended for?
Source-water metering	Apparent losses/Unaccounted for use	Utilities serving fewer than 3,300 people
Meter accuracy	Apparent losses	Utilities serving between 3,300 and more than 100,000 people
Leak detection and repair	Real losses	Utilities serving between 10,000 and 100,000 people
Annual water audits	Real losses	Utilities serving between 10,000 and 100,000 people
Loss prevention programs (ex. water main rehabilitation and replacement)	Real losses	Utilities serving more than 100,000 people

Source: USEPA Water Conservation Plan Guidelines

NWPA Community Water Supply (CWS) communities by population

NWPA CWS Communities by Population



Implementation approaches

Implementation approach	What does the approach entail?	Which measures does the approach address?
Technical assistance / partnerships	Technical assistance/ partnerships with organizations or government entities to control water loss (Ex. Washington State Department of Health Water Audit Technical Assistance Pilot)	Annual water audits
Rebate programs	Cash incentive/rebate programs to detect and repair leaks in a utility water system (Ex. Energy Trust of Oregon incentive program)	Leak detection and repair
Capital improvement planning + budgeting	Increasing budgets to invest in capital improvements. This could include conducting water rate studies to increase necessary revenue for capital expenditures.	Water loss presentation programs (ex. water main repair and replacement)
Ordinances	Local ordinances can require withdrawn water to be metered and prohibit unauthorized use of unmetered water through measures such as fines.	Source water metering

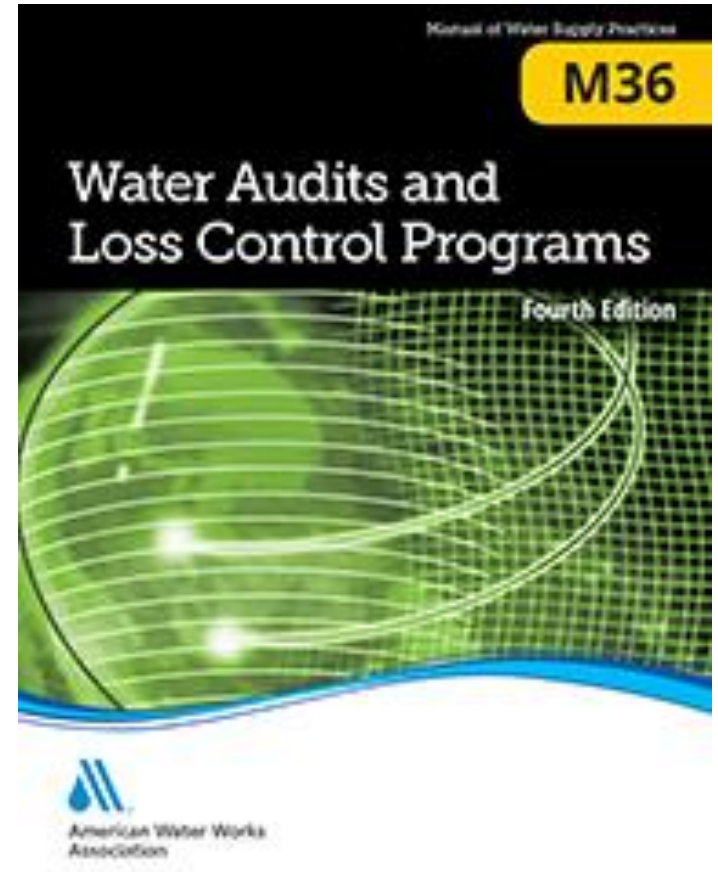
Case study: Water Audit Technical Assistance Pilot

Background:

- Washington requires utilities to maintain water loss below 10%

Strategies and approaches used:

- Washington State Department of Health is offering a free pilot technical assistance program to 10 utilities to complete the AWWA water audit and customize water loss prevention strategies



Case study: Municipal leak detection and repair rebate program

Background:

- Goal of addressing water leaks to improve energy performance of water and wastewater treatment facilities across Oregon municipalities

Strategies and approaches used:

- Energy Trust of Oregon offers municipalities a once-a-year \$1,000 rebate for the cost of assessing and repairing underground water leaks



Source: Energy Trust of Oregon

Current levels of implementation

Participating communities:

- Few NWPA communities are addressing water loss
- Often addressing to meet Lake Michigan water permit requirements

Case study: Elgin

Background:

- Working on a water system master plan
- Seeking to address water loss

Strategies and approaches used:

- Completed water audit to identify water loss level

Future/upcoming steps

- Identify water loss reduction strategies



Source: downtownelgin.com

Case study: Montgomery

Background:

- Aims to reduce water loss to less than 10%
- Focusing on unbilled authorized use, apparent losses, and real losses

Strategies and approaches used:

- Real losses
 - Annual water main leak detection
 - Water main replacement
 - Developed a district metered area for 'area of concern' to better track leaks
- Apparent losses
 - Full Customer Meter Change-Out Program with AMI Technology – Complete by 2026
 - Annual master meter testing



Source: Montgomeryil.org

Case study: Montgomery

Strategies and approaches used (continued):

- Unbilled authorized water:
 - Converting unbilled metered water to billed metered water
 - Forensic data investigation and analysis of billing data by a 3rd party consultant
 - Replacing meters for water that is recirculating through an effluent water treatment plant meter
 - Metering automatic flushing hydrants

Future/upcoming steps

- Continue preparing annual water audit based on the AWWA M36 methodology
- Monitor progress and pivot with strategies as necessary



Source: Montgomeryil.org

Case study: Yorkville

Background:

- Aims to reduce water loss to less than 10%
- Focusing on unbilled authorized use, apparent losses, and real losses

Strategies and approaches used:

- Real losses
 - Annual leak detection
 - Water main replacement
- Apparent losses
 - Annual master meter testing



Source: Yorkville.il.us

Case study: Yorkville

Strategies and approaches used (continued):

- Unbilled water use
 - Reviewing unbilled water uses; developing policies to better track and bill where feasible (converting unbilled metered water to billed metered water)
 - Reviewing enforcement efforts related to illegal water use policies/ordinances

Future/upcoming steps

- Continue preparing annual water audit based on the AWWA M36 methodology
- Monitor progress and pivot with strategies as necessary



Source: Yorkville.il.us

Case studies outside the NWPA

Leak detection and repair

The City of Chicago actively pursues system leak detection and repair by inspecting each water main every 4 years and the critical main every year.

Water main repair and replacement

The City of Evanston replaces water mains on average about one and half miles per year, to decrease the frequency and volume of leakage as well as decrease water main breaks.

Programs and Resources:

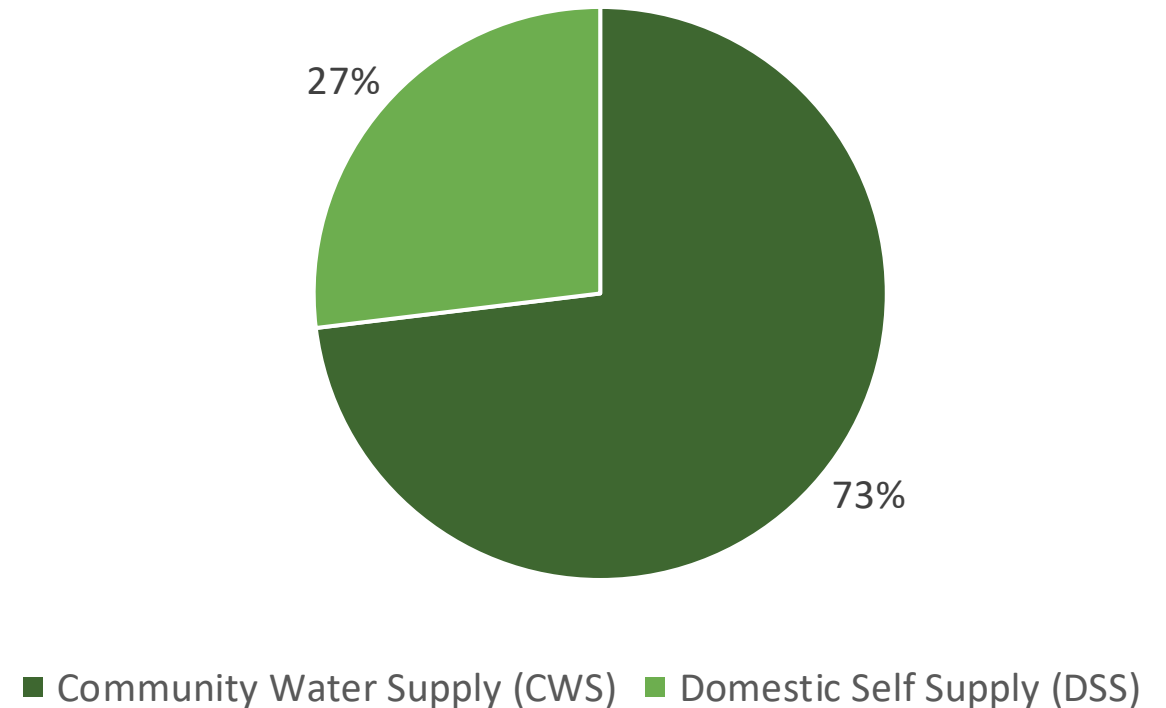
- AWWA Free Water Audit Software
 - <https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control/Free-Water-Audit-Software>
- US EPA Water Conservation Plan Guidelines
 - <https://www.epa.gov/watersense/water-conservation-plan-guidelines>
- IEPA Drinking Water Loans (State Revolving Fund Loans)
 - <https://epa.illinois.gov/topics/grants-loans/state-revolving-fund.html>

Water use information

Target audience

NWPA community water supply (CWS) communities

NWPA communities by water supply system type



Community water supply (CWS) sector data

CMAP Water Demand Forecast, 2022 (county-level projections)

- The Illinois Water Inventory Program (IWIP) 2018 water use data

Reported and projected CWS withdrawals

Municipal Community Water Supply (CWS) water withdrawals in MGD, historic (2018) and projected (2020-2050)*

	2018	2020	2025	2030	2035	2040	2045	2050
Kane	50.5	48.3	44.7	42.5	40.0	37.3	34.2	31.3
Kendall	5.0	4.8	4.8	4.7	4.6	4.3	4.1	3.9
Lake	51.1	49.7	47.6	45.9	44.5	42.3	39.9	37.5
McHenry	19.9	19.4	19.0	18.9	18.7	18.4	18.2	18.2
Total	126.5	122.1	116.2	111.9	107.8	102.3	96.4	90.9

Water savings estimates

Water Loss Strategy

Water Savings – Water 2050 method

- *IWIP PWS 2018 water withdrawals used as baseline (126.5 MGD)*
- *Assume maximum UFF (unaccounted for flow) of 10% for a utility.*
- *Assume on average 50% of UFF can be recovered*
- *10% of this savings is applied for the low conservation plan and 50% is applied for the high conservation plan.*

Result is water savings range of 0.63 MGD – 3.17 MGD

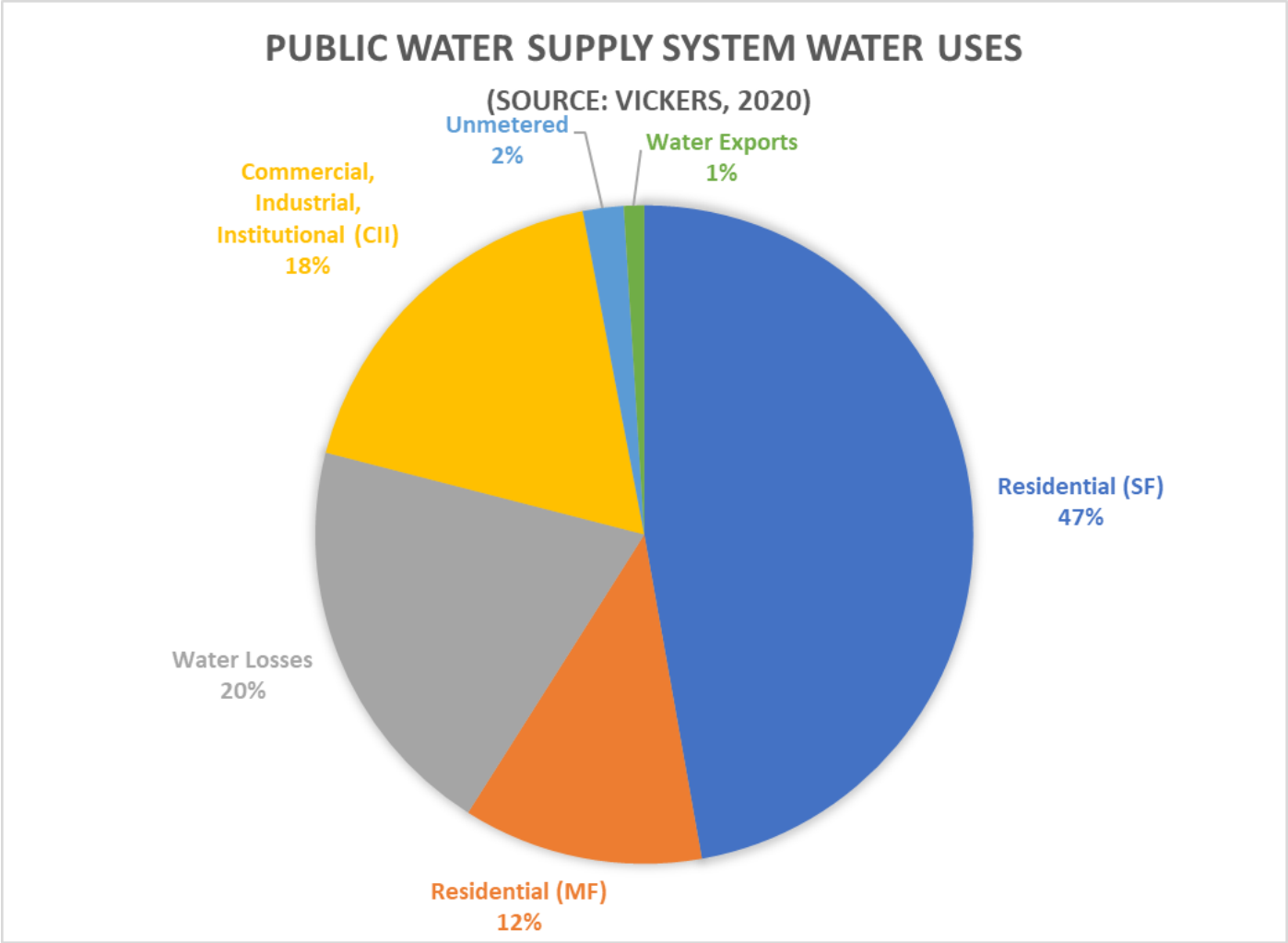
Water Loss Strategy

Water Savings –

- *IWIP PWS 2018 water withdrawals used as baseline (126.5 MGD)*
- *Assume water loss (non-revenue water) 14% - 20% for a utility.*
- What percent of that is real loss? Assume on average 50% can be recovered
- 100% implementation

Result is water savings range of 8.85 MGD – 12.65 MGD

How do community water suppliers use water?



Discussion

Discussion:

Are the water savings estimate assumptions still valid?

Discussion:

Are there other communities in the NWPA region that are addressing water loss?

- What measures are they taking?



Chicago Metropolitan
Agency for Planning



Questions?

Kelsey Pudlock
kpudlock@cmap.Illinois.gov

Margaret Schneemann
mschneemann@cmap.Illinois.gov

[@cmapillinois](https://www.instagram.com/cmapillinois) |    

