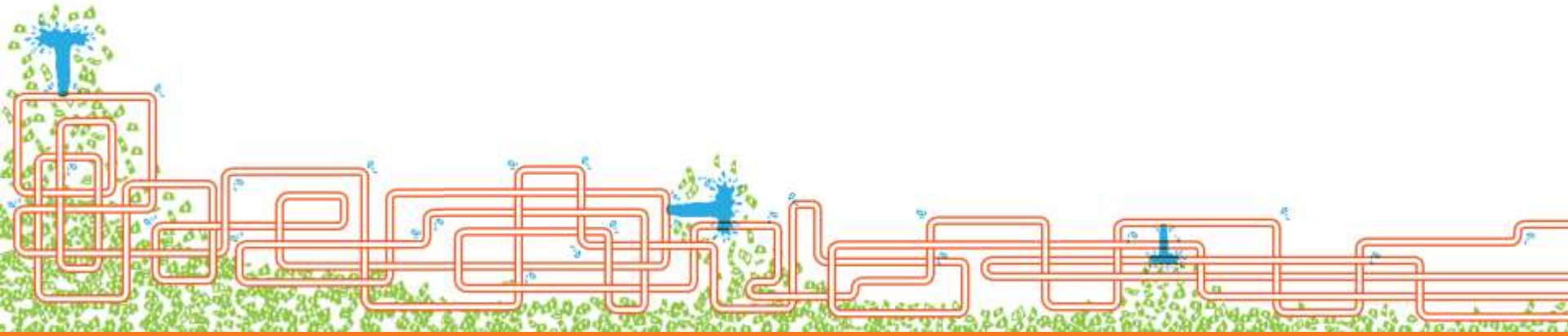
Metropolitan Planning Council

Immeasurable Loss: Modernizing Lake Michigan Water Use

Josh Ellis

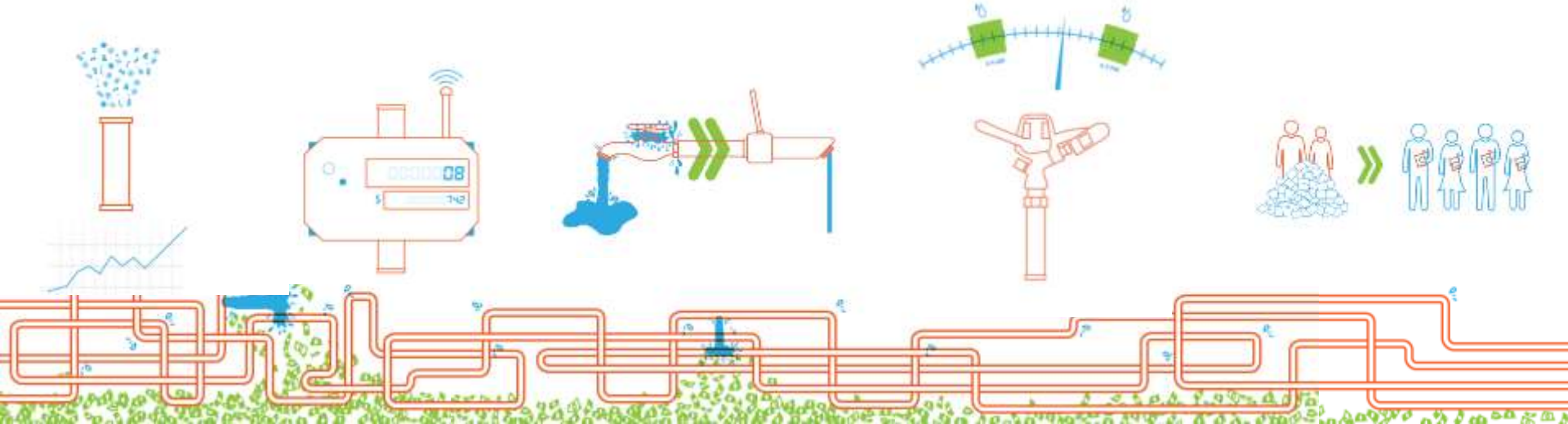
MPC Roundtable, May 7, 2013



WHY MODERNIZE?

Current opportunity

- IDNR has released proposed rule changes
- MPC supports changes, but recommends further action



Research methods

- LMO-2 data, 1999-2010
- Lawn sprinkling & plumbing ordinances
- National best practices
- Interviews

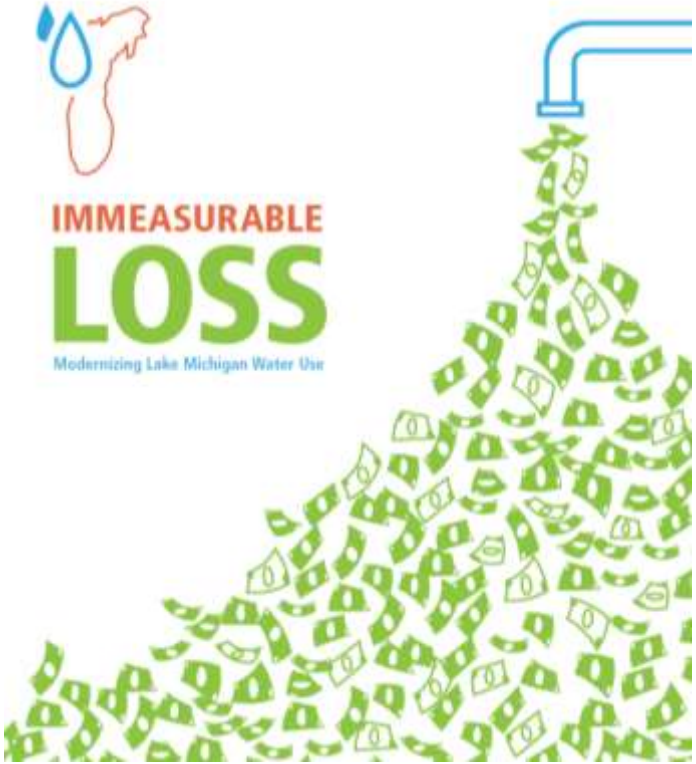
Professionals consulted for this paper

Bold type *indicates Lake Michigan permittee.*

Alliance for Water Efficiency
American Water Works Association
Center for Neighborhood Technology
Chicago Metropolitan Agency for Planning
City of Blue Island
City of Chicago
City of Des Plaines
Village of Glenview
Village of Grayslake
Illinois American Water (holds multiple permits for several service areas)
Illinois Dept. of Natural Resources
Illinois-Indiana Sea Grant
Village of LaGrange
Village of Lake Zurich (has permit, but has not commenced use)
Northwest Water Planning Alliance
Village of Palos Park
Village of Westmont
Village of Wheeling

Solutions

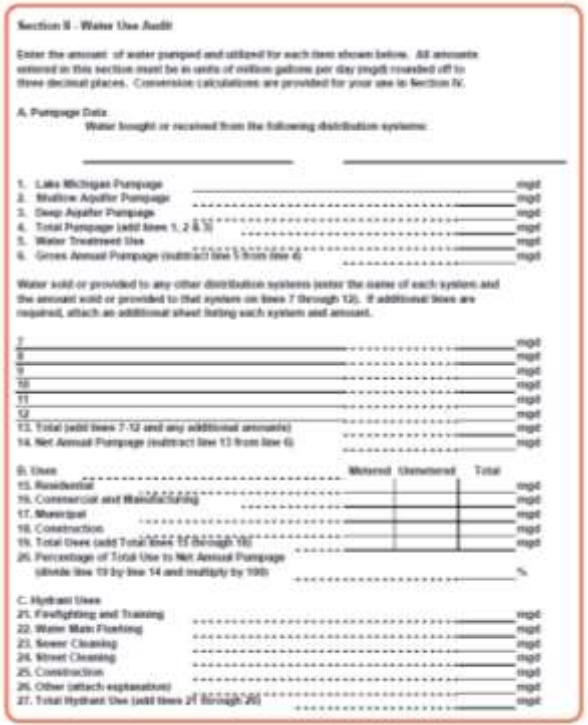
1. Accounting system
2. Water rates and metering
3. Plumbing standards
4. Outdoor water use standards
5. IDNR capacity



Improve the existing accounting system, while exploring a new approach

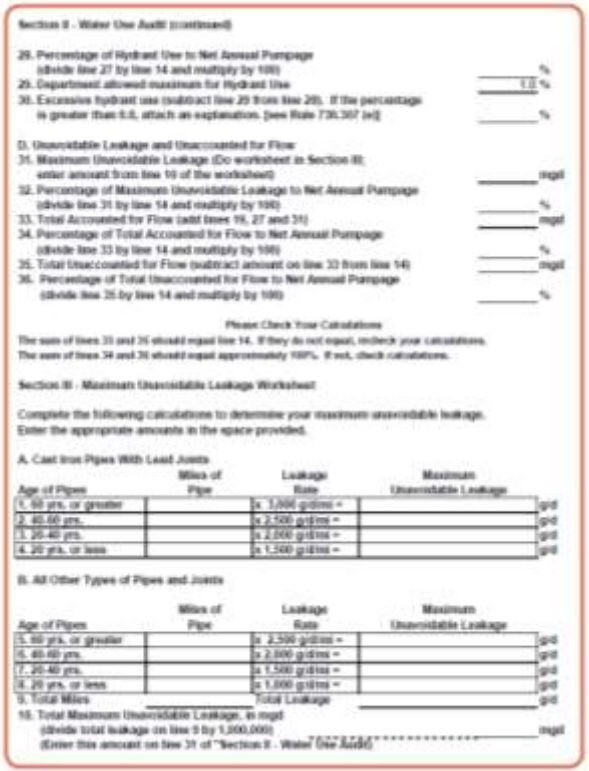
SOLUTION #1

Current accounting method: LMO-2

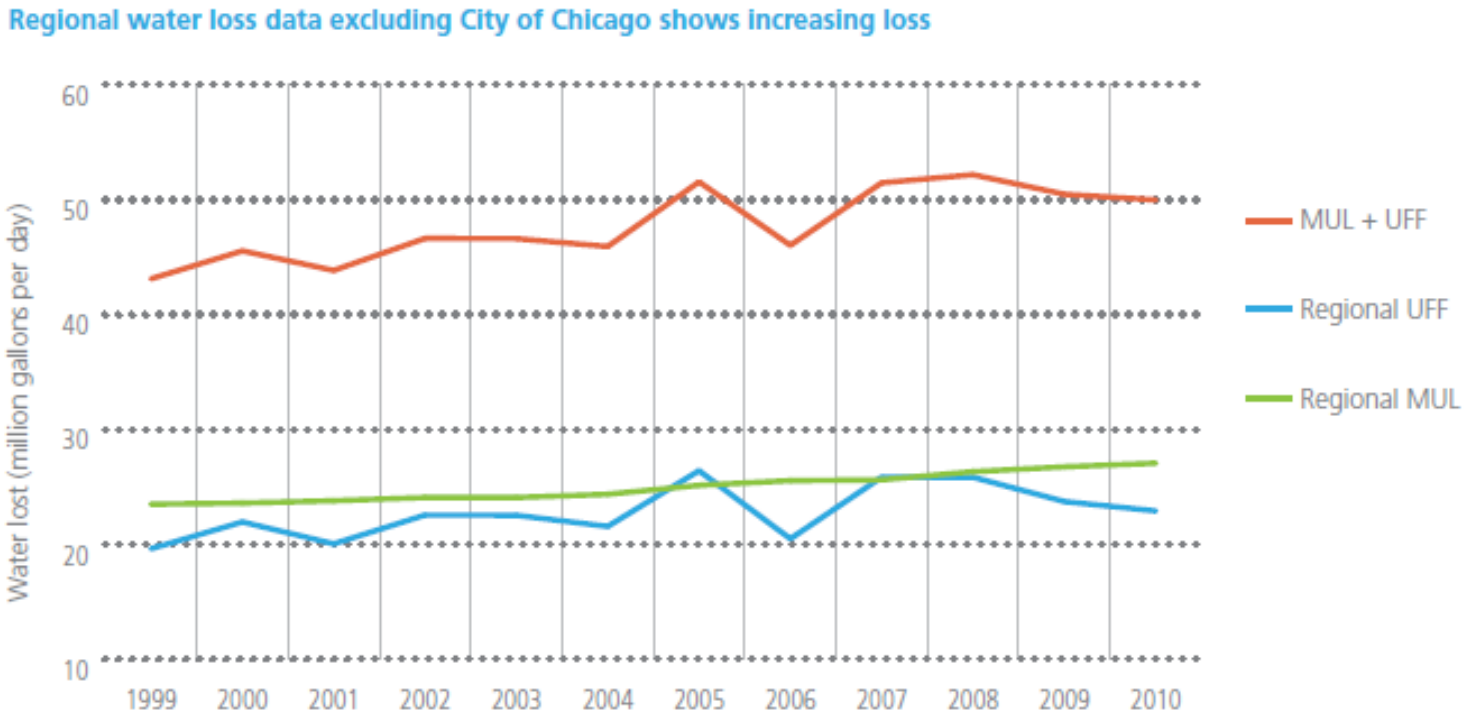


Measuring the quantity of water withdrawn or diverted from Lake Michigan

Last substantial update: Jan 1990



“Best information available”



Problem #1: Accounting system

Problem: Lack of useful data

Solution: Eliminate MUL now, but work towards more comprehensive performance metrics

Outcome: Data-driven management

Problem #1: Accounting system

NET ANNUAL PUMPAGE

The net amount of water a utility pumped in a given

−

METERED & UNMETERED WATER USED IN A GIVEN YEAR

+

MUL - MAXIMUM UNAVOIDABLE LEAKAGE

An allowable leakage exemption based on miles, type, and age of pipes.

=

UFF - UNACCOUNTED FOR FLOW

IDNR requires this be below 8% of net annual pumpage.

WE DON'T KNOW HOW MUCH WATER IS BEING LOST

To calculate water loss, permittees currently subtract the water used in a given year plus MUL – a bonus estimation based on pipes – from the total amount of water pumped. IDNR considers the difference "loss." Problem is, allowing the MUL exemption results in a figure that does not accurately represent how much water – and money – we're losing.

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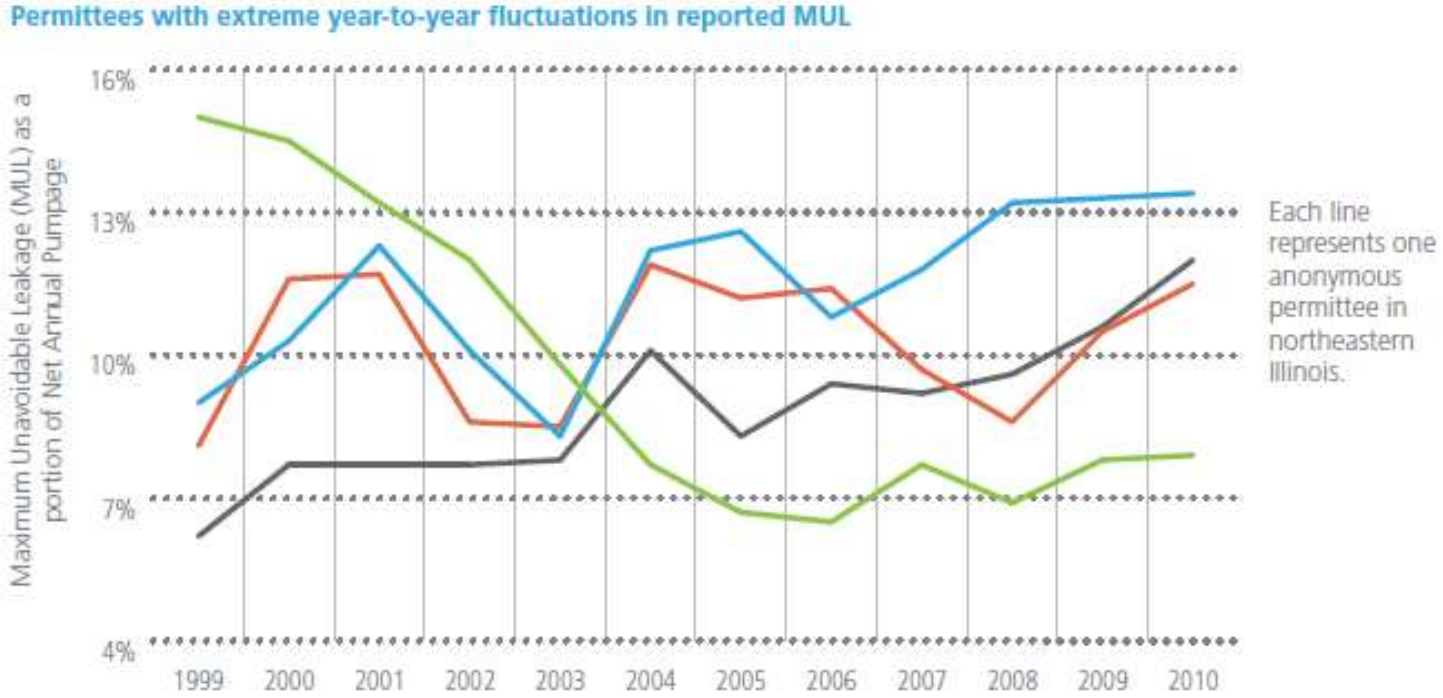
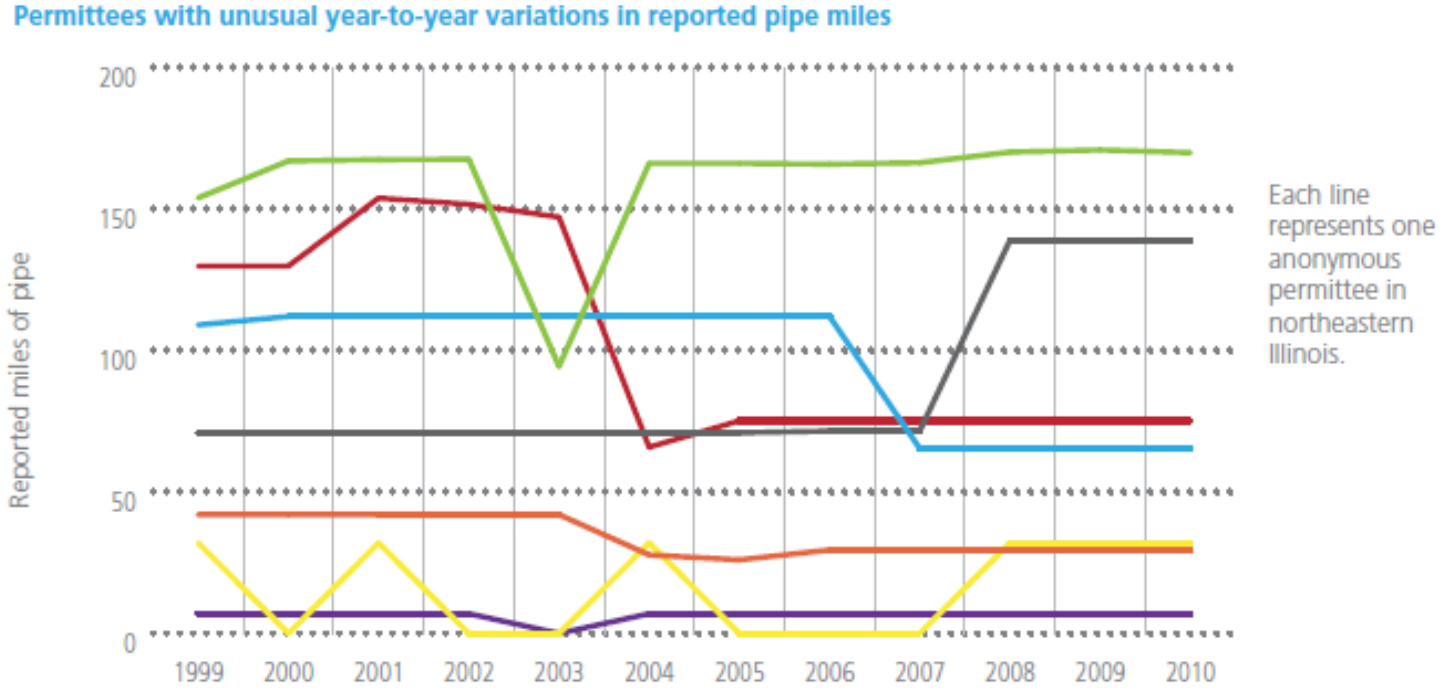
Problem #1: Accounting system

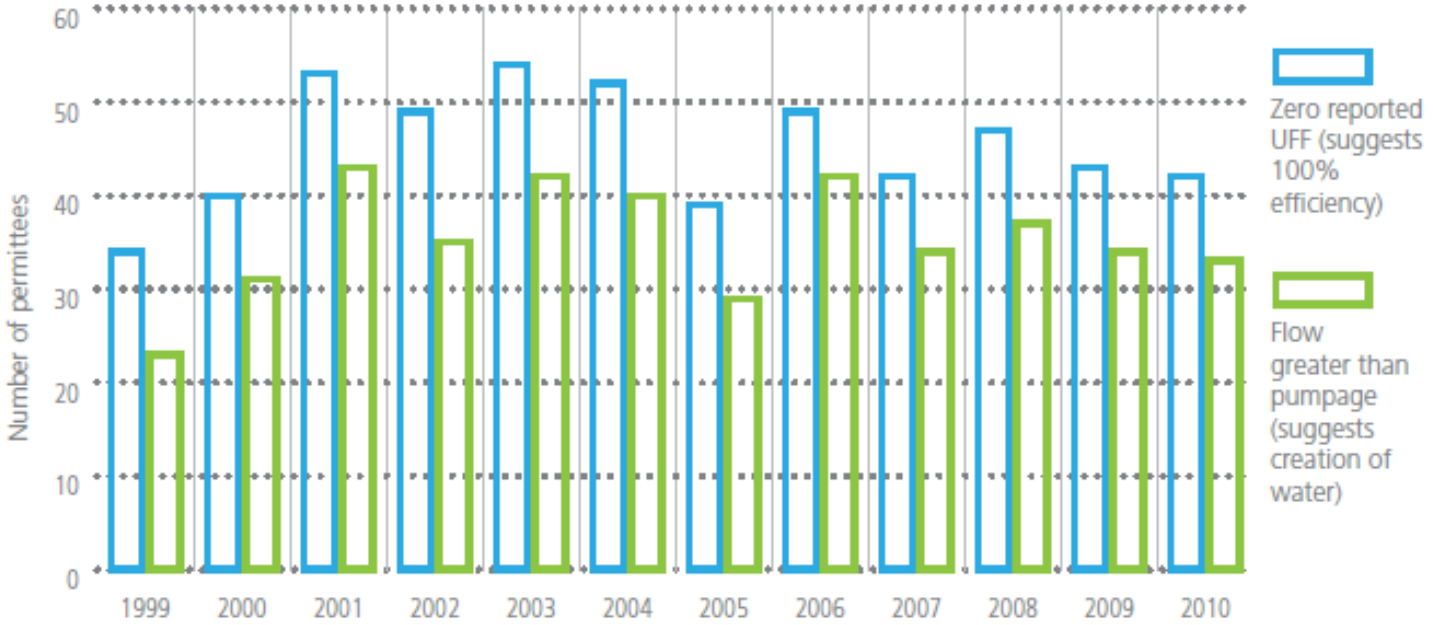


Problem #1: Accounting system

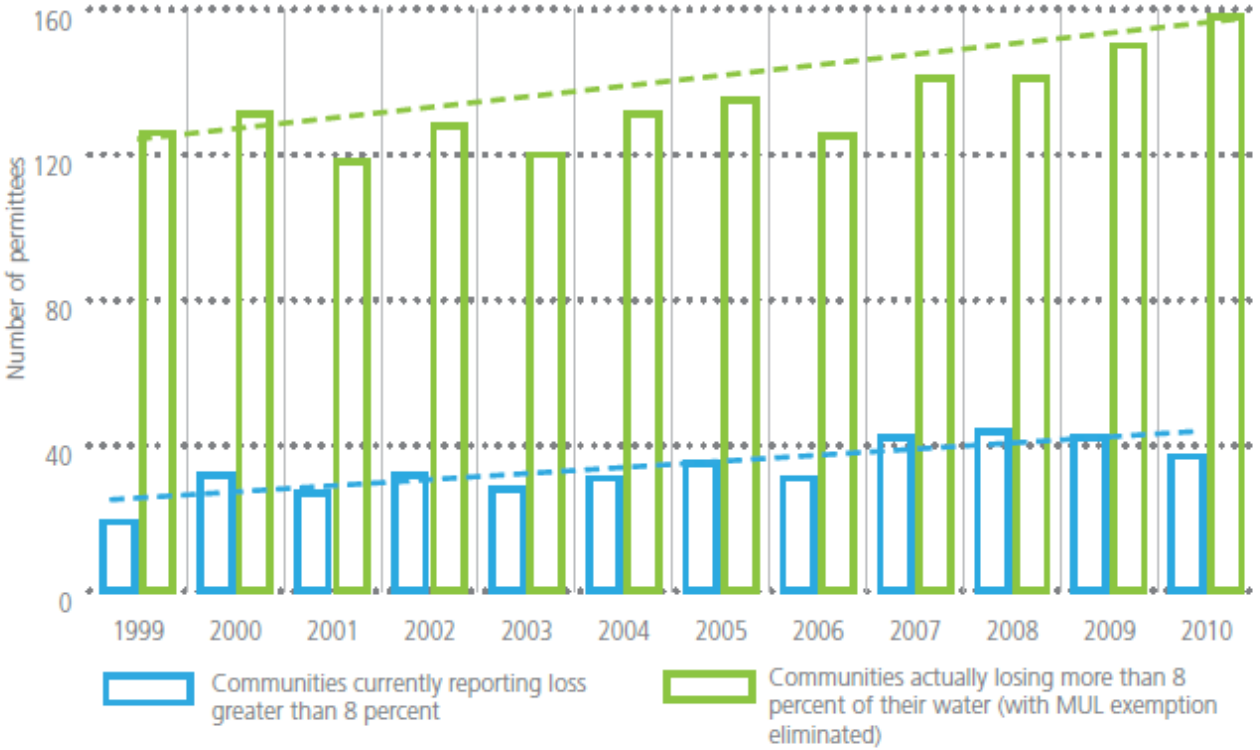


Problem #1: Accounting system

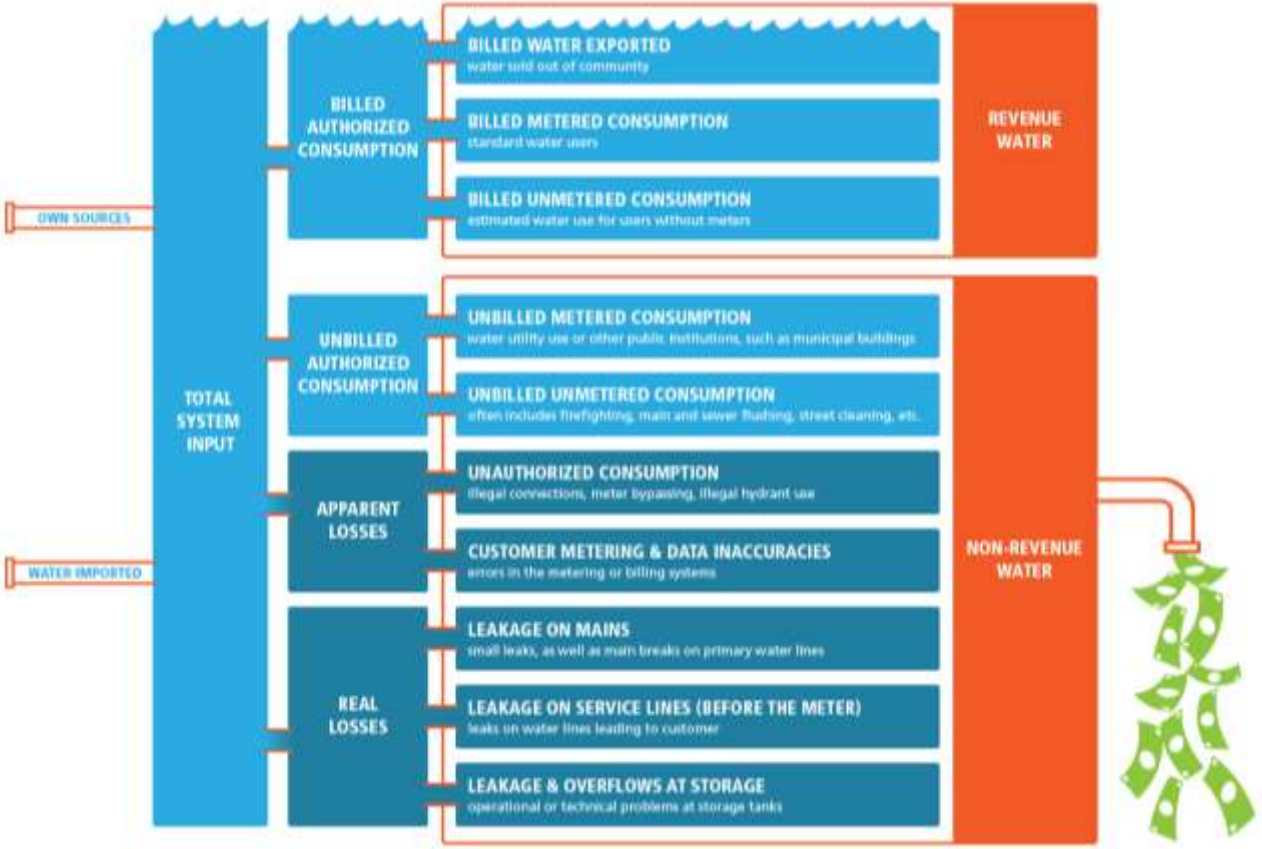
Current formula leads to impossible scenarios of zero water loss, created water



Life without MUL



Solution #1: Non-revenue water



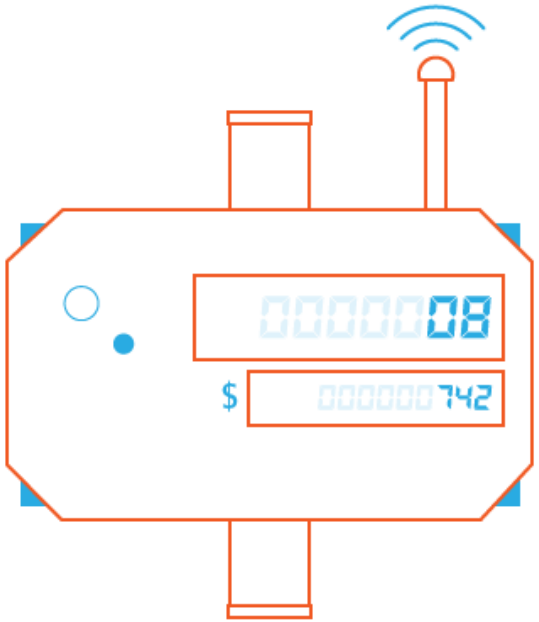
Solution #1: Rethink performance metrics

American Water Works Association

Encourage communities to set water rates based on cost and use comprehensive metering

SOLUTION #2

Problem #2: Water rates & metering

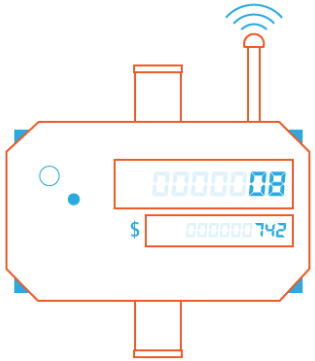


Problem: Water rates that don’t meet costs & lack of meters to track use

Solution: Full-cost pricing & universal metering

Outcome: Sufficient revenue for system maintenance

Problem #2: Water rates



ILLINOIS DEPARTMENT OF NATURAL RESOURCES
LAKE MICHIGAN WATER RATE SURVEY 2005

Thursday, July 28, 2005

Current Rates in $/1,000 gallons | Rate Structure

Permittee	Residential	Commercial	Minimum Rate	Minimum Rate Description	Flat Rate	Declining Rate	Increasing Rate	Bill Frequency
Addison	$3.71	$3.71	$14.60	for 2,000 gallons sewer included	X			Bi-Monthly
Alsip	$2.45	$2.45	$8.94	res./ $18.49 commercial		X		Bi-Mo/quart
Arlington Heights	$3.66	$3.66	$15.00	Usage less than 5000 gallons	X			Bi-Monthly
Bannockburn	$4.88	$4.88	$146.00	minimum bill per quarter	X			Quarterly
Beach Park	$5.40	$5.40	$5.40		X			Bi-Monthly
Bedford Park	$0.00	$2.32	$85.75	minimum 35,000 gallons		X		Monthly
Bellwood	$4.74	$4.74	$4.74	minimum bill	X			Monthly
Bensenville	$4.10	$4.10	$10.65	minimum bill	X			Monthly
Berkeley	$5.60	$5.60	$27.05	2,000 gallons	X			Monthly
Berwyn	$2.82	$1.34	21.11	minimum bill			X	Quarterly/Mo
Bloomingdale	$3.36	$3.96	$8.40	res./ $19.80 comm.- 5K gals	X			Bi-Monthly
Blue Island	$3.04	$3.04	$6.08	minimum 2,000 gallons	X			Monthly
Bridgeview	$4.24	$4.24	$4.24			$1.87>2K		Monthly
Broadview	$3.28	$3.28	$3.28		X			Monthly
Brookfield	$4.92	$4.92	$36.90	res./$12.27per month commercial	X			Quarterly/Mo
Buffalo Grove	$1.80	$1.80	$11.00	$5.50 per month commercial	X			Bi-Month/Mo
Burnham	$2.25	$2.25	$22.50	minimum 10,000 gallons	X			Quarterly
Burr Ridge	$2.50	$3.95	$4.65	fixed charge			$5.60> 60K	Bi-Monthly
Calumet City	$2.79	$2.79			X			Quarterly
Calumet Park	$2.77	$2.77	$25.35	res.9K / $11.58 comm. 3K		$2.46>54K		Quarterly/Mo
Carol Stream	$3.25	$3.25			X			Monthly
Central Stickney Sanitary District	$2.93	$2.93	$4.50	service fee	X			Monthly
Chicago	$1.33	$1.33			X			Bi-Monthly
Chicago Heights	$3.30	$3.30	$8.00	service charge	X			Bi-Month/Mo
Chicago Ridge	$3.13	$3.13	$37.56	res/$12.52 per month commercial	X			Quarterly/Mo
Cicero	$3.42	$3.42	$25.68	first 7,500 gallons	X			Bi-Month/Mo

NOTE: The purpose of this Lake Michigan Water Rate Survey is to provide the reader with a summary of the current water rates of all Lake Michigan domestic permittees. The reader is cautioned that comparing water rates can be very misleading due to the multitude of factors that influence the determination of a water rate.

*Permittee is not currently using Lake Michigan Water

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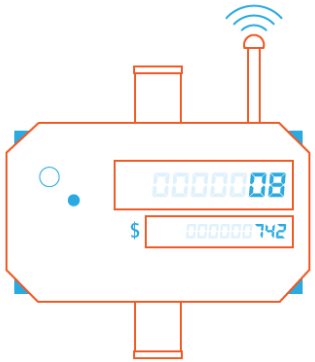
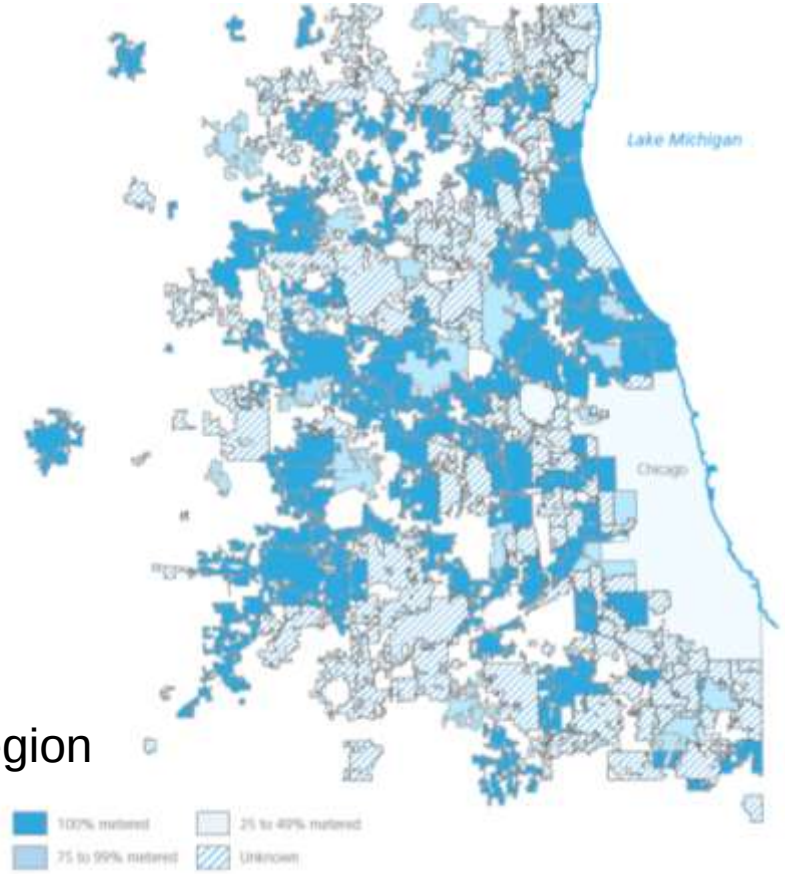
Problem #2: Metering



Inconsistent data on metering across the region



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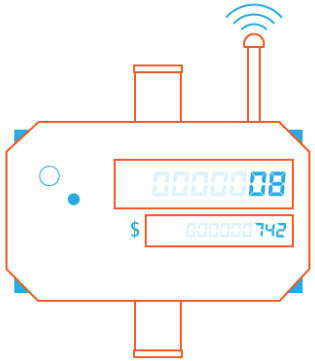
Solution #2: Guidelines for full-cost accounting



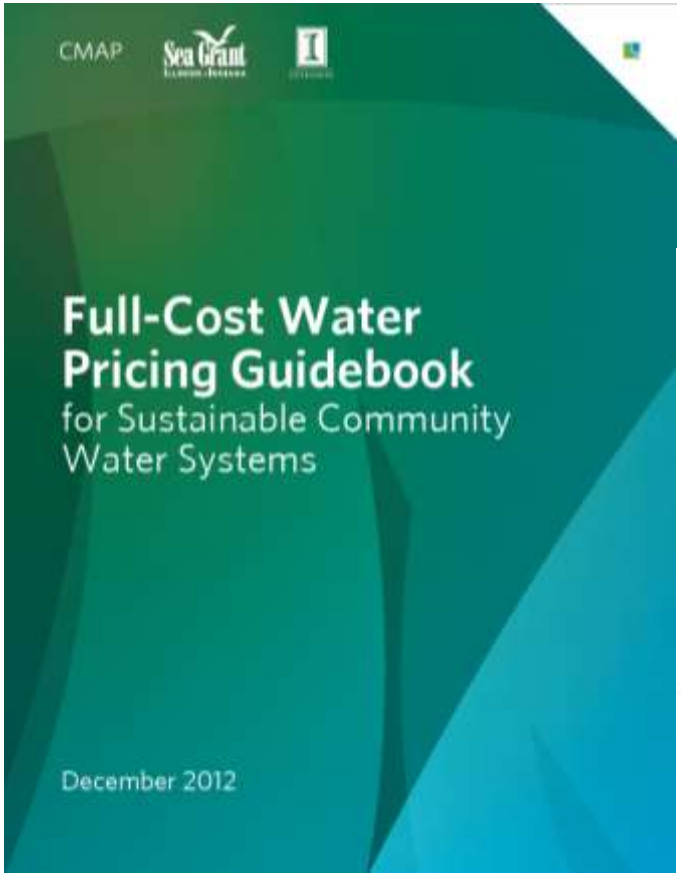
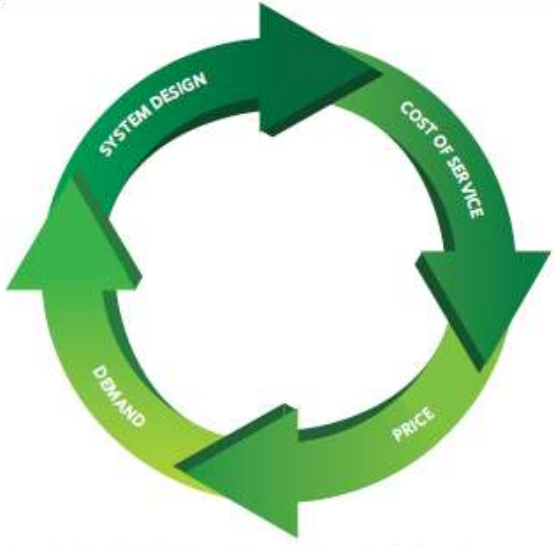


Figure 4. Role of price in system sustainability



Source: Beecher, Janice, Patrick Mann and James R. Landers. Cost Allocation and Rate Design for Water Utilities. The National Regulatory Research Institute, 1991.

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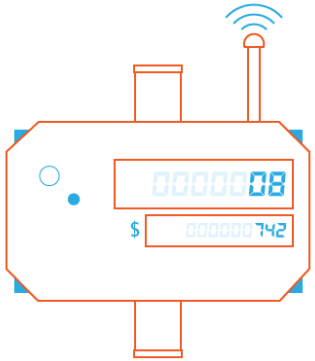
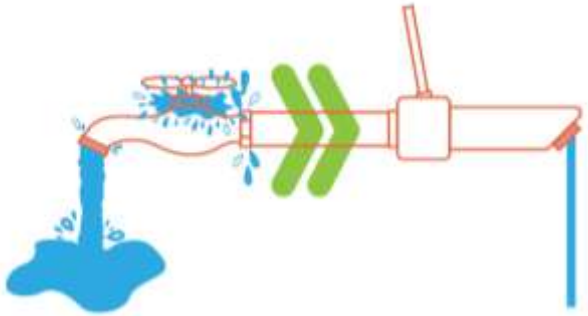
Solution #2: Universal metering



Require permittees to adopt modern plumbing standards

SOLUTION #3

Problem #3: Plumbing standards

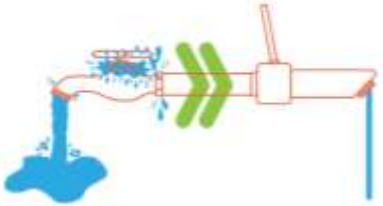


Problem: Inefficient plumbing & waste of potable water

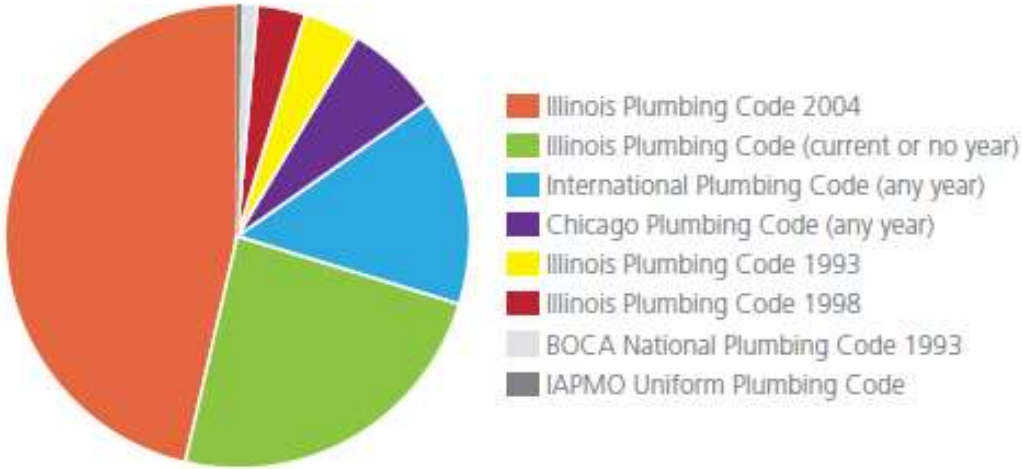
Solution: Modern plumbing standards & non-potable water reuse

Outcome: More efficient use of water

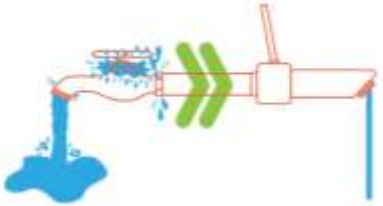
Problem #3: Plumbing standards



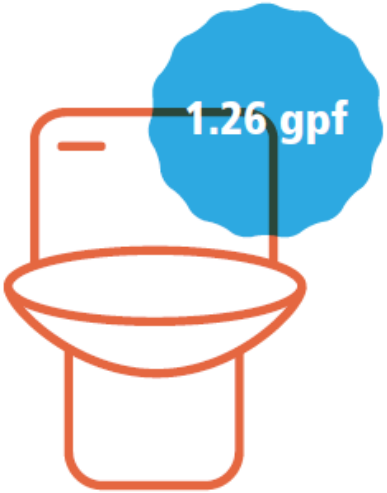
Municipalities often adopt an existing plumbing code rather than writing their own. This sample of 208 northeastern Illinois municipalities reveals a wide variety of codes in place.



Solution #3: Modern plumbing standards

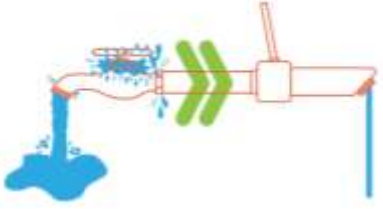


Illinois Department of PUBLIC HEALTH



EPA WaterSense

Solution #3: Non-potable water reuse



POTENTIAL SOURCES

- Rooftop rainwater
- Surface stormwater
- Graywater from showers, sinks, washers
- Cooling condensate
- Steam condensate
- Groundwater ejectors
- Cooling tower "blow down"
- Process wastewater

POTENTIAL USES

- Landscape irrigation
- Green roof irrigation
- Toilet flushing
- Washing machines
- Car/truck washing
- Cooling tower "make-up"
- Boiler "make-up"

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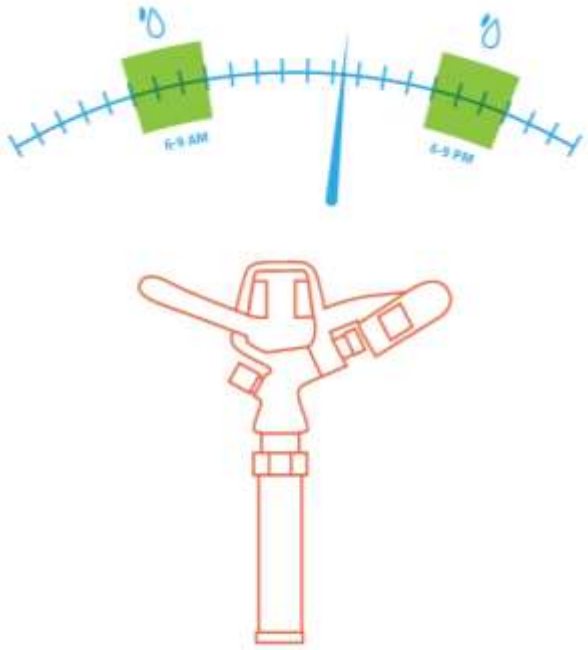
Strengthen and streamline outdoor water use standards

SOLUTION #4

Problem #4: Outdoor water use standards

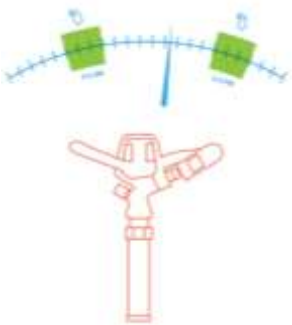


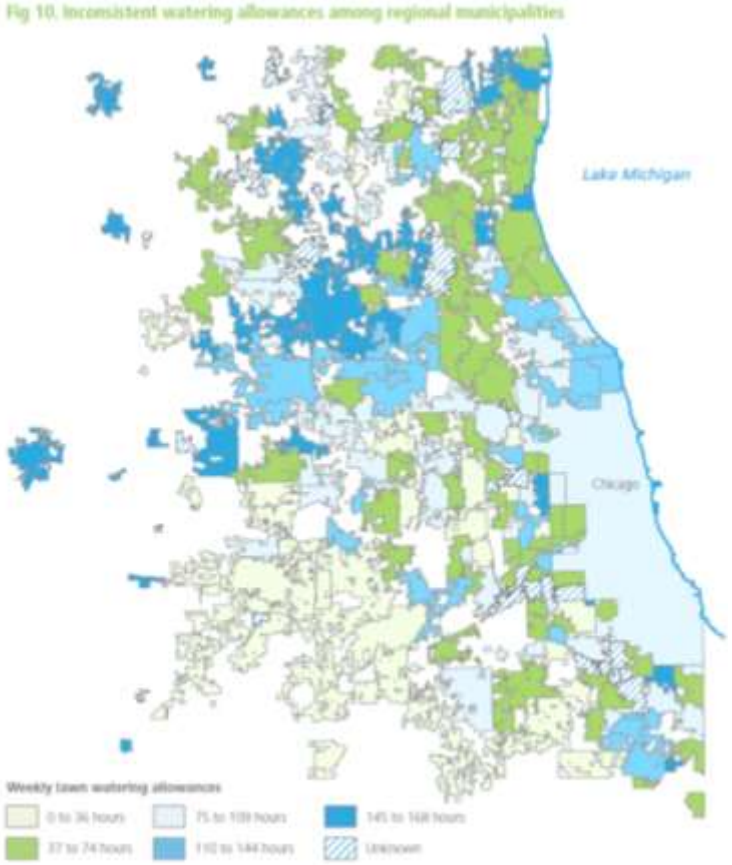
Problem: Treated water used inefficiently for outdoor use

Solution: Stronger/consistent outdoor watering ordinances

Outcome: Reduce peak demand & potable water waste

Problem #4: Outdoor water use standards





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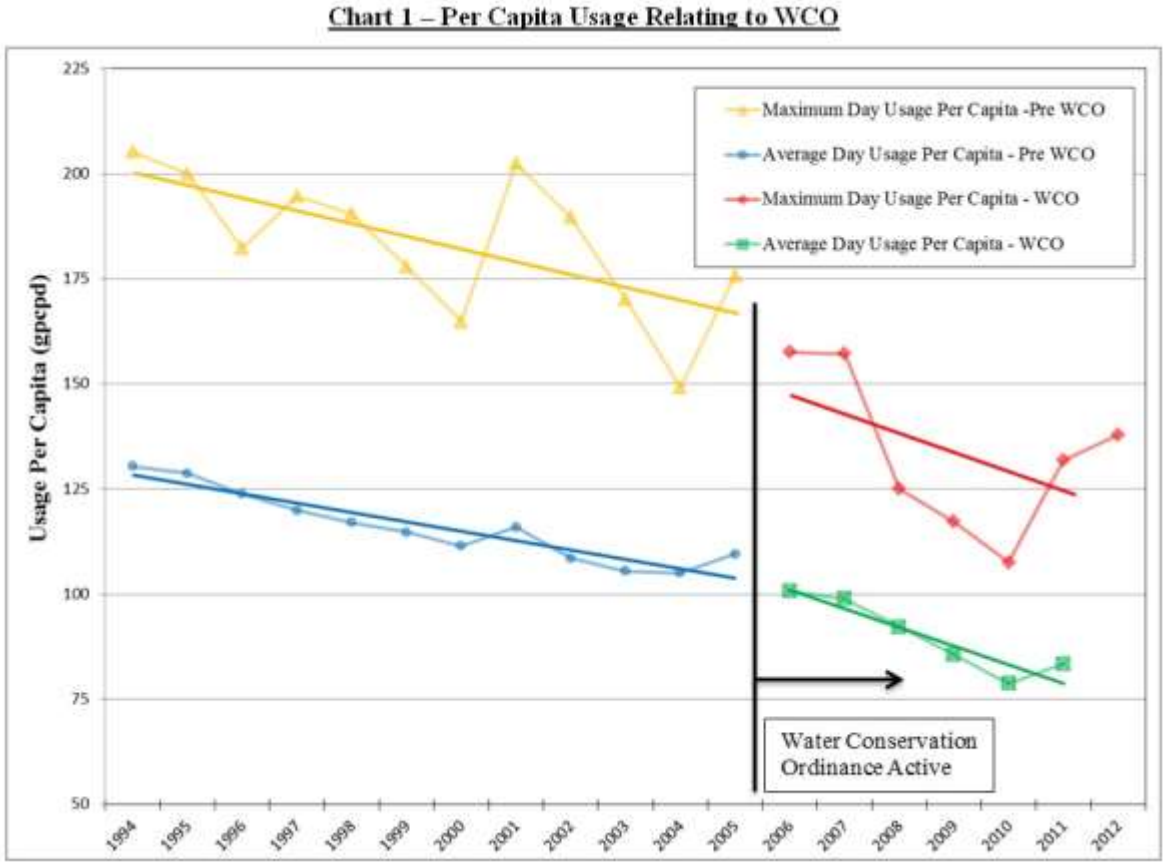
Solution #4: Better outdoor water use standards

Credit: City of Aurora



Increase the capacity of IDNR's Office of Water Resources to provide greater support to permittees

SOLUTION #5

Problem #5: IDNR capacity

Problem: Lack of IDNR staff capacity for proactive measures & collaboration

Solution: Increase capacity for data analysis & working with permittees

Outcome: Improved regional water management

Solution #5: Increase IDNR capacity

Proposed source for revenue to increase IDNR's capacity

Part 1: Base data processing fee of $1,000 = $202,000

Part 2: Fee based on net pumpage (<1MGD, 1-3.9, 4-20, >20) = $89,750

Part 3: Net loss as percentage of net pumpage = $148,250

Part 4: Fee for >1mil gal unmetered use per day = $1,000

Total: $441,100

Contact us:

MetropolitanPlanningCouncil

Josh Ellis

Program Director

jellis@metroplanning.org

@MPCJosh

www.metroplanning.org