

A Regional Water Future with One Water Collaborations

Reflect for a moment, In the past year have heard about...

- Population Growth Impacts
- Climate Change Effects
- Aging Infrastructure Needs
- Water Scarcity

Reflect on the progress...

- Great or Disappointing

Presenting to LUAC



Message

Environmental Services – Who We Are

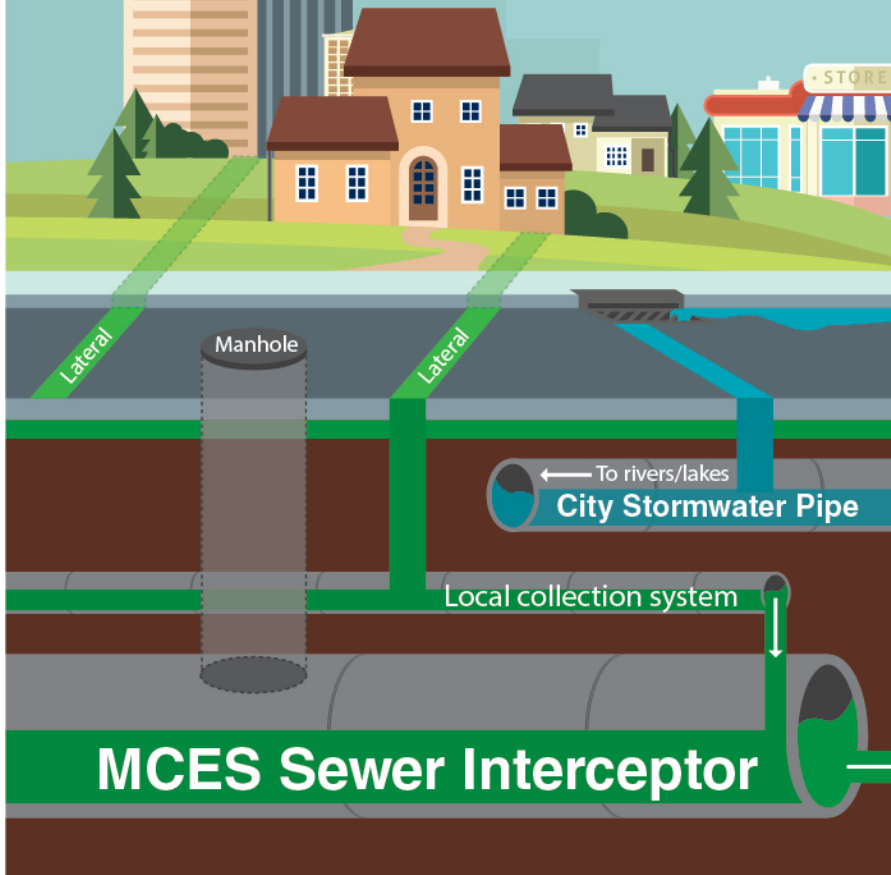
Water History – Understanding is Key to Future

One Water – the Opportunities and Challenges

Wastewater System



We treat wastewater from bathing, laundry, toilets, kitchens, commercial and industrial uses.



Provide wastewater services and integrated planning to ensure sustainable water quality and water supply for the region.

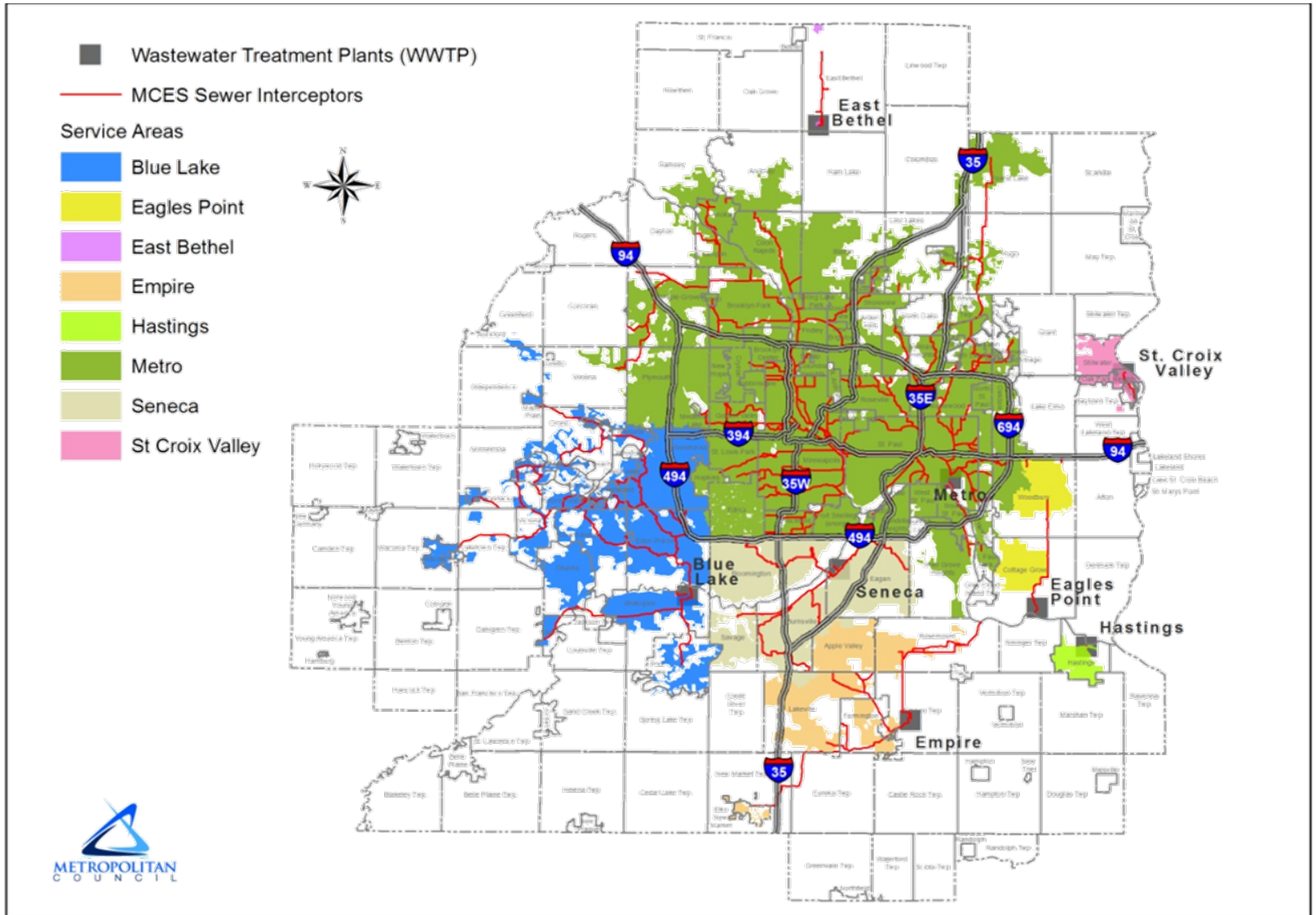
Our treatment process removes pollutants by converting them to small volume of organic solids, and returns clean water to the environment.

To wastewater
treatment
plants



Wastewater
Treatment
Plant

\$7 Billion in Existing Assets



Customer Level of Service

FINANCIAL



CHARGES & FEES
Charges and fees should be predictable, justifiable, and provide good value for the region.



RETAIN AAA BOND RATING
Retain AAA Bond rating in order to provide the lowest cost debt financing possible.



OPTIMIZE BUDGET PLAN
MCES' 5-year budget plan should optimize capital, O&M programs to meet customer service goals.



PRESERVE ASSETS
The region's wastewater assets should be well maintained to preserve their value and performance.



BE FAIR AND TRANSPARENT
Allocation of all charges should be fair, equitable, and transparent to the customer.

HEALTH, SAFETY, & ENVIRONMENT



COMPLY WITH PERMITS
Comply consistently with water, air, and other environmental permits.



MINIMIZE IMPACTS
Convey and treat wastewater safely with minimal backups, spills, and traffic impacts.



LEAD BY EXAMPLE
Be a leader on environmental sustainability, including water/energy conservation and water reuse.

CUSTOMER SERVICE



BE A GOOD NEIGHBOR
Mitigate community impacts related to odors, traffic, noise, and visual aesthetics.



MEET CAPACITY NEEDS
Provide conveyance and treatment capacity consistent with regional and local plans.



COMMUNICATE INFORMATION
Communicate with customers about financial info and capital projects & programs that impact them.



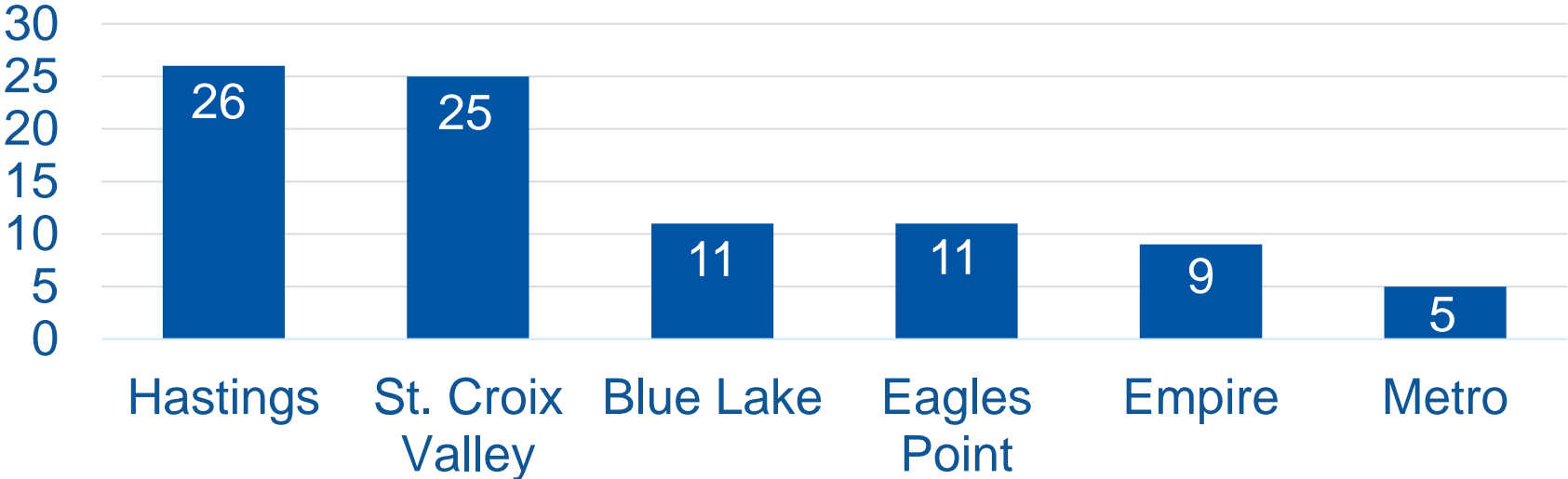
ENGAGE CUSTOMERS
Engage customers in a meaningful public process. Provide notice for changes in rules, fees, projects, environmental performance & resolving competing Council policies/interests.



COORDINATE WITH OTHERS
Optimize intergovernmental coordination in all MCES work that intersects with community work.

Compliance Performance

National NACWA Platinum Level Compliance

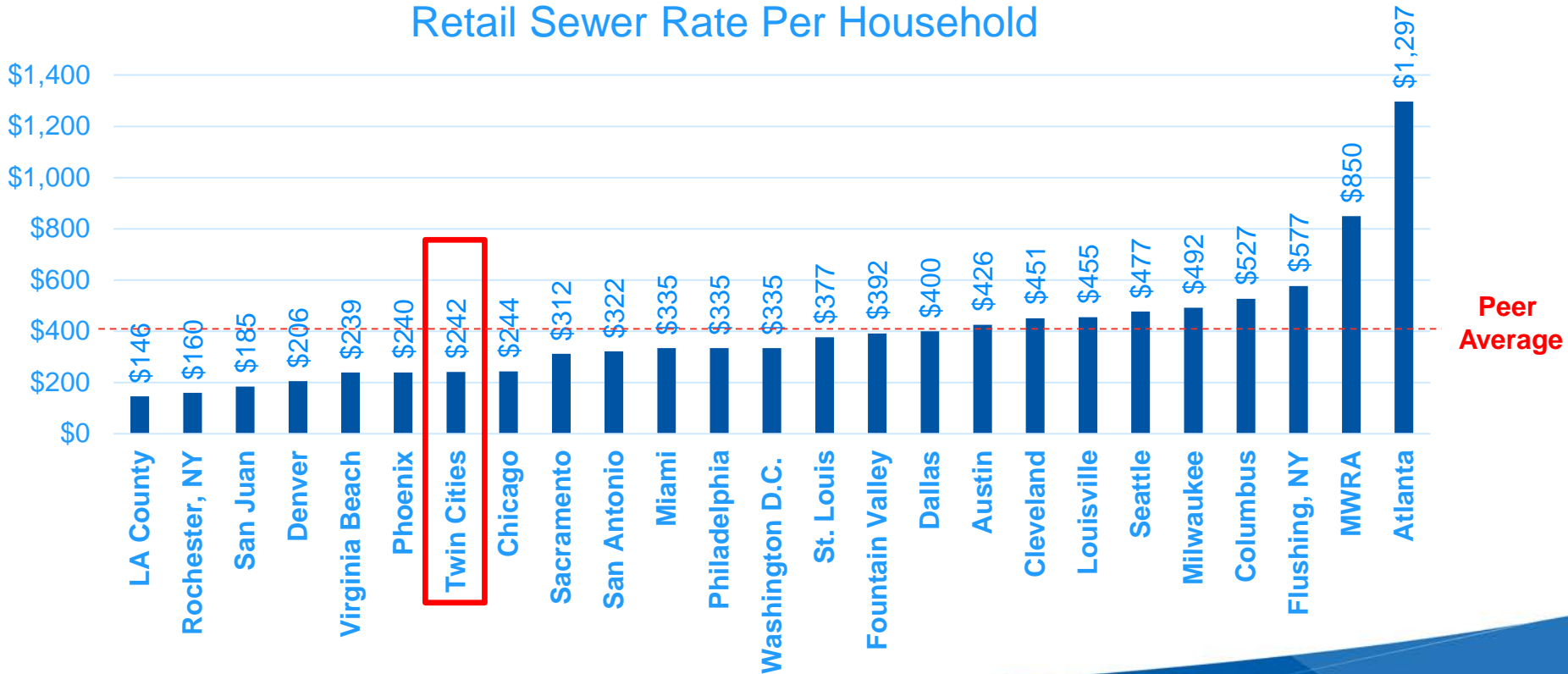


of Years with Greater than 5 Years Continuous Compliance

Comparative Information

25 peer city average retail sewer rate per household = \$404

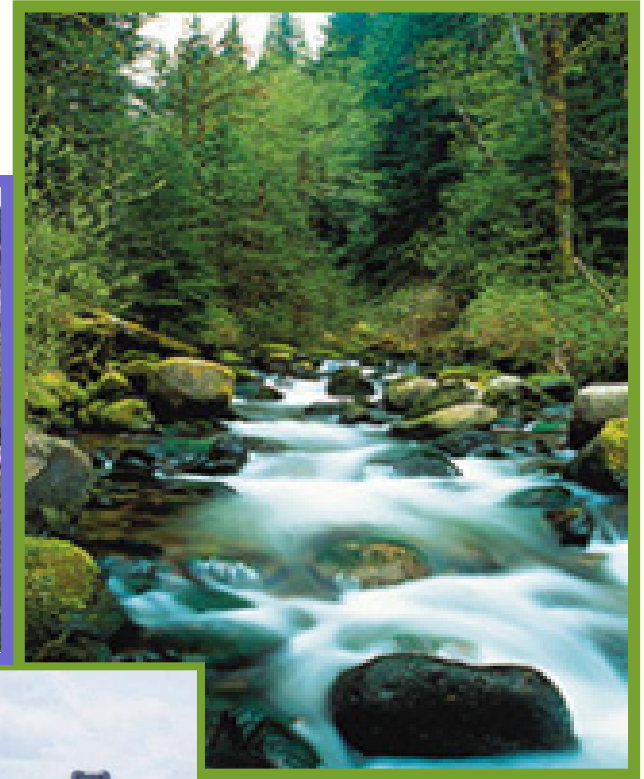
Retail Sewer Rate Per Household



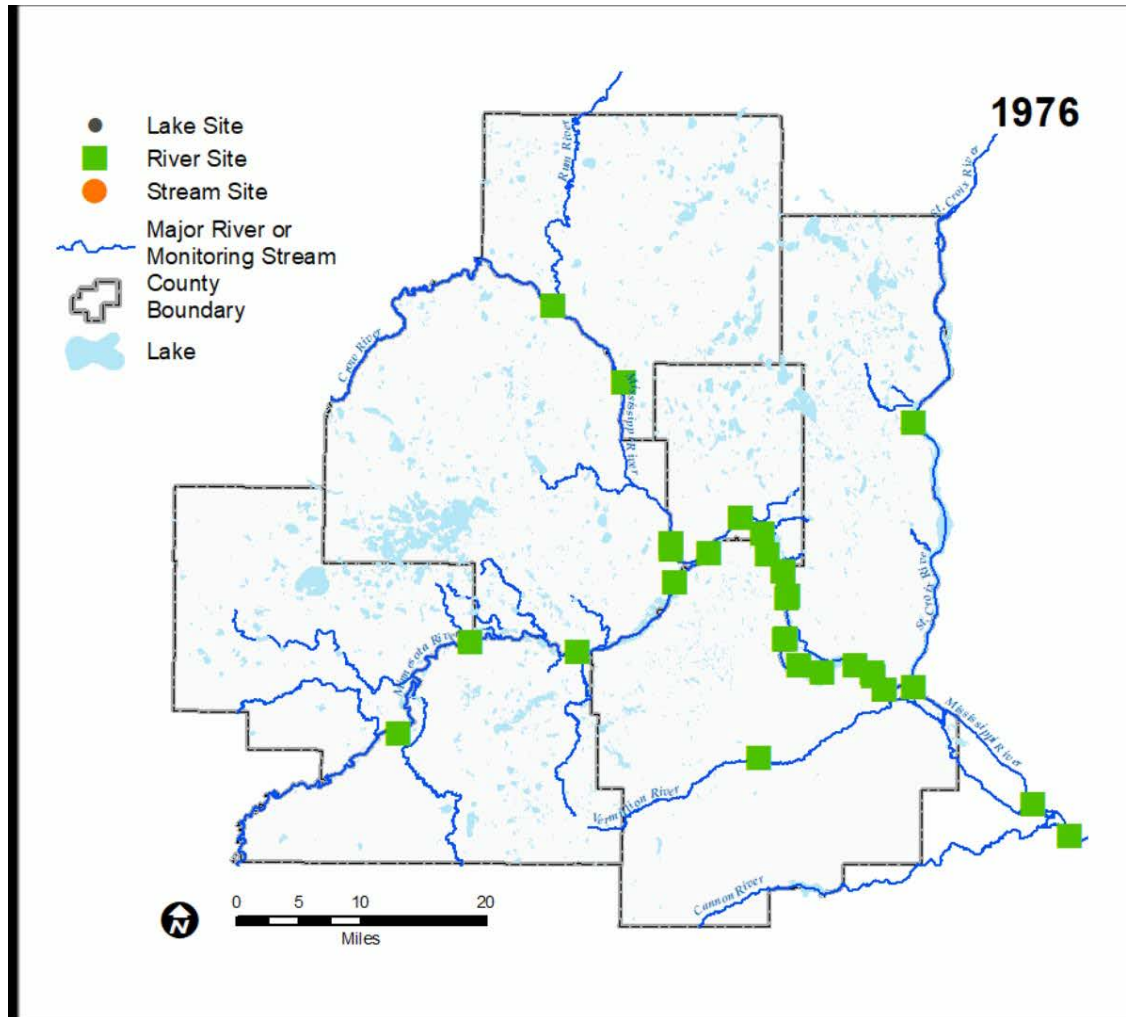
2013 Rates (per 2014 NACWA survey)

Surface Water

Provide wastewater services and integrated planning to ensure sustainable water quality and water supply for the region.



Water Quality Monitoring



Provide a robust dataset to understand surface water quality in the region

Water Supply

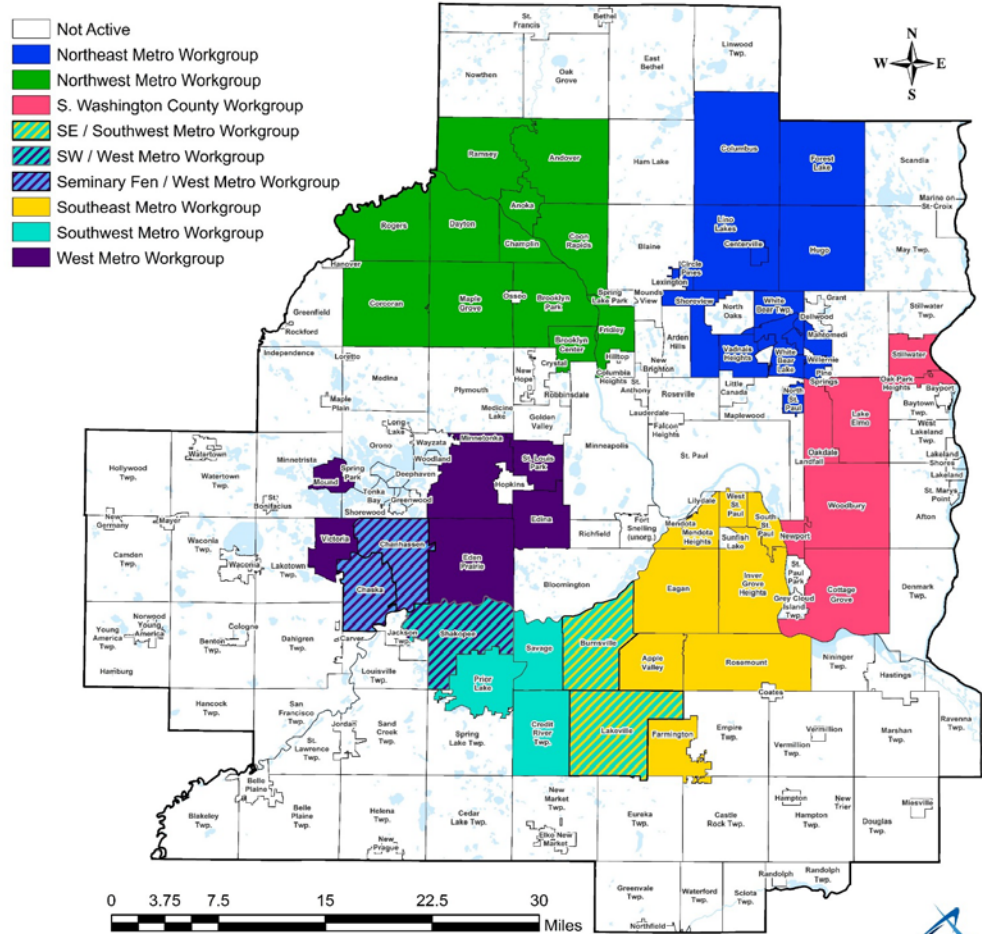
Provide wastewater services and integrated planning to ensure sustainable water quality and water supply for the region.

Metropolitan Area Water Supply Advisory Group

Technical Advisory Group

Sub-Regional Groups (seven)

Communities in Metro Area Water Supply Work Groups





METROPOLITAN COUNCIL

SIGNIFICANT EVENTS

BIG SHIFTS

RESPONSES

A HISTORY OF WATER FOR A THRIVING REGION

1838

- PWS BYE
- POPULATION BOOM
- IF YOU ARE ANXIOUS TO COMMIT SUICIDE PLEASE PURSUE IT AT ST. PAUL SWAMP WATER.
- CONCERNS ABOUT PUBLIC SANITATION OVERLAP

1950

- HOUSING AND SUBURBS ARE BUILT - RAPID POPULATION GROWTH
- MIN. BEE HEALTH: MISSISSIPPI RIVER - A PUBLIC NUISANCE
- DOGS BOWL
- CHOLERA AND TYPHOID UNDER CONTROL

1960

- REGIONAL SPRAWL
- SUBURBAN WASTE WATER PLANTS FAILING

1970

- RIVERS ON FIRE: BEST PRACTICES FAIL NATIONALLY
- CHEMICAL HEALTH RISKS IN DRINKING WATER

1980

- NEWS: SIGNIFICANT RISKS FROM CONTAMINATED GROUNDWATER
- NEWS: DROUGHT!
- NEWS: MAYBE WATCH
- NEWS: ALGAE BLOOM LAKE PEPIN
- FEDERAL FUNDING FOR SEWER SEPARATION AVAILABLE

1990

- MINNESOTA WETLANDS DISAPPEARING
- SAC PROBLEMS
- MIN. LEGISLATURE DIRECTS RESPONSE TO 1988 DROUGHT
- SAVANNE PENN STATE NATURAL AREA
- SAVANNE PENN IMPACTED BY GROUNDWATER WITHDRAWALS
- STAKEHOLDER LETTERS
- WHITE BEAR LITIGATION
- SAC CHALLENGED BY SMALL BUSINESS INTERESTS

2000

- WASTEWATER SERVICE EXPANSION

2010

- LARGE REGIONAL GROWTH PROJECTIONS
- FINALIST FOR 2015 NATURAL RESOURCES AWARD

2016

Thrive MSP 2040

RESPONSES:

- LAND FOR GRANT MILLS BECOMES MINNEAPOLIS
- MINNEAPOLIS BUILDS FIRST COMBINED SEWER
- BECAME KNOWN AS "TWIN CITIES"
- CONSTRUCTION METRO WATER REUSE PLANT
- SUBURBS END FRESHWATER WASTE WATER
- MINNESOTA + ST. PAUL ENDS ADD TO WASTE QUALITY MAINTENANCE
- MIN. LAND PLANNING ACT
- MET. COUNCIL WATER QUALITY MANAGEMENT DEVELOPMENT GUIDE
- NURP CREATED BY BPM
- LAKE MAINTENANCE BEGINS
- INDUSTRIAL PRE-TREATMENT PROGRAM CREATED
- US SAFE DRINKING WATER ACT
- METRO SURFACE WATER REUSE ACT
- MINNEAPOLIS AND ST. PAUL WATER WORKS
- 3M BUILT
- PRECURSOR TO MET. COUNCIL BEGINS MONITORING WATER QUALITY
- MINNEAPOLIS AND ST. PAUL WATER WORKS
- LOCK AND DAM #1
- METRO PLANT OPERATING
- FIRST SOLID WATER CONSERVATION DISTRICT
- SEWER AVAILABILITY CHARGES (SAC) CREATED
- METRO CITIES FORMS
- US SAFE DRINKING WATER ACT
- METRO SURFACE WATER REUSE ACT
- MIN. LAND PLANNING ACT
- MET. COUNCIL WATER QUALITY MANAGEMENT DEVELOPMENT GUIDE
- NURP CREATED BY BPM
- LAKE MAINTENANCE BEGINS
- INDUSTRIAL PRE-TREATMENT PROGRAM CREATED
- US SAFE DRINKING WATER ACT
- METRO SURFACE WATER REUSE ACT
- THINK TROPIC WATER QUALITY IMPROVEMENT LEADERSHIP
- MIN. WETLAND CONSERVATION ACT
- METRO ENERGY RECOVERY SYSTEM BUILT
- COMBINED SEWER OVERFLOW TREATMENT PLANT
- METRO ENERGY RECOVERY SYSTEM
- COMBINED SEWER DIVERSION TREAT PLANT
- ACCELERATED MSP
- U.S. SAFE DRINKING WATER ACT AMENDED
- TANK CREEP WEIRD AREA WATER SHOCK! A PLAN FOR ACTION
- METRO AREA SHED TALKS WATER SUPPLY PLAN
- NATL POLLUTANT PROGRAMME BUREAU SYSTEM (NPPS)
- MN WETLAND CONSERVATION ACT
- PHASE I SIDEWALKER 1/1 - 97 FROM
- METRO LAND PLANNING ACT REQUIRES COMP PLANS TO INCLUDE WATER PLANNING
- SAC TASK FORCE
- TANK CREEP WEIRD AREA WATER SHOCK! A PLAN FOR ACTION
- METRO SURFACE WATER PROTECTION ACT
- MET. COUNCIL STREAM MONITORING BEGINS
- MINNEAPOLIS + ST. PAUL AREA SHED TALKS WATER SUPPLY PLAN
- MN VOTERS PASS THE CLEAN WATER LAND AND LEGACY AMENDMENT
- METRO PLANT TIER 2 PHASE 2 REMEDIATION STUDIES
- NPPS EXPANDED
- GRANT FINANES FOR NURP'S SOURCE TRIP
- SOUTHSHORE WATER SUPPLY WASH GOOD
- 2008 REGIONAL DRY PLANNING
- MCE'S SETS WIDE-SCALE STRATEGIC PLAN FOR SUSTAINABLE SOLIDS MANAGEMENT
- MET. COUNCIL WATER SUPPLY PLANING
- METRO AREA WATER SUPPLY NOX CON.
- WATER RESOURCES MANAGEMENT PLAN
- MIN. VOTERS PASS THE CLEAN WATER LAND AND LEGACY AMENDMENT
- 6 ACTIVE SUBREGIONAL WATER SUPPLY GROUPS
- THURVE MSP 2040 ADOPTED BY METROPOLITAN COUNCIL
- COMMUNITY TECHNICAL WORK GROUP ADVISES ON MASTER PLAN UPDATE
- ONE WATERSHED, ONE PLAN
- UMBERELLA PERMIT
- EAST BETHEL PLANT GOES LIVE
- 2040 WATER RESOURCES POLICY PLAN
- WATER SUPPLY TECHNICAL ADVISORY COMMITTEE FORMED
- TARGETED STREAM WATER MANAGEMENT GRANT PROGRAM 81.5M
- EMPIRE PLANT RECOGNIZED AS A ROLE MODEL
- SANTS STADIUM / TRANSIT RECOGNIZED FOR STORM WATER REUSE

PROTECTING PUBLIC HEALTH

PROTECTING PUBLIC HEALTH + THE ENVIRONMENT

PRESERVING & IMPROVING ENVIRONMENTAL ECOSYSTEMS HEALTH

INTEGRATING ALL 3 FOR LIVABLE SUSTAINABLE CITIES

The Water Supply City



- Water for Potable Use
- Water for Non-potable Use

Evolution of Water Management

The Sewered City



- **Wastewater Management**

Evolution of Water Management

The Drained City



- **Stormwater Disposal**
- **Flood Risk Reduction**

Evolution of Water Management

1994

Environmental Services
Becomes Part of
Metropolitan Council

Minneapolis-
St Paul
Sanitary
District

1933

1967

Metropolitan Council

1969

Metropolitan Waste
Control Commission

Metropolitan Sewer
Board

The Waterways City



- **Stormwater Hydrology & Quality**
- **Improved Habitat**
- **Ecological Health**
- **Places for Social Interaction**
- **Recreational Opportunities**
- **Aesthetic**

Evolution of Water Management

One Water Water Cycle City



- **Total Water Cycle Management**
- **Integrated Water Systems**

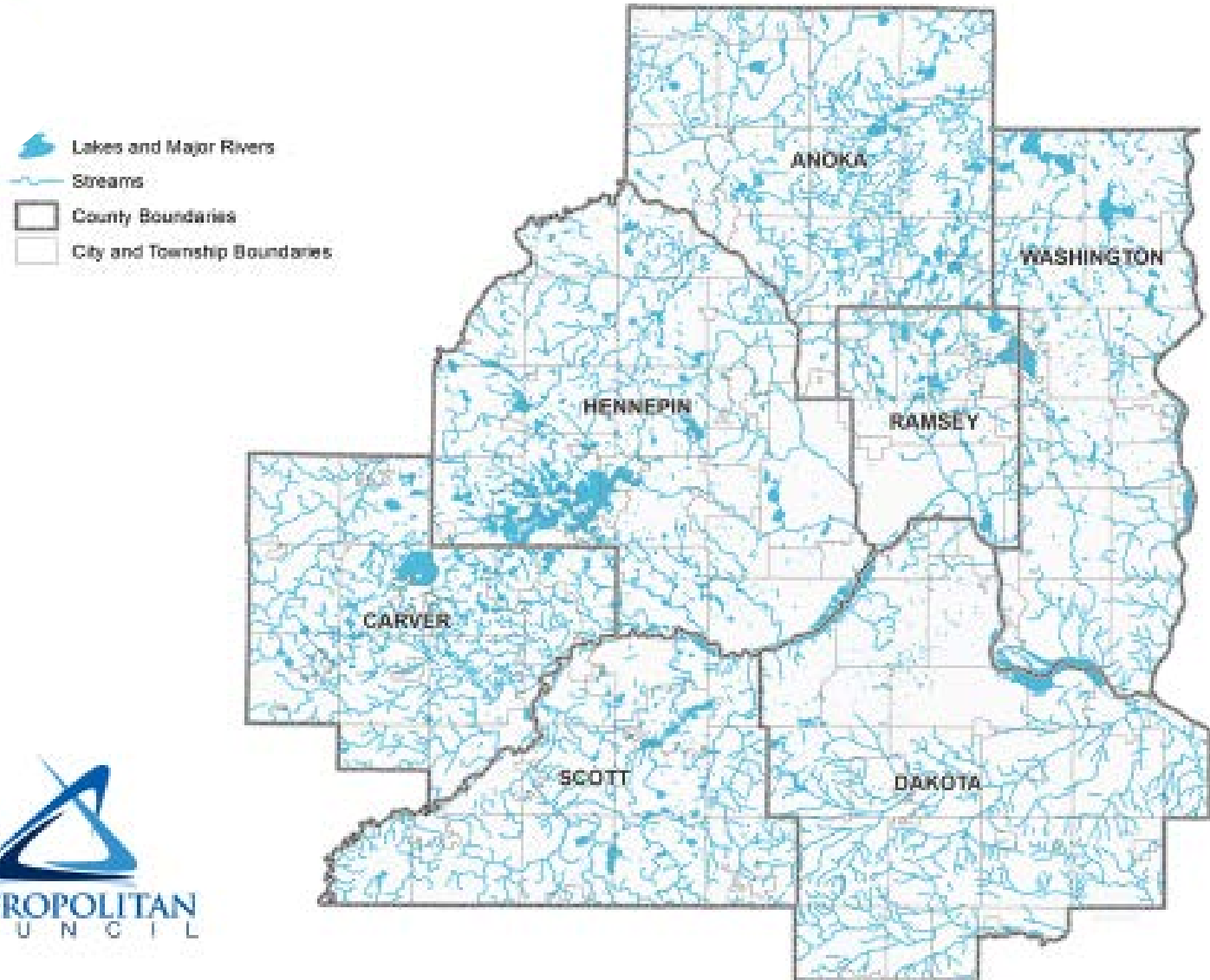
Evolution of Water Management

***Transformation
Becomes a Water
Utility News Theme***

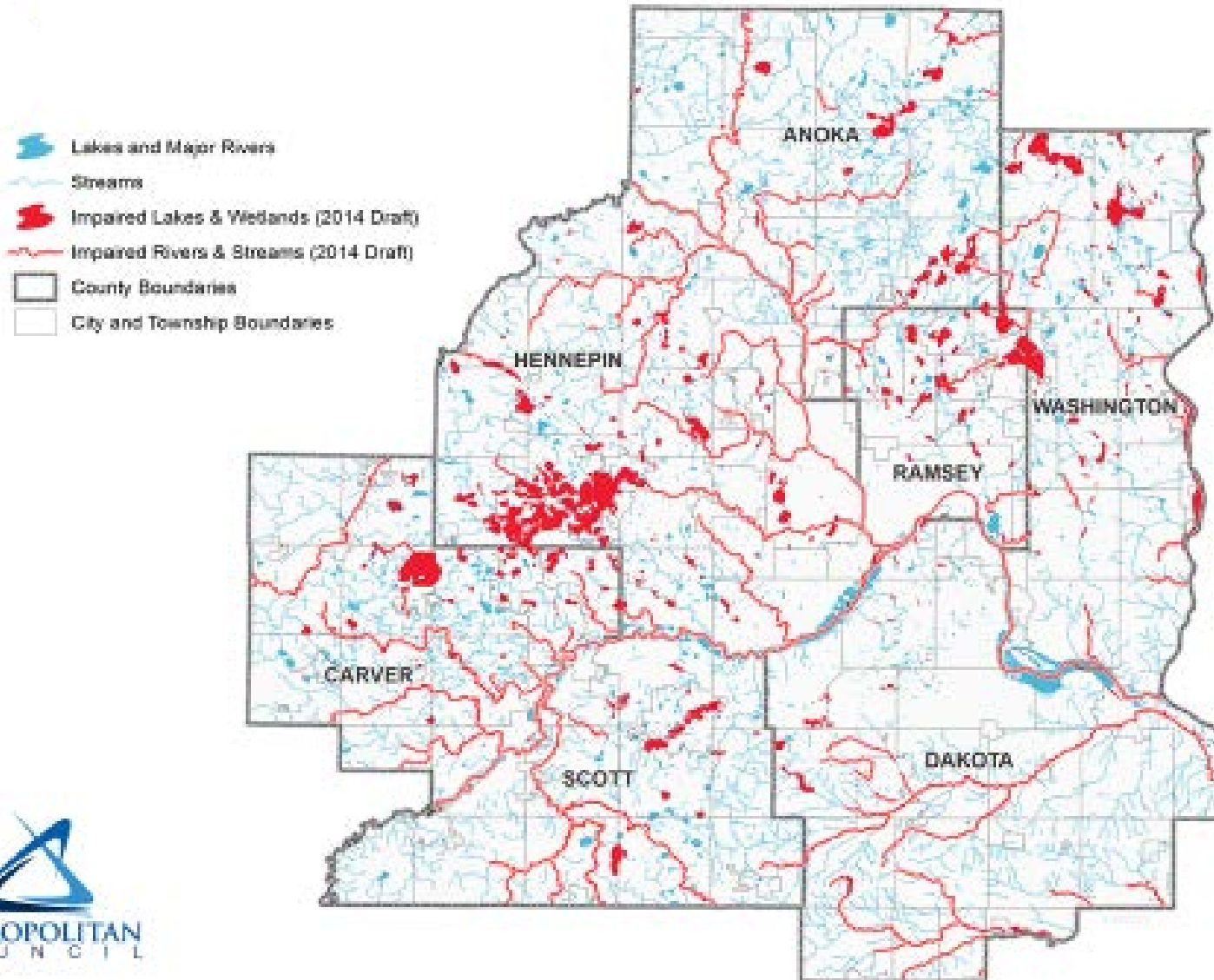


***Water
Challenges in
Minnesota Call
for
Transformation***

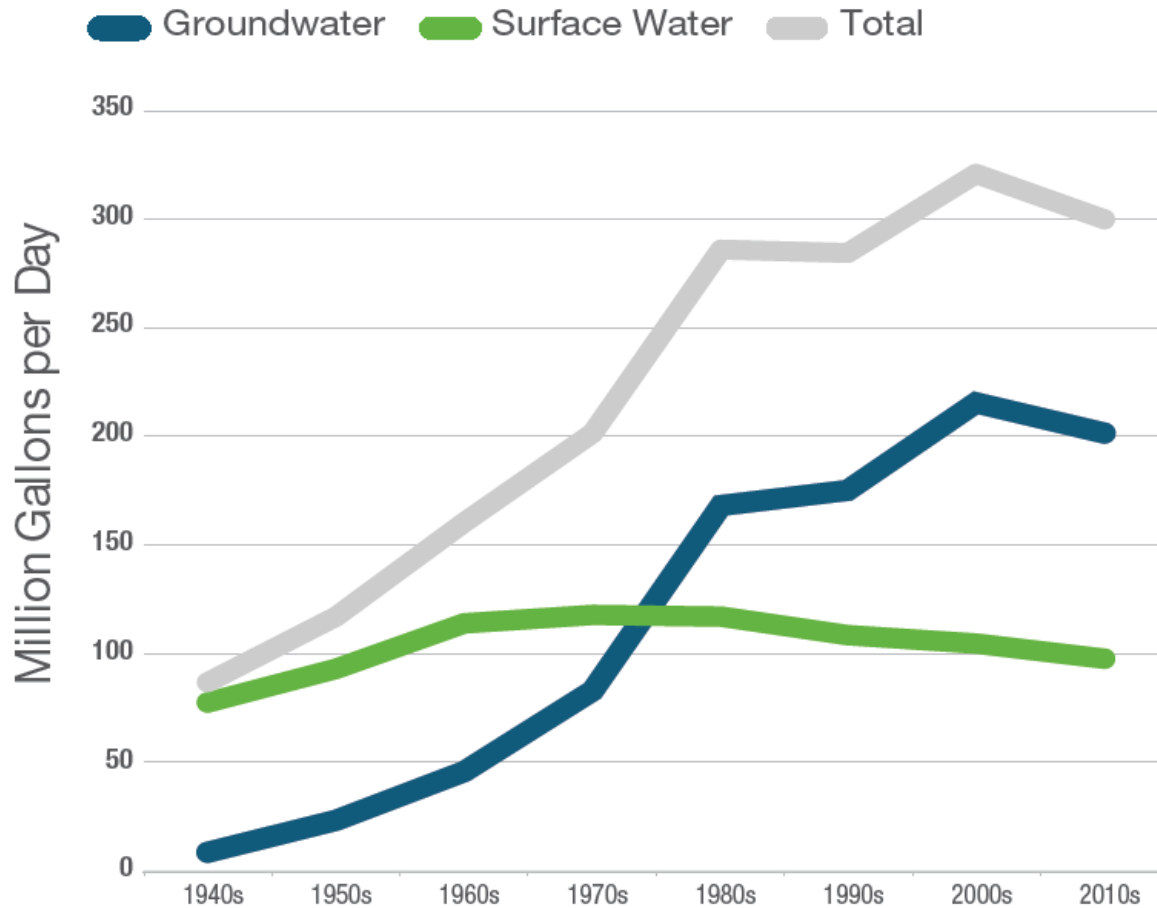
Waters of Region



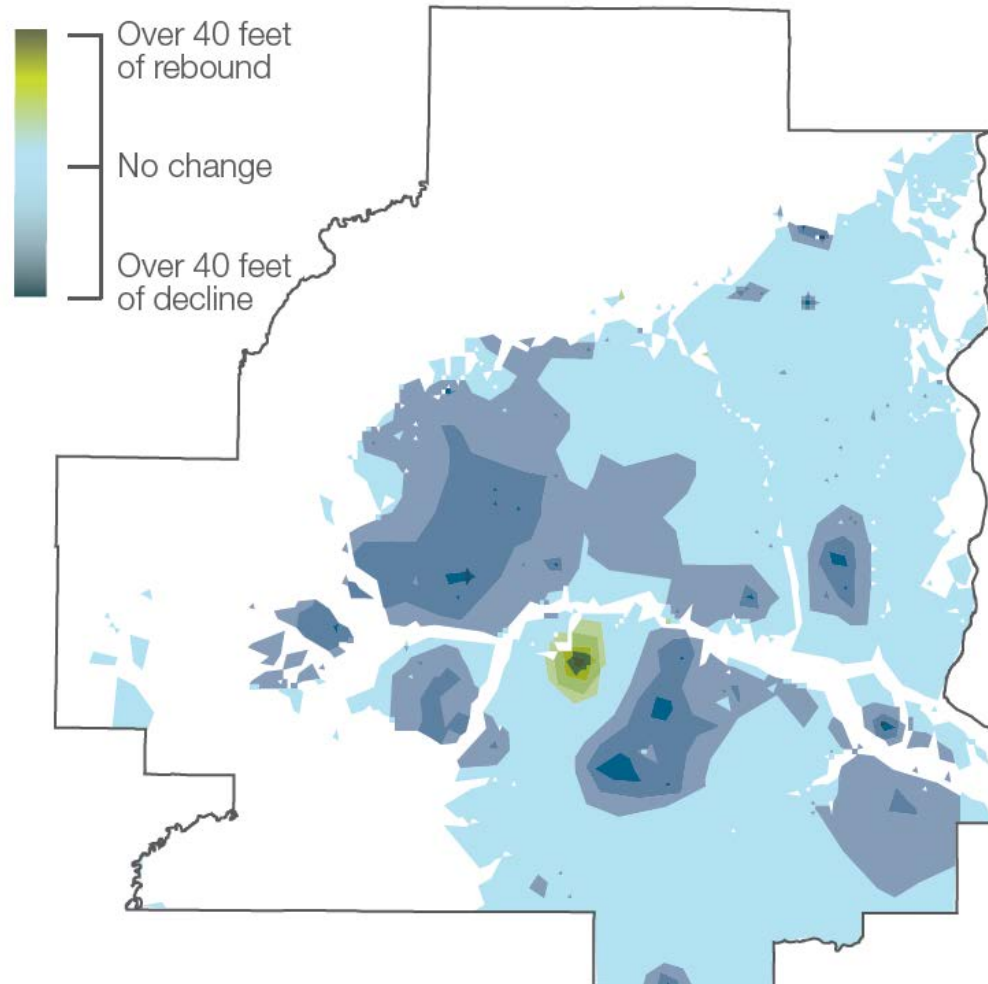
Impaired Waters of the Region



Water Supply Sources



CHANGE IN PRAIRIE DU CHIEN-JORDAN AQUIFER LEVELS FROM 2040 PUMPING



We Need to Change

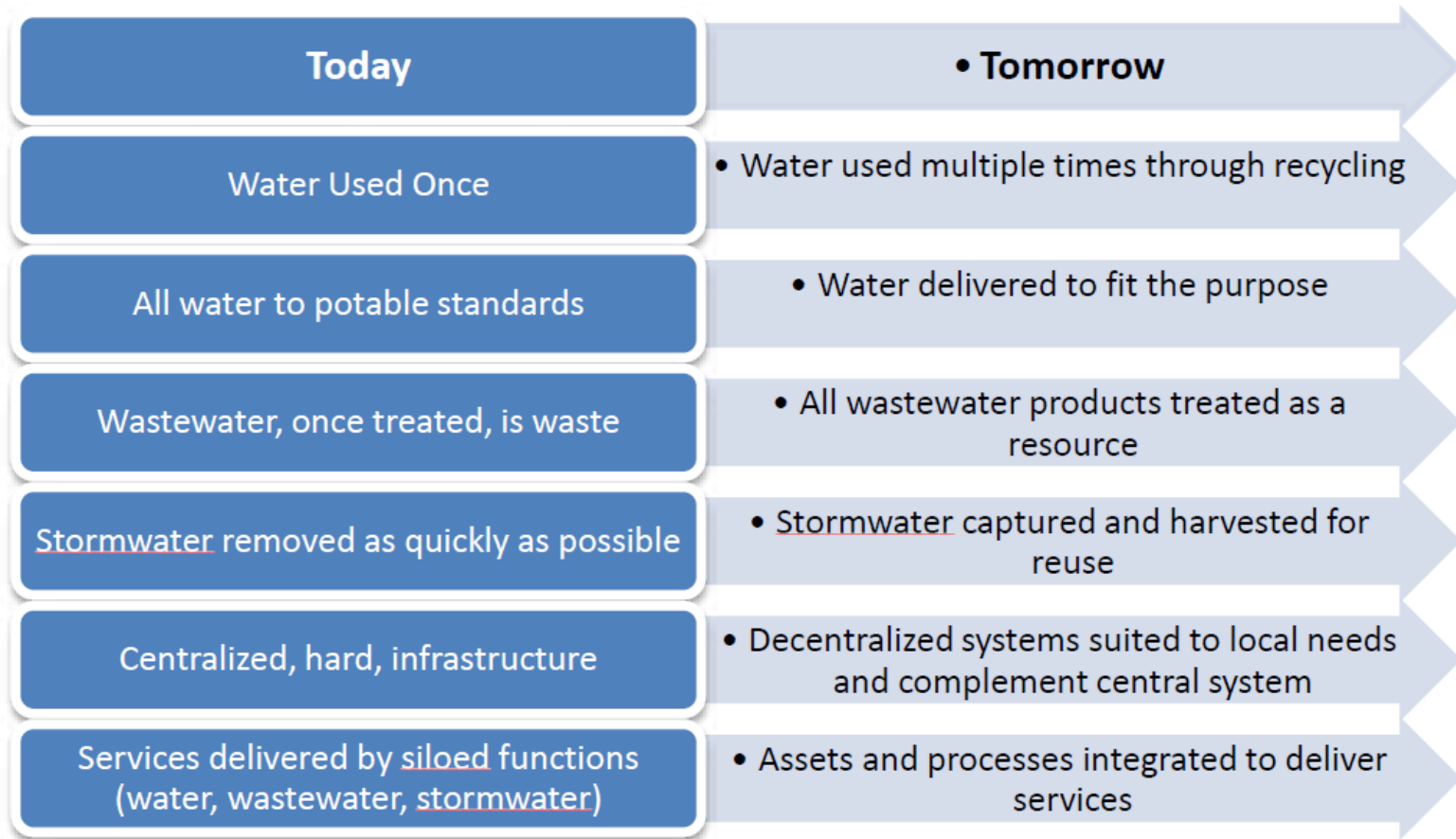


You can't solve today's
problems with the same
thinking that created
them Einstein

One Water

At it's heart, the One Water approach is about diverse stakeholders coming together to advance common-ground solutions to our water challenges.

Integrated Approach – One Water



Institutional Barriers	Underlying Causes
Planning that is uncoordinated and non-collaborative	Lack of an agreed upon and unifying vision
Economic and financial systems that are restrictive and traditional	Lack of leadership and political will
Legislation and regulations that are prescriptive, overlapping, and inconsistent	No clear drivers or sense of urgency
Citizen engagement that is uncoordinated, technical, and uninspiring	Lack of capacity for systems thinking/integration across water and other utilities or urban planning
Organizational and professional cultures that are siloed and inflexible.	Uncoordinated methods and processes for data collection, information sharing, and messaging

APWA Reporter / May 2016 / www.apwa.net

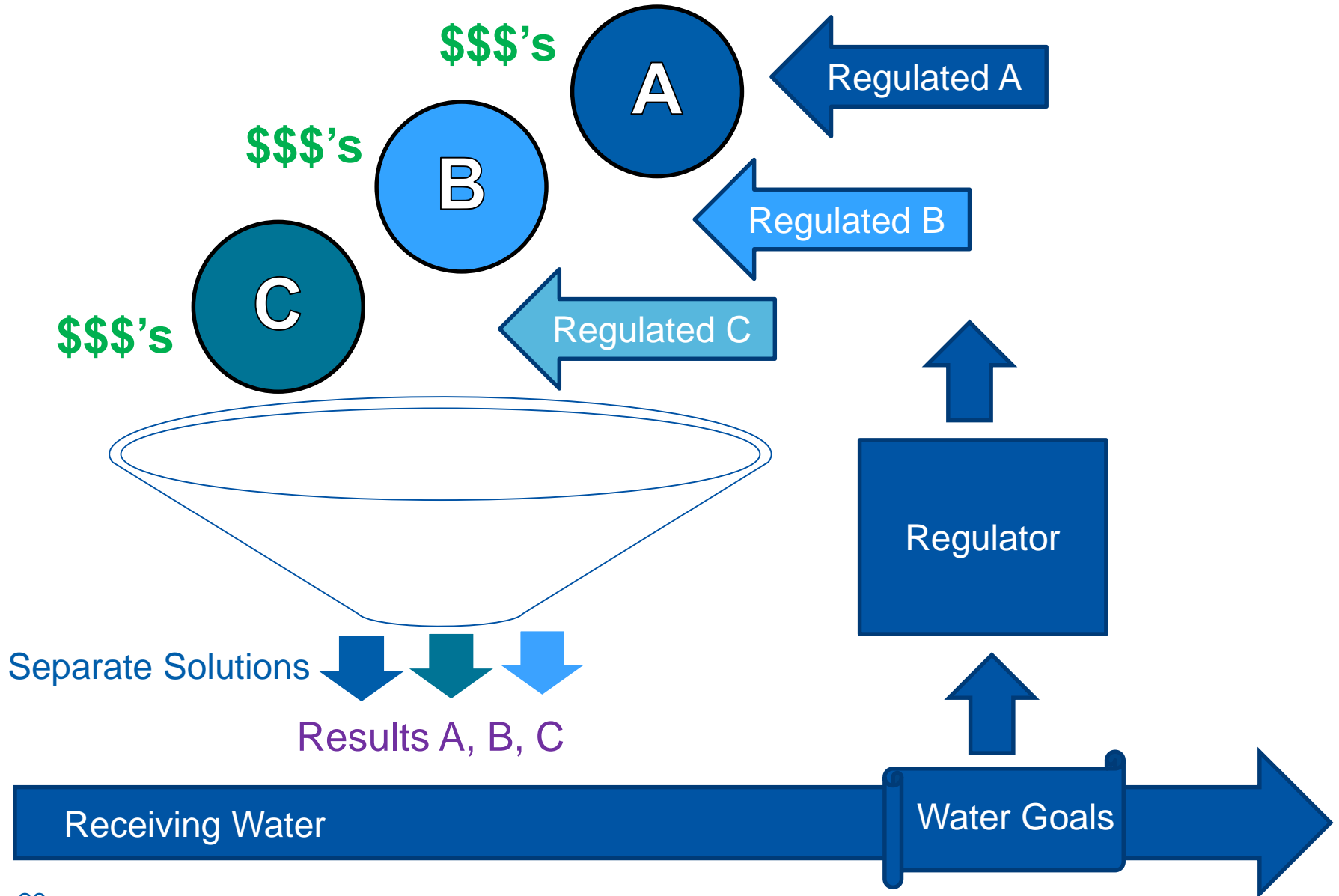
Modernizing the Clean Water Paradigm*

Creating a Modern Statutory Construct

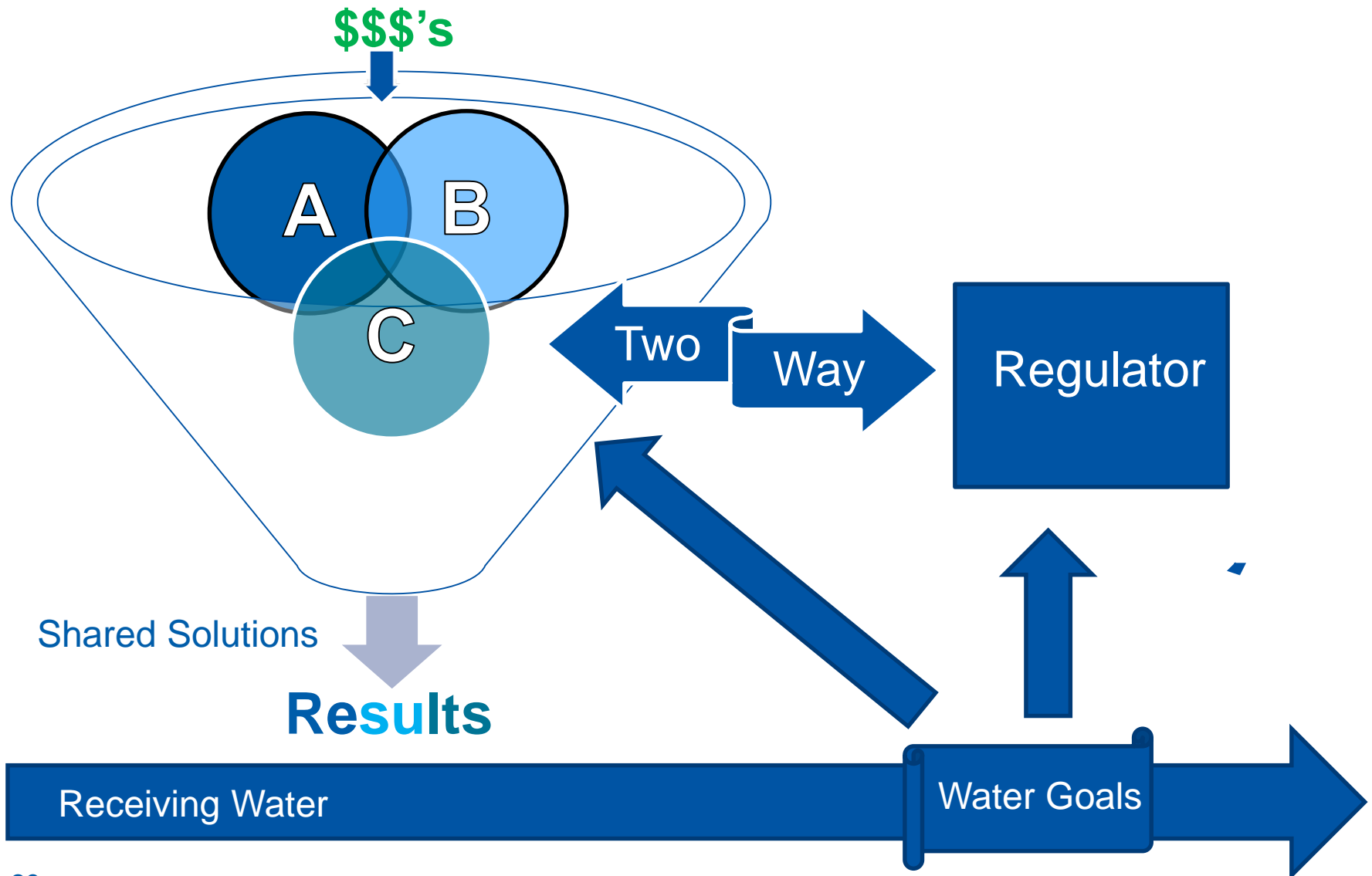
- Management of Water Quality Based on a Watershed Approach
 - A Unified Approach to Drinking Water and Clean Water Management
 - Empowering Utilities and Communities to Prioritize Clean Water Compliance
 - Support and Encourage Innovation
-
- **Creating New Relationships with Regulators**
-
- **Creating New Relationships with Stakeholders and the Public**

*NACWA - National Association of Clean Water Agencies

Traditional Statutory Construct



New Statutory Construct - Collaboration

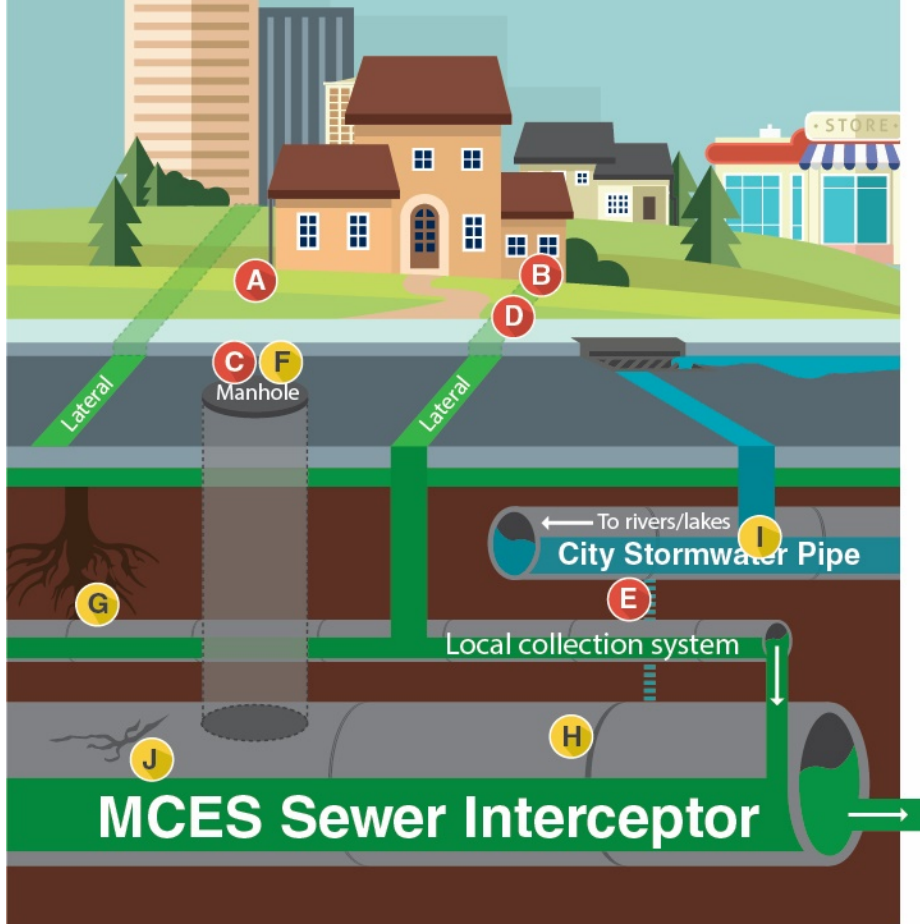


One Water...

- A Few Examples/Opportunities

What is inflow & infiltration?

I/I are ways that clear water makes its way into sanitary sewer pipes



INFLOW

- A Roof Drain Connection
- B Sump Pump or Foundation Drain Connection
- C Deteriorated Manhole
- D Uncapped or Broken Clean-Out
- E Storm Cross Connection

INFILTRATION

- F Faulty Manhole Cover/Frame
- G Root Intrusion
- H Open Joints
- I Faulty Service Connection
- J Broken or Cracked Pipe

I/I Program Goals



Protect Public Health by avoiding backup of sewage into basements



Protect Water Quality by avoiding spills to lakes and rivers



Maintain Economic Efficiency by avoiding unnecessary expansion of sewers and treatment plants

Minimal Impact Design Standards (MIDS)



MIDS represent the next generation of stormwater management in Minnesota.



Minimize stormwater runoff and pollution



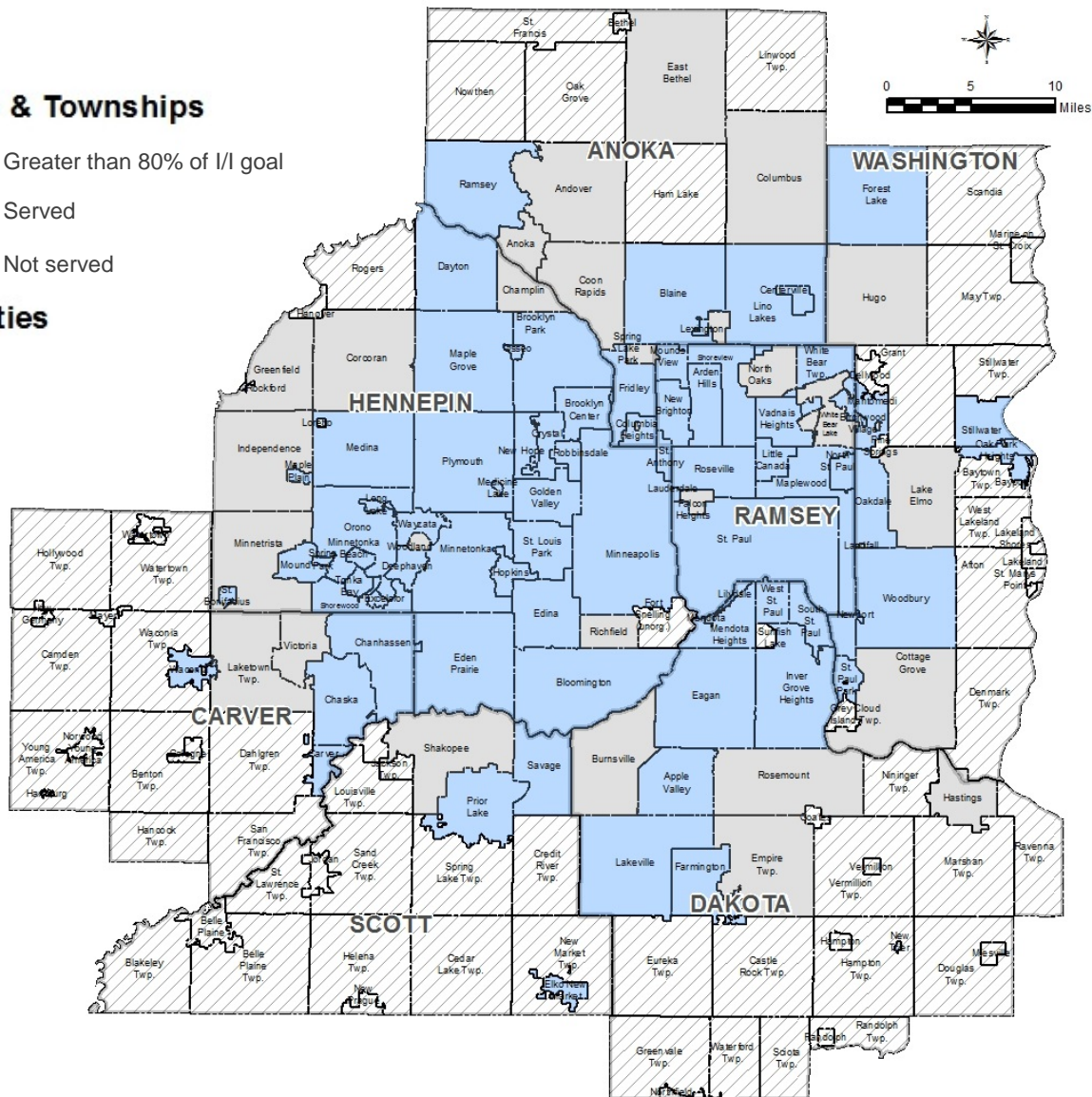
Preserve natural resources

Significant Wet Weather Flows

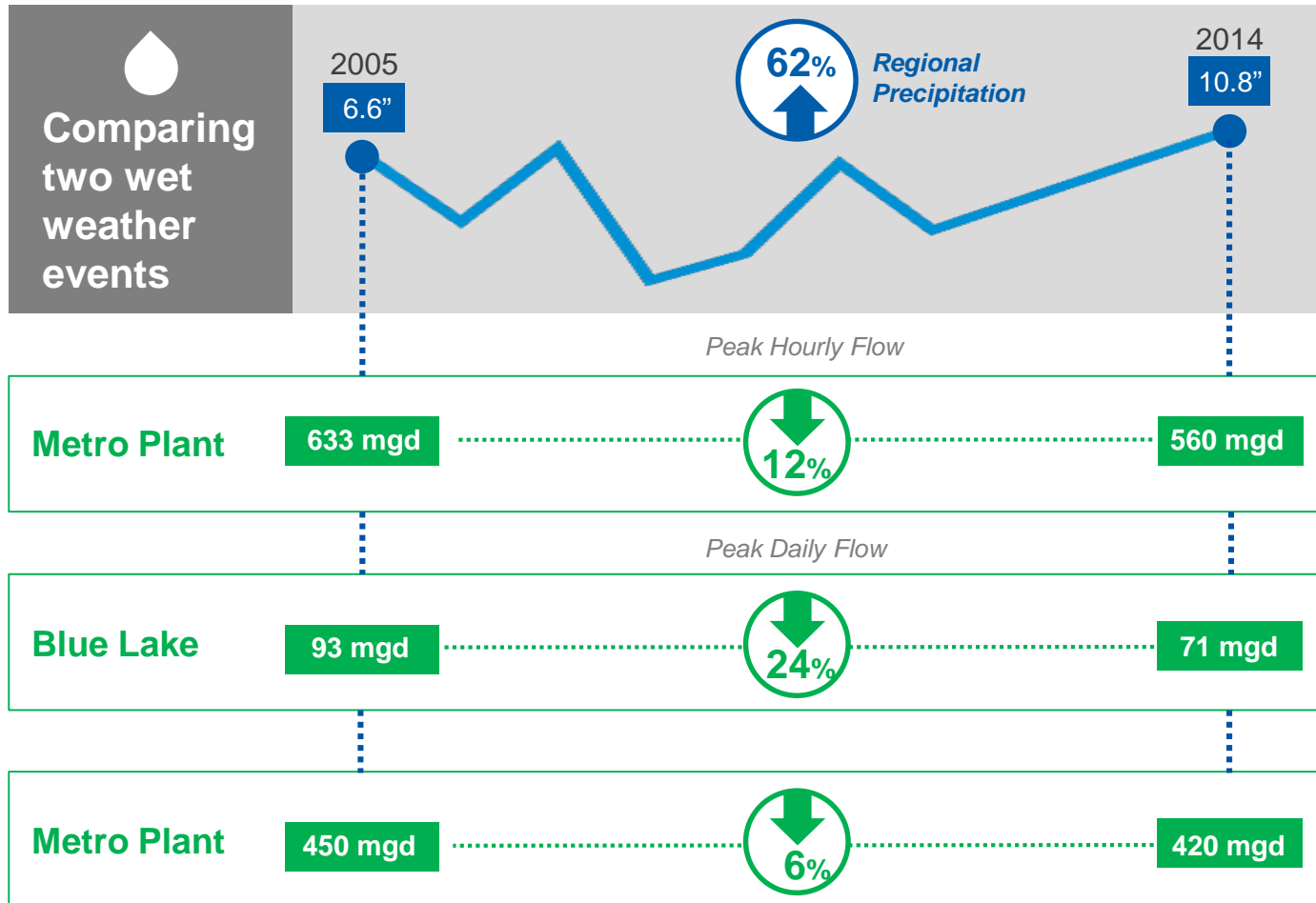
Cities & Townships

- Greater than 80% of I/I goal
- Served
- Not served

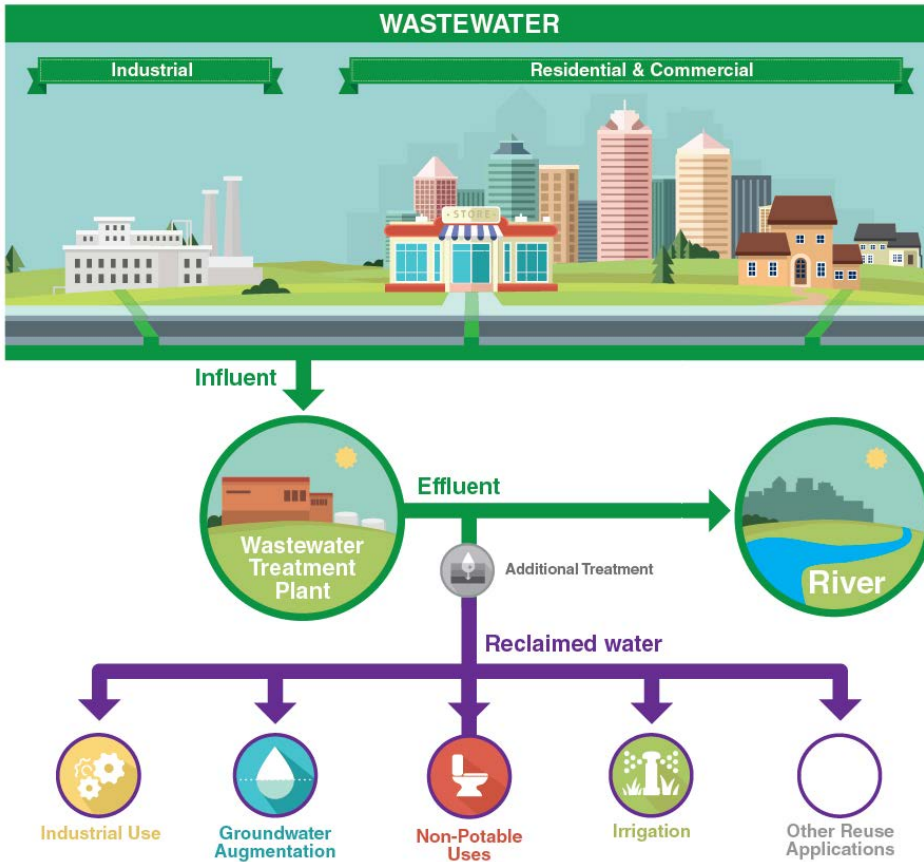
Counties



Major Storm Comparison



Wastewater Reuse



Wastewater reuse

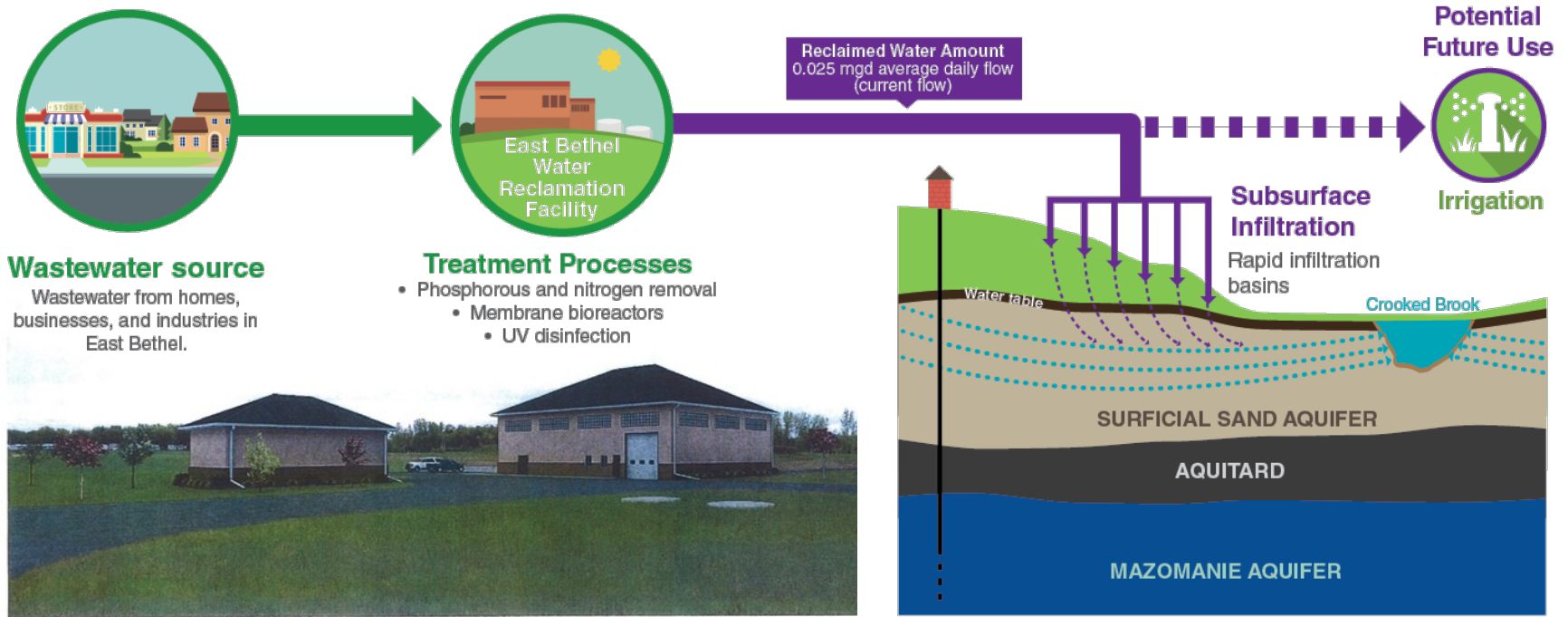
Using treated wastewater treatment plant (WWTP) effluent for beneficial use before releasing it back into the water cycle.

Reclaimed water

Effluent that has received additional treatment to make it suitable for specific reuse applications or beneficial use.

East Bethel Water Reclamation Plant

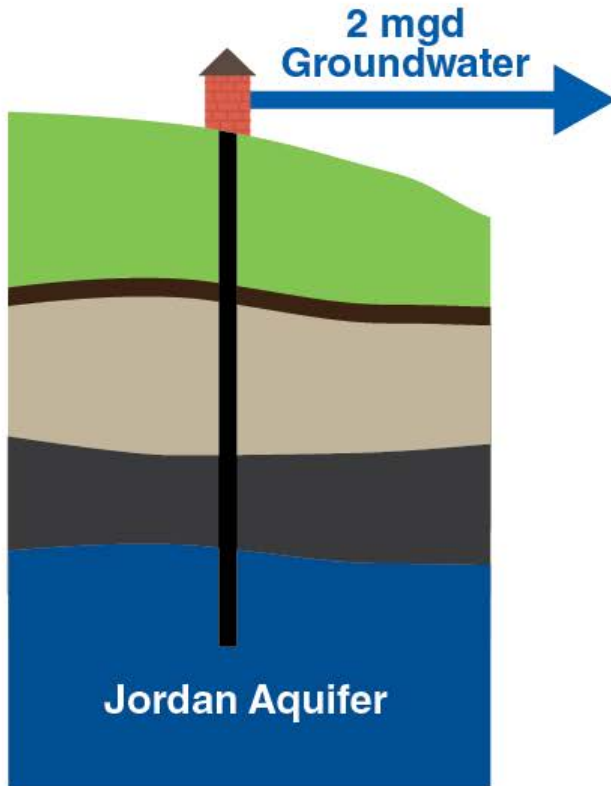
MCES Wastewater Reuse Initiative



SKB/Enerkem's Potential Waste-to-Fuel Project

Inver Grove Heights

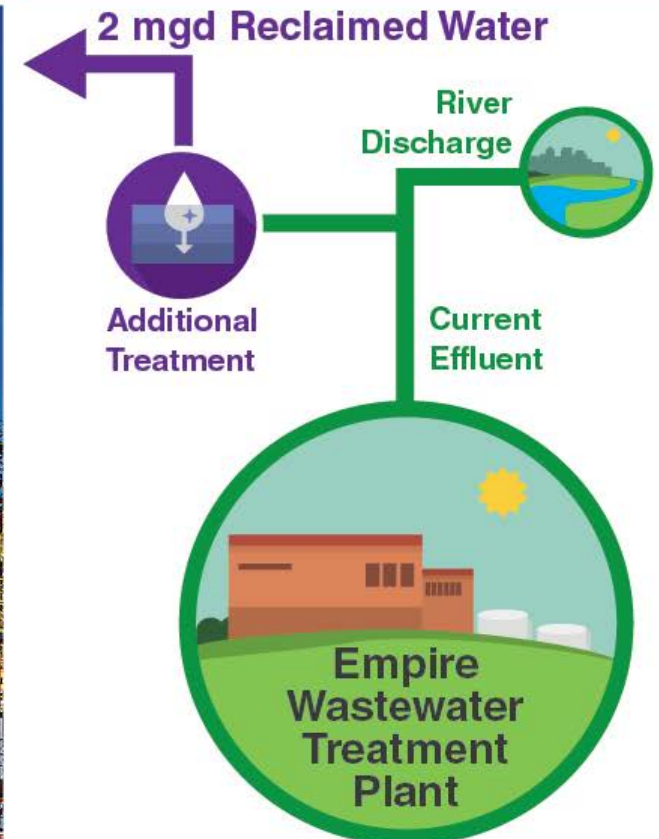
Groundwater Appropriation



OR



Reclaimed Water from MCES



Governor's 25x25 Initiative

From the outstate town halls, common issues with support for state improvement goals include:

- Aquatic invasive species
- Chloride/road salt
- Agricultural runoff
- Urban runoff
- Algae blooms
- Flooding

Governor's 25x25 Initiative

Some of the common themes for addressing the issues were to:

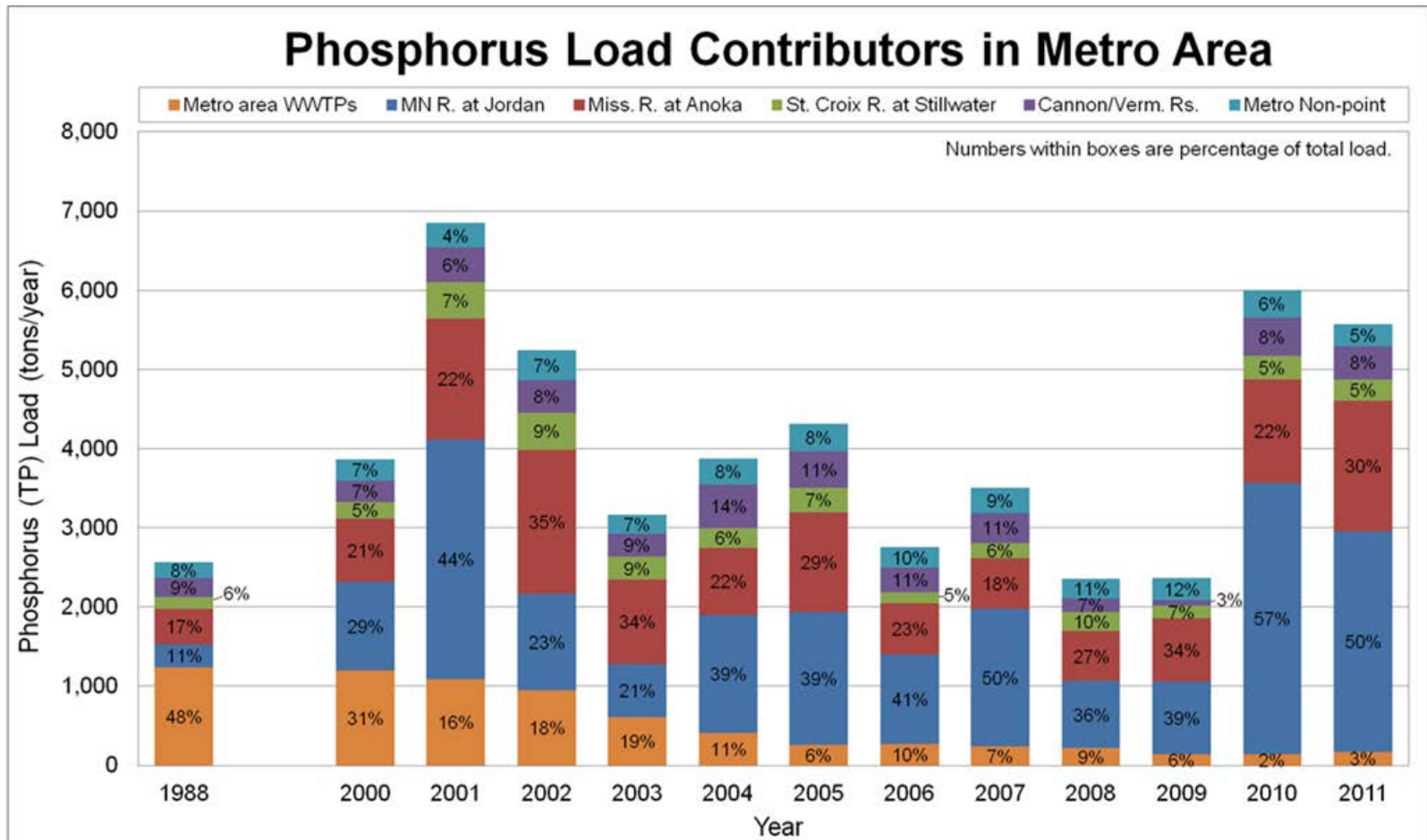
- Increase incentives
- Increase funding, especially for watersheds and SWCDs
- Require more cover crops on agricultural lands
- Regulate agriculture
- Provide more educational opportunities at all levels
- Collaborate: inter-governmental, public/private

Wisconsin Collaboration

- Yahara Watershed Improvement Network(WINS) Project
- Collaborative initiative to meet water quality criteria for phosphorus
- Madison Metropolitan Sewerage District
- Point and Nonpoint sources jointly implement strategies to reduce phosphorus loads at the lowest overall cost for the watershed
- Avoided \$224 M for Plant Upgrades with little return on the investment

MCES Phosphorus Reduction

- Significant WWTP effluent phosphorus reduction since 1988
- Future reductions:
 - Potentially hundreds of millions of dollars
 - Water quality benefits are unclear



MCES estimates based on river, stream, & WWTP monitoring

Chloride and Water Quality

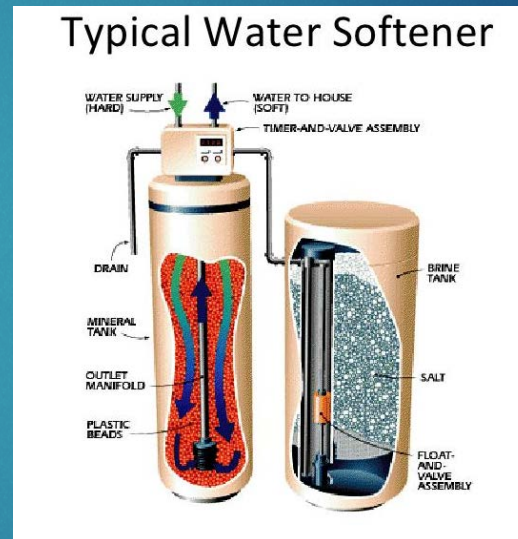
- ▶ Minnesota has a growing salty water problem
 - ▶ Threatens freshwater fish, aquatic life, and groundwater used for drinking
 - ▶ <https://www.pca.state.mn.us/chloride-and-water-quality>
- ▶ MPCA programs have been considering how to respond to the challenges of chloride
 - ▶ Present a unified message about why chloride pollution matters
 - ▶ Coordinate individual program efforts
 - ▶ Groundwater, wastewater, TMDLs, pollution prevention, etc.

Chloride Sources

Road Salt 56%*

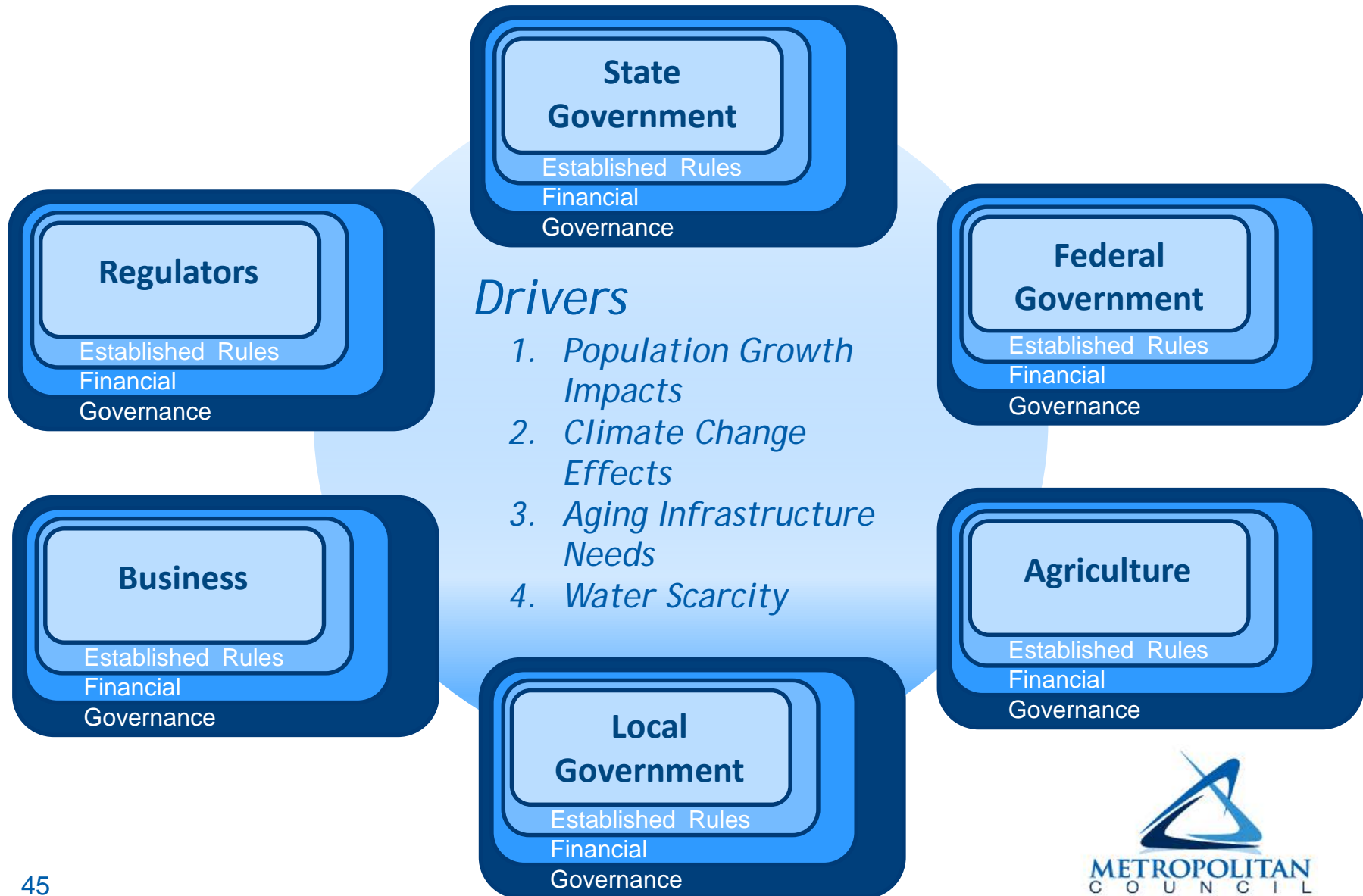


Water Softeners 44%*



- A Chloride Budget for Olmsted County, Robert Wilson, MSU-Mankato 2008
- Slide courtesy of David Lane, City of Rochester

Empowering Collaboration



Empowering Collaboration

