



City of Bismarck, North Dakota

Utility Cost of
Service & Rate
Design Study -
*Community
Stakeholder Meeting*



This is the beginning not the end...

What Today is All About:

Share information about the utility industry, rate concepts & strategies

Compare City's practices to others in the region

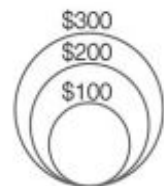
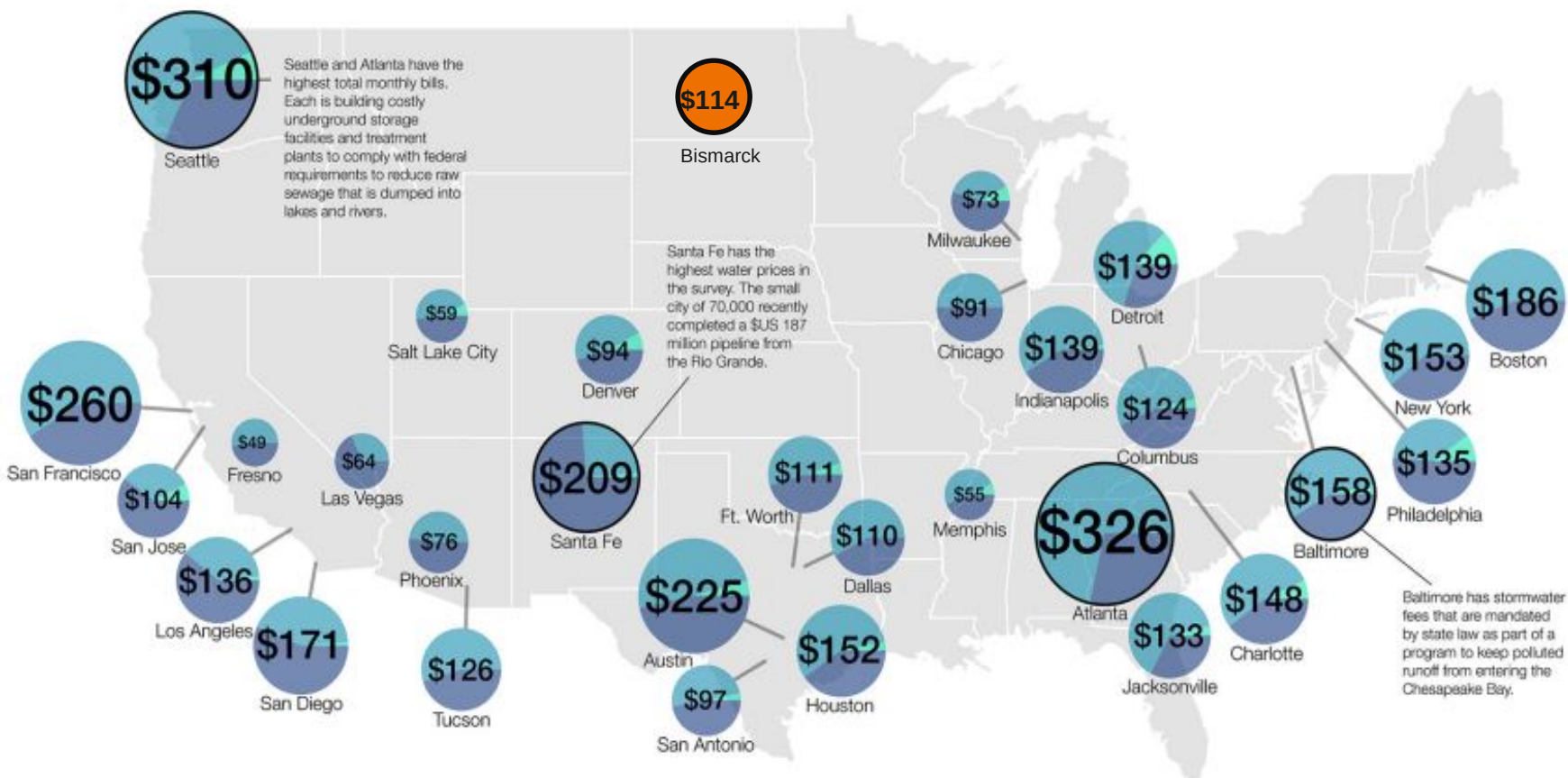
Receive questions, input, concerns, ideas from stakeholders

Concepts presented herein should NOT be taken as recommendations!

Agenda

- ▶ Water Resources Industry Overview
- ▶ Approach to Rate Studies
- ▶ Summary of Local Rate Structures
- ▶ Funding Strategies
- ▶ Questions and Answers

Water Resources Industry Overview



Water prices pay for treating, pumping, and delivering water, while sewer prices cover the cost of cleansing the water that goes down the drain.

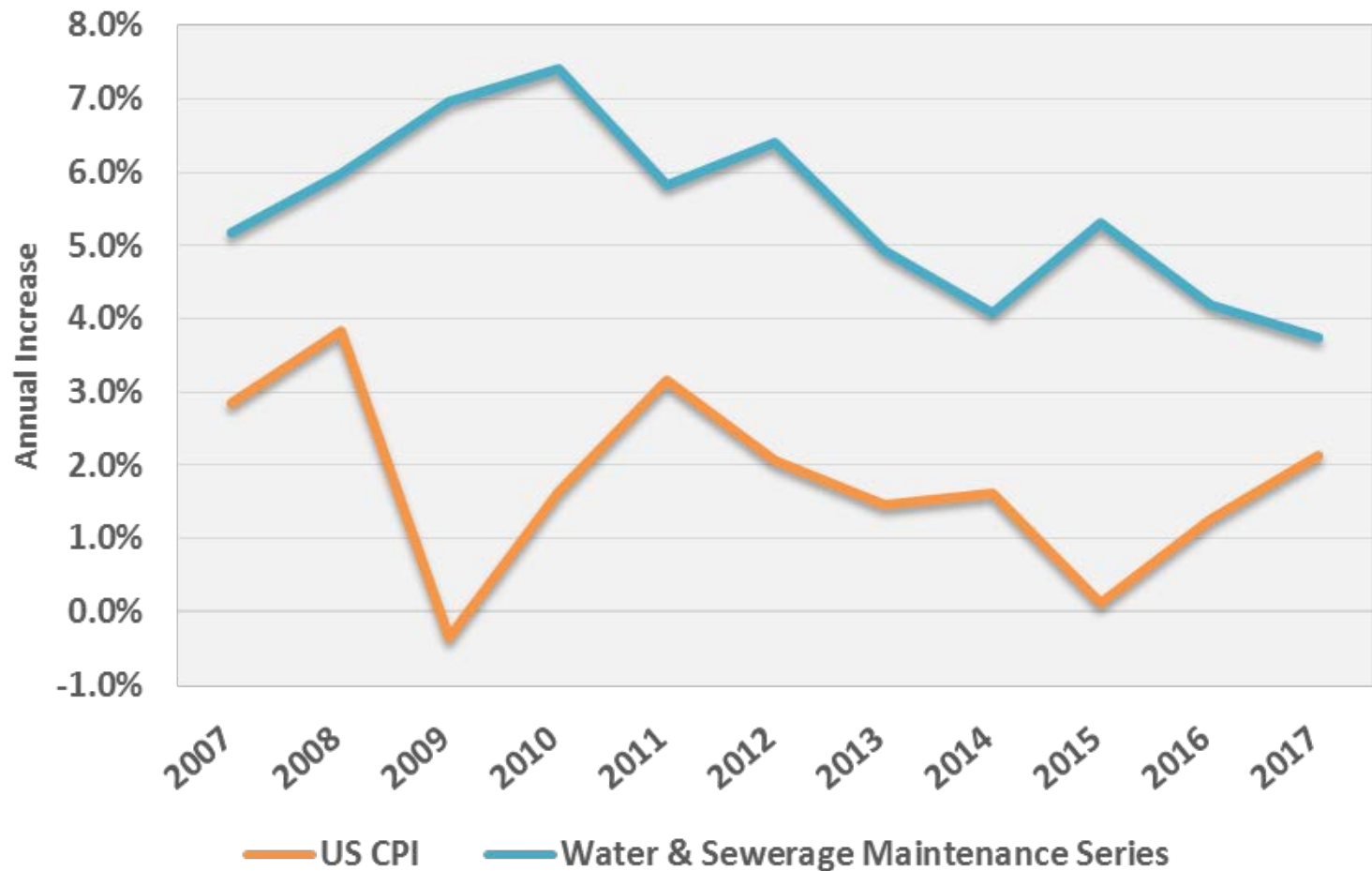


Sewer prices are often higher than water prices because more energy and chemicals are required for treatment. Following the Clean Water Act, the federal government gave grants for new treatment plants during the 1970s and 1980s. Over the past three decades, however, new spending has been cut for local sewer infrastructure.



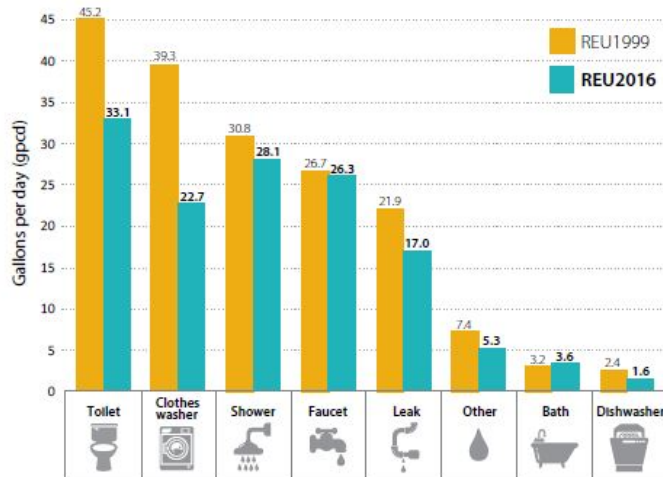
Stormwater fees are not included in every city's monthly bill. Some cities use general tax revenues to pay for projects to reduce polluted runoff from streets and parking lots. However, these projects must then compete for funds with other departments like police and schools.

Overall CPI vs. Water/Sewerage CPI



The common drivers of rate increases

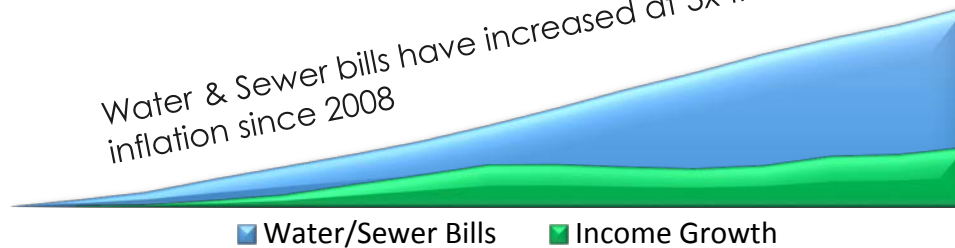
Continued Reductions in Water Use



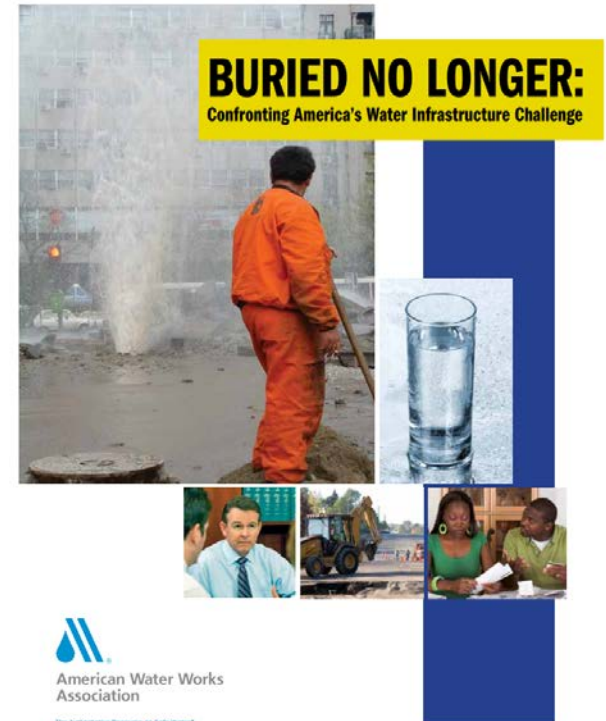
22%
DECREASE
PER HOUSEHOLD
DAILY WATER USE
1999 TO 2016

Affordability

Water & Sewer bills have increased at 3x the rate of inflation since 2008

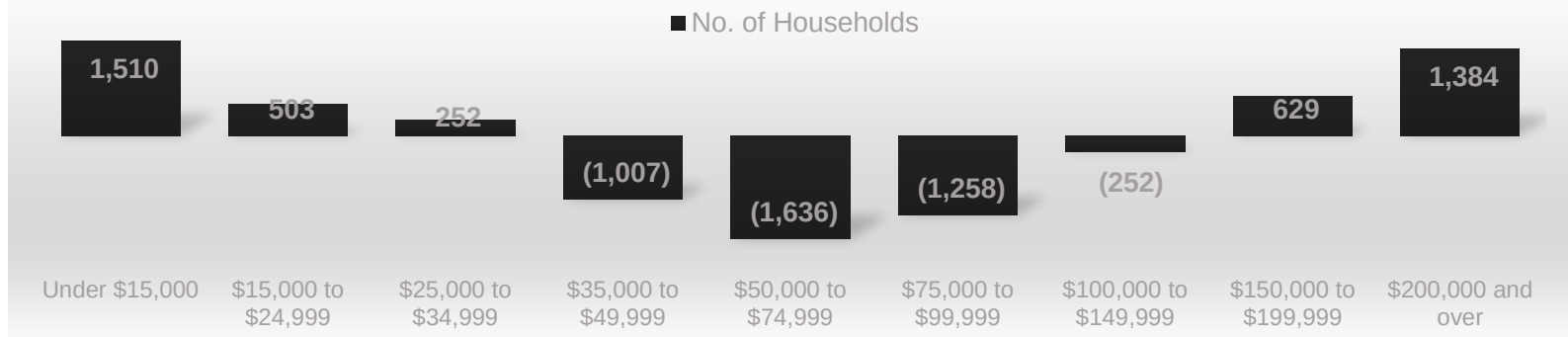


Infrastructure Reinvestment Needs

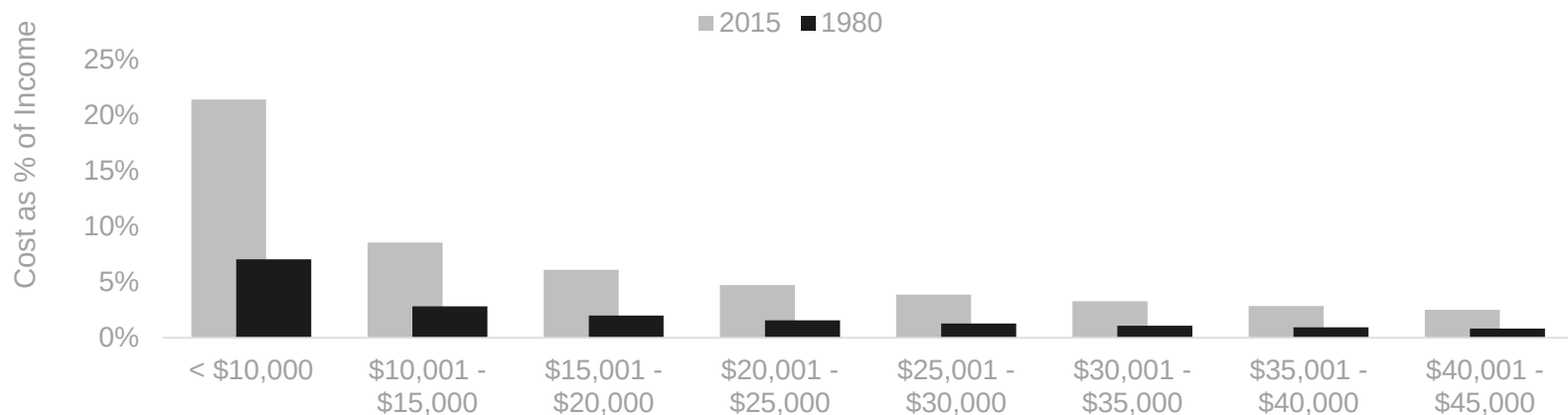


Financial burdens pronounced for growing number of lower-income households

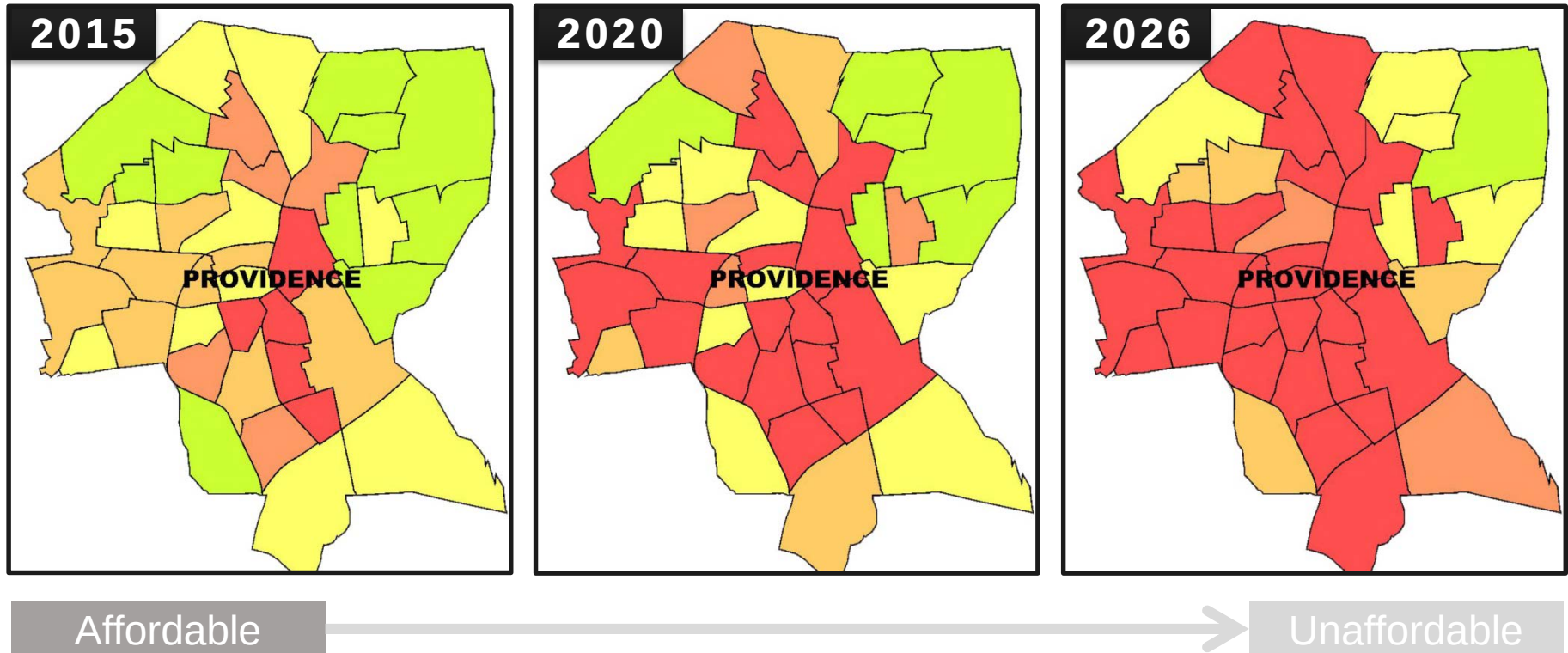
Change in No. of Households in Thousands 2000 to 2015



Financial Burden of an Annual Utility Bill at 2% of MHI (US Population)



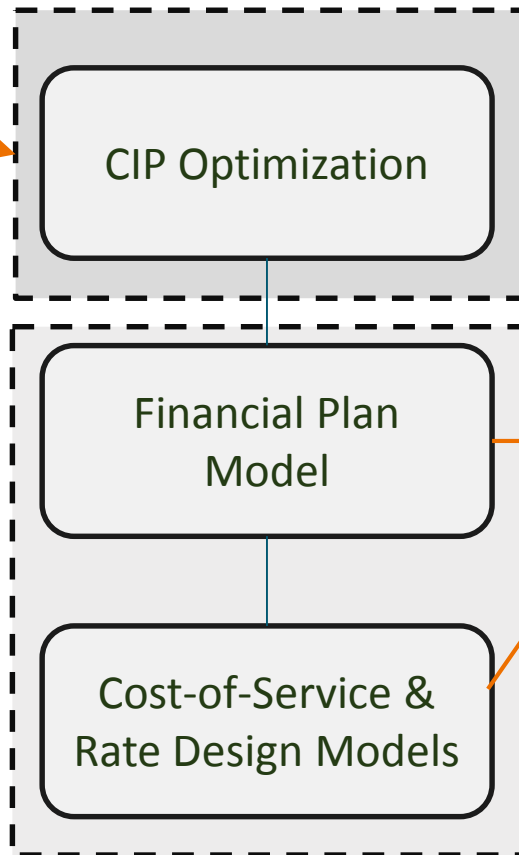
More than median income alone is being used to understand affordability



Maps present actual water/sewer bills as a percentage of income in each census tract. Green = Water/sewer bill that is affordable; Red = Water/sewer bill that is unaffordable. With detailed data and graphics like this, communities are able to better understand and communicate affordability. **More importantly they are using the data to inform system spending, target assistance programs, allocate costs, and even set rates.**

Trend is integrating affordability into the capital planning and rate setting process

Evaluate
Spending &
Funding
Alternatives

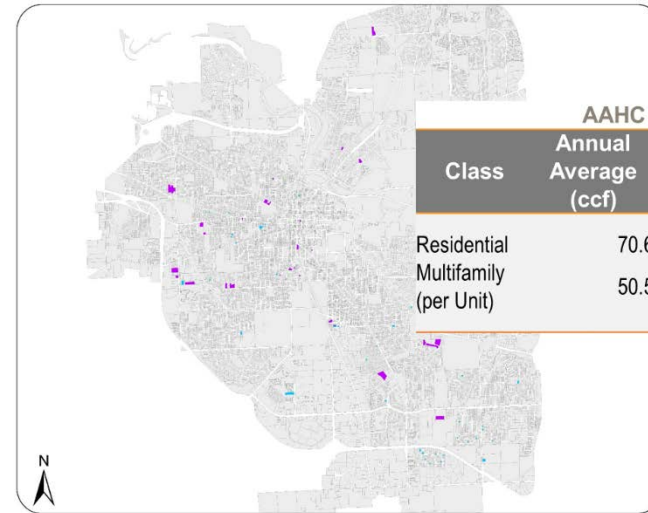
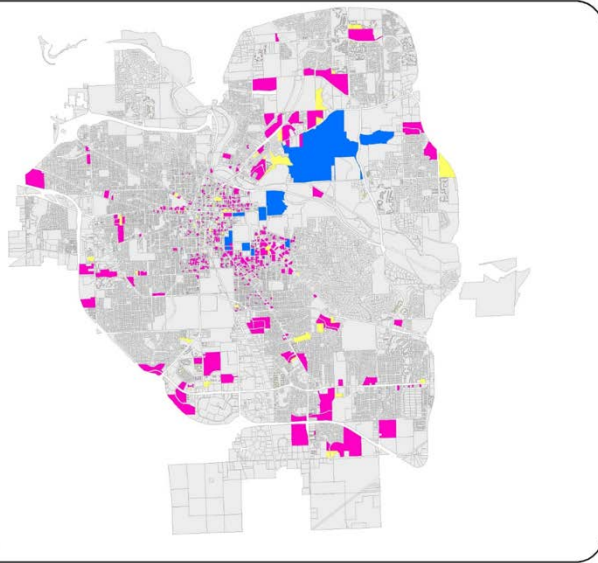


Understand Impact of
Future Rate Increases

Affordability

Consider Usage
Patterns & Service
Characteristics

Utilities have better data than ever before, and aren't afraid to use it!

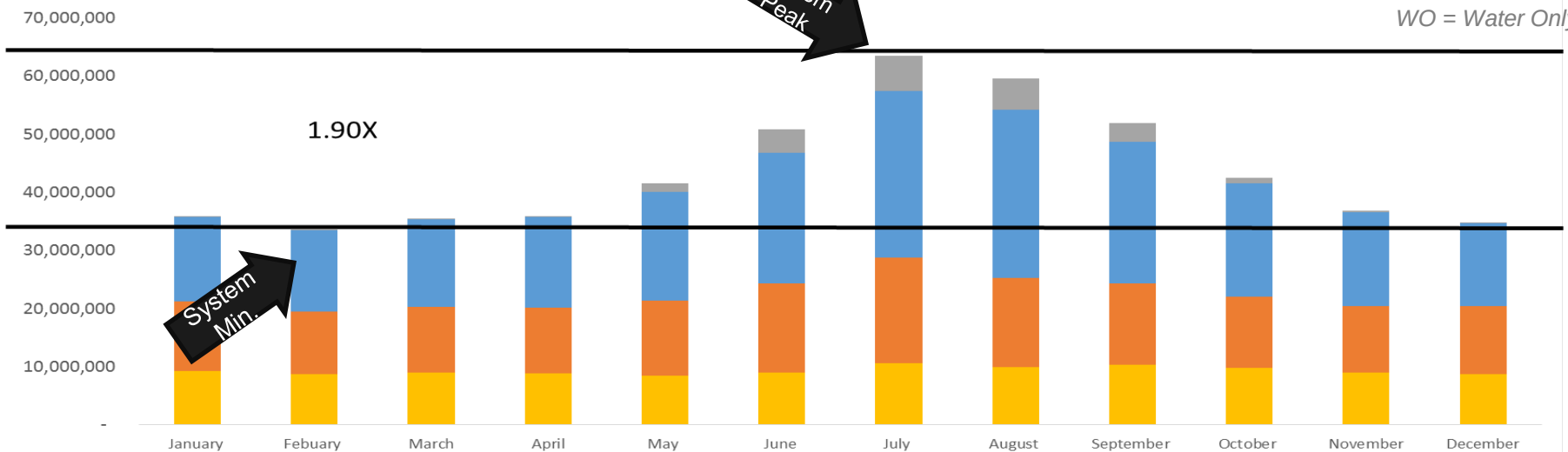


Class	AAHC Data		System-wide	
	Annual Average (ccf)	Peak Day Factor	Annual Average (ccf)	Peak Day Factor
Residential	70.6	1.30x	61.2	1.52x
Multifamily (per Unit)	50.5	1.29x	48.6	1.23x

AAHC = Ann Arbor Housing Commission

MULTI RES COM WO

WO = Water Only



Approach to Rate Studies

Core steps of utility ratemaking process

Fundamental Components

1. Revenue Requirement
2. Cost of Service
3. Rate Design
4. Communication!

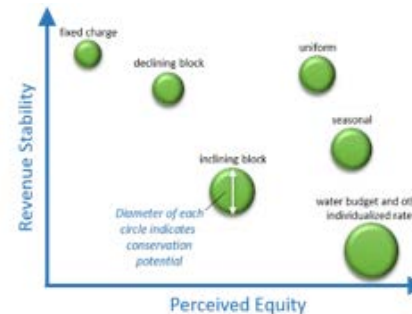
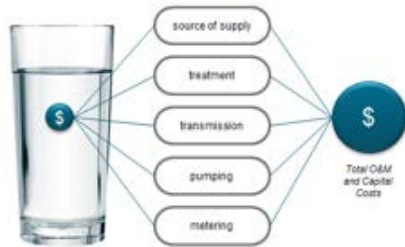
Revenue Requirement Analysis: Compares revenues to operating & capital costs to determine adequacy of existing rates

Cost of Service Analysis: Allocates the revenue requirements of the system to customers in a fair and equitable manner

Rate Design Analysis: Considers the level and structure of rates that will collect revenue requirements from each customer class

Communication: Explains the status quo, key issues/objectives, drivers of changes, and comparisons to local and national trends

Consider efficiency and needs: May not need to perform all steps each year



Revenue Requirements

- Operating Costs
- Capital Costs
- Financial Policies
 - Debt Coverage
 - Reserves

Cost Allocation

- Evaluate Available Data
- Establish Classes
- Identify Methodology
- Compare Results to Current Revenue

Rate Design

- Evaluate Objectives
- Identify Structures
- Set Parameters
- Customer Impacts

Communication

- Explain Process/Data
- Adjustment Drivers
- National Trends
- Local Practices

Key consideration: changes in water use

Approach to Rate Studies

Essential to ensure sustainability

- ▶ **Review multiple years of data:**
 - ▶ Water use and population
 - ▶ Economic data, rainfall, rate changes...
- ▶ **Model population & use/acct. separately**
- ▶ **Include price elasticity in forecasts**
- ▶ **Compare actual results to projections**

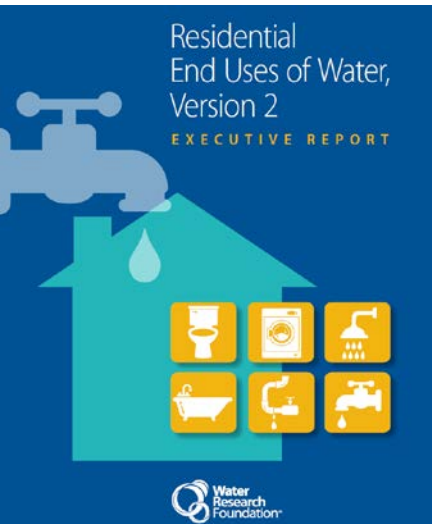
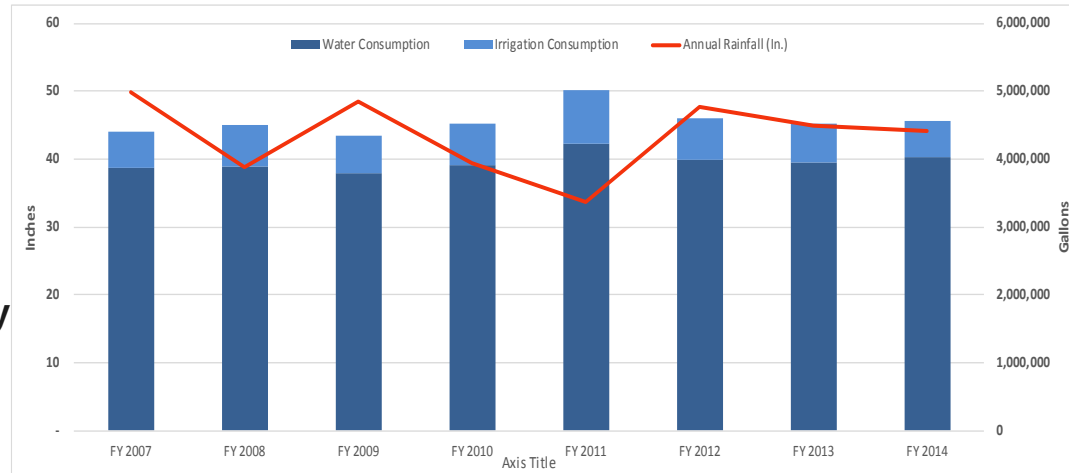
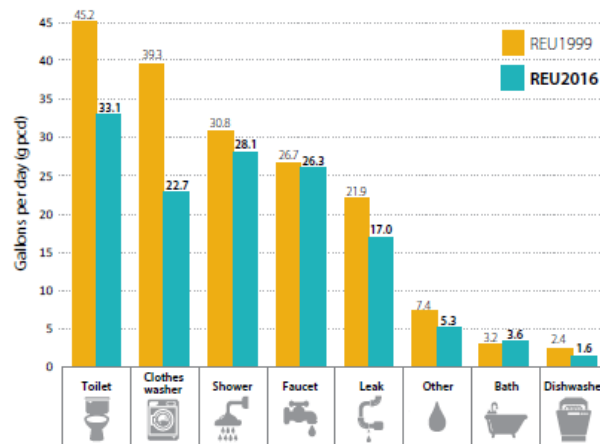
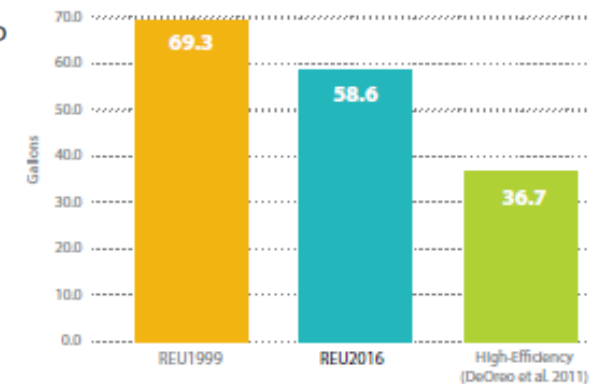


Figure 4. Average daily indoor per household water use
REU1999 and REU2016



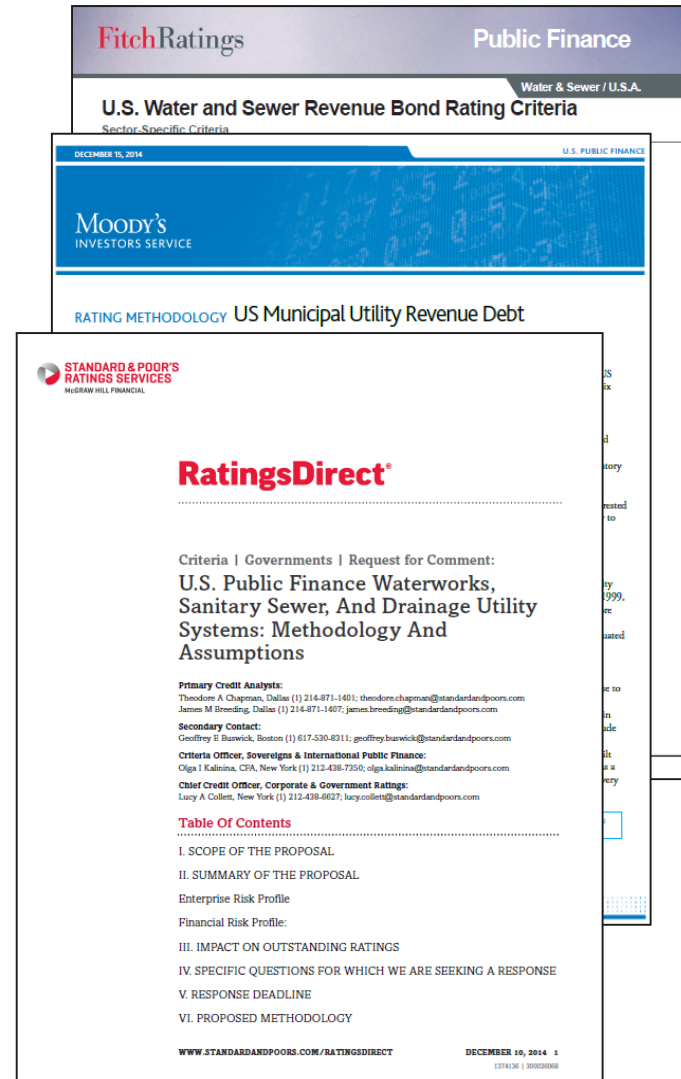
22%
DECREASE
PER HOUSEHOLD
DAILY WATER USE
1999 TO 2016

Figure 7. Indoor average gallons per
capita per day, REU1999, REU2016,
High Efficiency Studies

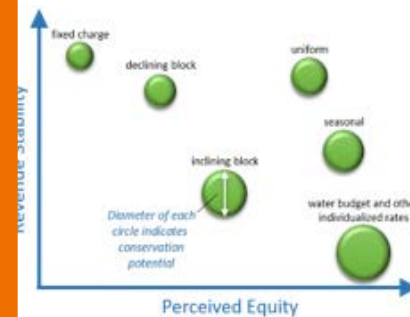
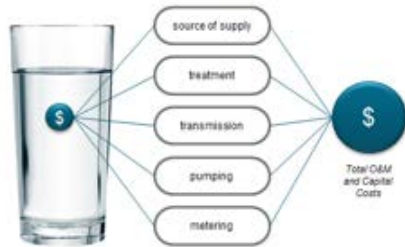


Key consideration: reserve policies

- ✓ General rules of thumb for reserves are provided by industry groups like AWWA:
 - ▶ Operating reserve equal $\geq$ 2 months of O&M
 - ▶ Capital reserve equal to the average annual cash funded CIP over the next 3 to 5 years
- ✓ Also, rating agencies publish criteria relative to reserves that they use to evaluate the creditworthiness of utilities
 - ▶ Days of free cash (strong systems $\geq$ 365 days)
- ✓ Reserve levels should be established considering risk from rates and weather:
 - ▶ Use of water conservation rates = more risk
 - ▶ Lower fixed charges = more risk
 - ▶ Exposure to drought conditions = more risk
- ✓ **Result:** Operating, Capital, and Rate Stabilization Reserve Considerations



Understanding cost allocation is important in selecting rate structures and setting rates



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Rate Design

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- Customer Impacts

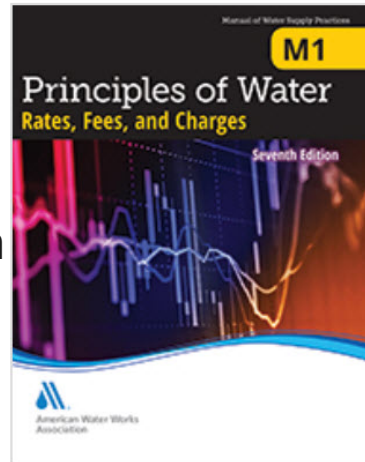
Communication

- Explain Process/Data
- Adjustment Drivers
- National Trends
- Local Practices

Use industry resources (as guidance)

AWWA Manual M-1

- ▶ Costs allocated to functions and then to users in proportion to contributions to system components
- ▶ Resource intensive (large systems)



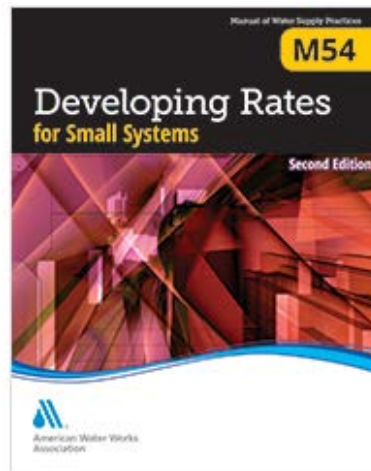
WEF Stormwater User Fee Programs

- ▶ Identifies general types of rate structures and legal framework
- ▶ Relatively new
- ▶ “High-level”



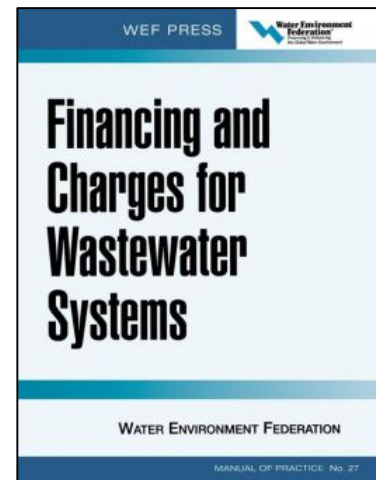
AWWA Manual M-54

- ▶ Uses billing data, such as meter size and flow, to establish rate structures that more generally apportion costs to customers
- ▶ Intended for systems with less granular data/resources



WEF MOP #27

- ▶ Similar to Manual M-1 in level of detail and cost allocation process
- ▶ Relies upon strength & flow
- ▶ Used by many communities



Goal: determine equitable distribution of revenue to be recovered by customer class

✓ Apply method best suited for data, conditions & goals

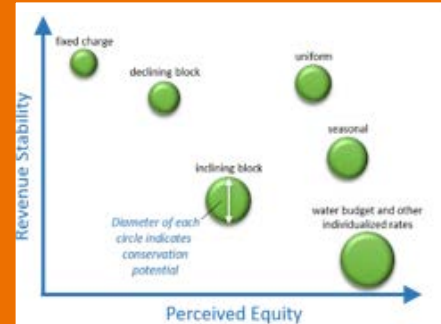
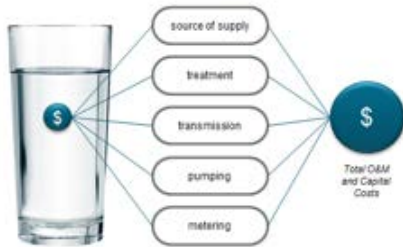
✓ Allocate costs to functions & then to customer classes

✓ Establish required revenue to collect from each class

- ✓ Orange = Current revenue
- ✓ Blue = Annual cost of serve
- ✓ Variance = Difference



Consider objectives in selecting rate structures for different customer classes



Revenue Requirements

- Operating Costs
- Capital Costs
- Financial Policies
 - Debt Coverage
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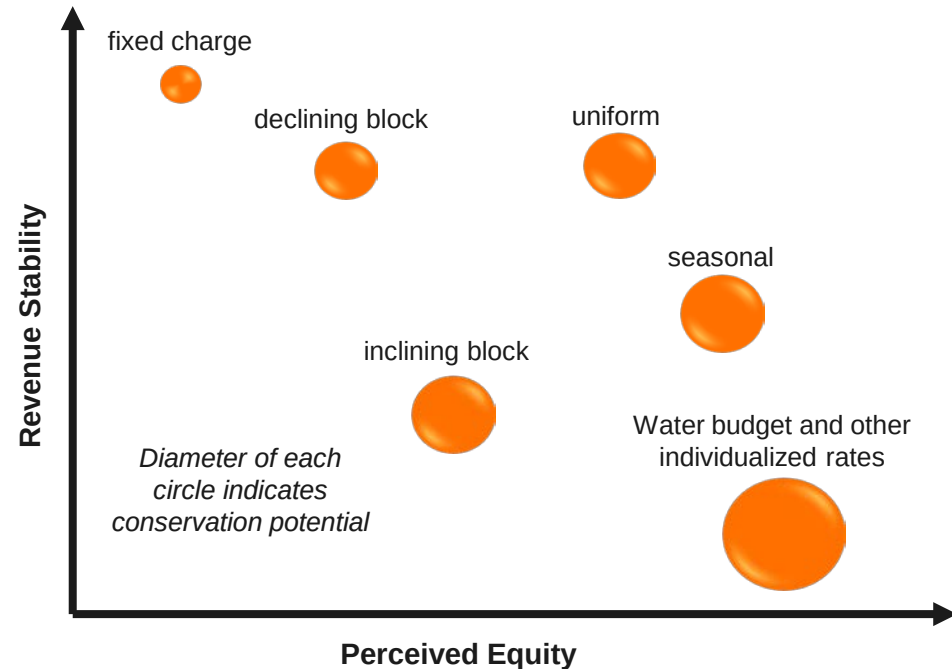
Selecting the right rate structure

✓ Identify structure that meets your needs:

- ▶ Conforms to industry practice
- ▶ Meets all legal requirements
- ▶ Easy to administer/understand
- ▶ Elasticity of demand & weather
- ▶ Conservation and affordability
- ▶ Availability of data/technology
- ▶ Stakeholder input/concerns

✓ Critical considerations:

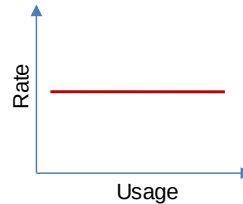
- ▶ Understanding distribution of system costs
- ▶ Integrating financial considerations
 - ▶ Reserve policies & revenue stability



Common water rate structures

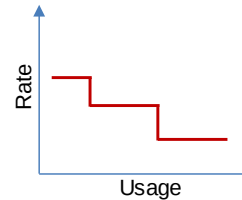
► Uniform Rate

- Same rate regardless of usage



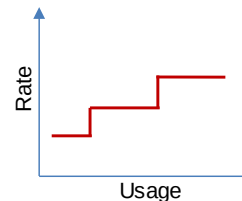
► Declining Block

- Rate decreases for higher levels of usage



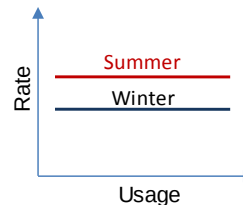
► Inclining Block

- Rate increases for higher levels of usage



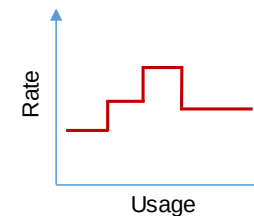
► Seasonal

- Higher rates in peak times of year



► Increasing/Decreasing

- Rate increases then decreases with higher usage



US Water Rate Structures

Source: AWWA 2016 Water & Wastewater Rate Survey

Chart V-19A. US Water Rate Structures, Residential

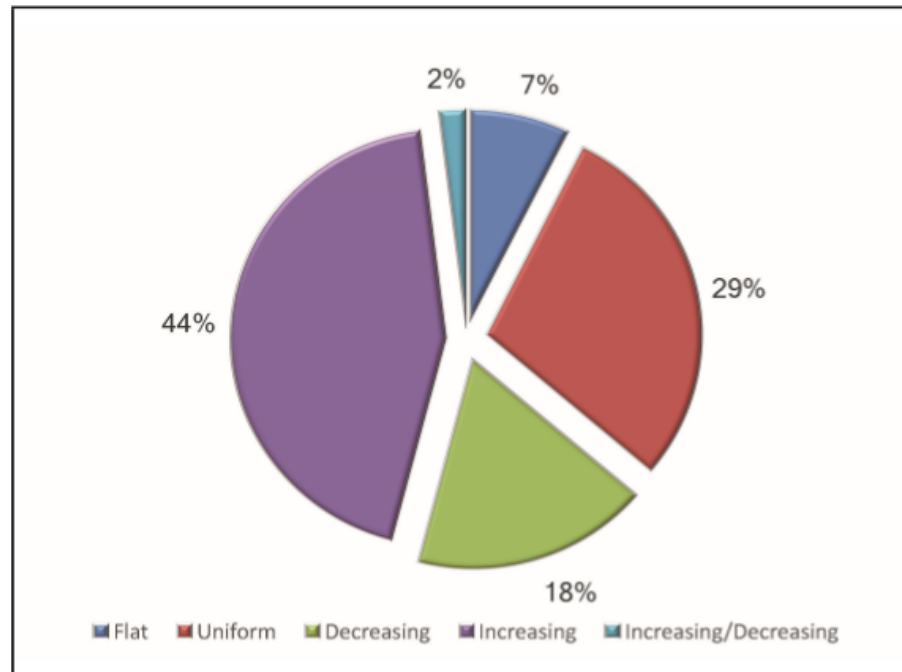
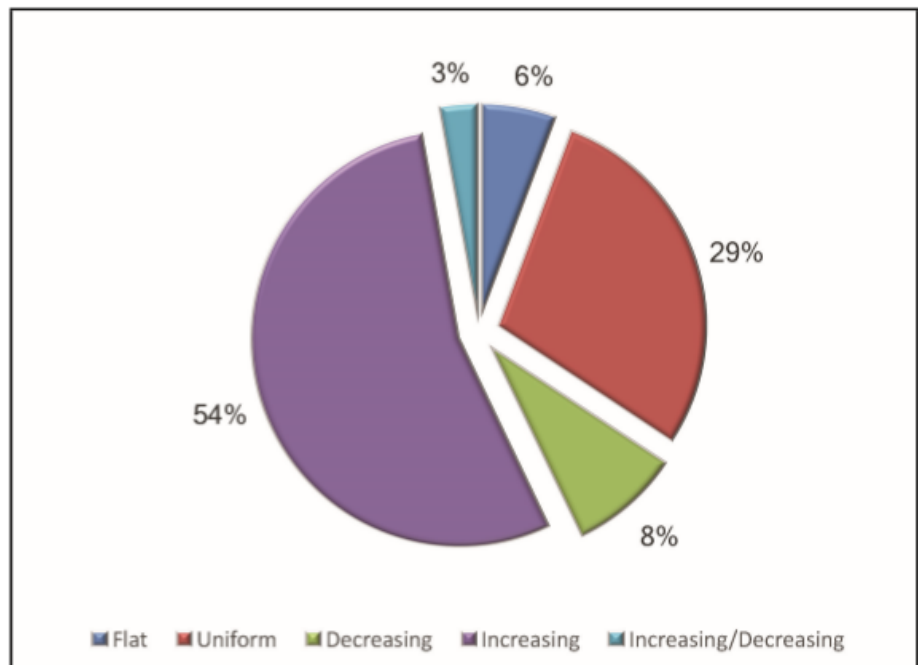


Chart V-19B. US Water Rate Structures, Nonresidential



US Wastewater Rate Structures

Source: AWWA 2016 Water & Wastewater Rate Survey

Chart V-20A. US Wastewater Rate Structures, Residential

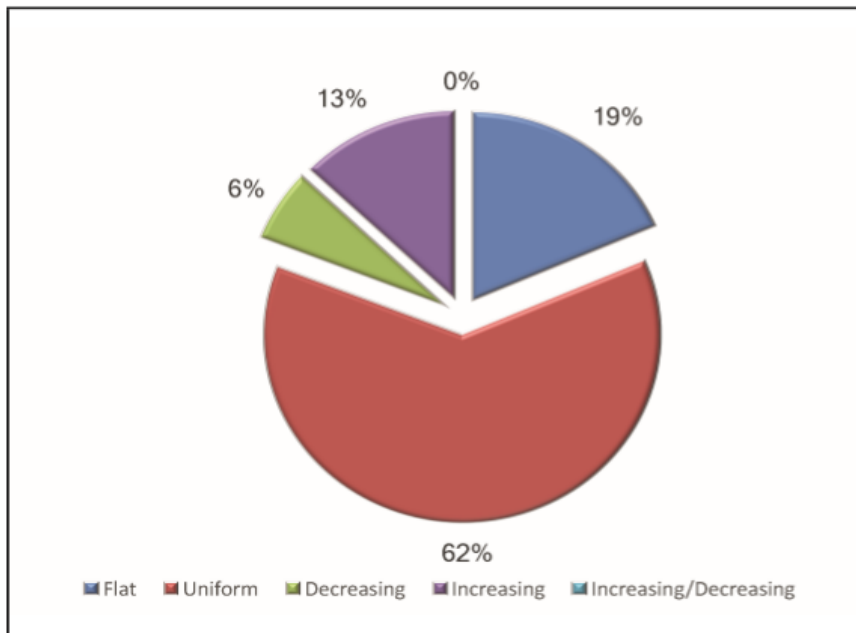
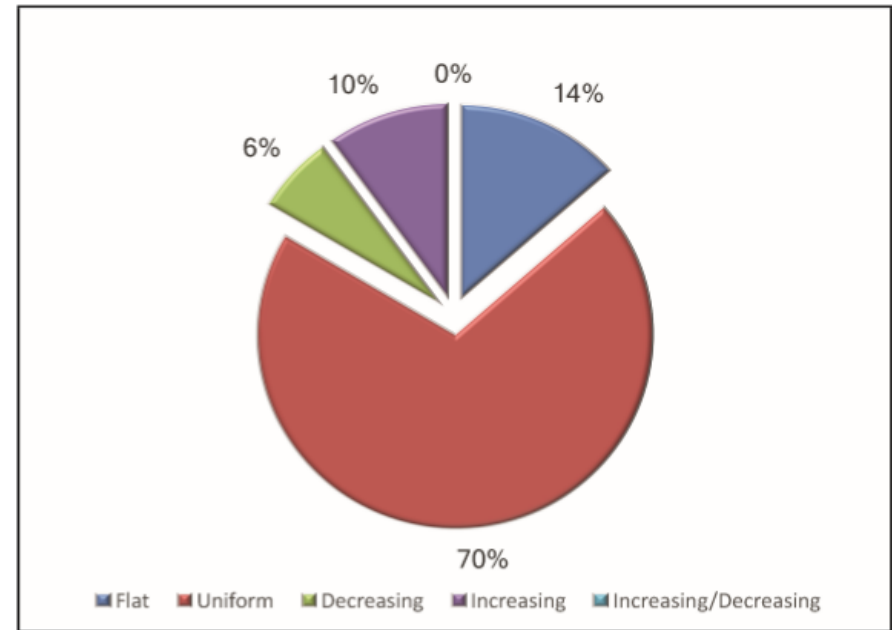
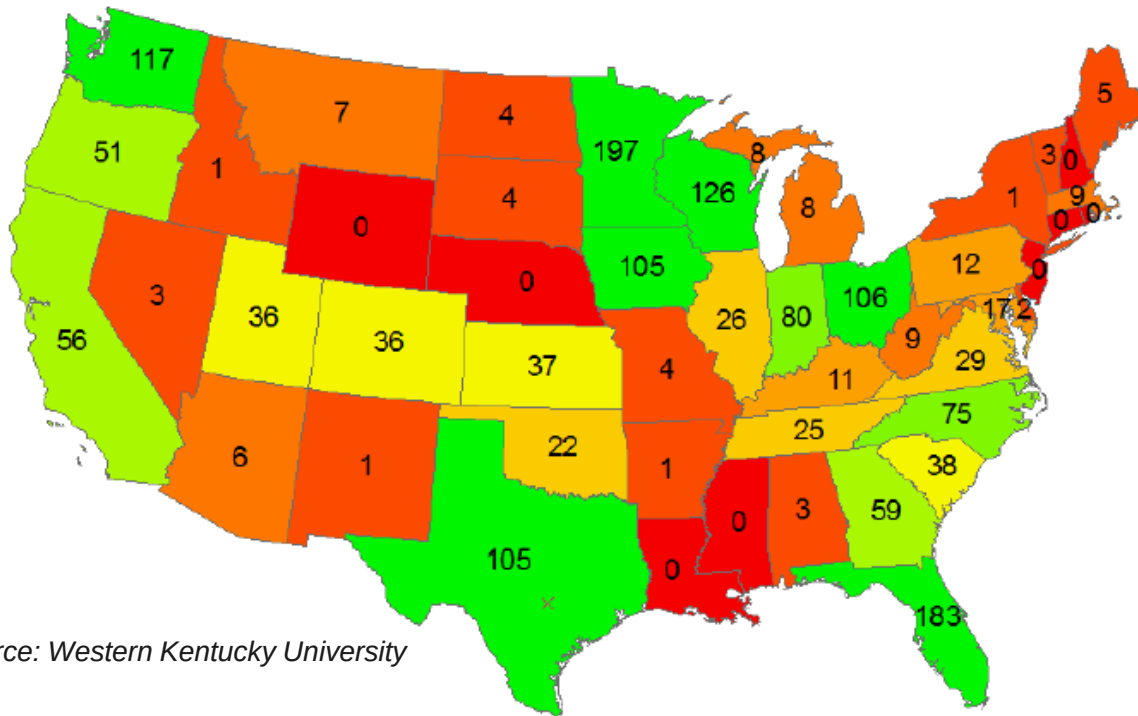


Chart V-20B. US Wastewater Rate Structures, Nonresidential



Stormwater utilities by state

Stormwater Utilities by State 2017



Source: Western Kentucky University

- ▶ Significant growth in number of stormwater utilities and user fees
- ▶ Fees typically based on:
 - ▶ Impervious Area
 - ▶ Gross Parcel Size
 - ▶ Intensity of Development
 - ▶ Accounts/Parcels

Summary of Local Rate Structures

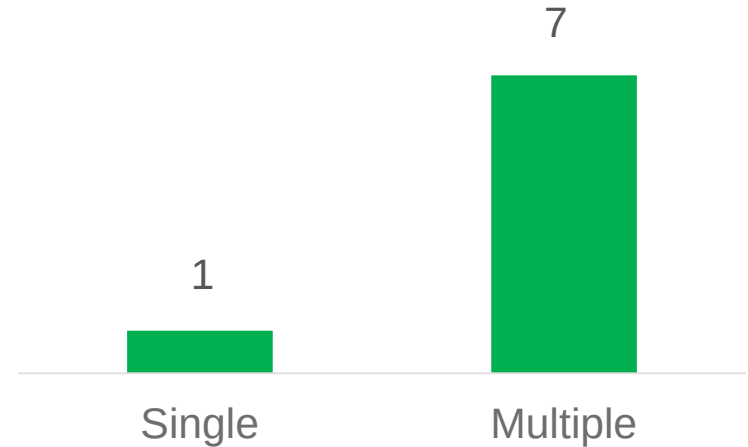
Customer classes in North Dakota

(West Fargo, Mandan, Williston, Bismarck, Minot, Dickinson, Fargo & Grand Forks)

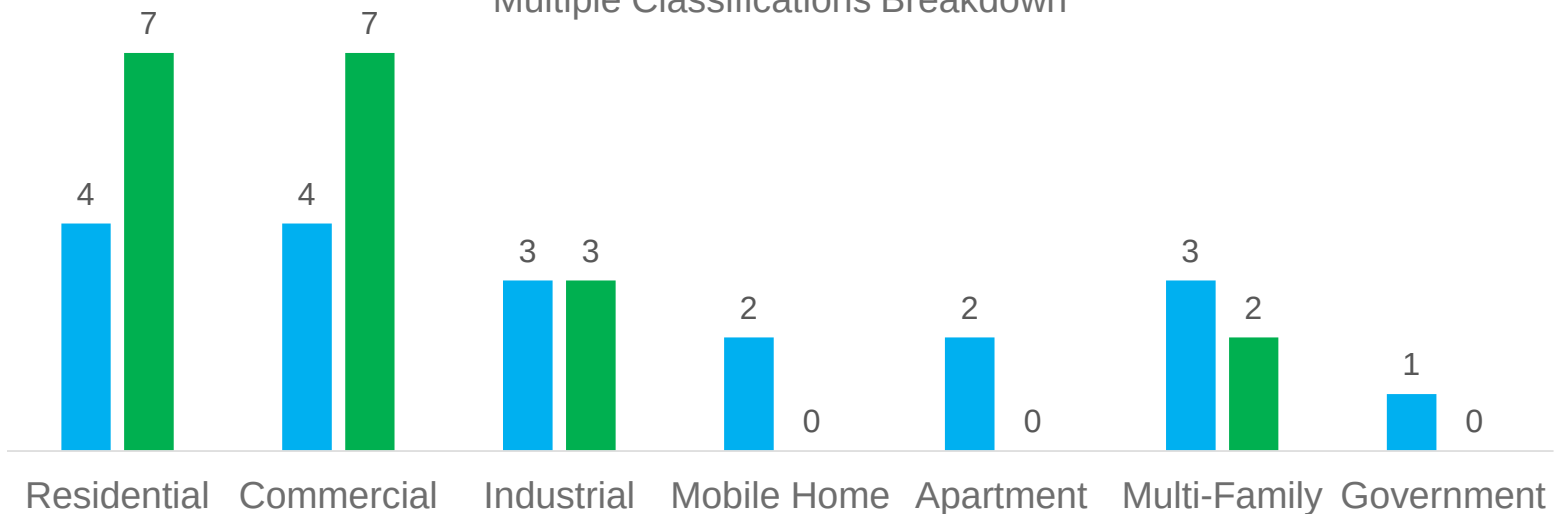
Water - Customer Classifications



Sewer - Customer Classifications



Multiple Classifications Breakdown



Water and Sewer Fixed Charges

What Costs to Recover

- Meter Reading
- Billing & Collection
- Customer Service
- Debt Service
- Other

Higher the fixed charge the greater the revenue stability

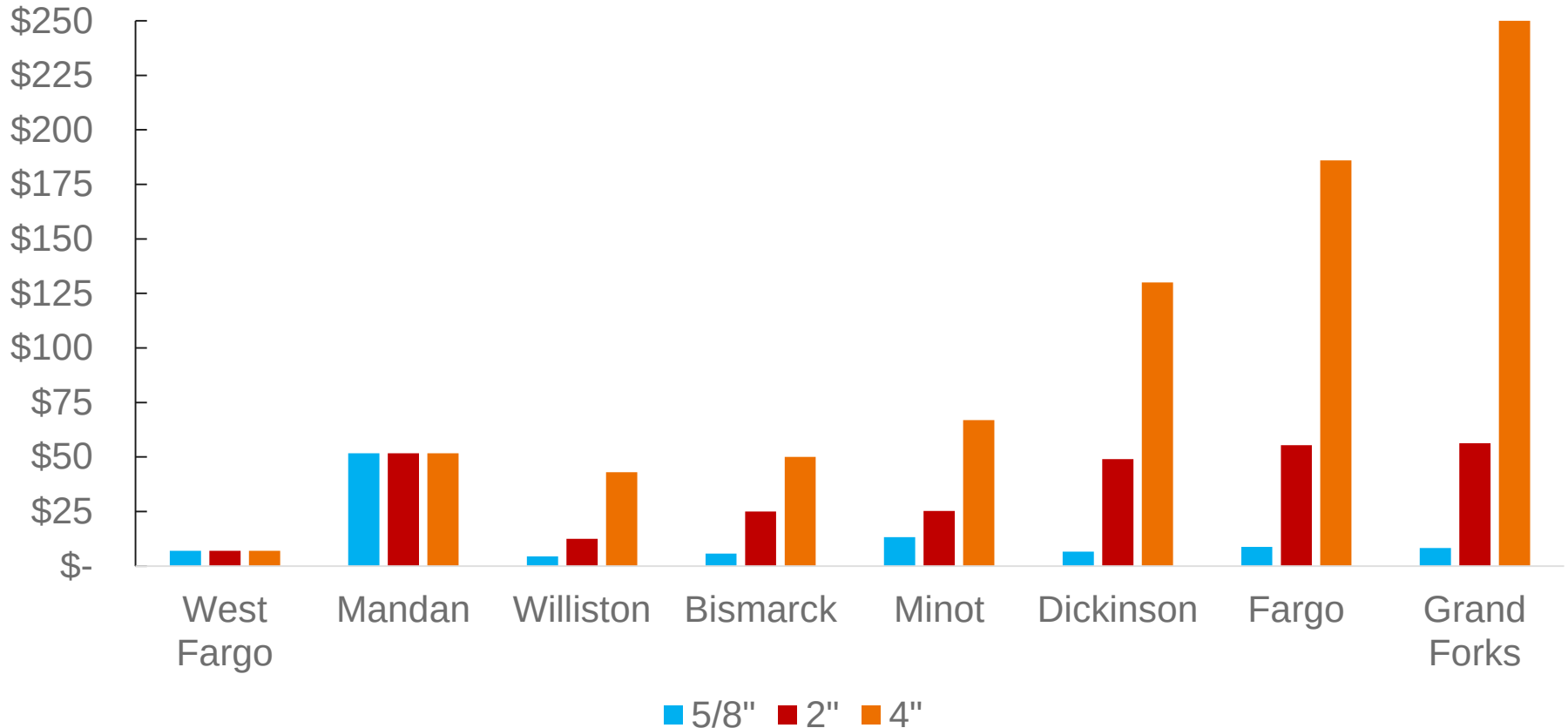
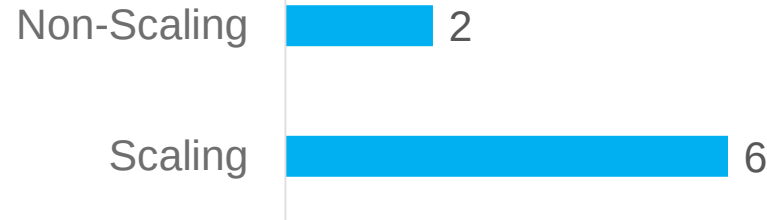
Higher the fixed charge the more expensive service is for smallest user

Basis for Applying the Charge

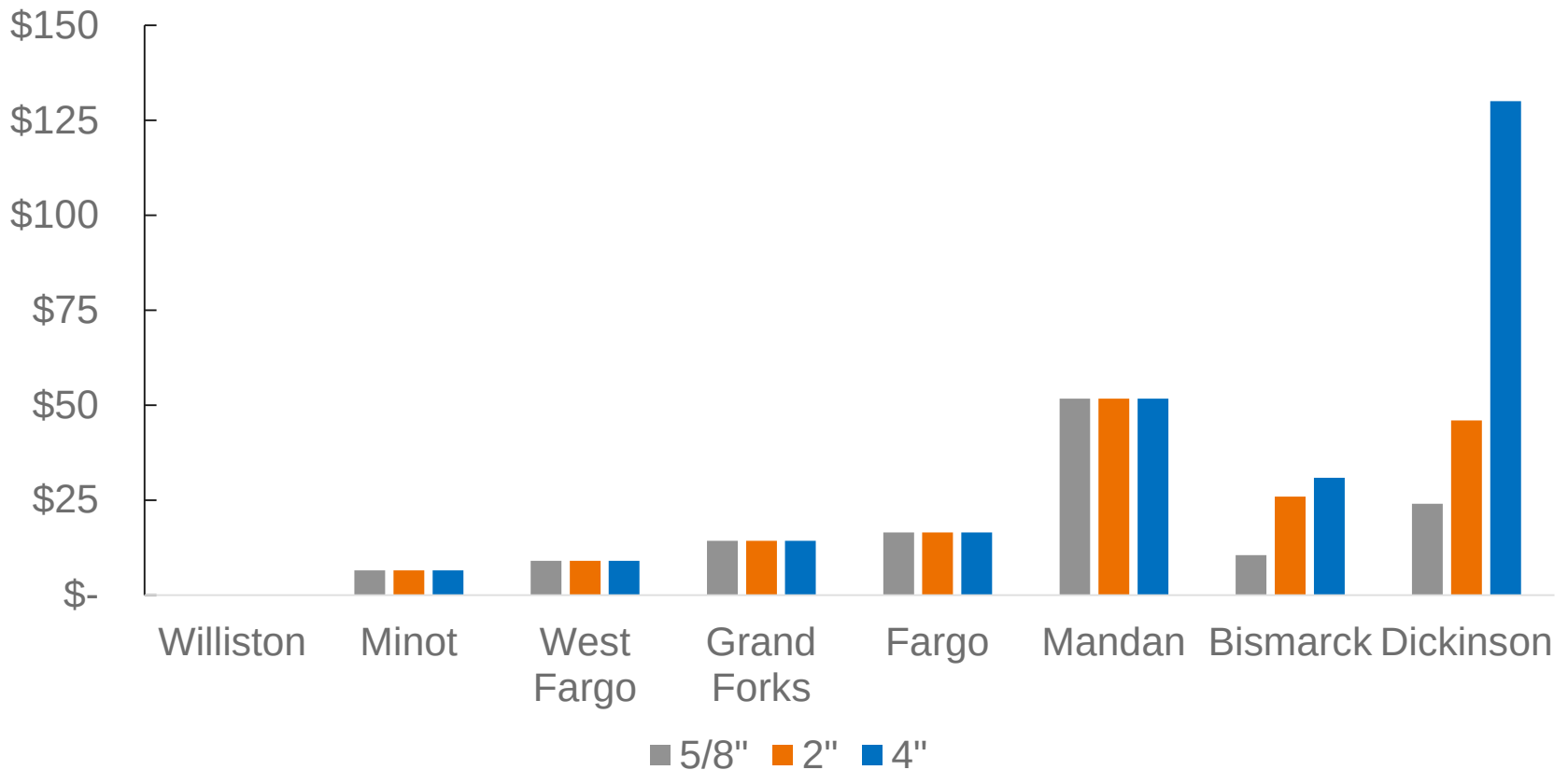
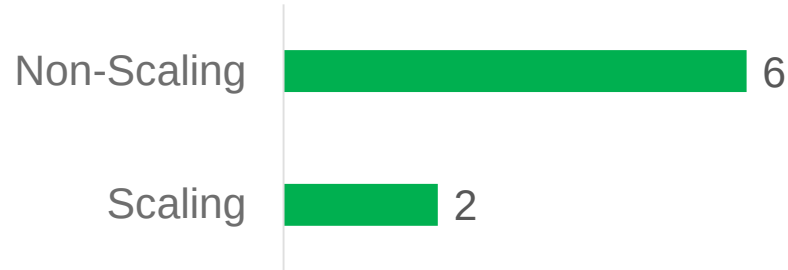
- Account
- Meter size
- Equivalent Residential Unit (ERU)

Basis selected should be consistent with costs recovered

Water Fixed Fees – Non Residential



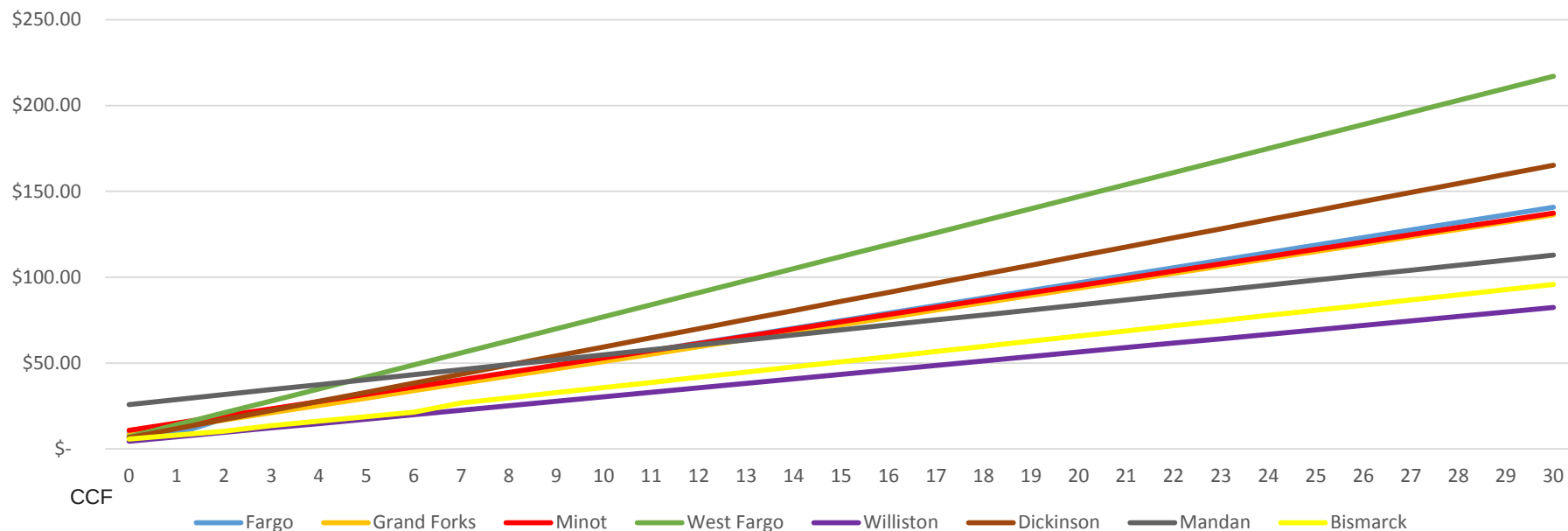
Sewer Fixed Fees – Non Residential



Water Volumetric Rate Structures

Summary of
Local Rates

Water Total Bill Comparison - 5/8"



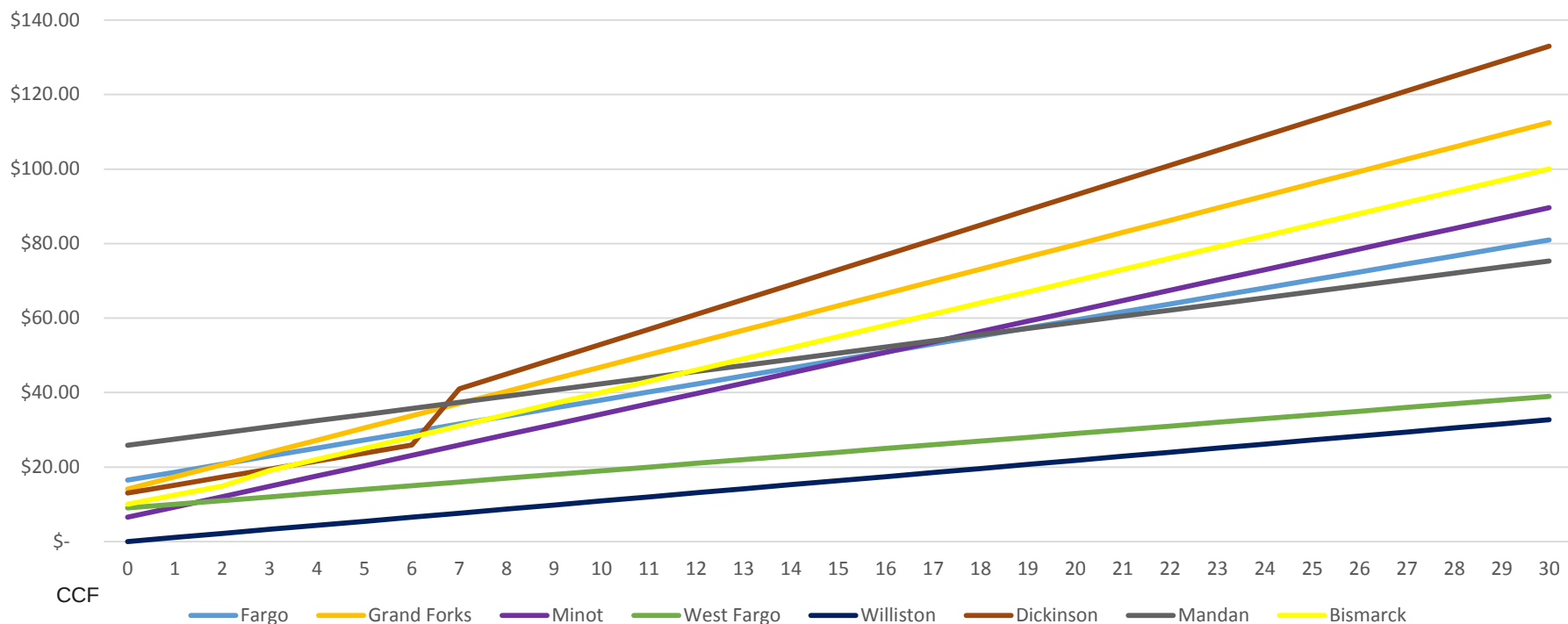
Community	1 CCF	2 CCF	3 CCF	4 CCF	5 CCF	6 CCF	7 CCF	30 CCF	267 CCF	2673 CCF
Fargo	Included	\$4.40							\$4.15	\$3.75
Grand Forks	\$4.27									
Minot	\$4.22									
West Fargo	\$7.00									
Williston	\$2.60 (Winter) / \$4.65 (Summer)									
Dickinson	\$5.29									
Mandan	\$2.90									
Bismarck	\$2.25		\$2.60				\$3.00			

\$2.25 (Winter) / \$4.30 (Summer)

Sewer Volumetric Rate Structures

Summary of
Local Rates

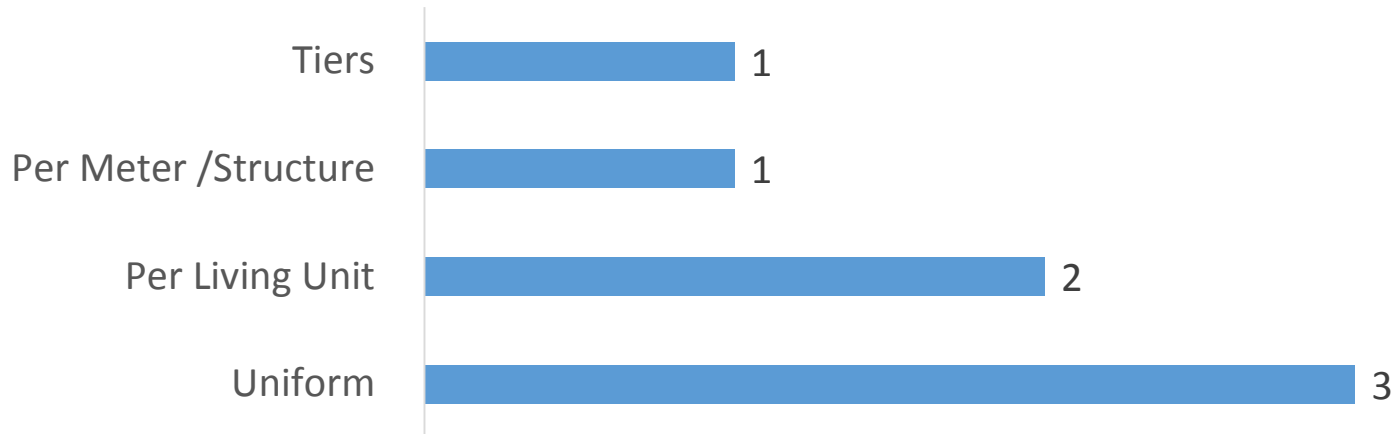
Sewer Total Bill Comparison - 5/8"



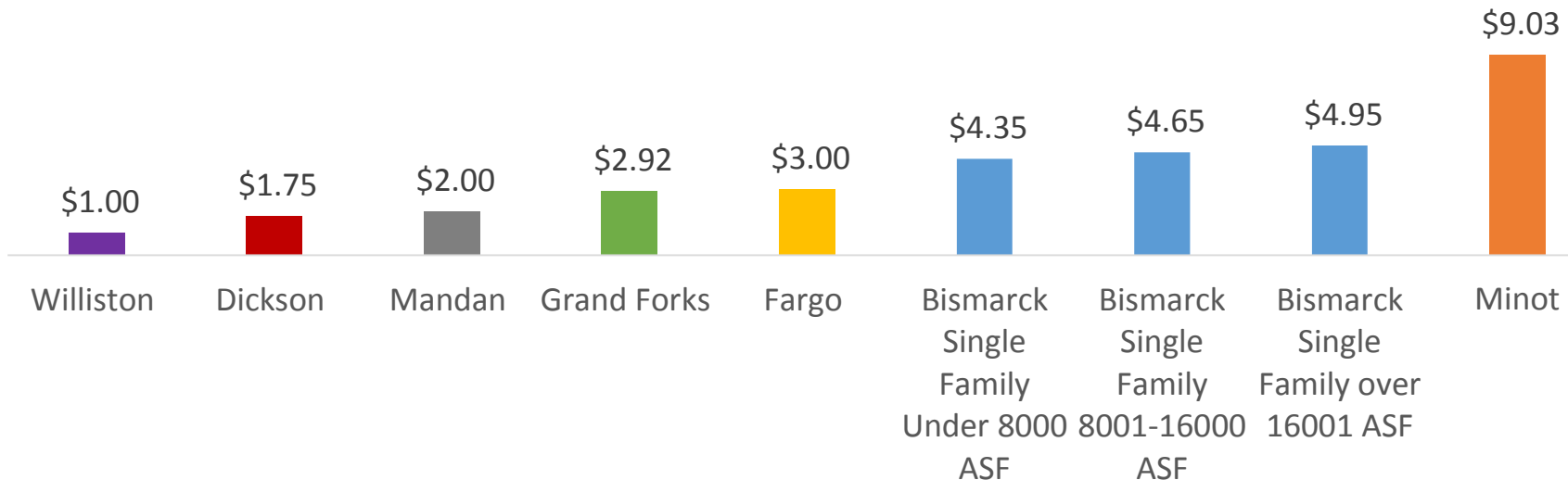
Community	Cap/Average	1 CCF	2 CCF	3 CCF	4 CCF	5 CCF	6 CCF	7 CCF	30 CCF
Grand Forks		\$3.28							
Minot		\$2.77							
West Fargo		\$1.00							
Williston	November - April Average	\$1.09							\$0.85
Mandan		\$1.65							
Fargo		\$2.15							
Bismarck	November - April Average	\$2.45	\$3.00						
Dickinson	5000 gallons in Summer	\$2.15						\$4.00	

Stormwater Rate Structures

Stormwater Rate Structures in North Dakota



Single Family Monthly Bill

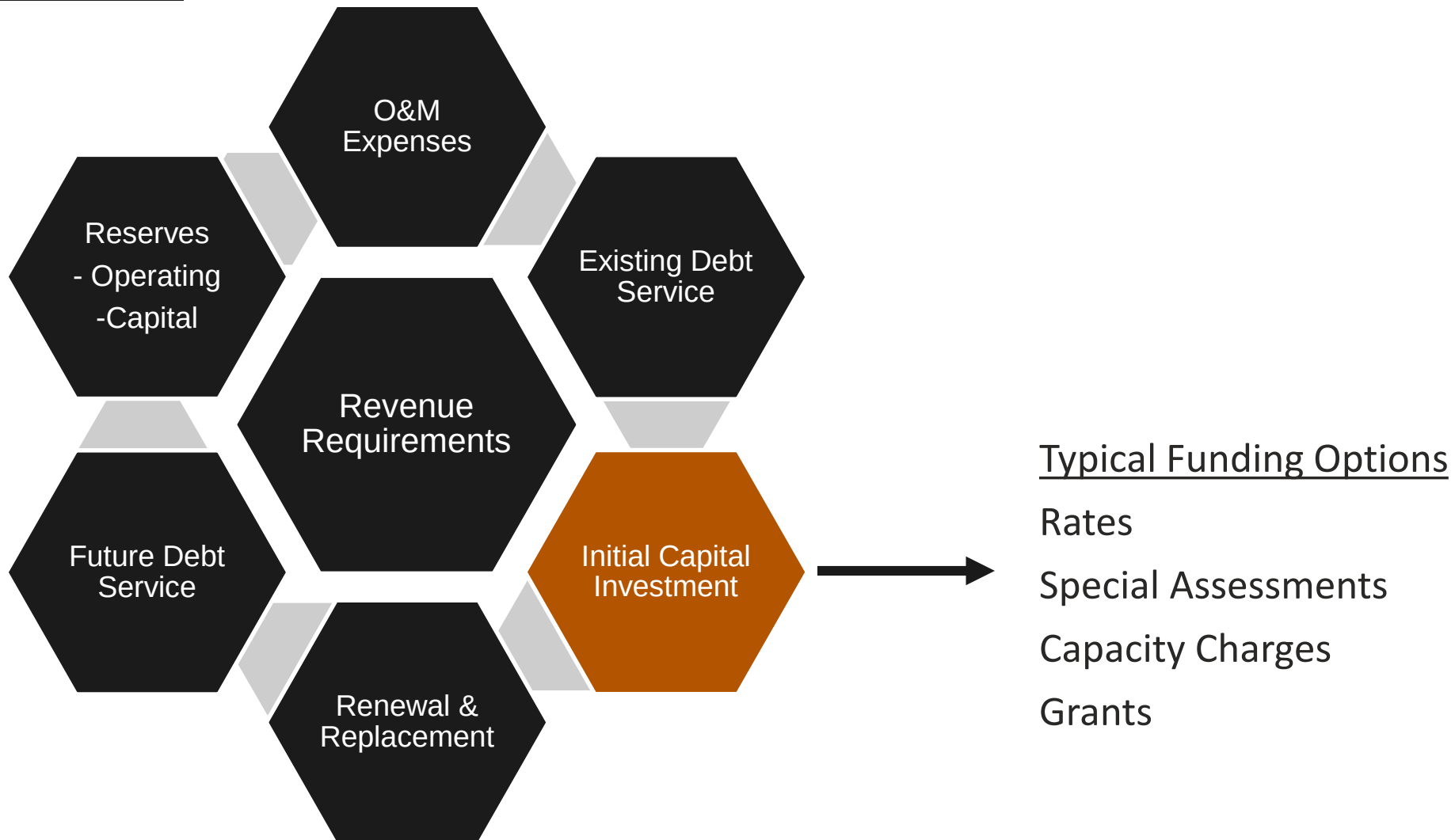


Funding Strategies

Municipal utilities typically stand alone

- ▶ Enterprise Fund operations that are self-supporting
 - ▶ Rates and fees are set to recover cost of providing service
 - ▶ Utilities reimburse General Fund for support services
 - ▶ No profit and no subsidy from General Fund
 - ▶ Function “as a business”
- ▶ Utility rates are user fees rather than taxes, and are designed based on use of/impact on systems
 - ▶ Should be cost-based
 - ▶ Cannot be arbitrary
- ▶ City: separate funds for water, sewer & stormwater

Utilities must identify appropriate mechanisms to recover all costs

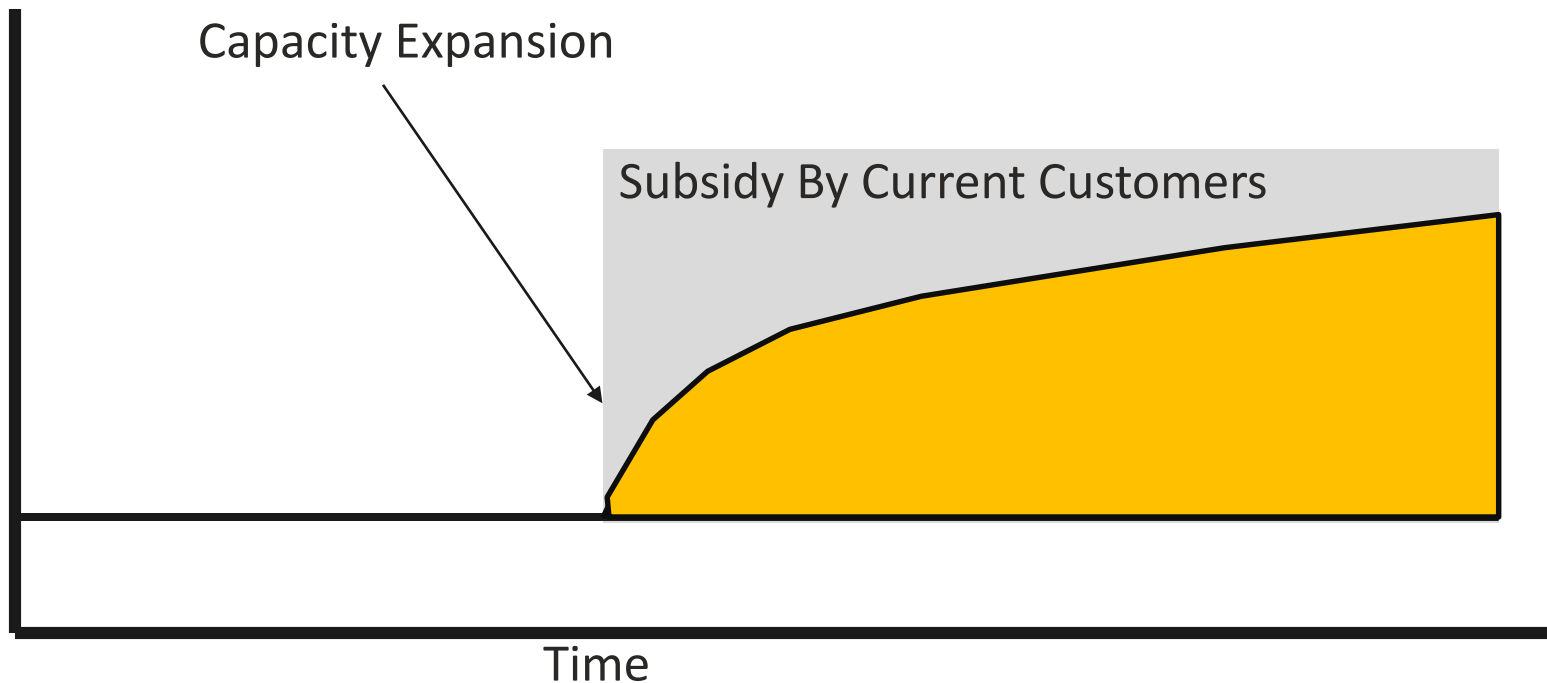


Common cost recovery mechanisms

	Developers	Rates	Impact Fees	Assessments
Local distribution and collection system assets	Standard	Rare	Rare	Common
Larger water transmission and wastewater conveyance assets	Uncommon – except to achieve schedule objectives and/or facilitate upsizing	Frequently bear part of the costs	Common	Occasionally
Treatment plants and other regional infrastructure	Uncommon	Frequently bear part of the costs	Common	Uncommon
Special services to specific areas, such as sewer extensions to septic tank areas	Uncommon – except to achieve schedule objectives	Frequently bear part of the costs	Rare	Common

The basic challenge

- Infrastructure is expensive to provide
- Long-term revenue from future customers don't always provide adequate funding to recover these costs
- Even if such revenue streams reflect the fully allocated cost of service, the costs of growth can impose significant burdens on existing customers



Industry-standard approaches

Connection fees and other up-front charges

- A tool to recover the costs of providing necessary capacity to serve new development
- Known as impact fees, capacity fees, capital recovery charges, readiness to serve fees, capital contribution fees, capital facility fees, system development charges, system buy-in charges, among other names

Related Fees and Charges

- Such as tap fees and meter fees most frequently recover these up-front, but non-capacity related costs

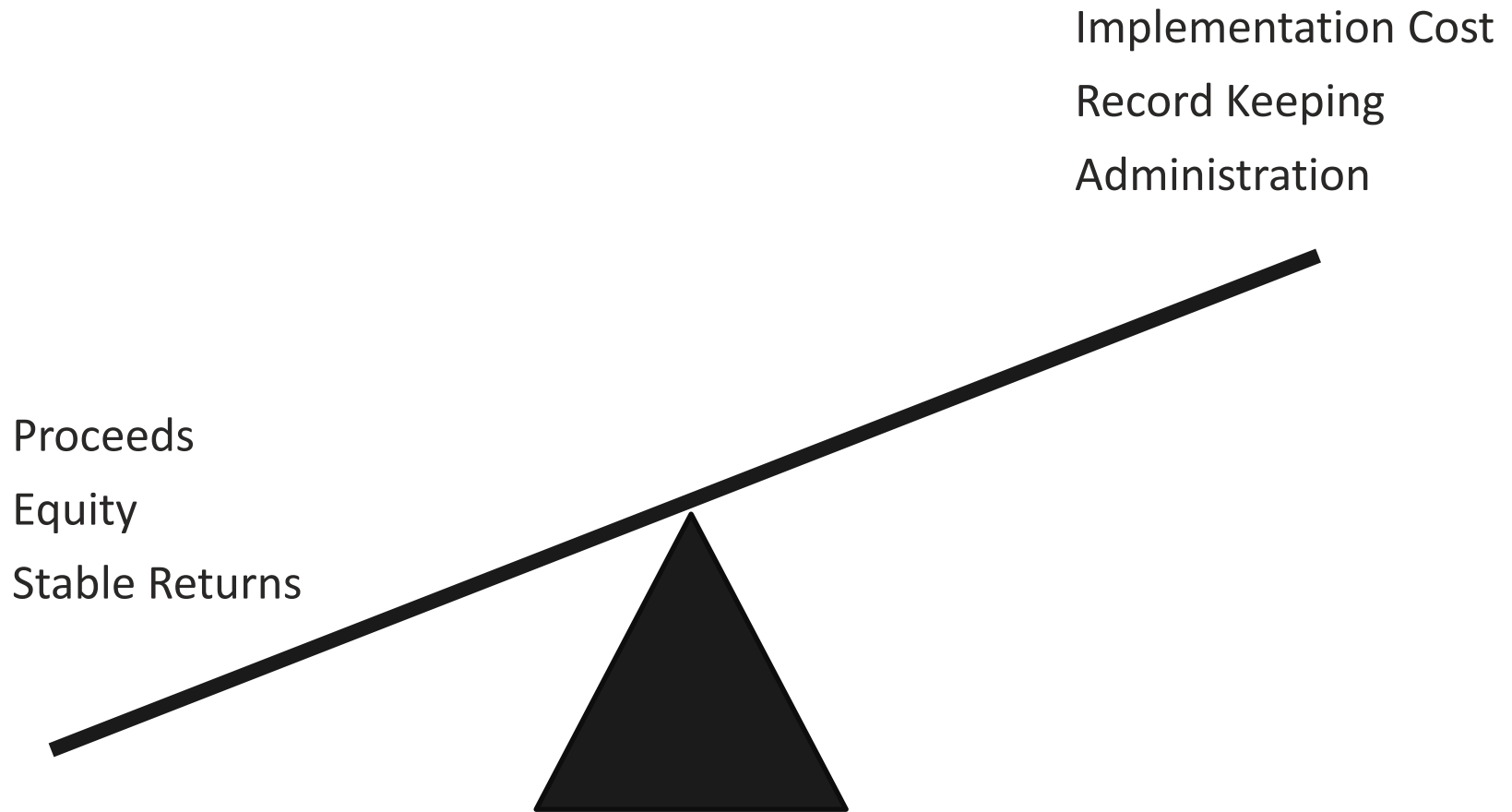
“The Dunedin Decision”

- CITY OF DUNEDIN v. CONTRACTORS AND BUILDERS ASSOCIATION OF PINELLAS COUNTY, 1975
 - Established the authority to impose impact fees 10+ years before the first state enabling legislation (Texas, 1987)
 - Created a mechanism through which new developments can pay for the infrastructure needs they generate
 - Set fundamental and lasting standards to focus on a proportionate allocation of costs for backbone facilities

“Backbone” capital charges are common nationwide

- Impact fees and similar charges are utilized throughout most of the country for water and sewer infrastructure
- Enabling legislation passed in about 30 states
- In many cases, a formally adopted fee structure is seen as an improvement over ad-hoc negotiated agreements, even within the development community

Must consider benefits and costs of alternative capital cost recovery approaches



Limitations of assessments

- Reliance on assessments can limit a City's ability to manage growth effectively
- In the absence of large fund balances in targeted reserve accounts, up-front charges are a critical tool in responding to growth
- A 15 year payback period is an unusually long period for up-front infrastructure
- Uncertainties regarding the timing of growth impose risks on the existing customer base, especially with a reliance on assessments

Impacts of less than full cost charges

- The potential for existing customers who have funded their own necessary infrastructure to bear the costs of providing infrastructure to new areas
- The danger that this subsidy could represent a permanent transfer of wealth with no realistic hope for payback or reciprocal benefit
- A reduction in a local government's ability to plan for and provide infrastructure in a logical and cost-effective manner, and a potential efficiency loss to all customers as a result

Capital cost recovery path forward

- **Establish a plan to engage with interested stakeholders in evaluating alternative cost recovery options available to Bismarck**
- Identify costs and benefits of each option
- For the preferred option(s), identify costs of appropriate types of infrastructure
- Calculate a proportionate share of each per equivalent residential unit or other measure
- Provide an implementation plan to the City

Questions and Answers