



Water and Sewer Charges 101

July 2023



WATER CHARGES 101

July 2023

Water System

5 

Treatment Plants



816 miles of
transmission main



3.8 MILLION
PEOPLE SERVED



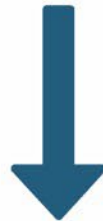
88 Member Partners
across **112** communities



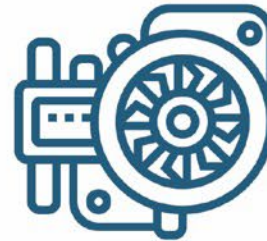
Treatment capacity of **1,720**
million gallons per day



3 Water
Intakes



19 BOOSTER
PUMP STATIONS



1,698 SQ. MILE
service area

MISSION: *To exceed our customer's expectations by utilizing best practices in the treatment and transmission of water and wastewater, while promoting health communities and economic growth.*

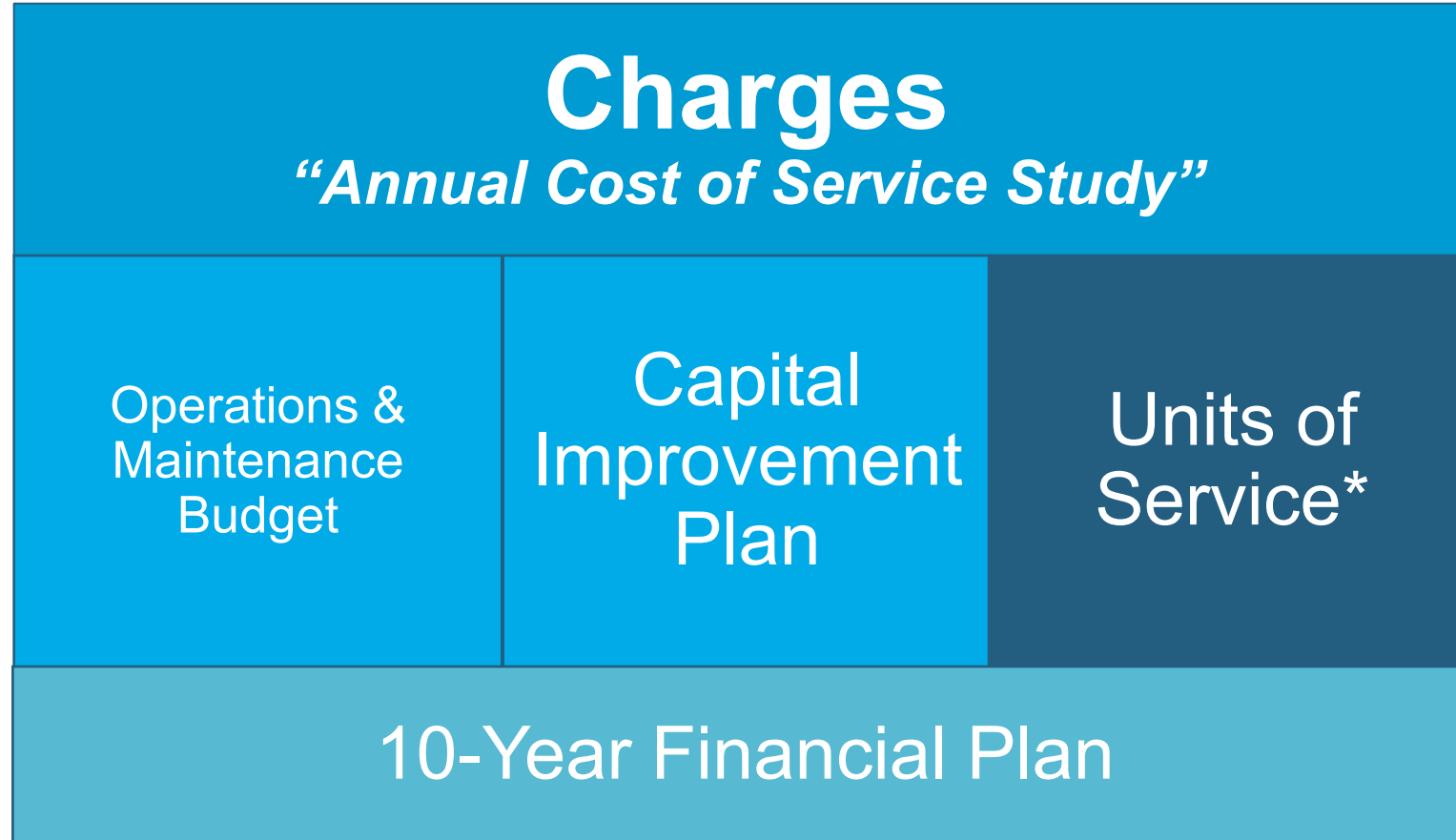
Principles and Generally Accepted Practices of Charge Development

Charge Development Overview

Charges are based on four key elements:

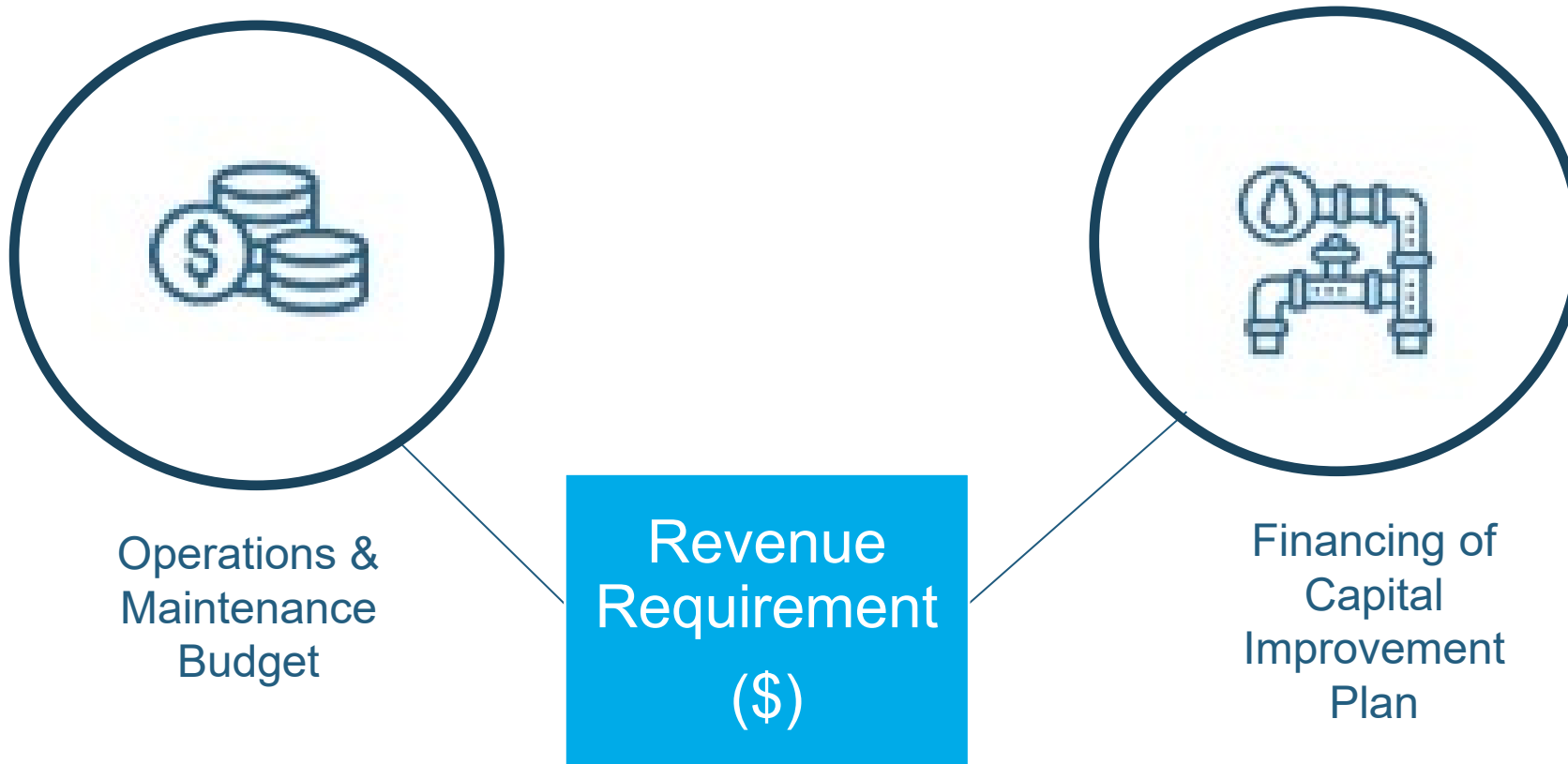
- 💧 *Budget*: The budget is also known as the “revenue requirement” as it defines the amount of revenue required to run the utility.
- 💧 *Capital Improvement Plan (CIP)*
- 💧 *Units of Service (UOS)*: For the water system, this includes the amount of water purchased each year and contracted demands during peak periods. For the sewer system, each member partner’s SHARE is based on contributed wastewater.
- 💧 *Cost of Service Study (COS)*: The outcome is the charge calculation for each member partner.

How are Charges established?



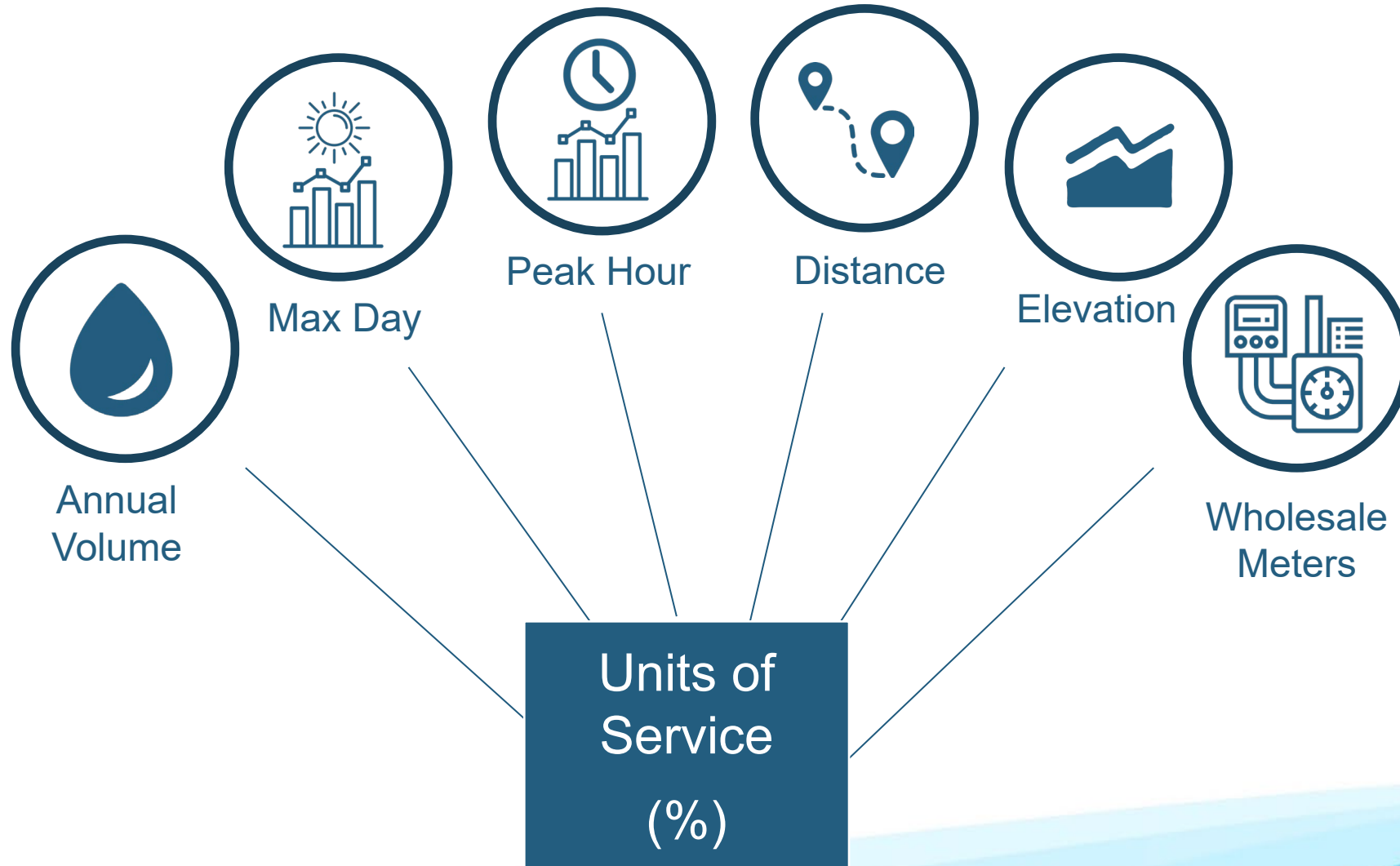
*Water: Share of budget based on amount of water purchased, contracted peak demands, and location within the Regional System.
Sewer: Each member partner's SHARE is based on contributed wastewater and certain legal agreements.

Revenue Requirement (Budget)



Units of Service

(system demand)



Core Charge Equation

$$\begin{array}{|c|} \hline \text{Revenue} \\ \text{Requirement} \\ \hline (\$) \end{array} \times \begin{array}{|c|} \hline \text{Units of} \\ \text{Service /} \\ \text{SHARE} \\ \hline (\%) \end{array} = \begin{array}{|c|} \hline \text{Charges} \\ \hline \end{array}$$

HOW THE GREAT LAKES WATER AUTHORITY SETS WATER CHARGES



1

GLWA creates a water budget. This budget is capped at a four percent increase (that means it can't increase more than four percent every year).

GLWA WATER BUDGET



2

The budget is then used to set charges for each community.

Factors that go into determining charges unique to each community are:

Usage patterns (How much water a city takes, particularly on the hottest days and the highest use day of the year)

Elevation from the water plant (It's harder to push water up hill)

Distance from the water plant (A long way for water to travel)



The more electricity that is needed to pump water to a city, the more expensive a city's charge will be. So, the farther and higher elevated a city is, the more energy is needed to pump water to it. There are also more pumps and pipes needed. Usage patterns also affect cost; it takes more effort to serve everyone at once, so if every city is taking water from the GLWA system at the same time, it will cost more. Cities that take their water from GLWA at night and place it into storage enjoy significant savings.

3

New charges are given to communities, and the communities then add their own local operating costs, which are typically a similar amount (approx 50/50). This total then results in the local rates that are billed to individual homeowners.

City A (Least Expensive)



City A has:

- Storage
- Low elevation
- Short distance from water plant



City B (More Expensive)



City B has:

- No storage
- Low elevation
- Farther distance from water plant



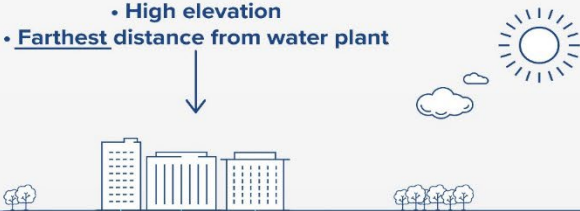
City C (Most Expensive)



City C has:

- No storage
- High elevation
- Farthest distance from water plant

**Varies by community;
50% on average*

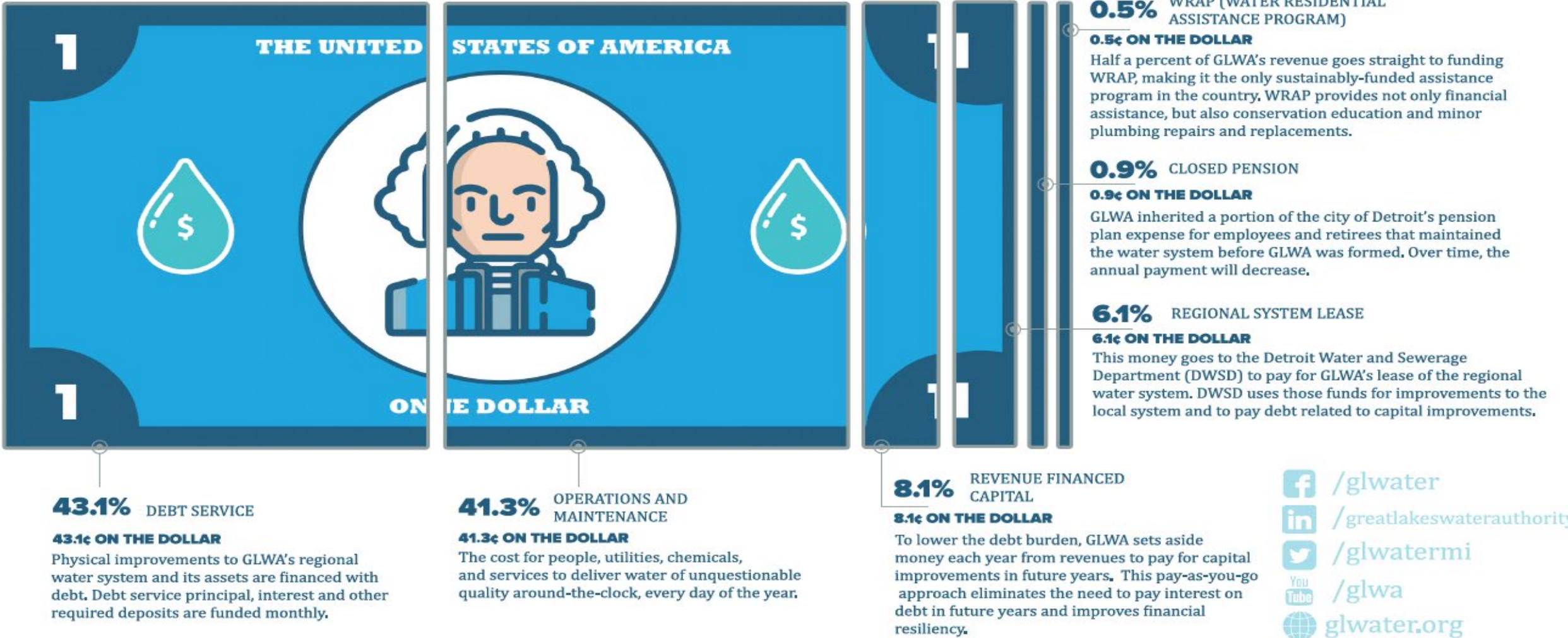


How can communities control their water charges?

- Storage.** Creating storage allows communities to avoid having to take water from the system during the highest use times of the day (peak hour) and during the hottest days of the year (max day).
- Manage.** Cities need to responsibly manage their local system's usage and make sure that they don't exceed the peak hour and max day volumes agreed to in their contracts with GLWA.
- Conserve.** Through proper local management, each community has an opportunity to reduce how much water it uses from the regional system.

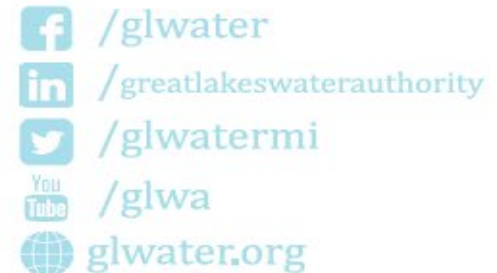
MAKING SENSE OF YOUR DOLLARS

Every dollar paid to GLWA for **Water Services** provides for...



WE ARE ONE WATER

Note: Percentages based on FY 2024 approved budget.



GLWA Average System Charge Adjustments

*Focusing on
Affordability while
building
resiliency.*

 **Average System Charge Adjustments**

Year	Water	Sewer
2018	1.8%	-0.7%
2019	1.8%	0.1%
2020	0.6%	0.8%
2021	3.2%	2.0%
2022	1.5%	-0.6%
2023	3.7%	2.4%
2024	2.75%	2.75%
7-Year Average	2.2%	0.9%

Approved FY 2024 Water Charges

- 💧 The Charge Increase, on average, is 2.75 % while the Budget increase is 4%, holding to the Four Percent Promise. This is possible based on:
 - 💧 Increased investment earnings and;
 - 💧 Increased estimated sales volumes.



City of Highland Park

FY 2024 Water Service Charges

City of Highland Park FY 2024 Water Charges

FY 2024 Wholesale Water Service Charge Schedule Calculation * *Highland Park*

	(1)	(2)	(3)	(4)	(5)	(6)
	Proforma					
	FY 2024 Revenue			FY 2024 Revenue	Effective	
	under Existing	System Charge Adjustment		Requirement	Charge	
	Charges	Index	Amount	Allocation	Adjustment	
	\$	%	\$	\$	\$	
<u>Revenue Requirement Analysis Summary</u>						
1 Wholesale Revenue Requirement	356,260,500	2.75%	9,808,300	366,068,800		
2 Highland Park SHARE (a)	0.322%	1.2%	0.004%	0.326%		See Line 19 Below
3 Highland Park Wholesale Revenue Req'ts	1,147,300	4.0%	46,400	1,193,700	3.7%	
4 Detroit Ownership Adjustment	75,700	1.7%	1,300	77,000	0.1%	
5 Flint KWA Debt Service Adjustment	22,100	1.4%	300	22,400	0.0%	
6 TOTAL	1,245,100		48,000	1,293,100	3.9%	
<u>FY 2024 Service Charge Schedule</u>						
7 Total Amount Required from Charges				1,293,100		
8 Fixed Monthly Charges @		60%		775,900	\$64,700 per month	
9 Commodity Charges @		40%	103,000	516,700	\$5.02 per Mcf *	

* Commodity Revenue Requirement adjusted to match 12 "rounded" monthly payments

City of Highland Park

Non-Master Metered Units of Service

- ◆ Prior to FY 2020, Highland Park water usage was invoiced based on a monthly historic average from old Highland Park water treatment plant usage reporting.
- ◆ In FY 2020, GLWA implemented the results of “Non-Master Metered Units of Service Study” prepared by Black & Veatch.
- ◆ This study determined that the appropriate wholesale water use proxy for Highland Park was 2.18 Million Gallon Per Day (mgd), which includes estimates of non-revenue (lost) water.
- ◆ That amount remains the baseline input for charge development and billing purposes today, although it has been moderately reduced to 2.13 mgd, consistent with reductions in System use.

Units of Service for Non-Master Metered Customers

TOTAL VOLUMES ASSIGNED BY ENTITY	AVG. DAY (MGD)	MAX DAY (MGD)	PEAK HOUR (MGD)
Dearborn	12.7	21.8	30.3
Detroit	90.9	111	131
Highland Park	2.18	2.79	2.86

- Prior to FY 2020, Highland Park water usage was invoiced based on a monthly historic average from old Highland Park water treatment plant usage reporting. The monthly usage amounts remained the same year after year.
- In FY 2020, GLWA implemented the results of “Non-Master Metered Units of Service Study” prepared by Black & Veatch. This study used various measuring and analytical techniques to produce proxies of “wholesale water use” for Detroit, Dearborn, and Highland Park.

City of Highland Park

Non-Master Metered Units of Service

Calculation of NMM Customer Units of Service - FY 2024

	(1)	(2)	(3)	(4)	(5)	(6)
			Peaking Factor		Peak Demands	
	<u>Sales</u>	<u>Avg Day</u>	<u>Max Day</u>	<u>Peak Hour</u>	<u>Max Day</u>	<u>Peak Hour</u>
	<i>Mcf</i>	<i>mgd</i>			<i>mgd</i>	<i>mgd</i>
	<i>from above</i>				<i>(2) * (3)</i>	<i>(2) * (4)</i>
Detroit	4,174,000	85.54	1.34	1.59	115.00	136.00
Dearborn	561,600	11.51	2.06	2.86	23.80	32.90
Highland Park	104,000	2.13	1.54	1.57	3.28	3.36
Total	4,839,600	99.19			142.08	172.26



SEWER CHARGES 101

July 2023

Wastewater System



The largest single-site
wastewater treatment
facility in the United
States



195 miles of trunk
sewers & interceptors



2.8 MILLION
PEOPLE SERVED



19 Member Partners
across **79** communities



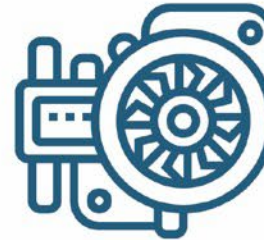
Treatment capacity of **1,700**
million gallons per day



8 
CSOs

3 
Interceptors

9 PUMP
STATIONS



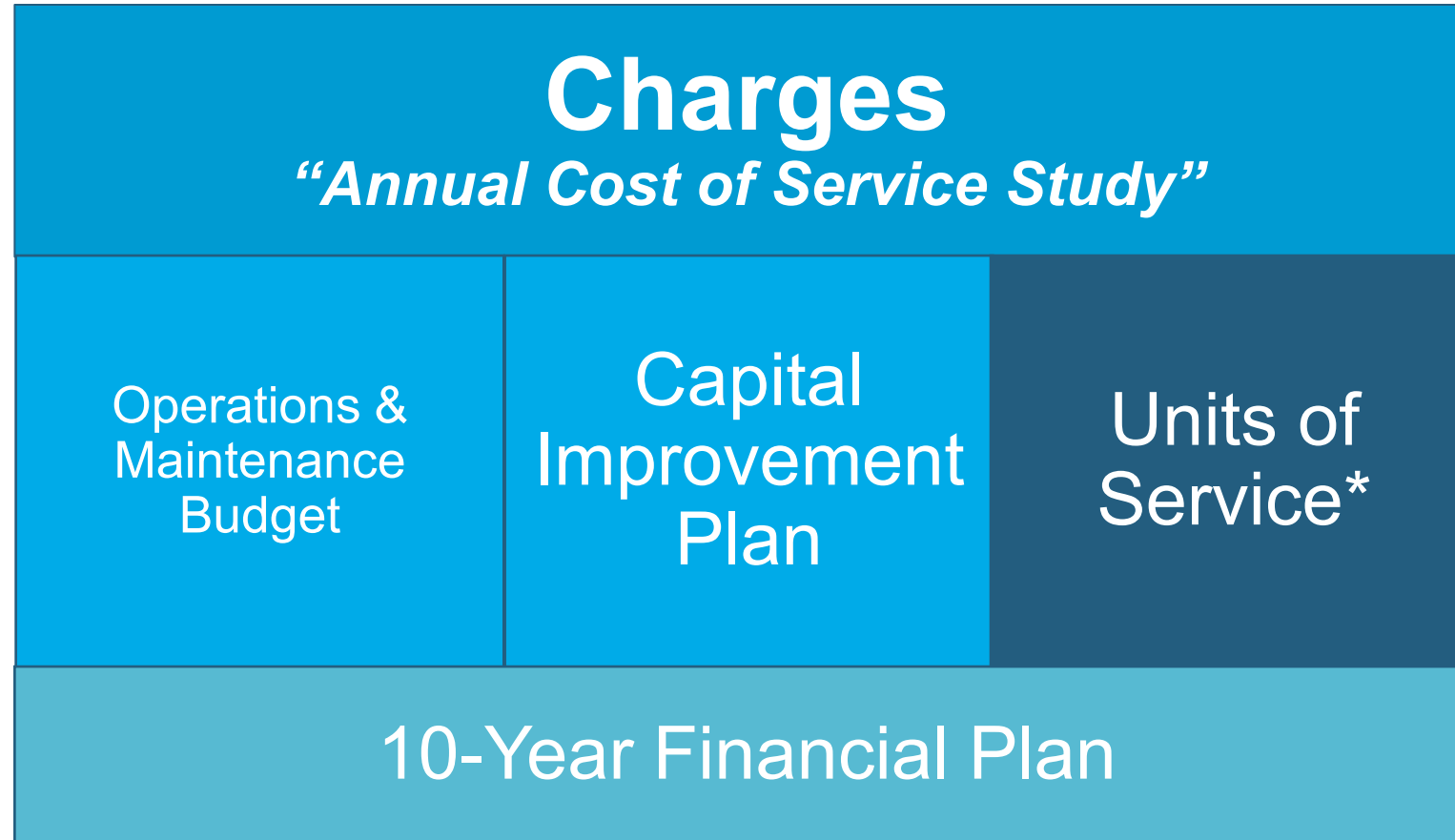
944 SQ. MILE
service area

VISION:

Through regional collaboration, GLWA strives to be the provider of choice, dedicated to efficiently and effectively delivering the nation's best water and sewer services in partnership with our member partners.

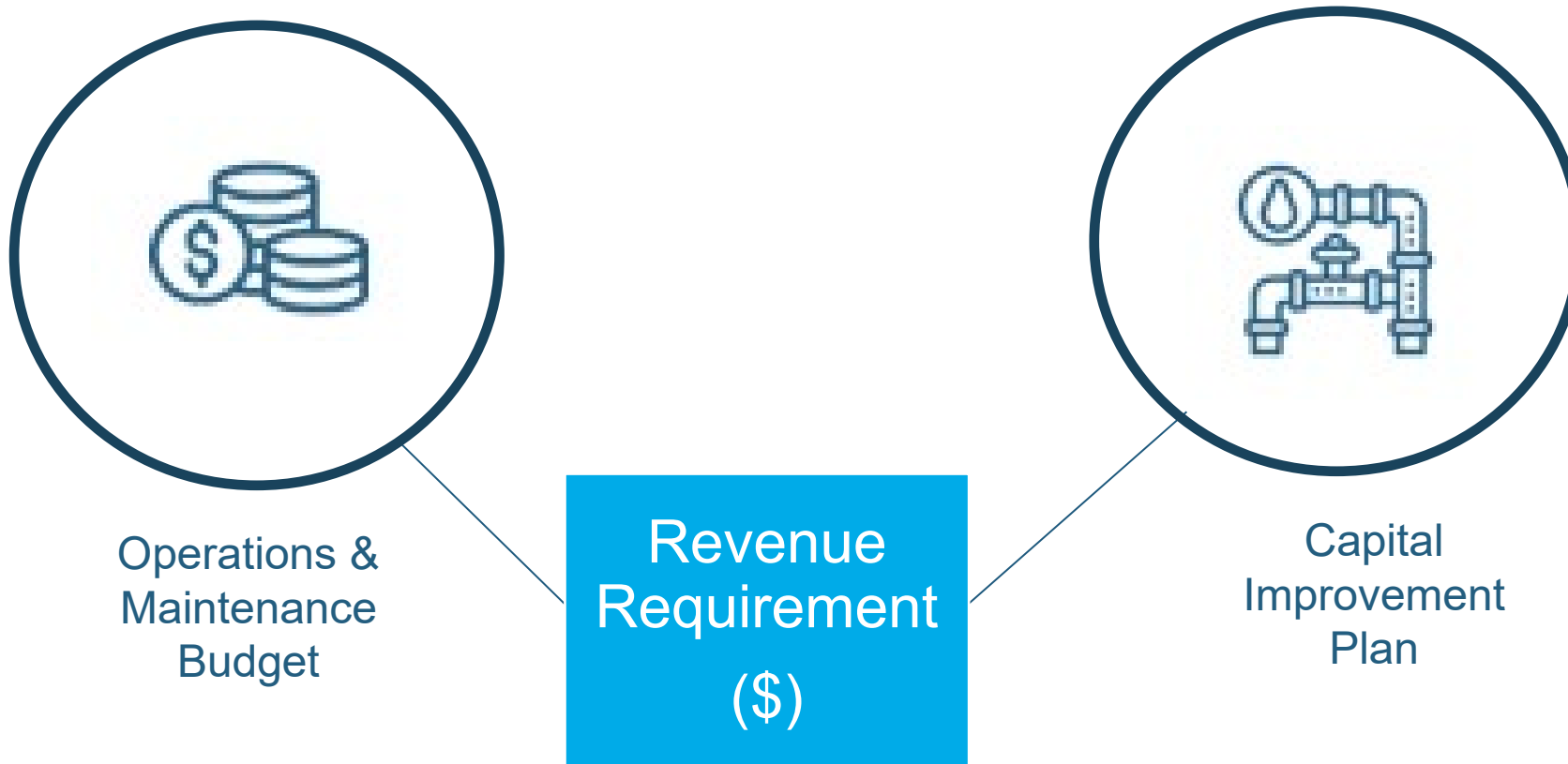
Principles and Generally Accepted Practices of Sewer Charge Development

How are Charges established?



* Water: Share of budget based on amount of water purchased, contracted peak demands, and location within the Regional System.
Sewer: Each member partner's SHARE is based on contributed wastewater and certain legal agreements.

Revenue Requirement (Budget)



Core Charge Equation

$$\begin{array}{|c|} \hline \text{Revenue} \\ \text{Requirement} \\ \hline (\$) \end{array} \times \begin{array}{|c|} \hline \text{Units of} \\ \text{Service /} \\ \text{SHARE} \\ \hline (\%) \end{array} = \begin{array}{|c|} \hline \text{Charges} \\ \hline \end{array}$$

HOW THE GREAT LAKES WATER AUTHORITY SETS SEWER CHARGES



GLWA SEWER BUDGET

GLWA creates a sewer budget. This budget is capped at a four percent increase (that means it can't increase more than four percent every year). Each community's sewer charge is based on the sewer budget and allocated as a "SHARE," which is determined by the flow it sends to GLWA's Water Resource Recovery Facility (previously known as the Wastewater Treatment Plant). The type of flow and how costly each type of flow is to treat determine a community's charge.



Sanitary
(Most Expensive)
\$\$\$



Water that comes from households, commercial and other facilities, including from toilets, sinks and drains.



Non-Sanitary
(Less Expensive)
\$



Dry Weather Inflow and Infiltration
Water that seeps into pipes.

and



Storm Water
Rain water that washes into sewers.

HOW CAN COMMUNITIES CONTROL THEIR SEWER CHARGES?

If a community can control its flow, it can control its cost.



Green Infrastructure*

An example of green infrastructure is a green roof, which soaks up rain water rather than letting it wash off into drains that lead to the Water Resource Recovery Facility. This reduces storm water flow.

(*Green Infrastructure is an approach to water management that protects, restores or mimics the natural water cycle.)



System Maintenance

Regular maintenance, repair and improvements can help communities prevent increased flow from DWII.



Separate Sewer System

A separate sewer system is more efficient than a combined system. Separate systems reduce a community's costs because storm water is not sent to the Water Resource Recovery Facility for treatment.

SANITARY SEWER

STORM SEWER

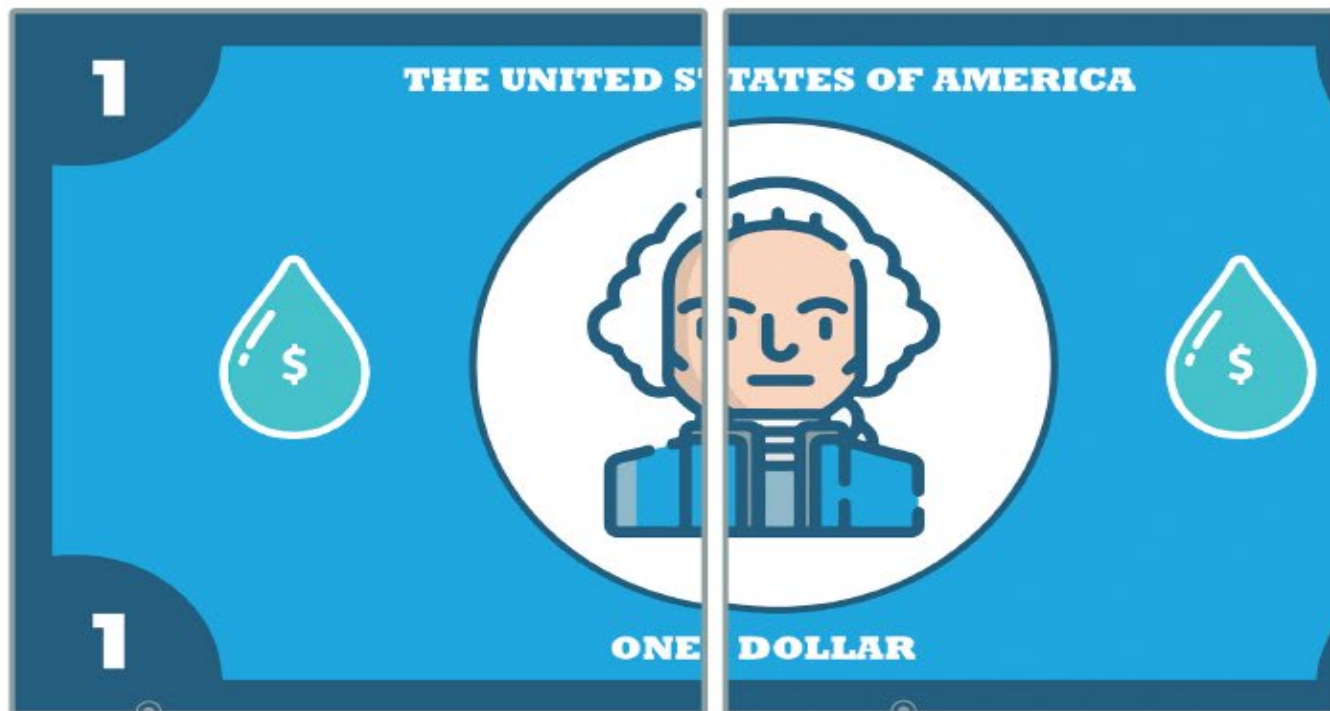
COMBINED SEWER SYSTEM

This system is more expensive for a community because all types of flows are combined, therefore they are all sent to the Water Resource Recovery Facility for treatment.



MAKING SENSE OF YOUR DOLLARS

Every dollar paid to GLWA for
Wastewater Services provides for...



45.6% DEBT SERVICE

45.6¢ ON THE DOLLAR

Physical improvements to GLWA's regional wastewater system and its assets are financed with debt. Debt service principal, interest and other required deposits are funded monthly.

41.1% OPERATIONS AND MAINTENANCE

41.1¢ ON THE DOLLAR

The cost for people, utilities, chemicals, and services to deliver effective and efficient wastewater services around-the-clock, every day of the year.

6.0% REVENUE FINANCED CAPITAL

6.0¢ ON THE DOLLAR

To lower the debt burden, GLWA sets aside money each year from revenues to pay for capital improvements in future years. This pay-as-you-go approach eliminates the need to pay interest on debt in future years and improves financial resiliency.

0.5% WRAP (WATER RESIDENTIAL ASSISTANCE PROGRAM)

0.5¢ ON THE DOLLAR

Half a percent of GLWA's revenue goes straight to funding WRAP, making it the only sustainably-funded assistance program in the country. WRAP provides not only financial assistance, but also conservation education and minor plumbing repairs and replacements.

1.3% CLOSED PENSION

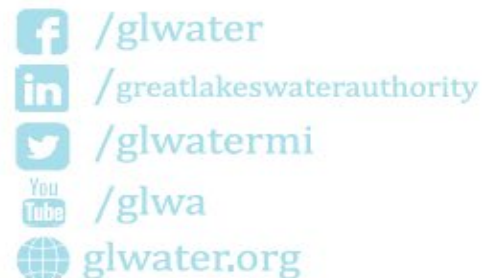
1.3¢ ON THE DOLLAR

GLWA inherited a portion of the city of Detroit's pension plan expense for employees and retirees that maintained the sewer system before GLWA was formed. Over time, the annual payment will decrease.

5.5% REGIONAL SYSTEM LEASE

5.5¢ ON THE DOLLAR

This money goes to the Detroit Water and Sewerage Department (DWSD) to pay for GLWA's lease of the regional wastewater system. DWSD uses those funds for improvements to the local system and to pay debt related to capital improvements.



WE ARE ONE WATER

Note: Percentages based on FY 2024 approved budget.

GLWA Average System Charge Adjustments

*Focusing on
Affordability while
building
resiliency.*

 **Average System Charge Adjustments**

Year	Water	Sewer
2018	1.8%	-0.7%
2019	1.8%	0.1%
2020	0.6%	0.8%
2021	3.2%	2.0%
2022	1.5%	-0.6%
2023	3.7%	2.4%
2024	2.75%	2.75%
7-Year Average	2.2%	0.9%



City of Highland Park

FY 2024 Sewer Service Charges

City of Highland Park

FY 2024 Sewer Charges

FY 2024 Suburban Wholesale Sewer Service Charge Schedule Calculation *

Highland Park

APPROVED 2/22/2023
EFFECTIVE JULY 1, 2023 FOR ALL BILLS
ISSUED ON OR AFTER AUGUST 1, 2023

	(1)	(2)	(3)	(4)	(5)	(6)
	Existing FY 2023 Charges	System Charge Adjustment		Proposed FY 2024 Charges	FY 2024 Fixed Monthly Charge	Effective Charge Adjustment
	\$	Index %	Amount \$	\$	\$	%
<u>Revenue Requirement Analysis Summary</u>						
1 Highland Park Allocated Wholesale Revenue Req'ts	5,311,100	2.81%	149,300	5,460,400	455,100	2.8% (a)
2 Detroit Ownership Adjustment	109,400	0.0%	0	109,400	9,100	0.0%
3 Adjusted Allocated TOTAL Revenue Requirements	5,420,500	2.8%	149,300	5,569,800	464,200	2.8%
4 Fixed Monthly Charge	451,700	2.8%	12,500	464,200		
<u>Relative Increase over Wholesale Revenue Requirement</u>						
5 Detroit Ownership Adjustment		2.1%		2.0%		Line 2 / Line 1
(a) Highland Park SHARE		1.144%		1.144%	<- No Change in SHARES until FY 2025	

City of Highland Park

“D+” Units of Service

- ◆ Highland Park is part of the “D+” Customer Class for purposes of computing Sewer SHARES and Charges. This Customer Class includes all of Detroit, Highland Park, Hamtramck, and parts of other Communities
 - ◆ Detroit accounts for approximately 95% of the Customer Class.
- ◆ Contributed Sanitary contributions from these Customers are based on reported retail water sales data
- ◆ Contributed “Non-Sanitary” Wastewater Volumes for these Member Partners are not easily allocable to individual Customers, and are assigned based on historical analyses from prior flow balance studies
 - ◆ They are also “discounted” by 50% to recognize that some portion of the Non-Sanitary contributions in the D+ area should be treated as a Regional System responsibility.

D+ SHARE Calculations

	(1)	(2)	(3)	(4)	(5)	(6)
	Calculation of FY 2022 D+ SHARE Allocation			Calculation of FY 2022 D+ SHARES		
	<u>Treatment/ Conveyance</u>	<u>CSO</u>	<u>Total</u> <i>wtd avg (1)-(2)</i>	<u>Treatment/ Conveyance</u>	<u>CSO</u>	<u>Total</u> <i>wtd avg (4)-(5)</i>
				<i>~ (1)</i> 38.017%	<i>~ (2)</i> 87.069%	<i>wtd avg (4)-(5)</i> 44.639%
1 Grosse Pointe	0.477%	0.262%	0.425%	0.181%	0.228%	0.190%
2 Hamtramck	1.961%	1.831%	1.911%	0.746%	1.595%	0.853%
3 Harper Woods	0.123%	0.015%	0.103%	0.047%	0.013%	0.046%
4 Highland Park	2.633%	2.371%	2.564%	1.001%	2.065%	1.144%
5 Redford Township	0.112%	0.153%	0.128%	0.043%	0.133%	0.057%
6 Wayne County #3	0.016%	0.040%	0.025%	0.006%	0.035%	0.011%
7 Detroit	94.678%	95.327%	94.844%	35.994%	83.000%	42.338%
8 Total D+	100.000%	100.000%	100.000%	38.017%	87.069%	44.639%

- Highland Park's existing Sewer SHARE of 1.144% reflects their relative Share of the overall D+ Customer Class Share based on their contributed sanitary volumes, an allocated portion of the non-sanitary volumes in the class, and their individual CSO participation based on legal agreements.
- The specific calculations are set forth in a "D+ SHARE Calculations" memorandum from The Foster Group dated 11/13/2020.
- Annual Flow Balance reports provide the inputs to the overall calculations.



References

Water System Charges 101

REFERENCES

- 💧 [FY 2024 Schedule of Water and Sewer Service Charges \(glwa.wpenginepowered.com\)](https://glwa.wpenginepowered.com)
- 💧 [FY 2024 Service Charge Recommendations \(glwa.wpenginepowered.com\)](https://glwa.wpenginepowered.com)
- 💧 [Phase 1: Units Of Service For Non-master Metered Customers Of Great Lakes Water Authority And System Water Audit](#)
- 💧 [Phase 2: Units Of Service For Non-master Metered Customers Of Great Lakes Water Authority And System Water Audit](#)
- 💧 [City of Highland Park Water and Sewer Rates](#)

Sewer System Charges 101

REFERENCES

- 💧 [FY 2024 Schedule of Water and Sewer Service Charges \(glwa.wpenginepowered.com\)](https://glwa.wpenginepowered.com)
- 💧 [FY 2024 Service Charge Recommendations \(glwa.wpenginepowered.com\)](https://glwa.wpenginepowered.com)
- 💧 [D+ SHARE Calculations 11-13-2020](#)