



Town of Purcellville, VA

Water and Sewer Rate Study

Cost of Service Results

October 15, 2019



Study Approach / Schedule



Objectives of Cost of Service Analysis

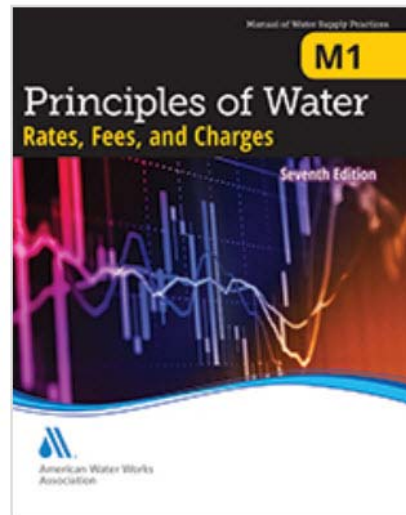
- The total cost of service is the annual revenue requirement of the utility, which is recovered from the utility's customers.
- The utility system is made up of different functions, which drive costs.
- Different customer types use the system functions differently and, as a result, the cost to serve these customer types vary.

Goal: Use customer and system data to determine the **cost to serve** each class and collect revenue from each class according to the resulting cost allocation.

Application based on Industry Guidance

American Water Works Association (AWWA) Manual M-1

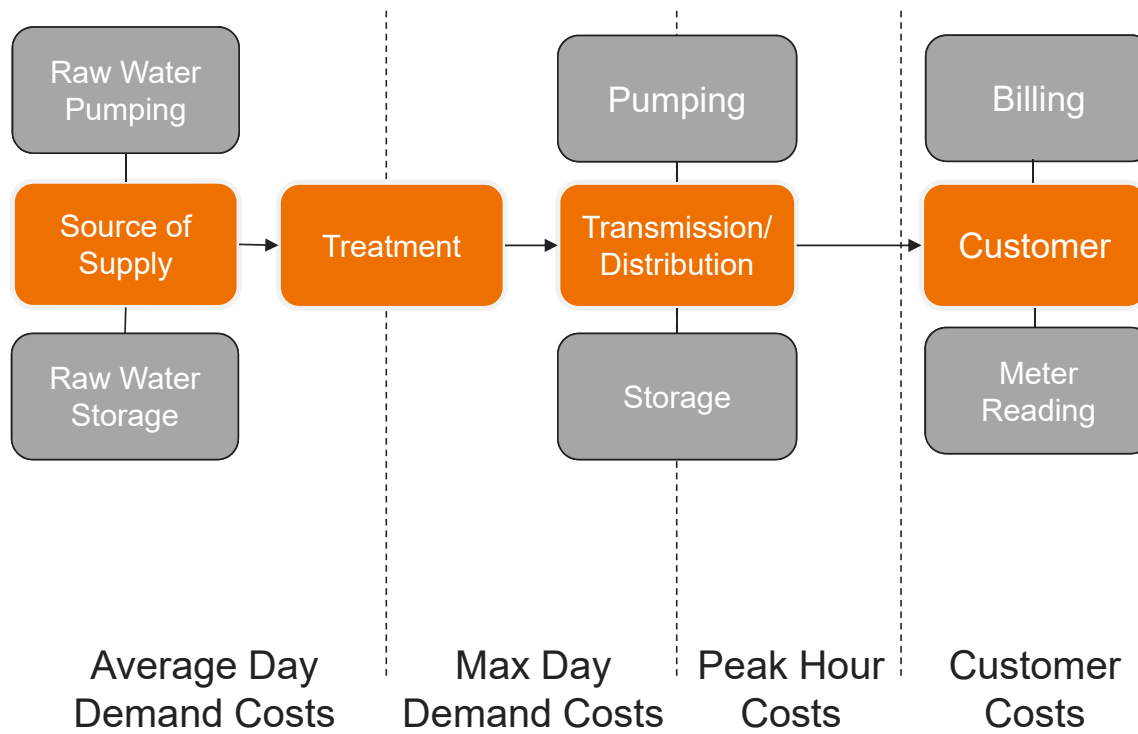
- ▶ Costs allocated to functions and then to users in proportion to contributions to system components



Process used:

- 1) Functionalize system costs
- 2) Allocate functional costs to cost components (base vs. extra capacity, customer-related costs)
- 3) Develop unit costs for each cost component of the system
- 4) Determine customer classes; develop units of service based on customer data
- 5) Distribute costs to customer classes based on unit costs and units of service

Functionalizing System Costs



Allocation Process

- FY 2020 budget was used as the test year for analysis
- Each line item was reviewed with relevant staff and allocated to system functions

Allocation Factors

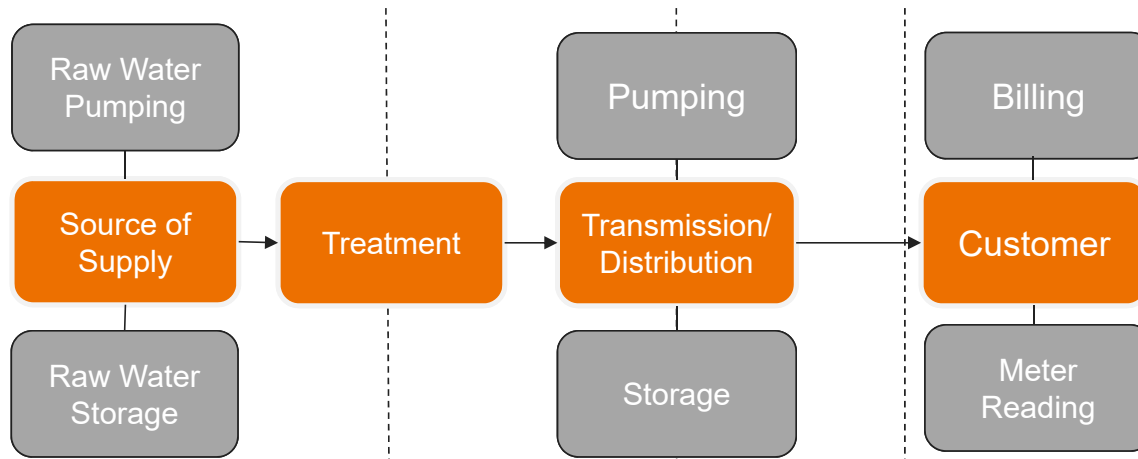
Source of Supply	Treatment	Transmission	Distribution	Customer
100.0%	0.0%	0.0%	0.0%	0.0%

Expense Line Item	FY 2020	Source of					
	Water Expenses	Allocation Factor	Supply Allocation	Treatment Allocation	Transmission Allocation	Distribution Allocation	Customer Allocation
Operations and Maintenance							
Water Staff Salary	\$625,392	System Operators	30.0%	60.0%	5.0%	2.5%	2.5%
Overtime	\$31,000	System Operators	30.0%	60.0%	5.0%	2.5%	2.5%
Chargeback to GF	\$493,226	Weighted FTEs	23.6%	6.3%	16.0%	31.8%	22.4%

Function	Base Capacity	Extra Capacity	Extra Capacity	Customers
	Avg Day	Max Day	Peak Hour	
Source of Supply	100%			
Treatment	74%	26%		
Transmission	74%	26%		
Distribution	37%	13%	50%	
Customer				100%

Functionalizing System Costs/ Unit Costs

Method



	Average Day Demand Costs	Max Day Demand Costs	Peak Hour Costs	Customer Costs	Total
Test Year Costs	\$2.2M	\$0.4M	\$0.2M	\$0.4M	\$3.2M
Unit Costs	\$13.24/kgal	\$16.00/kgal	\$16.78/kgal	\$76.16/account	\$17.99/kgal

Developing Customer Classes

Things to consider when developing customer classes:

- Service characteristics
- Demand patterns
 - Average day, maximum day, peak hour, monthly distribution
- Number of customers by type

Categories of Customers Served by Purcellville Water System

Single Family
Residential

Multi-Family
Residential

Commercial

Institutional

Individually Metered
Single Family

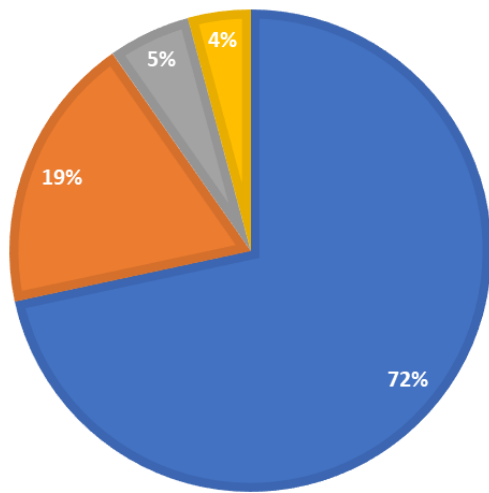
Apartment
Complexes

Businesses,
Town Properties

Educational

Customer Class Units of Service

VOLUME DISTRIBUTION

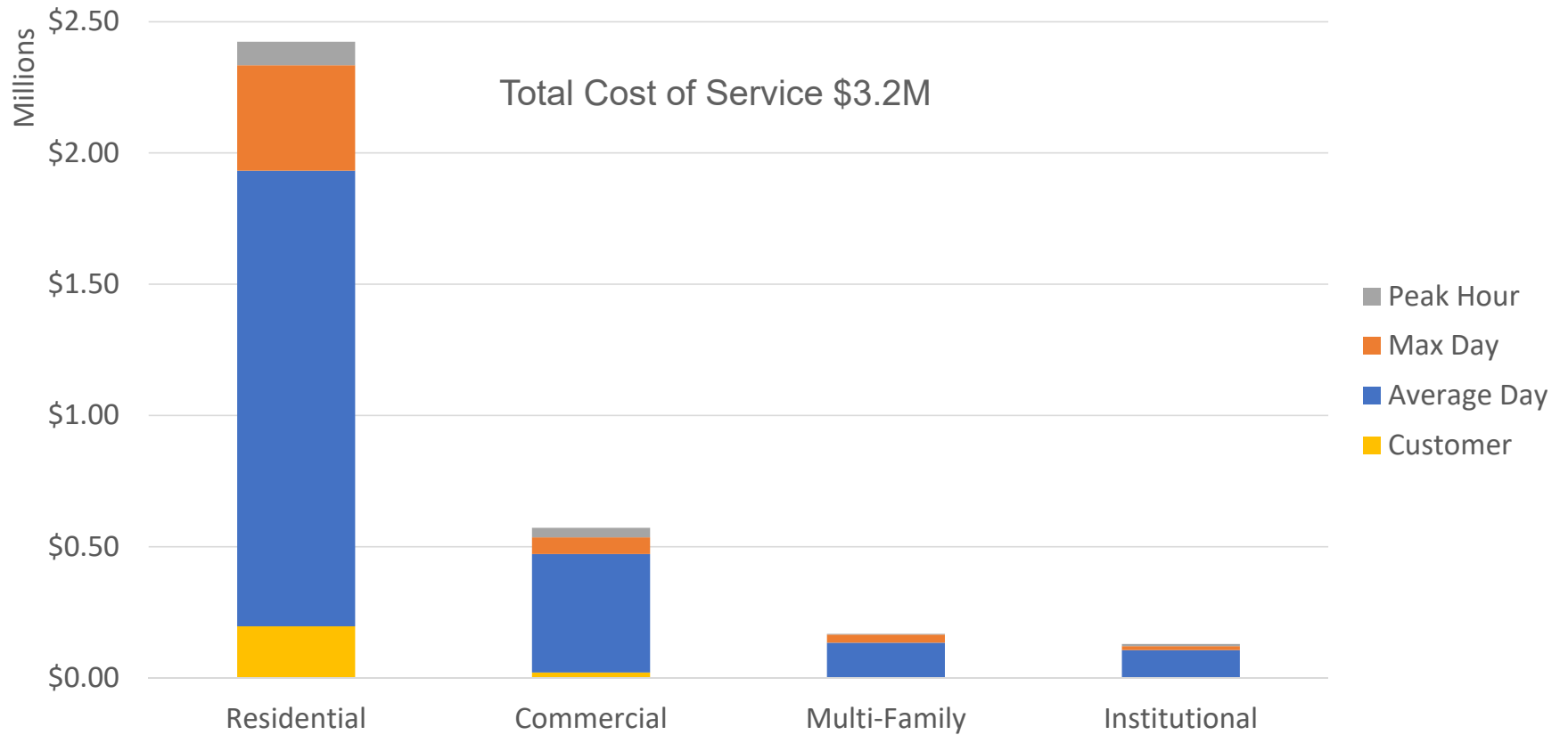


■ Residential ■ Commercial
■ Multi-Family ■ Institutional

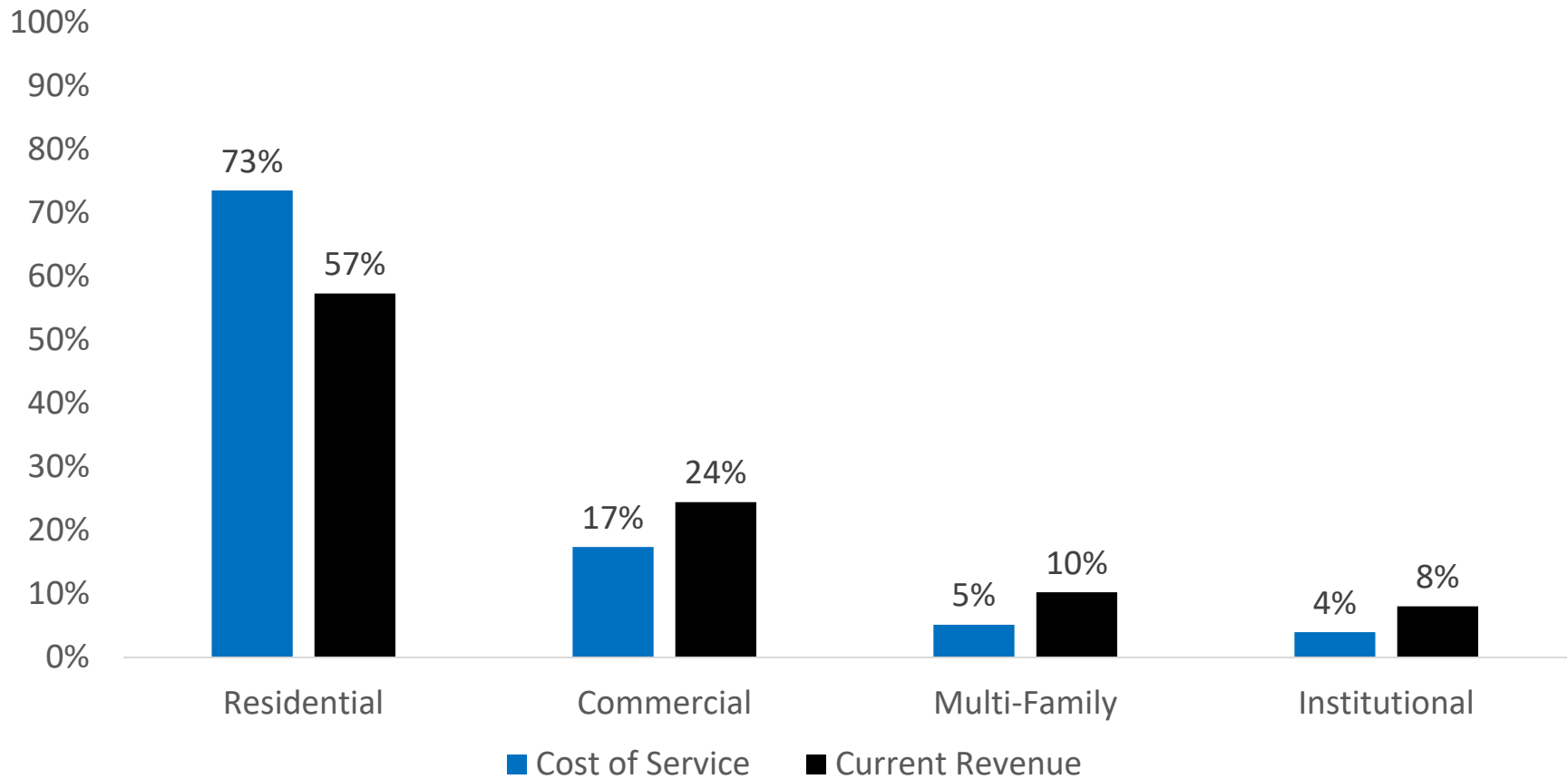
Customer Class	# of Accounts	Annual Average Day Demand (kgal)	Annual Max Day Demand (kgal)	Annual Peak Hour Demand (kgal)
Single Family	2,588	131,048	13,466	80,140
Commercial	273	34,114	2,130	31,984
Multi-Family	14	10,087	1,036	2,326
Institutional	12	7,696	498	7,471

Observation: Overall peaking on water system is limited

Cost of Service by Customer Class

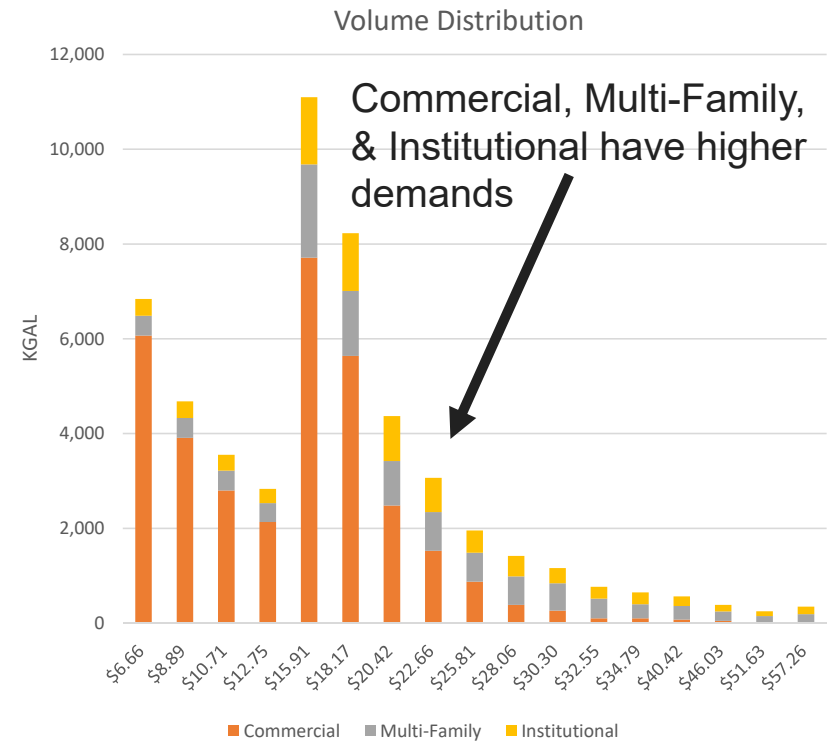
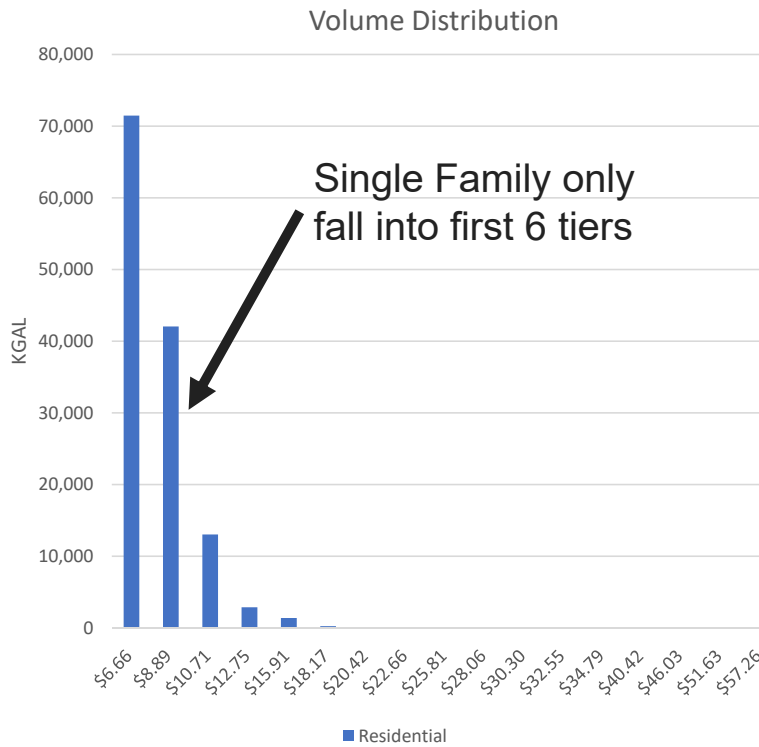


Cost of Service To Current Revenue

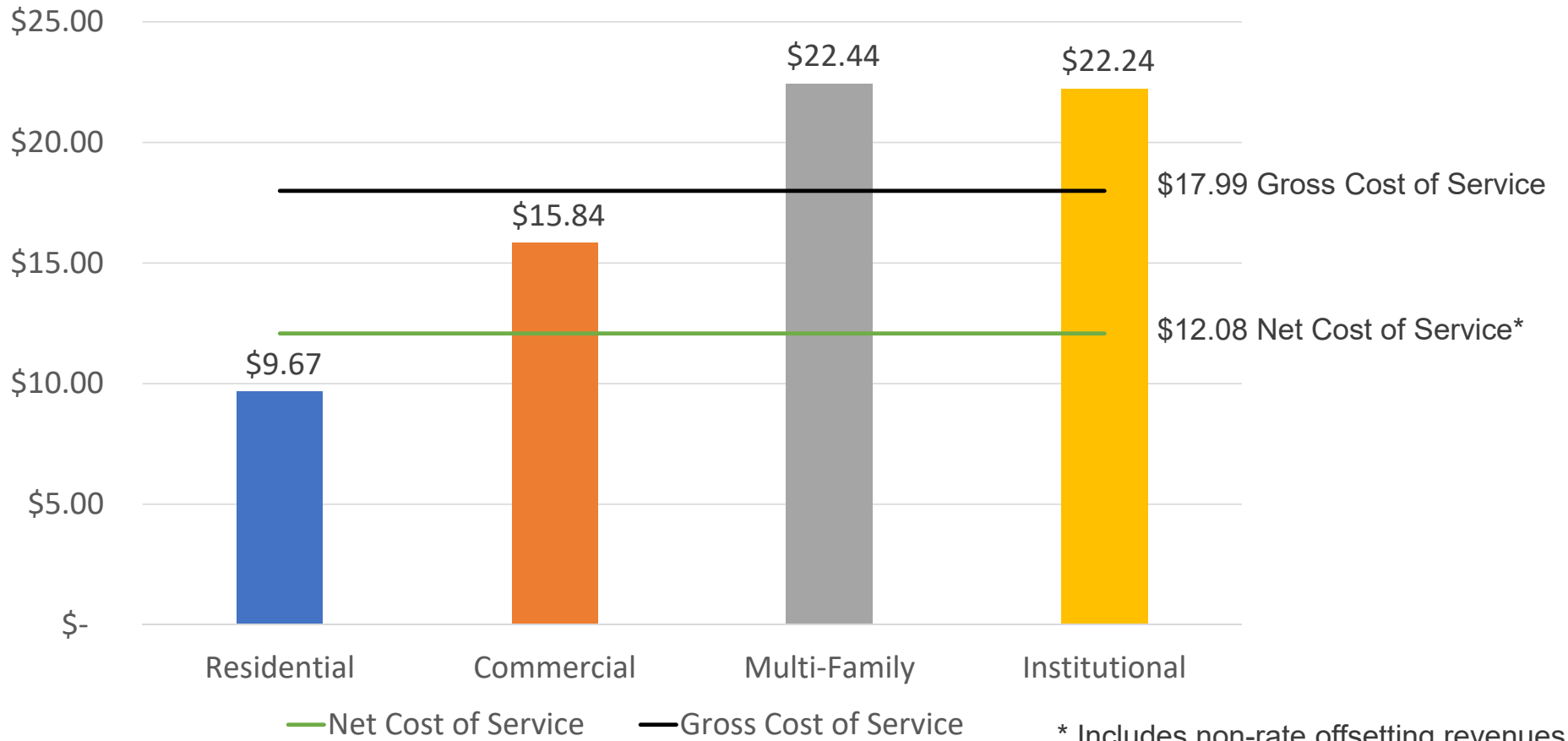


Water Rate Structure Impacts

Usage Tier (kgal)	Water Rate (per kgal)
0 to 5	\$6.66
5 – 10	\$8.89
10 – 15	\$10.71
15 – 20	\$12.75
20 – 50	\$15.91
50 – 100	\$18.17
100 – 150	\$20.42
150 – 200	\$22.66
200 – 250	\$25.81
250 – 300	\$28.06
300 – 350	\$30.30
350 – 400	\$32.55
400 – 450	\$34.79
450 – 500	\$40.42
500 – 550	\$46.03
550 – 600	\$51.63
Over 600	\$57.26



Unit Cost Comparison per 1,000 gallons



Cost of Service Findings

- Cost of providing water service and current cost recovery are not aligned
- Current inequity is potentially unsustainable as Town increases water system revenues to meet future expenditures
 - Potential for existing and future large volume customers to seek alternatives
 - Further impacting revenues
- Current one size fits all water rate structure needs to be examined and likely modified

How to Use Cost of Service Findings

Goal: Use customer and system data to determine the cost to serve each class and **collect revenue** from each class according to the resulting cost allocation.

- There are different methods for recovering revenue from customer classes (fixed charges, uniform volume rates, tiered volume rates)
- Methods may vary based on customer class
- Methods chosen will depend on Town's objectives (fixed cost recovery, conservation, equity within customer class)
- **Next Steps: Stantec will present rate design recommendations at Council Meeting 10/28/19**

Recommended Customer Classes

