

GFOAA 31st Annual Conference & Training

Fundamentals of Cost of Service and Rate Design

Jim Marshall, Senior Manager
Jackson Thornton Utilities Consultants
Montgomery, AL



Overview

- Cost of Service Objectives
- Cost of Service Study
- Rate Design



Cost of Service Objectives



- Revenue Stability and Sufficiency
- Fairness and Equity
 - Fair is related to cross subsidies
 - Equity is related to $\text{Price}=\text{Cost}$
- Ability to Pay
- Simplicity (Admin & Cust Understanding)
- Legally Defendable



Ten Components to COS Study

1. Assemble the Team
2. Target Management and Policy Objectives
3. Determine Test Period and Methodology for setting Revenue Requirements
4. Calculate the Revenue Requirement
5. Functionalize the Revenue Requirement and Capital Investment



Cost of Service Study



Ten Components Cont'd.

6. Classify the Revenue Requirement based on Cost Causation
7. Determine Allocation Factors
8. Allocate Costs to Customer Classes
9. Summarize Results of the Study
10. Design Rates to Meet Class Revenue Responsibility and Study Objectives



Component 1 – Assemble the Team



- Group Effort – Takes a team
- Leadership
 - Management – Emphasize the importance of the study and determine key team members
 - Professional Experts (provide independent, objective party)
- Areas Involved
 - Accounting and Finance
 - Engineering and Operations
 - Customer Service



Component 2 – Management and Policy Objectives



- Identify inequities between or within customer classes
- Provide a basis for the reasonableness of rates
- Consideration of non-cost factors
- Revenue stability
- Transitions to new rate structures and levels should be gradual to mitigate economic dislocation
- Legal requirements such as coverage ratios and reserve levels.



Component 3 – Test Period and Methodology



- Determine Test Period – Test period is the period over which the revenue requirement will be developed.
 - Typically 12 months in length
 - Three Common Approaches
 - Historical – a recent “typical” year
 - Pro forma – historical basis with known and measurable variances
 - Projected – budgeted or forecasted
 - Other Factors
 - Availability of data
 - Timing of adjustments
 - Regulatory considerations




Component 3 – Test Period and Methodology



- Two methods for calculating the revenue requirement
 1. Cash Method
 - Typically used for municipal or governmental utilities
 2. Utility Method
 - Typically used by investor-owned utilities



Component 4 – Calculation of Revenue Requirement Cash Method



- Determine the total revenue required to be generated from rates to allow for the utility to operate, maintain, and develop infrastructure in a manner that is prudent, safe and reliable



Calculation of Revenue Requirement Cash Method Cont'd.

Operations & Maintenance Expense

Plus: Taxes and PILOT

Plus: Debt Service

Plus: Rate Funded CIP

Revenue Requirement

Less: Other Revenues

Rate Revenue Requirement

- O&M does not include depreciation expense
- Debt service includes both principal and interest
- Rate funded CIP typically targets non-growth capital projects
- Must consider restricted income when applying other revenue



Component 5 – Functionalize the Rev. Requirement & Cap. Investment



- Grouping each component of the revenue requirement based on function
 - Treatment
 - Distribution
 - Pumping
 - Admin. & General

Accounting systems typically do most of this for you



Component 6 – Classification Based on Cost Causation



- Classify each component of the revenue requirement based on cost driver
- Cost of service depends on volumes, peaking requirements, and customers
- Useful tools to establish classification percentages include
 - Base sales vs. extra capacity sales
 - Minimum system calculation
 - Fire protection requirements

Component 6 – Classification Based on Cost Causation

	<u>Test Yr.</u>	<u>Base</u>	<u>Ex-Cap</u>	<u>Cust</u>	<u>FP</u>	<u>Total</u>	<u>Description</u>
WTP Chemicals	\$ 155,477	79%	21%	0%	0%	100%	As SLC
Engineering Fees	\$ 26,039	61%	16%	16%	7%	100%	As Treat/Dist
Billing Expense	\$ 57,531	0%	0%	100%	0%	100%	

- Base costs are the costs associated with total usage
- Extra-capacity are the costs associated with meeting the peak demand
- Customer costs are the costs associated with having a customer on the system
- Fire protection costs are the costs associated with providing the flow requirements by class



Component 7 – Determine Allocation Factors



- Cost allocation is the process of allocating the system revenue requirement to each rate class
 - Fair & Equitable
 - Defendable
- Developing the true customer cost and consumption cost
 - Matching fixed and variable expenses with revenue



Allocation Factors Cont'd.



- Typical Allocation Factors include:
 - Number of customers by class of service
 - Sales by customer class
 - Peak contribution by class
 - Fire Protection Requirements

Component 8 – Allocate Costs to Customer Classes

	<u>Test Yr.</u>	<u>Residential</u>	<u>Commercial</u>
Total Customers	194,568	190,848	3,720.00
	100%	98%	2%
Billing Expense	\$ 57,531	\$ 56,431	\$ 1,100
Total Volume	1,304,563	1,245,252	59,311
	100%	95%	5%
WTP Chemicals	\$ 122,547	\$ 116,975	\$ 5,571



Component 9 – Summarize Results

	Total	Residential	Commercial
TOTAL REV. REQ.			
Operations & Maintenance Expense	\$ 4,366,380	\$ 4,205,987	\$ 160,394
Plus: Debt Service	\$ 2,418,010	\$ 2,330,610	\$ 87,401
Plus: Rate Funded Capital	\$ 1,058,120	\$ 1,016,710	\$ 41,409
Total Revenue Requirement	<u>\$ 7,842,510</u>	<u>\$ 7,553,306</u>	<u>\$ 289,204</u>
Less: Other Revenue	<u>\$ 329,179</u>	<u>\$ 323,586</u>	<u>\$ 5,593</u>
Rate Requirement	<u>\$ 7,513,331</u>	<u>\$ 7,229,720</u>	<u>\$ 283,611</u>



Summarize Results Cont'd.



CUSTOMER	Total	Residential	Commercial
Operations & Maintenance Expense	\$ 1,131,644	\$ 1,110,008	\$ 21,636
Plus: Debt Service	\$ 2,418,010	\$ 2,330,610	\$ 87,401
Plus: Rate Funded Capital	\$ 167,382	\$ 164,182	\$ 3,200
Total Revenue Requirement	<u>\$ 3,717,036</u>	<u>\$ 3,604,799</u>	<u>\$ 112,237</u>
Less: Other Revenue	<u>\$ 329,179</u>	<u>\$ 323,586</u>	<u>\$ 5,593</u>
Rate Requirement	<u>\$ 3,387,857</u>	<u>\$ 3,281,213</u>	<u>\$ 106,644</u>
Annual Billings	194,568	190,848	3,720
Calculated Customer Charge		\$ 17.19	\$ 28.67



Summarize Results Cont'd.



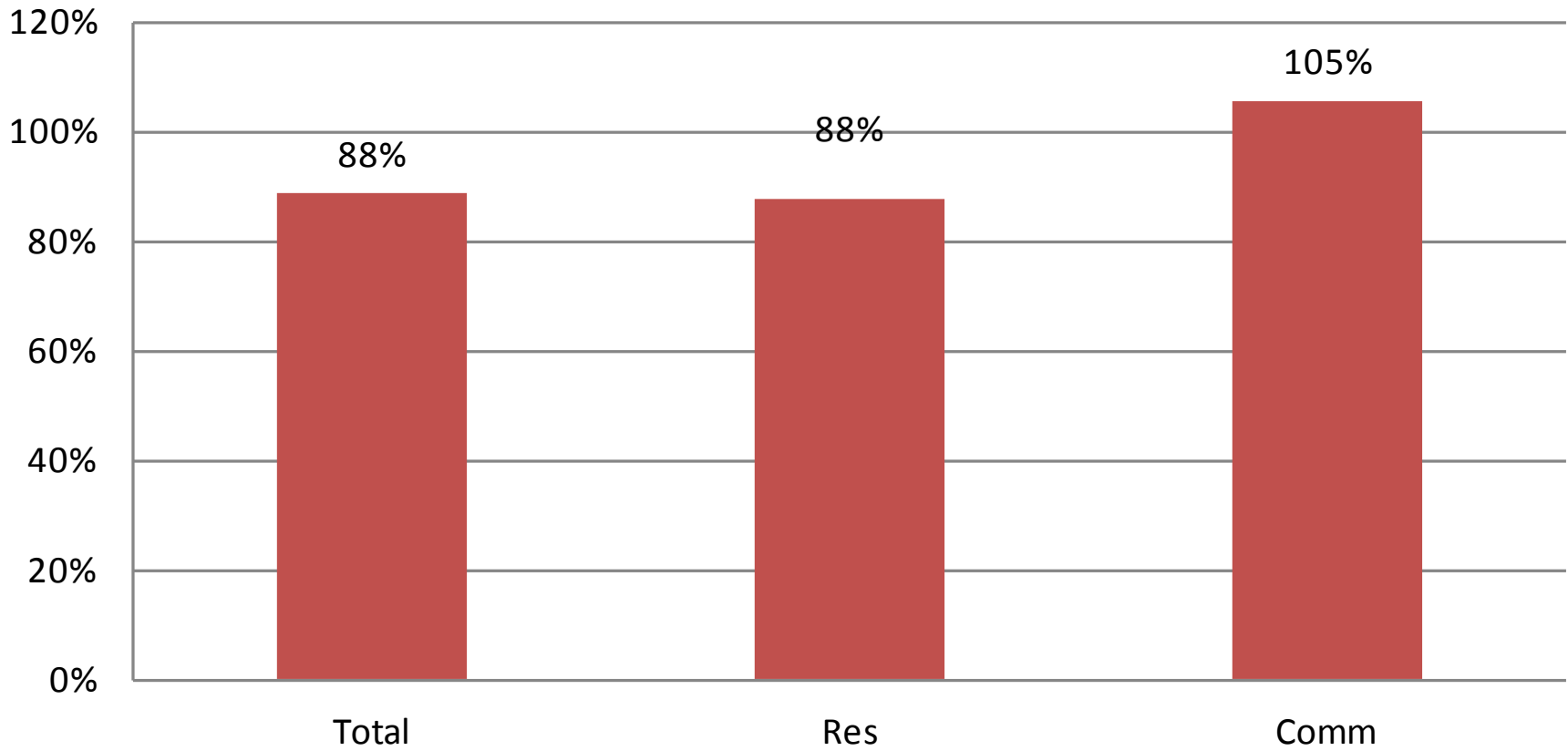
CONSUMPTION	Total	Residential	Commercial
Operations & Maintenance Expense	\$ 3,234,737	\$ 3,095,979	\$ 138,758
Plus: Debt Service	\$ -	\$ -	\$ -
Plus: Rate Funded Capital	\$ 890,738	\$ 852,528	\$ 38,209
Total Revenue Requirement	<u>\$ 4,125,474</u>	<u>\$ 3,948,507</u>	<u>\$ 176,967</u>
Less: Other Revenue	\$ -	\$ -	\$ -
Rate Requirement	<u>\$ 4,125,474</u>	<u>\$ 3,948,507</u>	<u>\$ 176,967</u>
Annual Sales (750 gallon units)	1,304,563	1,245,252	59,311
Calculated Water Rate (Unit)		\$ 3.17	\$ 2.98



Summarize Results Cont'd.



Recovery by Rate Class

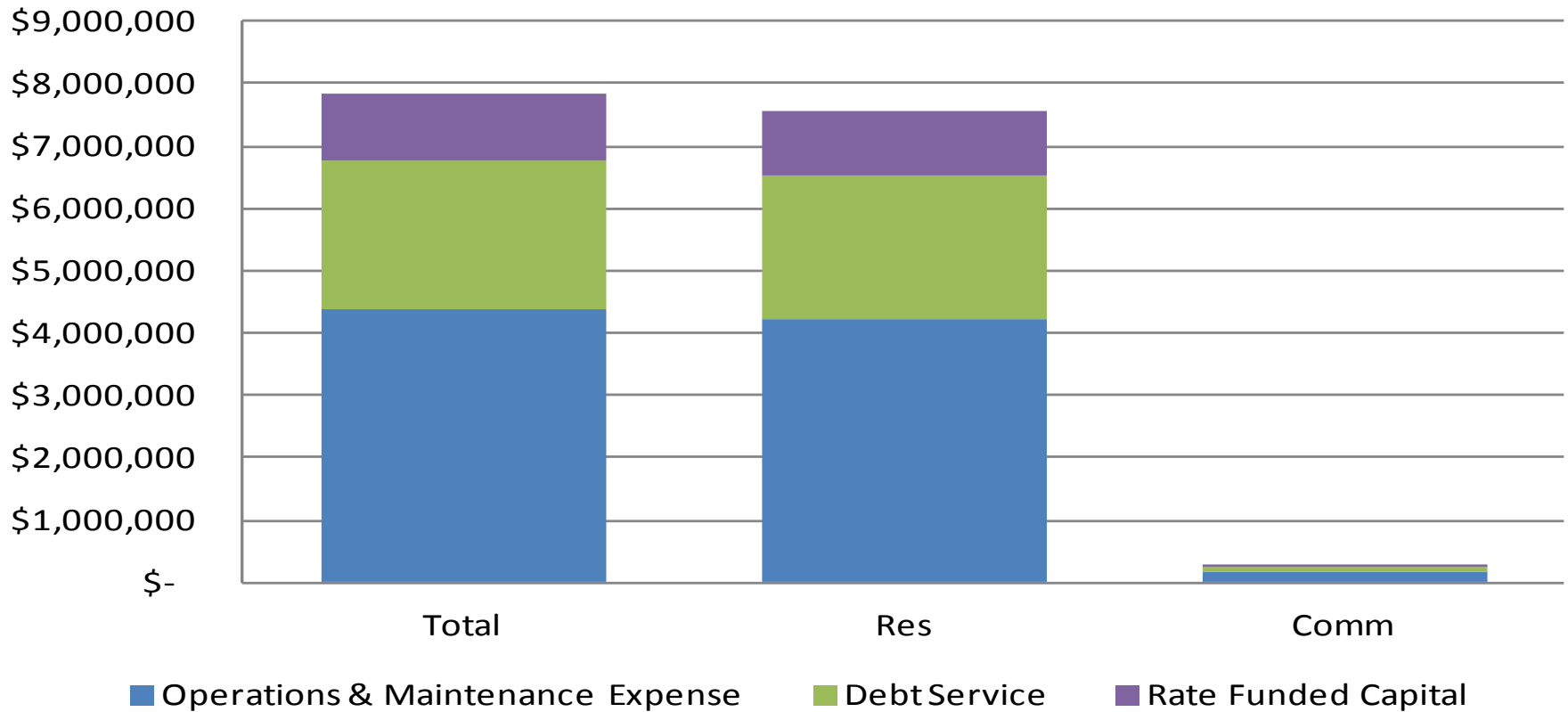




Revenue Requirement by Class



Rev. Req. by Rate Class

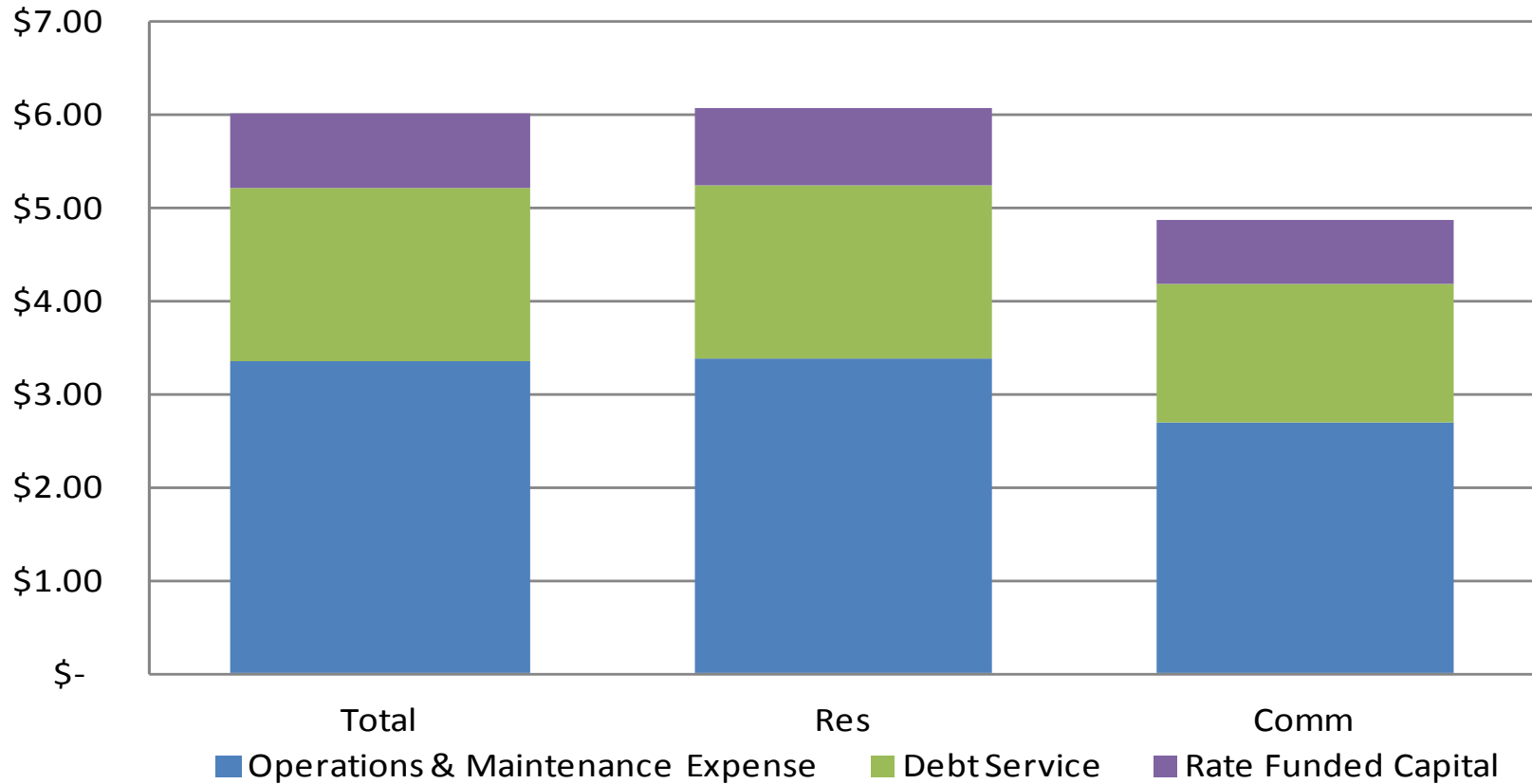




Revenue Requirement per Unit



Rev. Req./Unit





Component 10 – Rate Design



- Rate design is the process of taking what the COS tells you about the true cost structure, and developing a rate that is supported by the COS study but also meets the financial, political and social goals of the utility.
- Transitions to new rate structures and levels should be gradual to mitigate economic dislocation
- Determine average unit costs
- Do you want to generate revenue or change consumption behavior?

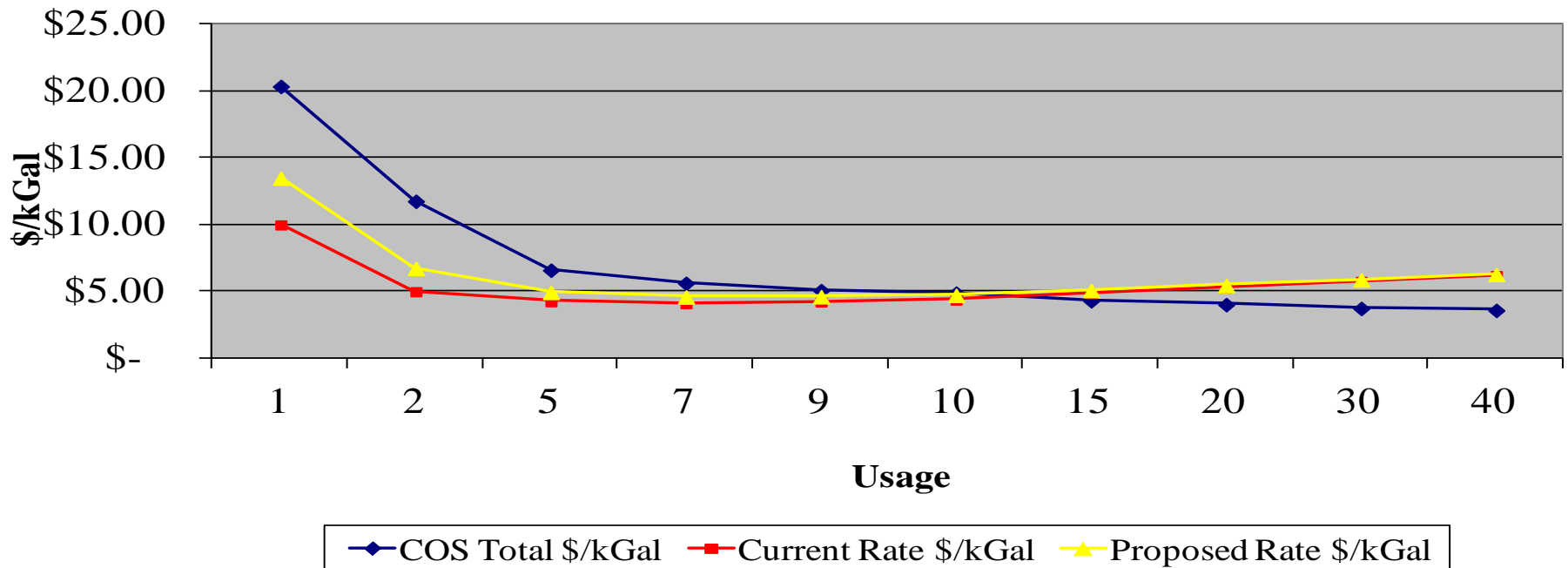


Inclining Block



	<u>Cost of Service</u>	<u>Current Rate</u>	<u>Proposed Rate</u>	<u>Difference</u>
Customer Charge (2 Units)	\$ 17.19	\$ 10.00	\$ 13.50	\$ 3.50
Next 6 Units (3-8)	\$ 3.17	\$ 3.75	\$ 3.75	\$ -
Next 6 Units (9-14)		\$ 5.63	\$ 5.63	\$ -
Next 6 Units (15-20)		\$ 6.56	\$ 6.56	\$ -
All Additional Usage		\$ 7.50	\$ 7.50	\$ -

Residential Cost Curve





Inclining Block



Usage	COS Rates	Current Rates	Proposed Rates	Monthly Change	Daily Change	Current \$/kGal	Proposed \$/kGal
1	\$ 20.36	\$ 10.00	\$ 13.50	\$ 3.50	\$ 0.12	\$ 10.00	\$ 13.50
2	\$ 23.53	\$ 10.00	\$ 13.50	\$ 3.50	\$ 0.12	\$ 5.00	\$ 6.75
5	\$ 33.05	\$ 21.25	\$ 24.75	\$ 3.50	\$ 0.12	\$ 4.25	\$ 4.95
7	\$ 39.39	\$ 28.75	\$ 32.25	\$ 3.50	\$ 0.12	\$ 4.11	\$ 4.61
9	\$ 45.73	\$ 38.13	\$ 41.63	\$ 3.50	\$ 0.12	\$ 4.24	\$ 4.63
10	\$ 48.90	\$ 43.76	\$ 47.26	\$ 3.50	\$ 0.12	\$ 4.38	\$ 4.73
15	\$ 64.76	\$ 72.84	\$ 76.34	\$ 3.50	\$ 0.12	\$ 4.86	\$ 5.09
20	\$ 80.61	\$ 105.64	\$ 109.14	\$ 3.50	\$ 0.12	\$ 5.28	\$ 5.46
30	\$ 112.32	\$ 173.14	\$ 176.64	\$ 3.50	\$ 0.12	\$ 5.77	\$ 5.89
40	\$ 144.03	\$ 248.14	\$ 251.64	\$ 3.50	\$ 0.12	\$ 6.20	\$ 6.29
Average Usage			7				



Rate Trends



- Remove the usage included in the minimum.
 - This can be done in phases to minimize the effect on smaller customers.
- Irrigation only rates
 - Can be developed in a way that the cost matches that of the residential tail blocks
- Seasonal Rates
- Budget Based Water Rates
- Lifeline Rates



Discussions



- Are lifeline rates needed?
- Does low income correlate with low usage?
- Do we have competition?
- Should ratemaking seek a “social” as opposed to a “economic” or “business” objective
- Should rates reward conservation?
- Need to have impact fees at appropriate levels



Contact Information



- Jim Marshall, Jackson Thornton Utilities Consultants
 - Email: Jim.Marshall@JacksonThornton.com
 - Direct: 334/261-6483

- Sarah Chandler, Jackson Thornton Utilities Consultants
 - Email: Sarah.Chandler@JacksonThornton.com
 - Direct: 334/532-0474