Water Rate Study
Cost of Service Update
Water Commission

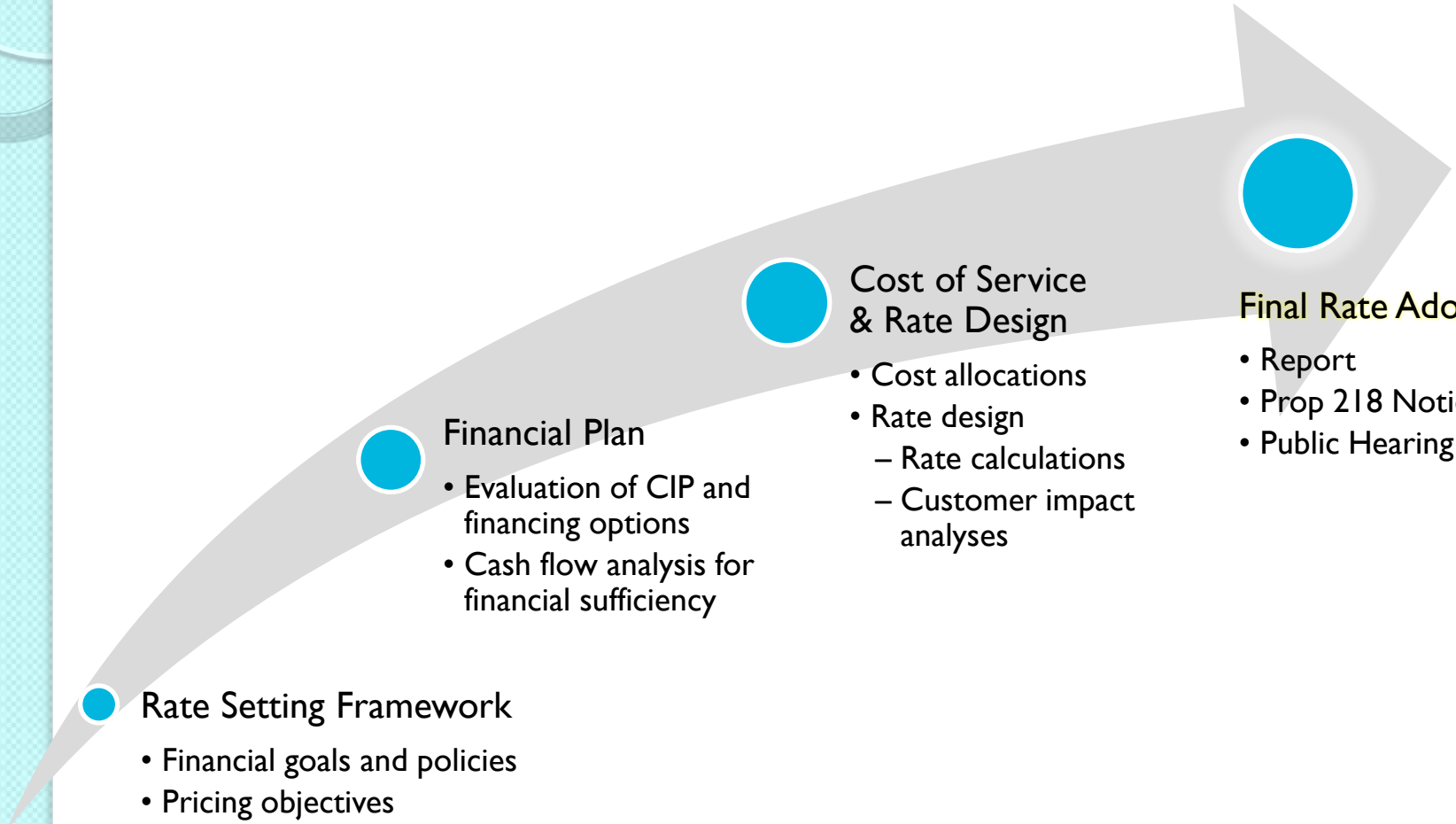
January 4, 2016

Agenda

- Steps in conducting a Water Rate Study
- Legal Environment with Rate Making
- What is Cost of Service?
- Results of Cost of Service
- Tier Definitions
- Inside vs. Outside Rate Discussion
- Private Fire Service

STEPS IN CONDUCTING A WATER RATE STUDY

Steps in Conducting Water Rate Study



LEGAL ENVIRONMENT WITH RATE MAKING

Legal Environment with Rate Making

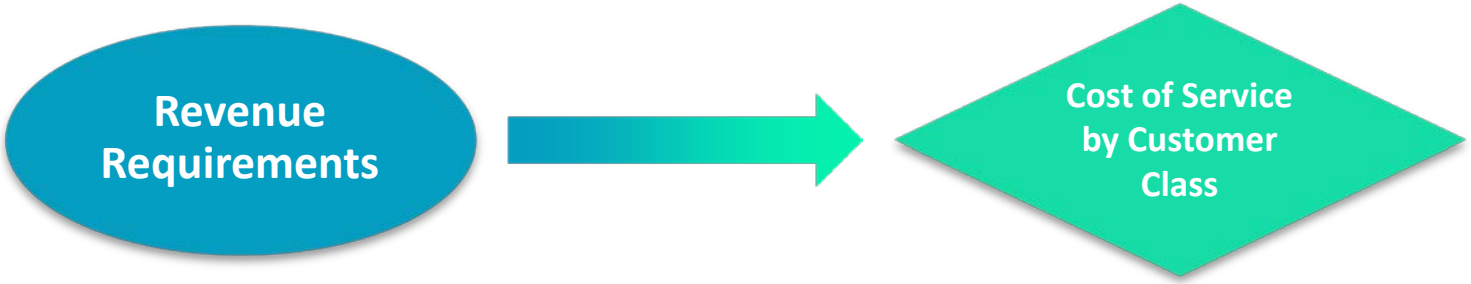
- Cost of Service Requirements
  - Proposition 218 and Proposition 26 (Article XIIIC and XIIID of California Constitution)
  - California Government Code 54999
- Pass-through Provision
  - AB 3030 – Section 53756 to the Government Code
- Water Conservation
  - Article X of California Constitution
  - CA Water Code Chapter 3.4 – Allocation-based Conservation Water Pricing (AB 2882)
  - SB X7-7 – 20% reduction by 2020
  - Executive Order B-29-15 (25% reduction State-Wide)

CASE STUDY:
SAN JUAN CAPISTRANO

- Recent Litigation: CTA vs. City of SJC
  - Rate payers (Capistrano Taxpayer Association, CTA) sued the City of San Juan Capistrano over its water budget rate structure
- The Orange County Superior court ruled that the rates did not meet the nexus requirement in August 2013
- Key factors:
  - Lack of administrative record
  - City used multipliers to justify the tiered rates without any administrative record of an underlying rationale

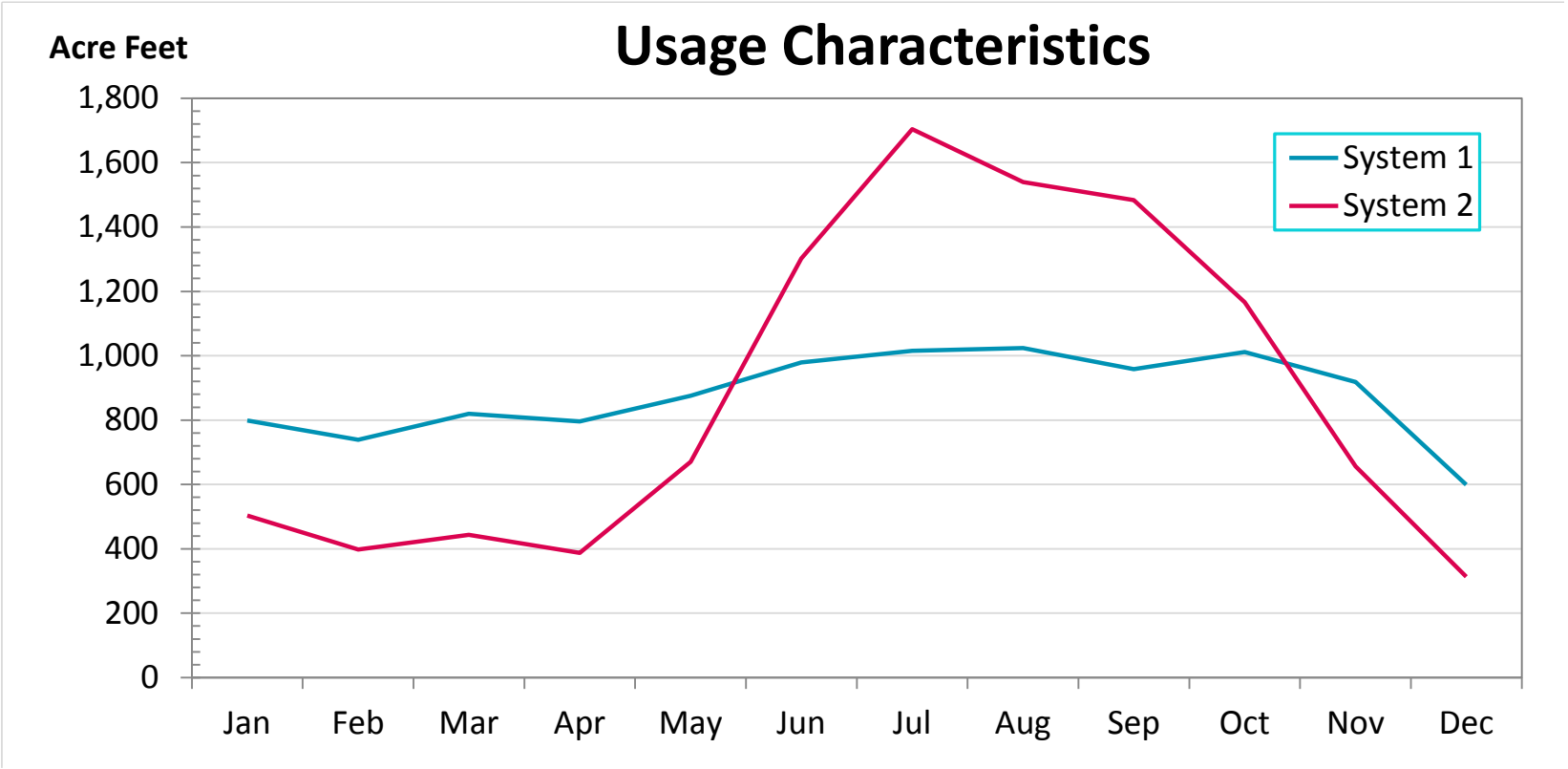
WHAT IS COST OF SERVICE?

WHAT IS **COST OF SERVICE?**



- Recover costs from users in proportion to their use of the system, recognizing the impact of each class on system facilities and operations
  - A cost-based process of converting revenue requirements into unit costs
  - Allocation of cost of service to customer classes is based on customer usage characteristics
- Cost of service is the fundamental benchmark used to establish utility rates in the United States

WATER SYSTEM **COSTS AND PEAKING DEMAND**



Both water systems have annual demand of approximately 10,500 AF / year.

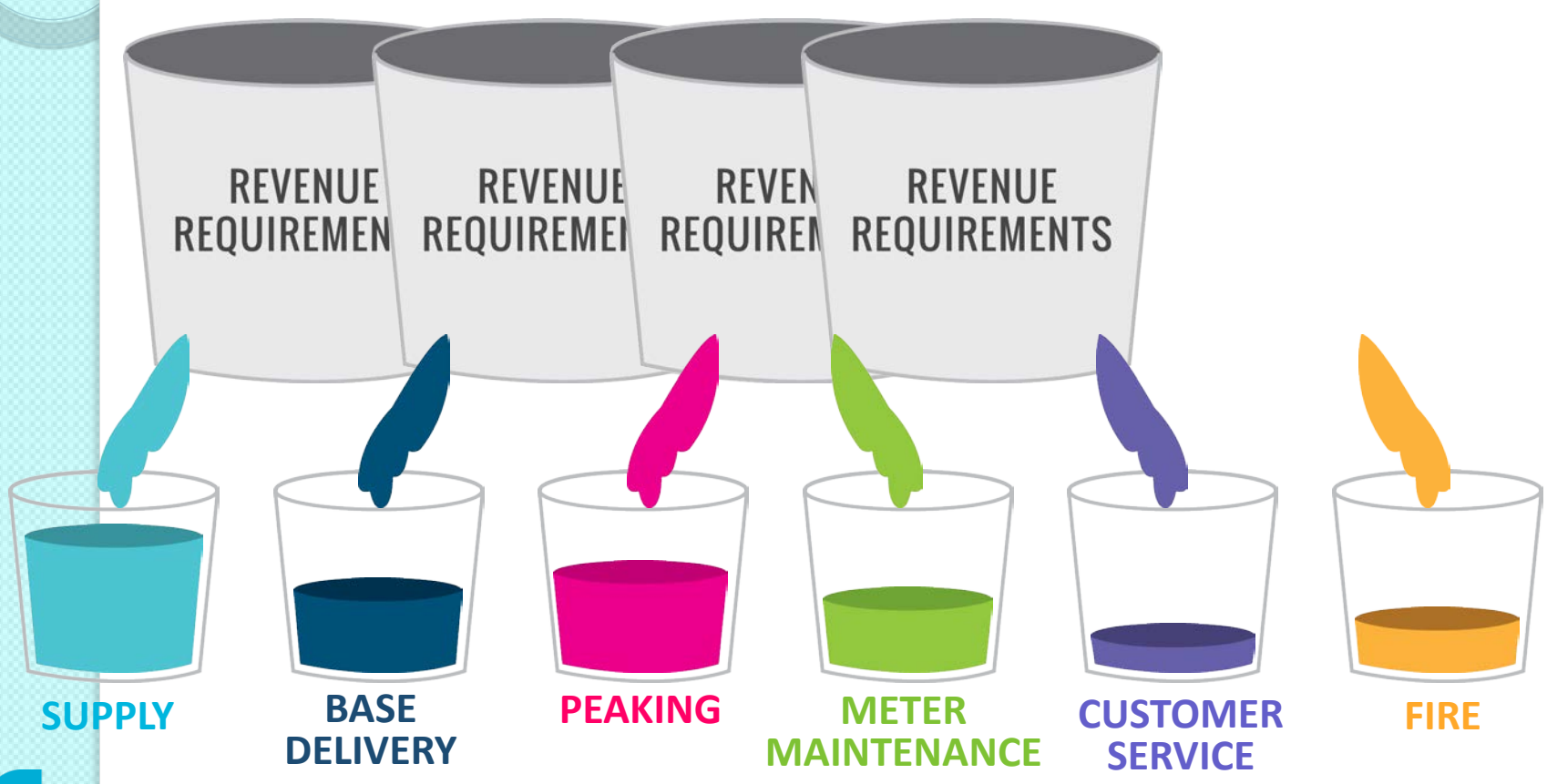
Which water system requires larger facilities/infrastructure?

Cost of Service Principles

Rationale:

- Different types of customers generate different costs because their patterns of use or characteristics are different
- Cost of service allows the matching of rates charged to each group with the costs of serving them
- Each group will “pay its own way”; no subsidies

Cost of Service Process



PRICE **RATIOS & JUSTIFICATIONS**

Nexus between tier prices & cost of service:

- Cost of water supplies
- Peaking cost of capital
- Conservation program costs
- Potential new sources of supply

RESULTS OF COST OF SERVICE

First Step in Cost of Service

- A year that reflects normal water operation must be selected to conduct the cost of service analysis
  - This is called the “test year”
- Fiscal Year 2013 was determined to be the test year
- Future revenues needs will be higher than Fiscal Year 2013
  - The cost of service analysis will be increased by the percentage necessary to meet future revenue needs

Asset Allocation

COS Allocations	Base	Max Day	Max Hour	Fire Protection	Elevation Pumping	Billing & CS	Meters	General	Total
Raw Water Pumping	$ 17,456,835	$ 8,914,129	$ 16,528,280	$ 18,385,390	$ -	$ -	$ -	$ -	$ 61,284,634
Elevation Pumping	$ -	$ -	$ -	$ -	$ 10,652,796	$ -	$ -	$ -	$ 10,652,796
Treatment	$ 95,176,277	$ 48,600,652	$ -	$ -	$ -	$ -	$ -	$ -	$ 143,776,929
Reservoir	$ 18,365,251	$ 9,378,001	$ -	$ 11,889,965	$ -	$ -	$ -	$ -	$ 39,633,217
Collection	$ 20,952,750	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,952,750
Transmission	$ 60,468,933	$ 30,877,753	$ -	$ -	$ -	$ -	$ -	$ -	$ 91,346,687
Distribution Storage	$ 7,364,583	$ 3,760,638	$ 6,972,850	$ 7,756,317	$ -	$ -	$ -	$ -	$ 25,854,389
Distribution	$ 43,431,216	$ 22,177,642	$ 41,121,045	$ 45,741,387	$ -	$ -	$ -	$ -	$ 152,471,291
Customer Service	$ -	$ -	$ -	$ -	$ -	$ 566,432	$ -	$ -	$ 566,432
Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,518,771	$ -	$ 3,518,771
Fire Protection	$ -	$ -	$ -	$ 17,081,398	$ -	$ -	$ -	$ -	$ 17,081,398
General	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,284,962	$ 11,284,962
	$ 263,215,847	$ 123,708,815	$ 64,622,176	$ 100,854,457	$ 10,652,796	$ 566,432	$ 3,518,771	$ 11,284,962	$ 578,424,256
	46%	**21%**	**11%**	**17%**	**2%**	**0%**	**1%**	**2%**	

O&M Allocation

	O&M Expenses	% Allocation
Water Supply	$5,551,711	27.8%
Base	$3,378,896	16.9%
Max Day	$1,181,859	5.9%
Max Hour	$1,400,227	7.0%
Fire Protection	$1,794,361	9.0%
Elevation Pumping	$971,302	4.9%
Billing & CS	$1,087,568	5.4%
Meters	$432,229	2.2%
Conservation	$523,273	2.6%
General	$3,664,098	18.3%
Total O&M Allocation	**$19,985,523**	**100%**

COS Allocation

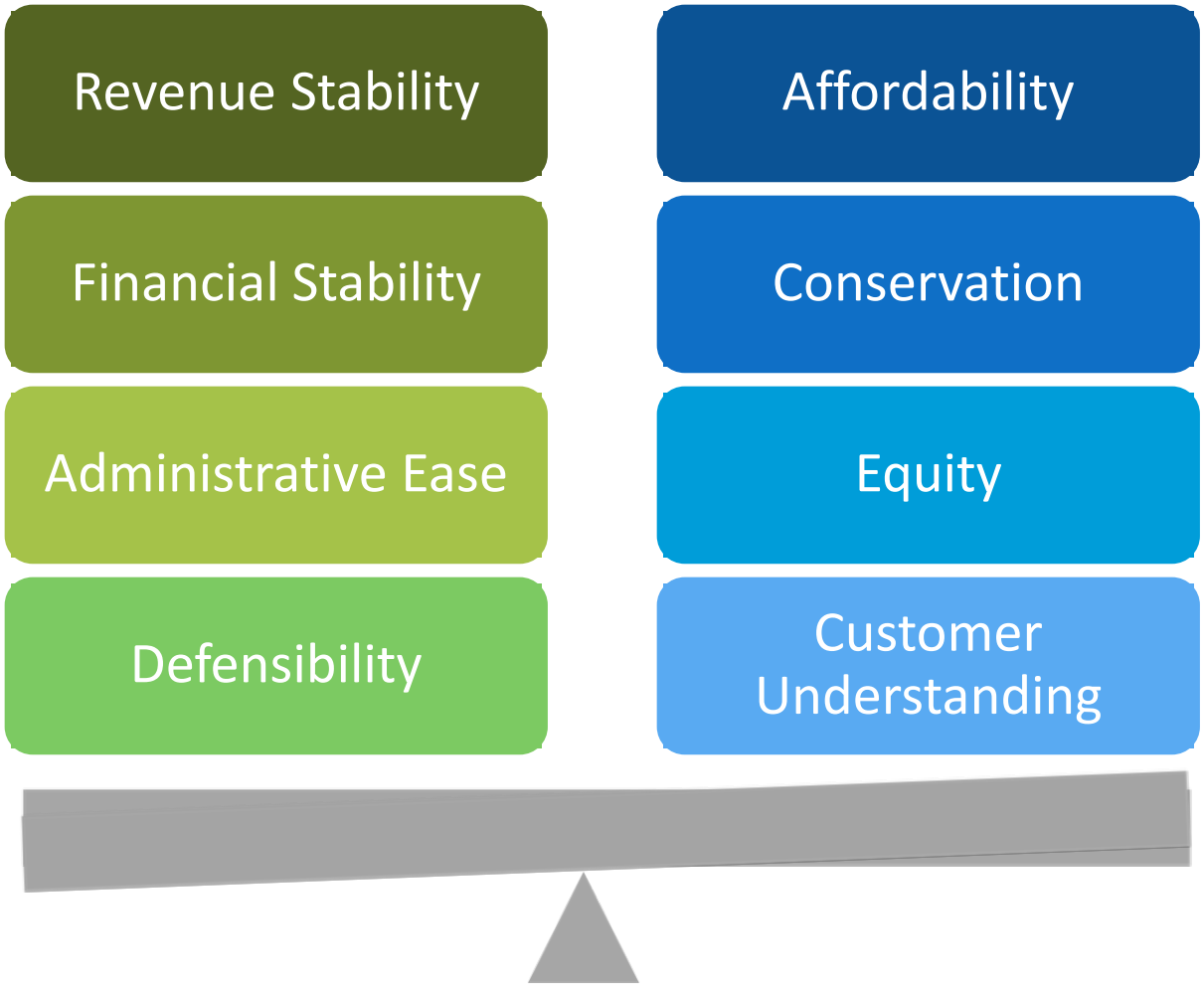
		% Allocation	Fixed	Variable
Base Supply	$5,551,711	23.4%		✓
Supplemental Water Supply	$0	0.0%		✓
Base	$8,625,722	36.3%	✓	✓
Peaking Costs	$7,188,562	30.3%	✓	✓
Billing & CS	$1,450,876	6.1%	✓	
Meters	$614,938	2.6%	✓	
Conservation	$523,273	2.2%		✓
Rev Offset	-$1,311,481	-5.5%		✓
Elevation Pumping	$1,064,632	4.5%		✓
Private Fire Protection	$33,462	0.1%	✓	
Total	**$23,741,695**	**100%**		

RATE DESIGN OPTIONS

Rate Structure Options

	Uniform	Inclining Tiered	Water Budget
SFR		✓	✓
MFR	✓	✓	✓
Commercial / Municipal	✓	✓	
UCSC Campus	✓	✓	✓
Landscape	✓		✓
Coastal Ag	✓	✓	✓

Balancing Competing Pricing Objectives



Conservation Pricing Objectives

Administration	Equity	Appropriate Funding Mechanisms	Rate Stability & Affordability	Promotes Efficiency / Conservation
• Customer Understanding • Easy to Implement • Easy to Administer	• Equitable in Allocating CIP Cost • Perceived to be Fair to the Public • Align Supply & Demand	• Revenue Stability • Revenue Sufficiency • Potential Funding Mechanism for Alt. Water Supply & Conservation Programs	• Rate Stability • Mitigate Customer Impact • Affordability for Essential Use	• Promotes Conservation • Tool for Drought Management Action Plan • Promotes Efficiency • Rewards Past Conservation Effort • Economic Development • Based on Individual Needs • Scientific Method

Pricing Objective Exercise

Most Important / Critical = 1; Very Important = 2; Important = 3; Least Important = 4

Importance Rankings	Pricing Objectives	Average
Most Important	Revenue Sufficiency	1.1
Very Important	Promotes Efficiency	1.6
	Revenue Stability	1.7
	Perceived to be Fair to the Public	1.8
	Affordability for Essential Use	1.8
	Customer Understanding	1.9
	Promotes Conservation	2.0
	Rate Stability	2.0
Important	Tool for Drought Management Action Plan	2.3
	Equitable in Allocating CIP Cost	2.4
	Potential Funding Mechanism for Alt. Water Supply & Conservation Programs	2.4
	Scientific Method	2.4
	Align Supply & Demand	2.6
	Mitigate Customer Impact	2.7
Least Important	Economic Development	2.9
	Easy to Administer	2.9
	Rewards Past Conservation Effort	3.1
	Easy to Implement	3.1
	Based on Individual Needs	3.2

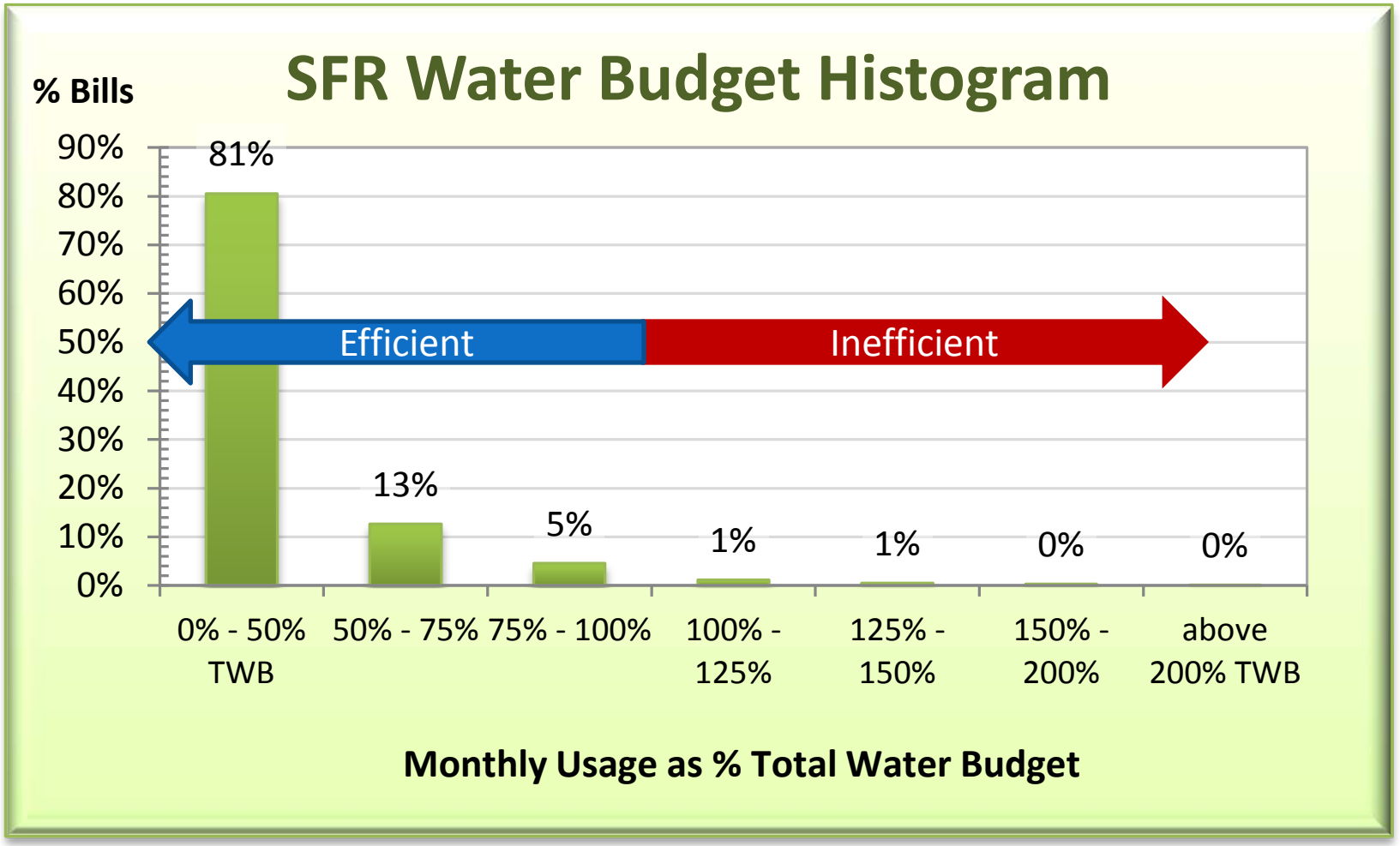
Rate Structure Evaluations

Pricing Objective	Flat	Uniform	Seasonal	Winter Average	Inclining Tiered	Water Budget
Revenue Sufficiency	★★★★★	★★★	★★★	★★★	★★★	★★★
Promotes Efficiency	★	★★	★★	★★★	★★★	★★★★★
Revenue Stability	★★★★★	★★★	★★	★★	★★	★★★
Perceived to be Fair to the Public	★	★★	★★	★★★	★★★★★	★★★
Affordability for Essential Use	★	★★	★★	★★★	★★★	★★★★★
Customer Understanding	★★★★★	★★★★★	★★★	★★	★★★★★	★
Promotes Conservation	★	★★	★★★	★★★	★★★★★	★★★
Rate Stability	★★★★★	★★★	★★	★★	★★	★★★

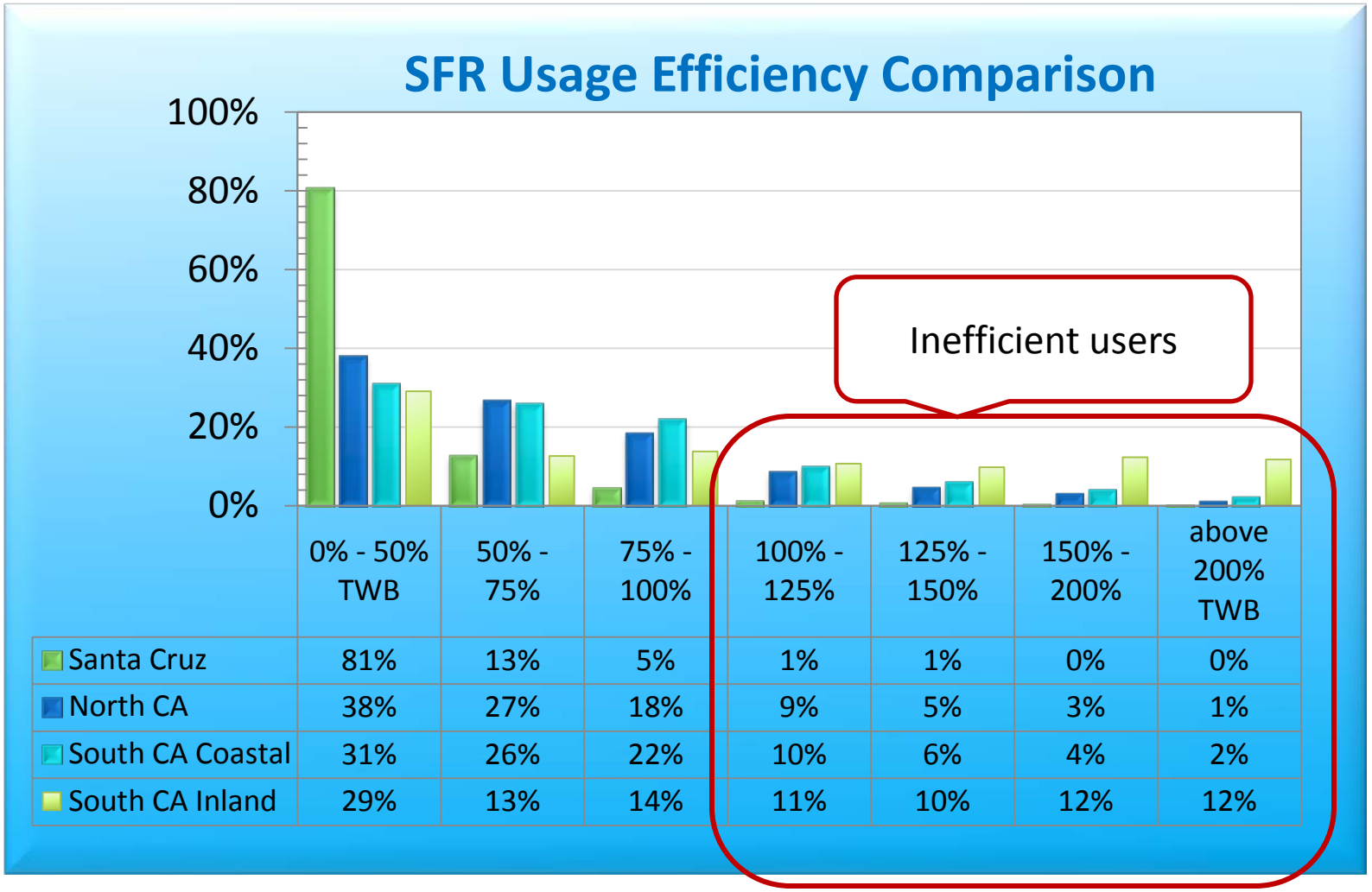
SFR Water Budget Factors

- Indoor Use
  - Default Household Size = 4 persons / household
  - GPCD = 55 gallons per capita per day
- Outdoor Use
  - Consistent with Landscape Model Ordinance and uses Actual Weather
  - Landscape Area = 100% * (Lot Size – Foot Print – Hardscape)

SFR Water Use Efficiency



SFR Usage Efficiency Comparison



	0% - 50% TWB	50% - 75%	75% - 100%	100% - 125%	125% - 150%	150% - 200%	above 200% TWB
Santa Cruz	81%	13%	5%	1%	1%	0%	0%
North CA	38%	27%	18%	9%	5%	3%	1%
South CA Coastal	31%	26%	22%	10%	6%	4%	2%
South CA Inland	29%	13%	14%	11%	10%	12%	12%

Observations

- Santa Cruz SFR users are very efficient
- Water budget rate structure may not promote further efficient use
- Analysis suggests that the savings from a water budget rate structure would not cover the costs of implementation

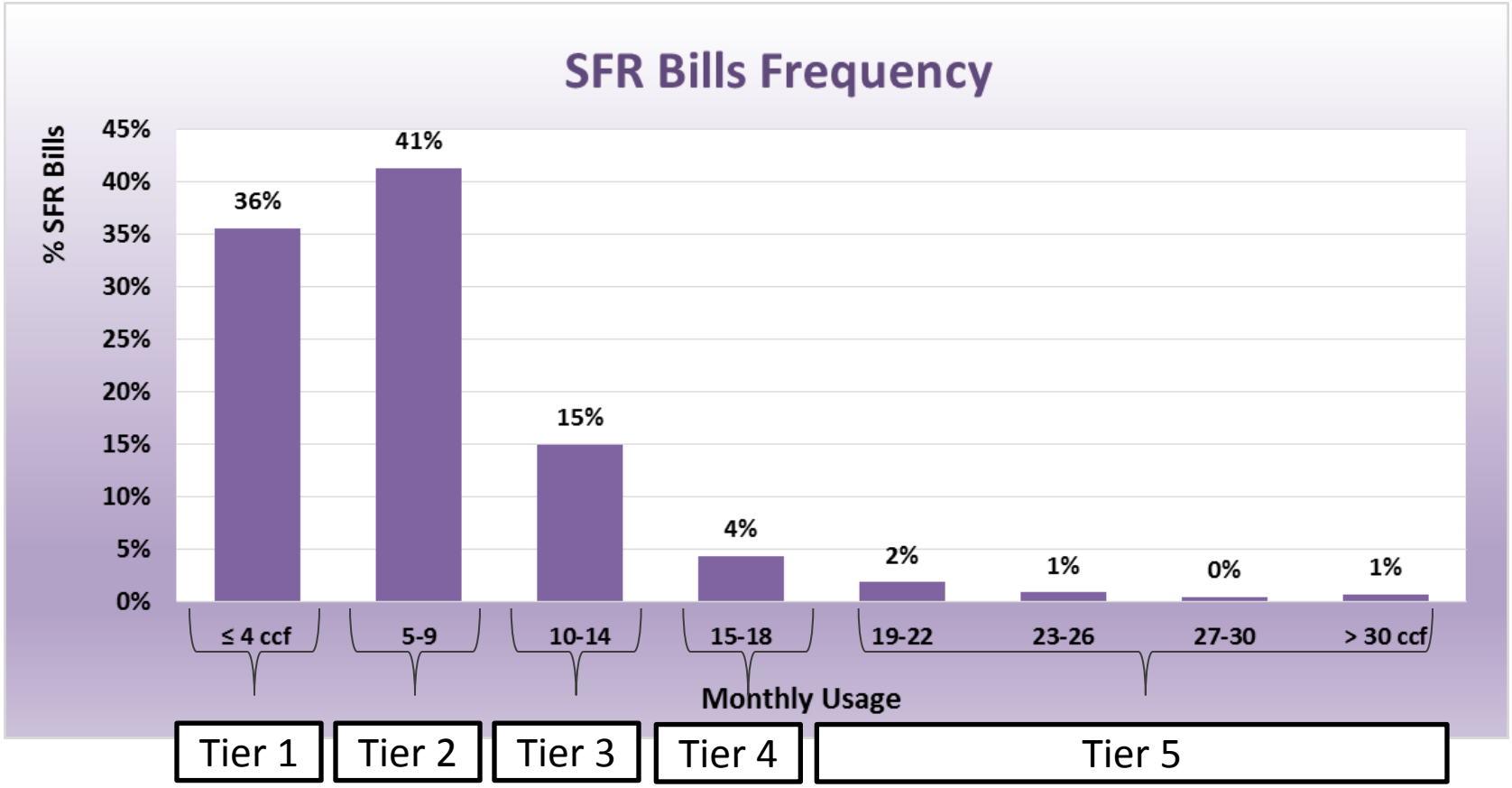
Proposed Rate Design Options

- **SFR**
  - Keep inclining tiers
- **MFR**
  - Tiers based on # of dwelling units
- **Commercial**
  - Uniform
  - Inclining
- **UCSC**
  - Uniform
- **Landscape**
  - Uniform
  - Budget-based
- **Coastal Ag**
  - Uniform

Current SFR Tier Widths

- Tier 1 = 0 - 4 ccf
- Tier 2 = 5 - 9 ccf
- Tier 3 = 10 - 14 ccf
- Tier 4 = 15 – 18 ccf
- Tier 5 = 19 ccf & above

SFR 2013 Consumption



- On average, 36% of SFR customers used 4 or fewer ccf per month during 2013;
- On average, 77% of SFR customers (36% + 41%) used 9 or fewer ccf per month during 2013; etc.

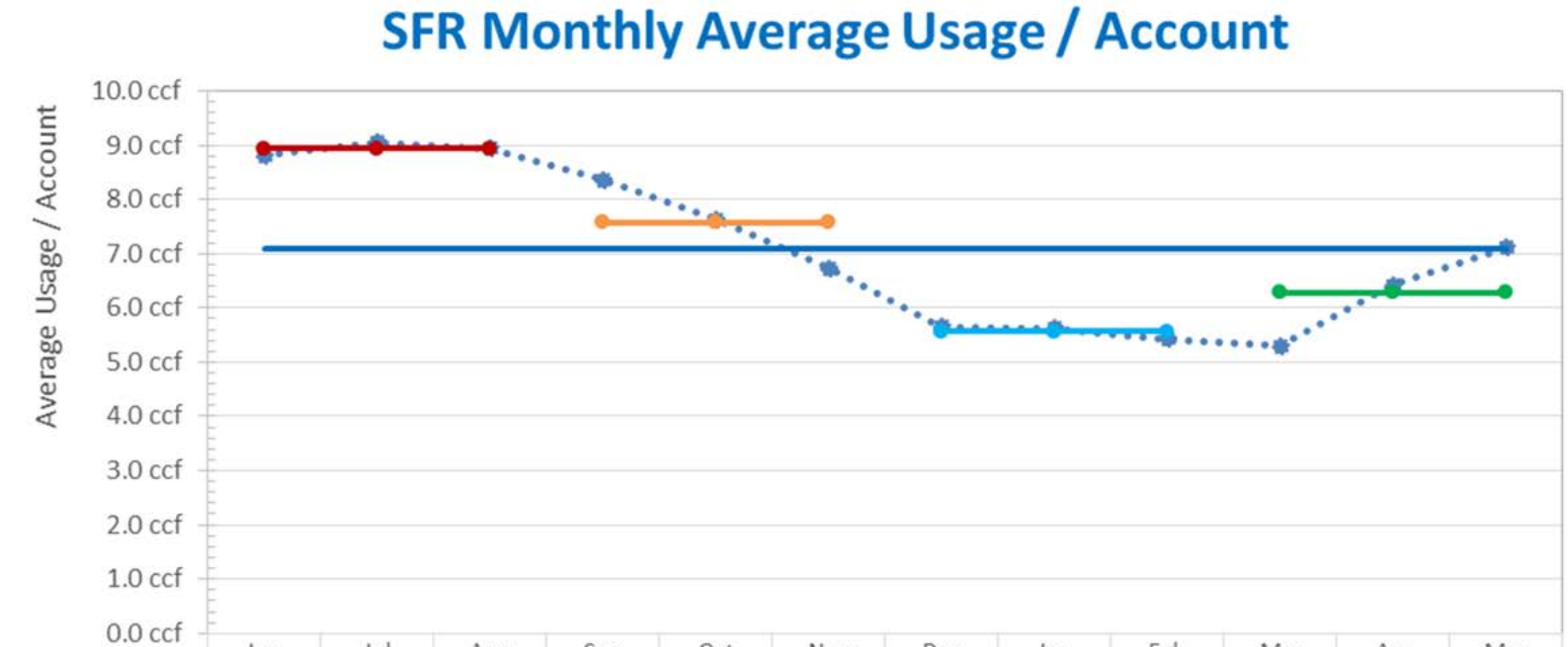
Tier Width Justification

- Given Prop 218 and recent litigation, it is recommended that a rationality be established in regards to the tier widths

Rationality for Tier Width

- Seasonal Usage Analysis
  - Tier 1 = Avg winter use
  - Tier 2 = Avg spring/fall use
  - Tier 3 = Avg summer use

2013 SFR Monthly Avg Use / Acct



	Jun Summer	Jul Summer	Aug Summer	Sep Fall	Oct Fall	Nov Fall	Dec Winter	Jan Winter	Feb Winter	Mar Spring	Apr Spring	May Spring
Monthly	8.8 ccf	9.1 ccf	8.9 ccf	8.4 ccf	7.6 ccf	6.7 ccf	5.7 ccf	5.6 ccf	5.4 ccf	5.3 ccf	6.4 ccf	7.1 ccf
Annual	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf	7.1 ccf
Seasonal	8.9 ccf	8.9 ccf	8.9 ccf	7.6 ccf	7.6 ccf	7.6 ccf	5.6 ccf	5.6 ccf	5.6 ccf	6.3 ccf	6.3 ccf	6.3 ccf

Colored Bars are seasonal averages for summer (red), fall (orange), winter (blue) and spring (green)

Realignment of Tier Width

- Current Tiers
  - Tier 1 = 0 - 4
  - Tier 2 = 5 - 9
  - Tier 3 = 10 - 14
  - Tier 4 = 15 – 18
  - Tier 5 = 19 +
- Seasonal Usage
  - Tier 1 = 0 - 5
    - Average winter
  - Tier 2 = 6 - 7
    - Average fall / spring
  - Tier 3 = 8 - 9
    - Average summer
  - Tier 4 = 10 +

MFR Tier Definitions

- Recommend setting the tier widths the same as SFR
  - Take into account the number of units

- Multi-Family with 5 units
  - Tier 1 = 0 - 25
  - Tier 2 = 26 - 35
  - Tier 3 = 36 - 45
  - Tier 4 = 46 +

- Multi-Family with 10 units
  - Tier 1 = 0 - 50
  - Tier 2 = 51 - 70
  - Tier 3 = 71 - 90
  - Tier 4 = 91 +

Commercial

- Options
  1. Uniform
  2. Inclining based on meter size

- Example: 2 in meter
  - Tier 1 = 0 - 20
  - Tier 2 = 21 - 40
  - Tier 3 = 41 - 60
  - Tier 4 = 61 +

- Example: 6 in meter
  - Tier 1 = 0 - 60
  - Tier 2 = 61 - 120
  - Tier 3 = 121 - 181
  - Tier 4 = 181 +

UCSC and North Coast

- Uniform

Landscape / Irrigation

1. Uniform
2. Simple Budget Based
   - Uniform ETAF
   - Seasonal or Historical ETo
3. Complex Budget Based
   - Site specific ETAF
   - Real-Time ETo

INSIDE VS. OUTSIDE

Outside Surcharge

- Current Surcharge is 27.5% on both fixed and commodity
- How do we rationalize the outside city surcharge?
  - Surcharge based on assets benefiting only outside customers
    - Divide the assets between inside, outside and shared
    - Take into account the number of meters by size between inside and outside service areas
      - Convert different sizes of meters into Equivalent Meter Units (EMU)

Allocation of Asset

Asset Category	Total RC Asset	Inside	Outside	Shared	Total
Raw Water	61,284,634			61,284,634	61,284,634
Elevation	10,652,796	6,178,621	2,556,671	1,917,503	10,652,796
Treatment	143,776,929			143,776,929	143,776,929
Reservoir	39,633,217			39,633,217	39,633,217
Collection	20,952,750			20,952,750	20,952,750
Transmission	91,346,687	25,577,072	20,096,271	45,673,343	91,346,687
Distribution	25,854,389	4,136,702	4,653,790	17,063,897	25,854,389
Distribution	152,471,291	83,859,210	65,562,655	3,049,426	152,471,291
Customer	566,432			566,432	566,432
Meters	3,518,771			3,518,771	3,518,771
Fire Protection	17,081,398			17,081,398	17,081,398
General	11,284,962			11,284,962	11,284,962
	$ 578,424,256	**$ 119,751,606**	**$ 92,869,387**	**$ 365,803,263**	**$ 578,424,256**

Shared Allocation

- Shared asset are allocated by meter size ratios
  - AWWA Meter Capacity Ratios
    - Inside = 270,336 (~65%)
    - Outside = 146,208 (~35%)
- Inside Shared Allocation
  - ($365,803,263 x 65%) = $237,405,390
- Outside Shared Allocation
  - ($365,803,263 x 35%) = $128,397,873

Inside/Outside Methodology

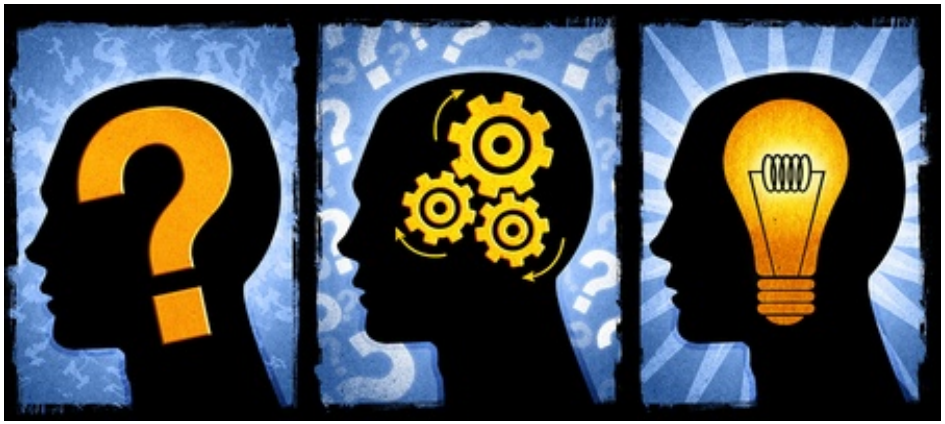
	Shared Assets	Unique Assets	Total Assets	EMU's	$/EMU
Inside $/EMU	$237,405,390	$119,751,606	$357,156,996	270,336	$1,321
Outside $/EMU	$128,397,873	$92,869,387	$221,267,260	146,208	$1,513
	$365,803,263	$212,620,993	$578,424,256	416,544	
Surcharge % for Outside City Customers					**15%**

- Surcharge % was determined by:
  - ($1,513 – $1,321) / $1,321 = 15%
  - Apply 15% surcharge on both commodity and readiness-to-serve

Private Fire Service

- Water system is sized for the hottest day plus fire protection
- Two types of fire protection:
  - Public Fire
    - General Benefit / Safety
  - Private Fire
    - Protects property
    - Property owner typically get's a discount on fire insurance
- Currently the City does not charge for Private Fire
  - Given there is a benefit to the property owner, it is recommended that a Private Fire charge be determined

Discussion



PRIVATE FIRE CHARGE

Fire Protection Allocation

Connection Size	Demand Factor (^2.63)	Unit Counts	Fire Equivalent Connections
Public Hydrants			
1"	1.00	-	-
2"	6.19	-	-
3"	17.98	-	-
4"	38.32	-	-
6"	111.31	37,800	4,207,553
8"	237.21	-	-
10"	426.58	-	-
Total Public Hydrants Equivalent Units			**4,207,553**
Private Fire Lines			
1"	1.00	-	-
2"	6.19	2,736	16,937
3"	17.98	0	-
4"	38.32	144	5,518
6"	111.31	72	8,014
8"	237.21	96	22,772
10"	426.58	0	-
Total Private Fire Lines Equivalent Units		3,048	**53,241**

Public/Private Allocation

	Equivalent Units	% Allocation	Revenue Requirement	Fire Protection Costs
Public	4,207,553	98.8%	$ 2,677,960	$2,644,498
Private	53,241	1.2%		$33,462
Total Fire Protection	**4,260,794**			**$2,677,960**

Private Fire Meter Charge for 2013

	Private Fire
Rev Requirements	$33,462
Units of Service (annual)	53,241
Unit Cost of Service	**$0.63**

Fire Service Size	Fire Flow Factor	Private Fire Charge ($/Meter)	# of Fire Services
1-in	1.00	$0.63	0
2-in	6.19	$3.89	2,736
3-in	17.98	$11.30	0
4-in	38.32	$24.08	144
6-in	111.31	$69.96	72
8-in	237.21	$149.09	96
10-in	426.58	$268.11	0

Inside Meters vs. Outside Meters

Inside

Meter Size	Number of Meters	AWWA Capacity Ratio	Capacity EMU (Annual)
5/8-in	14,348	1.00	172,176
3/4-in	150	1.50	2,700
1-in	748	2.50	22,440
1 1/2-in	294	5.00	17,640
2-in	250	8.00	24,000
3-in	35	17.50	7,350
4-in	15	31.50	5,670
6-in	6	80.00	5,760
8-in	3	140.00	5,040
10-in	3	210.00	7,560
Total Inside EMU's			**270,336**

65%

Outside

Meter Size	Number of Meters	AWWA Capacity Ratio	Capacity EMU (Annual)
5/8-in	7,507	1.00	90,084
3/4-in	65	1.50	1,170
1-in	574	2.50	17,220
1 1/2-in	164	5.00	9,840
2-in	157	8.00	15,072
3-in	14	17.50	2,940
4-in	9	31.50	3,402
6-in	5	80.00	4,800
8-in	1	140.00	1,680
10-in	0	210.00	-
Total Outside EMU's			**146,208**

35%