

CONSUMPTION-BASED FIXED REVENUE

A novel, equitable approach to
financial sustainability

Matt Williams, MBA

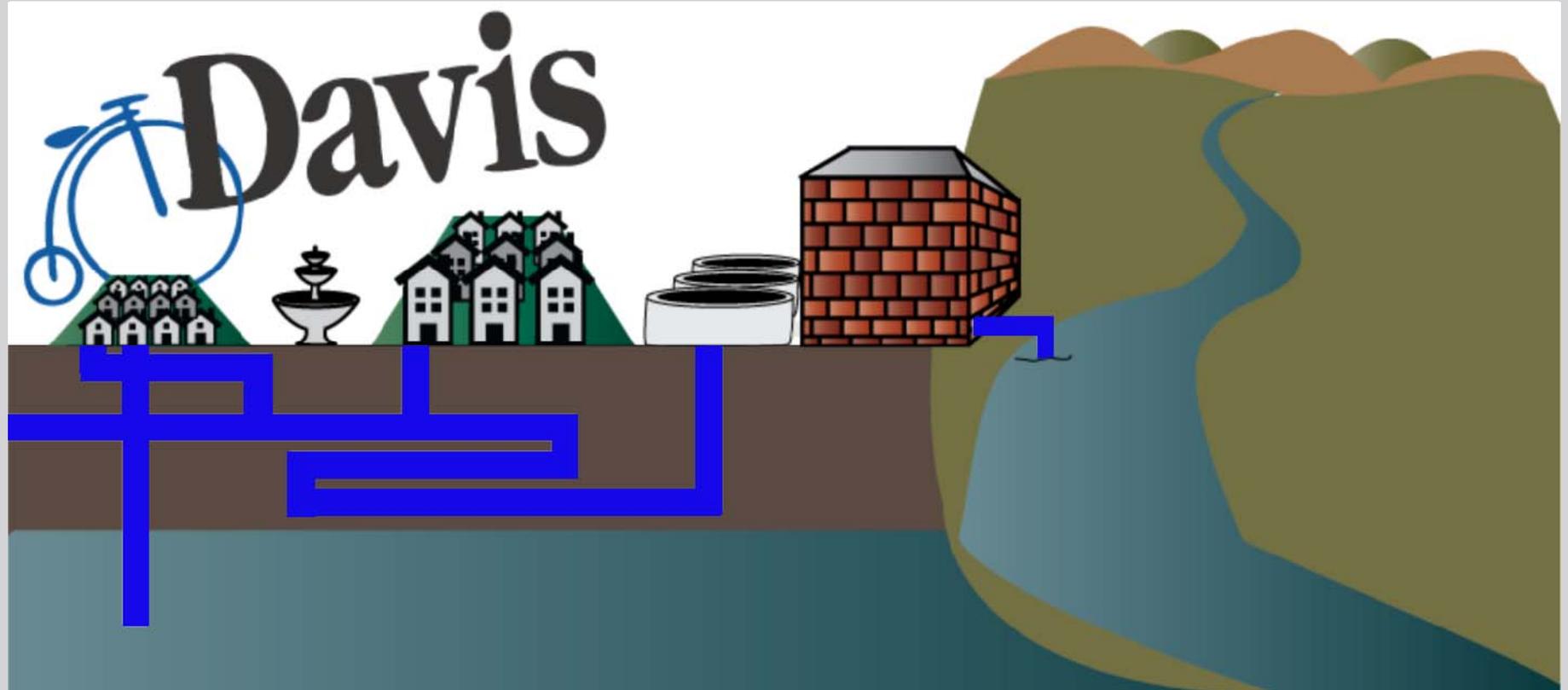
Davis resident

Frank Loge, PhD

Civil & Environmental Engineering, Professor

UC Davis Center for Water-Energy Efficiency, Director

CITY OF DAVIS



PROBLEM STATEMENT

- The efficiency of urban water use has been increasing between 1995 and 2005.
- Urban water use in California fell by nearly 25 percent from 247 to 201 gallons per person per day
- When customers reduce water use, utilities lose money because they cannot cover their fixed costs, which for most utilities are the majority of total costs.



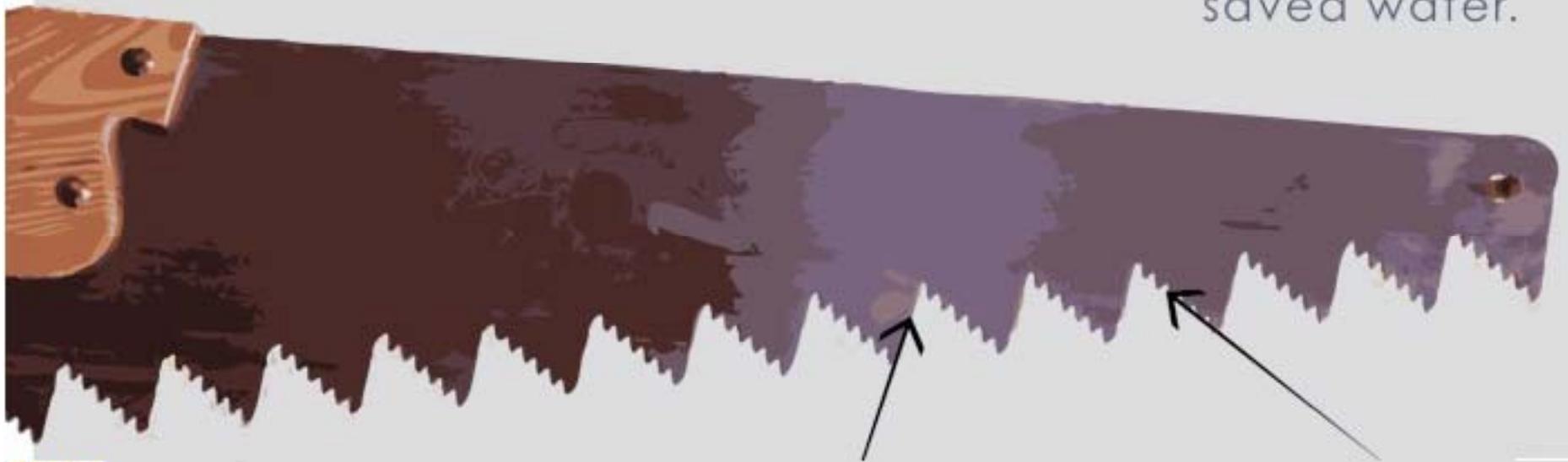
PROBLEM STATEMENT

- To eliminate losses, utilities then use rate increases which send confusing messages to water users.
- Instead of being rewarded for their behavior, customers are actually charged more after they have successfully saved water.



PROBLEM STATEMENT

- To eliminate losses, utilities then use rate increases which send confusing messages to water users.
- Instead of being rewarded for their behavior, customers are actually charged more after they have successfully saved water.



POLITICAL PAIN

FISCAL PAIN



SOLUTION STATEMENT

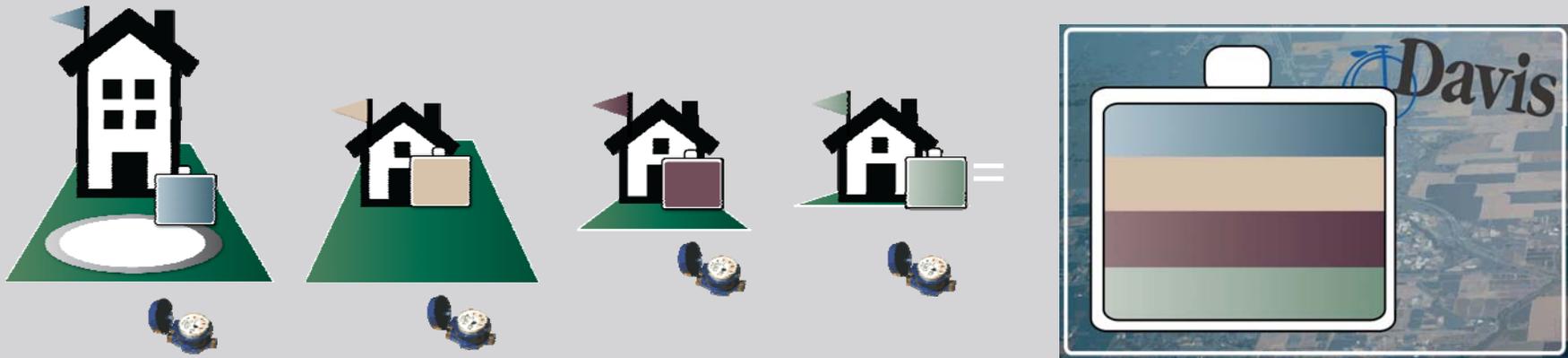
- The solution we propose is simply an extension of water budgets, in that it is allocating the fixed costs on a budget, as well as the variable costs.
- To truly achieve Prop 218 proportionality, we think the major consideration in any analysis of residential connections is the idea of actual water use relative to potential water use of each given account.



THE STANDARD APPROACH



- Allocate fixed cost based on water meter size





Current Rates–Fixed Charges

Meter Size	Bi-Monthly Base Rate	Ratio
5/8" or 3/4"	\$23.00	1.0
1 inch	\$32.40	1.4
1½ inch	\$55.80	2.4
2 inch	\$84.00	3.7
3 inch	\$160.00	7.0
4 inch	\$244.00	10.6
6 inch	\$476.00	20.7
8 inch	\$758.00	33.0

A 20% surcharge on the total bill applies to customers outside City of Davis city limits.



Fixed vs. Variable: 2011/12 Water Budget

Budgeted Expense	2011/12 Budget	Estimated Fixed %	Estimated Variable %	Estimated Fixed \$	Estimated Variable \$
FUND 511 - Water Operations					
1110-7252 Miscellaneous	\$351,260	60%	40%	\$211,000	\$141,000
7520 Utility Resources Management	\$370,745	80%	20%	\$297,000	\$74,000
7522 Water Production	\$2,869,635	50%	50%	\$1,435,000	\$1,435,000
7523 Water Distribution	\$2,053,439	50%	50%	\$1,027,000	\$1,027,000
7526 Cross-Connection Control	\$121,296	100%	0%	\$121,000	\$0
7527 Fire Hydrant Maintenance	\$702,217	100%	0%	\$702,000	\$0
7528 Water Conservation	\$0	50%	50%	\$0	\$0
7529 New Services/Meter Install	\$16,906	100%	0%	\$17,000	\$0
7531 North Davis Meadows	\$86,732	100%	0%	\$87,000	\$0
7536 Water Support - City Facilities	\$45,395	100%	0%	\$45,000	\$0
7565 Water Inter-Department Charges	\$234,119	100%	0%	\$234,000	\$0
7602 - 8543 Miscellaneous	\$329,924	60%	40%	\$198,000	\$132,000
8835 Debt Service	\$163,789	100%	0%	\$164,000	\$0
9895 Transfer to Capital Replacement Fund 512	\$2,767,268	80%	20%	\$2,214,000	\$553,000
Total	10,112,725			\$6,752,000	\$3,362,000
Percentage Split				67%	33%
FUND 512 - Water Capital Replacement					
7520 Utility Resources Management	\$70,000	80%	20%	\$56,000	\$14,000
8110-8217 Capital Replacement Misc.	\$2,981,603	80%	20%	\$2,385,000	\$596,000
8543 JPA Contribution	\$4,275,000	90%	10%	\$3,848,000	\$428,000
8836 - 8840 Debt Service	\$1,042,154	100%	0%	\$1,042,000	\$0
9895 Transfer from Fund 511	(\$2,767,268)	80%	20%	(\$2,214,000)	(\$553,000)
Total	\$5,601,489			\$5,117,000	\$485,000
Percentage Split				91%	9%
FUND 513 - Water Capital Expansion					
8110-8185 Capital Expansion	\$349,533	100%	0%	\$350,000	\$0
8543-8552 JPA Contribution	\$0	100%	0%	\$0	\$0
8836 Debt Service	\$302,416	100%	0%	\$302,000	\$0
9895 Contribution transfer From ?????	(\$150,000)	100%	0%	(\$150,000)	\$0
8223-8225 Capital Expansion	\$1,015,000	100%	0%	\$1,015,000	\$0
Total	\$1,516,949			\$1,517,000	\$0
Percentage Split				100%	0%
Total All Water Funds	\$17,231,163			\$13,386,000	\$3,847,000
Percentage Split				78%	22%



Fixed vs. Variable: 2011 Water Revenues

	Amount	% of Total
Fixed Revenues		
Base Charges	\$2,808,008	26.5%
Other Revenues (1)	\$691,313	6.5%
Variable Revenues		
<u>Metered Charges</u>	<u>\$7,116,068</u>	<u>67.0%</u>
Total	\$10,615,389	100.0%

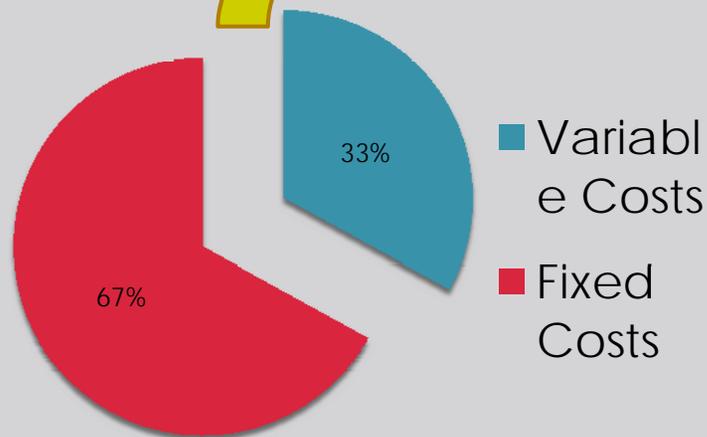
1 – Other Revenues include Interest, Sale of Surplus/Salvage, North Davis Meadows Water Service, and Others

FIXED VS. VARIABLE ... COST VS. REVENUES

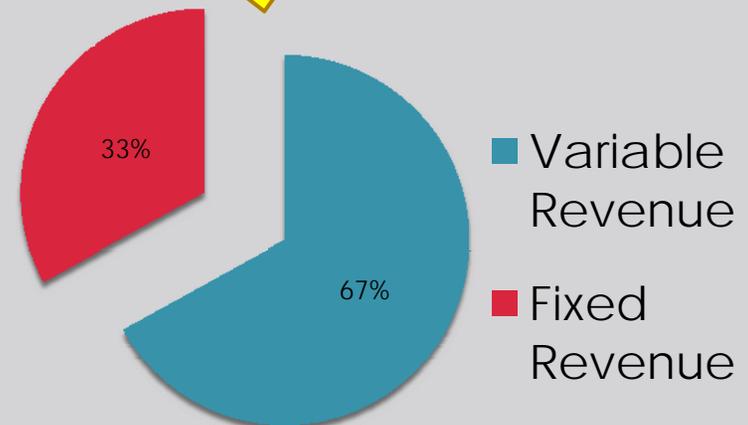
- For every \$2.00 of revenue lost to conservation...

CURRENT RATE DESIGN

COST PROPORTIONS



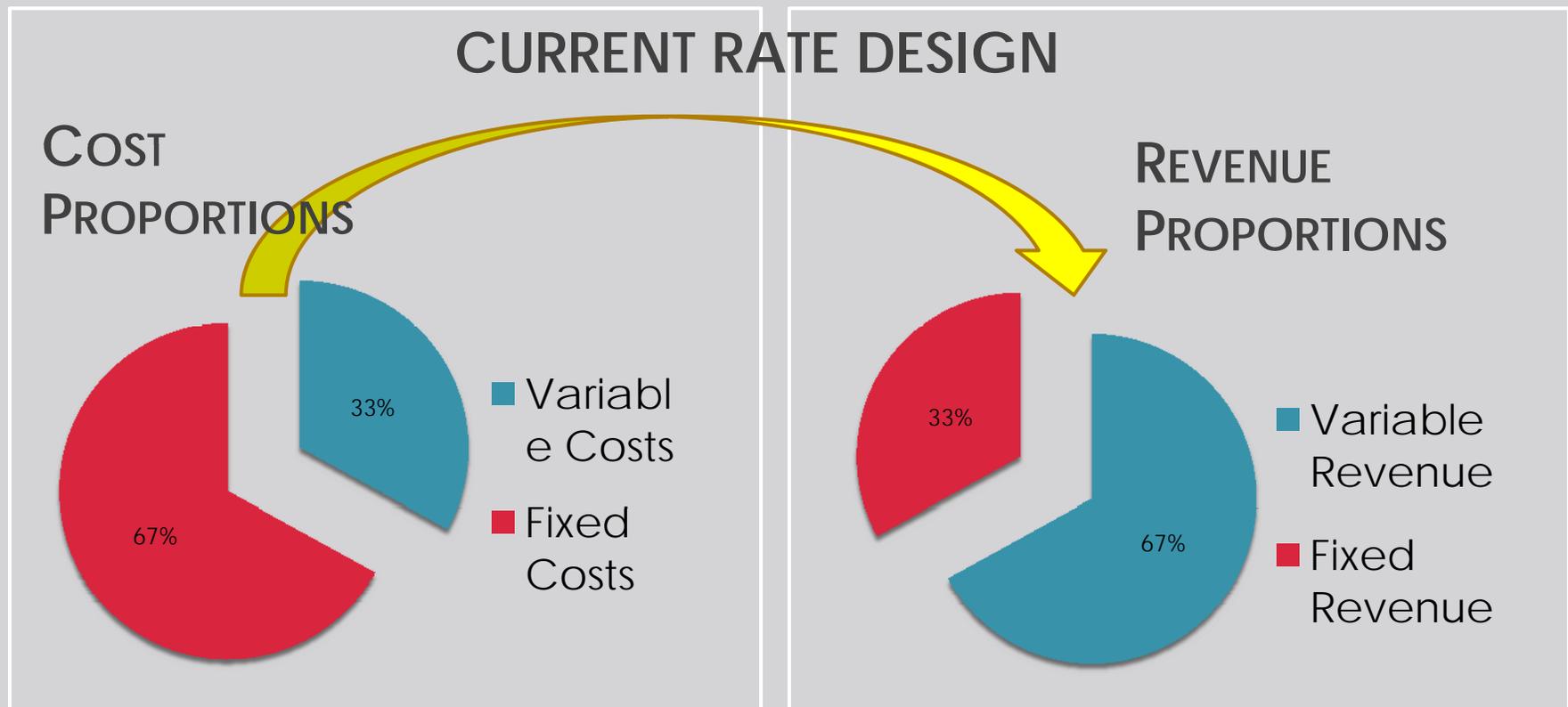
REVENUE PROPORTIONS



- Only \$1.00 of cost is saved...

FIXED VS. VARIABLE ... COST VS. REVENUES

- The end result of this disconnect is a STRUCTURAL DEFICIT...



- And the more we conserve, the more DEFICIT we create

DEALING WITH A STRUCTURAL DEFICIT

- Build a cushion (“gouge” customers in early years)
- Run with the deficit (Davis did this for years)
- Go back to the consumers frequently with a new rate structure with higher rates



DEALING WITH A STRUCTURAL DEFICIT

- Build a cushion (“gouge” customers in early years)
- Run with the deficit (Davis did this for years)
- Go back to the consumers frequently with a new rate structure with higher rates

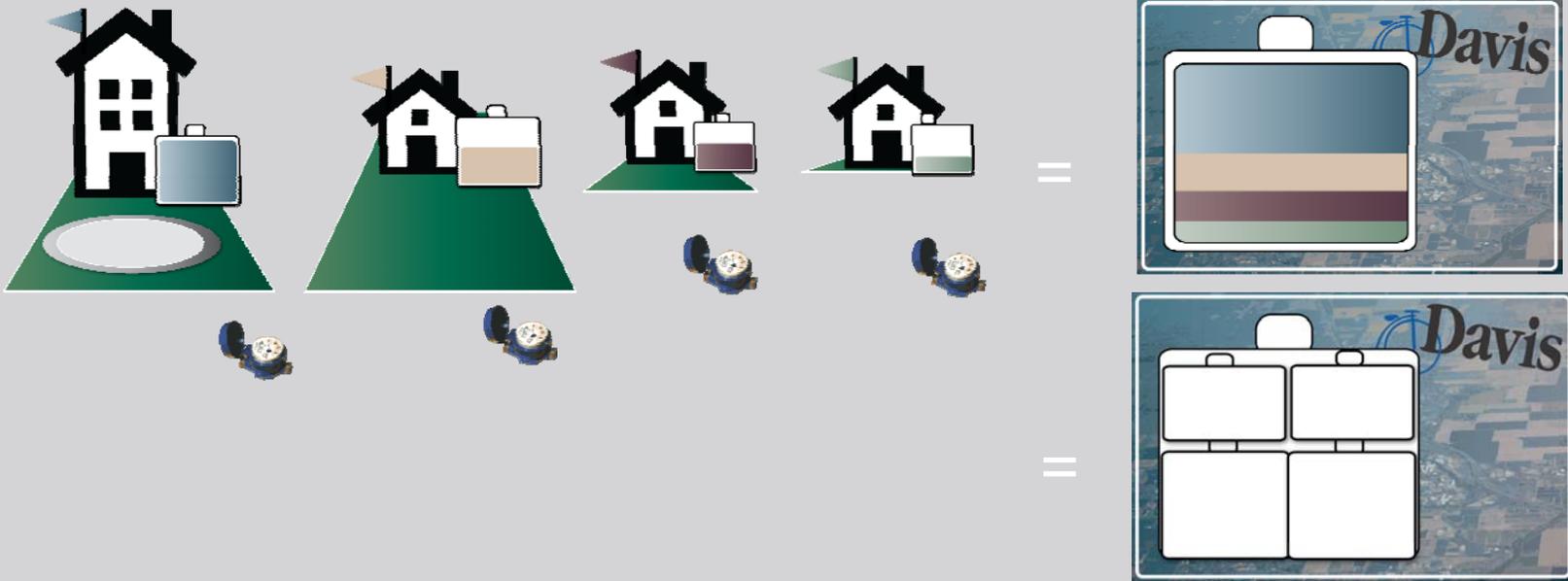
NONE OF THESE OPTIONS MEET THE STANDARD OF PROVIDING
REASONABLE AND STABLE WATER RATES FOR THE CONSUMER AND...
ALL ARE POLITICAL DYNAMITE



THE PROBLEM W/ ALLOCATING FIXED COSTS TO RATES BASED ON METER SIZE



- Certain accounts use more water



DIVERSITY OF HOMES



BIG HOUSE
BIG LOT
BIG/SMALL FAMILY



SMALL HOUSE
BIG LOT
BIG/SMALL FAMILY



SMALL HOUSE
SMALL LOT
BIG/SMALL FAMILY



CONDO
NO LOT
BIG/SMALL FAMILY





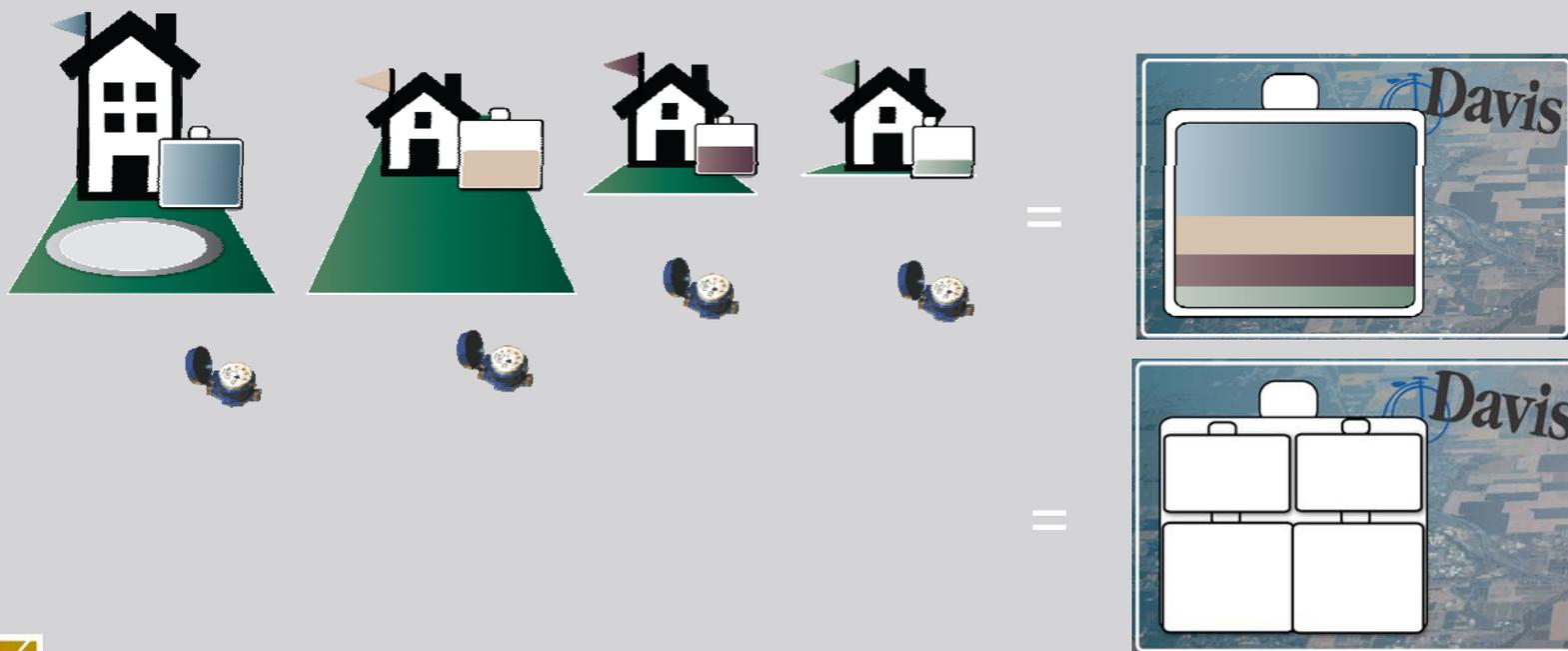
=



PROPOSED SOLUTION



- Consumption-based fixed rates



CREATING CONSUMPTION-BASED FIXED REVENUE

A step by
step
process

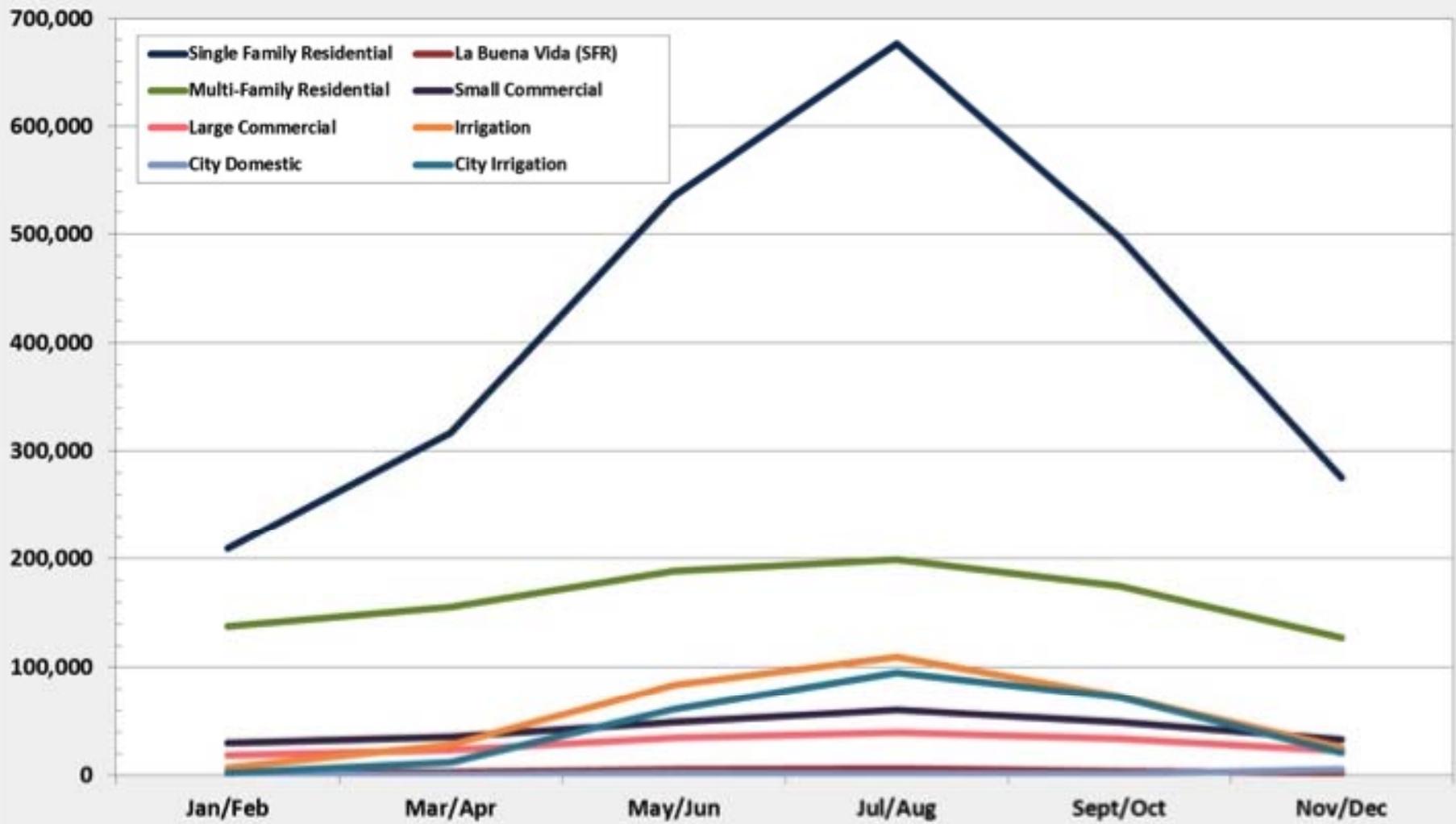


(1) CHOOSE REPRESENTATIVE PERIOD

2011							
Class	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sept/Oct	Nov/Dec	Total
Single Family Residential	209,572	316,471	536,079	676,186	497,243	275,765	2,511,316
La Buena Vida (SFR)	2,083	2,984	5,188	6,436	3,800	2,353	22,844
Multi-Family Residential	137,573	155,415	188,376	198,744	174,755	127,190	982,053
Small Commercial	29,395	35,359	49,068	60,096	48,852	33,372	256,142
Large Commercial	18,476	22,971	34,815	39,148	34,039	22,347	171,796
Irrigation	7,091	27,955	83,722	109,950	73,548	25,734	328,000
City Domestic	468	793	2,199	1,749	1,657	5,646	12,512
City Irrigation	2,307	12,203	61,391	95,268	72,801	21,305	265,275
Total	406,965	574,151	960,838	1,187,577	906,695	513,712	4,549,938



City of Davis 2011 Bi-Monthly Water Consumption (HCF) by Class



(2) CALCULATE ALLOCATION PROPORTIONS

2011						Average
Class	Jul/Aug	Total	Annual Proportion	Jul/Aug Proportion	Accounts	Account Allocation
Single Family Residential	676,186	2,511,316	55.2%	56.8%	14,395	0.003834%
La Buena Vida (SFR)	6,436	22,844	0.5%	0.5%	342	0.001468%
Multi-Family Residential	198,744	982,053	21.6%	16.7%	517	0.041748%
Small Commercial	60,096	256,142	5.6%	5.0%	558	0.010089%
Large Commercial	39,148	171,796	3.8%	3.3%	131	0.028823%
Irrigation	109,950	328,000	7.2%	9.2%	255	0.028270%
City Domestic	1,749	12,512	0.3%	0.5%	26	0.010577%
City Irrigation	95,268	265,275	5.8%	8.0%	208	0.028030%
Total	1,187,577	4,549,938	100.0%	100.0%	16,432	



(3) ALLOCATE FIXED COSTS

2011		Average	Fixed
		Account	Costs
Class	Accounts	Allocation	Proportion
Single Family Residential	14,395	0.003834%	\$ 3,726,734
La Buena Vida (SFR)	342	0.001468%	\$ 33,900
Multi-Family Residential	517	0.041748%	\$ 1,457,343
Small Commercial	558	0.010089%	\$ 380,109
Large Commercial	131	0.028823%	\$ 254,941
Irrigation	255	0.028270%	\$ 486,744
City Domestic	26	0.010577%	\$ 18,568
City Irrigation	208	0.028030%	\$ 393,661
Total	16,432		\$ 6,752,000



(4) VARIABLE COSTS PROPORTIONALITY

2011			Variable	
Class	Accounts	CCF Total	Costs Proportion	Variable \$ per CCF
Single Family Residential	14,395	2,511,316	\$ 1,855,640	\$ 0.7389
La Buena Vida (SFR)	342	22,844	\$ 16,880	\$ 0.7389
Multi-Family Residential	517	982,053	\$ 725,650	\$ 0.7389
Small Commercial	558	256,142	\$ 189,266	\$ 0.7389
Large Commercial	131	171,796	\$ 126,942	\$ 0.7389
Irrigation	255	328,000	\$ 242,363	\$ 0.7389
City Domestic	26	12,512	\$ 9,245	\$ 0.7389
City Irrigation	208	265,275	\$ 196,014	\$ 0.7389
Total	16,432	4,549,938	\$ 3,362,000	



(5) VIEW INDIVIDUAL ACCOUNTS

		Annual	Annual		Change
Meter Size	12 Months	Current Fees	New Fees	Change	Percent
1 - inch	438	\$ 940.60	\$ 1,091.67	\$ 151.07	16%



(5) VIEW INDIVIDUAL ACCOUNTS

		Annual	Annual		Change
Meter Size	12 Months	Current Fees	New Fees	Change	Percent
1 - inch	438	\$ 940.60	\$ 1,091.67	\$ 151.07	16%

Let's put that \$150 into perspective.

- The change for the individual account is \$150, but that \$150 change means a change of less than one penny for all the other accounts billed by the agency.
- We refer to that as "THE INSURANCE EFFECT" . . . accounts across the rate structure are insulated from significant consumption changes by an individual account.



DOES COMPARING

THE NEW RATES TO

THE CURRENT RATES

TELL US ANYTHING?



PROBLEMS AREN'T ONLY FISCAL

- Subsidization in 11,620 Single Family Residences with $\frac{3}{4}$ inch meters

Percentile	Annual Consumption (in ccf)
0	0
10	58
20	83
30	103
40	122
50	139
60	158
70	180
80	209
90	257
100	1,289

The 5,800 accounts ABOVE the yellow line SUBSIDIZE the 5,800 accounts BELOW the yellow line



PROBLEMS AREN'T ONLY FISCAL

- Subsidization in 11,620 Single Family Residences with $\frac{3}{4}$ inch meters

Percentile	Annual Consumption (in ccf)
0	0
10	58
20	83
30	103
40	122
50	139
60	158
70	180
80	209
90	257
100	1,289

HOW MUCH IS
THE SUBSIDY?



PROBLEMS AREN'T ONLY FISCAL

- Subsidization in 11,620 Single Family Residences with $\frac{3}{4}$ inch meters

Percentile	Annual Consumption (in ccf)	Subsidization
0	0	\$ -
10	58	\$ (8,157)
20	83	\$ (35,161)
30	103	\$ (41,392)
40	122	\$ (35,519)
50	139	\$ (24,289)
60	158	\$ (12,735)
70	180	\$ 4,656
80	209	\$ 22,808
90	257	\$ 41,139
100	1,289	\$ 88,651



PROBLEMS AREN'T ONLY FISCAL

- Subsidization within a class for like volume based on meter size

Meter Size	Water Class	12 Months ccf	Jul/Aug 2011 ccf	Annual Current Fees	Annual New Fees	Change
2 - inch	Multi-Family Residential	12,288	2,844	\$23,811	\$25,263	\$1,452
4 - inch	Multi-Family Residential	13,730	2,810	\$27,511	\$26,137	(\$1,374)



PROBLEMS AREN'T ONLY FISCAL

- Subsidization within a class for like volume based on meter size

Meter Size	Water Class	12 Months ccf	Jul/Aug 2011 ccf	Annual Current Fees	Annual New Fees	Change
2 - inch	Multi-Family Residential	12,288	2,844	\$23,811	\$25,263	\$1,452
4 - inch	Multi-Family Residential	13,730	2,810	\$27,511	\$26,137	(\$1,374)

By paying a higher fixed fee for potential meter capacity, the second apartment complex SUBSIDIZES the first apartment complex.



PROBLEMS AREN'T ONLY FISCAL

- Subsidization within a class for like volume based on meter size

Meter Size	Water Class	12 Months ccf	Jul/Aug 2011 ccf	Annual Current Fees	Annual New Fees	Change
2 - inch	Multi-Family Residential	12,288	2,844	\$23,811	\$25,263	\$1,452
4 - inch	Multi-Family Residential	13,730	2,810	\$27,511	\$26,137	(\$1,374)

Which fee structure do you think is more fair?



PROBLEMS AREN'T ONLY FISCAL

- Aggregate subsidization between classes

	Class	Current Fees	New Fees	Change	Subsidization
	Large Commercial	\$ 398,675	\$ 453,057	\$ 54,382	13.6%
	Small Commercial	\$ 672,576	\$ 749,412	\$ 76,836	11.4%
	Church	\$ 37,693	\$ 48,930	\$ 11,237	29.8%
	Parks	\$ 569,866	\$ 783,419	\$ 213,554	37.5%
	Schools	\$ 240,377	\$ 324,257	\$ 83,880	34.9%
	Multi-Family Residential	\$ 2,079,206	\$ 1,898,314	\$ (180,893)	-8.7%
	Multi-Family Residential - Irrigation	\$ 140,076	\$ 210,322	\$ 70,246	50.1%
	Single Family Residential	\$ 6,245,047	\$ 6,018,411	\$ (226,636)	-3.6%



PROBLEMS AREN'T ONLY FISCAL

- Aggregate subsidization between classes

	Class	Current Fees	New Fees	Change	Subsidization
	Large Commercial	\$ 398,675	\$ 453,057	\$ 54,382	13.6%
	Small Commercial	\$ 672,576	\$ 749,412	\$ 76,836	11.4%
	Church	\$ 37,693	\$ 48,930	\$ 11,237	29.8%
	Parks	\$ 569,866	\$ 783,419	\$ 213,554	37.5%
	Schools	\$ 240,377	\$ 324,257	\$ 83,880	34.9%
	Multi-Family Residential	\$ 2,079,206	\$ 1,898,314	\$ (180,893)	-8.7%
	Multi-Family Residential - Irrigation	\$ 140,076	\$ 210,322	\$ 70,246	50.1%
	Single Family Residential	\$ 6,245,047	\$ 6,018,411	\$ (226,636)	-3.6%
	El Macero	\$ 419,516	\$ 470,591	\$ 51,074	2.8%
	Willowbank	\$ 93,687	\$ 98,934	\$ 5,247	5.6%



Arguably, setting fixed fees by meter size fails Proposition 218's proportionality test

- It requires low-water-use customers to pay fixed costs for water they have the theoretical potential to use, but do not have the actual capacity to use.
- It gives those customers who use a larger "share" of the water infrastructure (based on meter size) an incentive to do so.
- Thrifty and extravagant water users pay the same fixed fee, but derive entirely different benefits from the system.
- The thrifty user's fixed fees cover some of the fixed costs the wasteful user imparts on the system, in effect subsidizing the water waster.



SOLUTION STATEMENT

- Balance is achieved between competing objectives



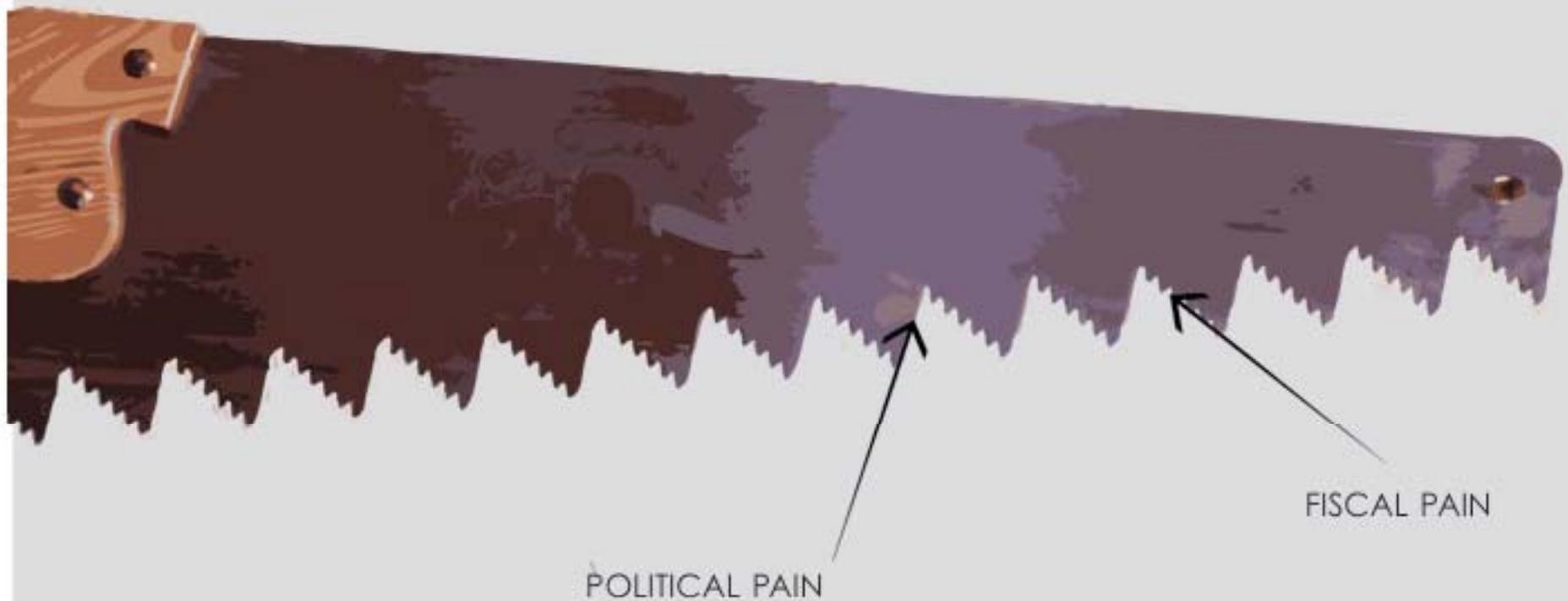
WHEN WATER AGENCIES CREATE WATER RATE STRUCTURES, THEY ARE FORCED TO DEAL WITH THREE COMPETING FORCES

- **Prop 218** -- The requirements of Proposition 218 passed in 1996 by California voters, which created the California Constitution article XIII D, section 6 ... specifically that property-related fees, such as water service fees, shall not exceed the proportional cost of providing the service attributable to a parcel
- **California Constitution Article X Water Section 2** -- The provisions of California Constitution article X, section 2, which create the framework within which public agencies must establish and enforce water conservation measures and are charged with the responsibility of managing water resources, and
- **Fiscal Responsibility** – **with** the two key components being FISCAL STABILITY and FISCAL SUSTAINABILITY



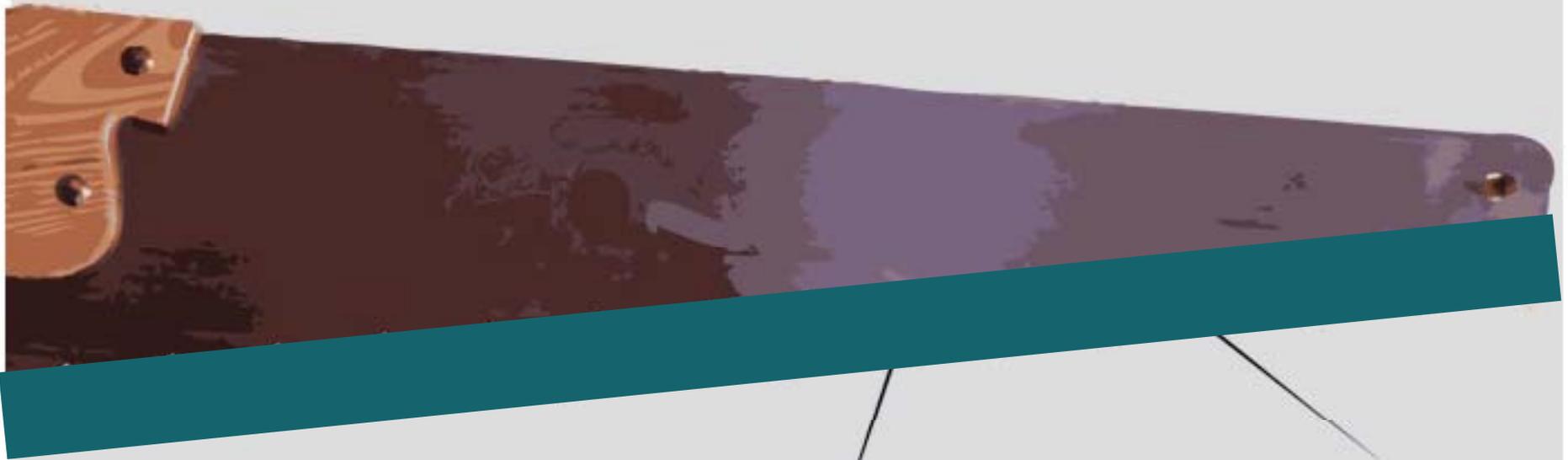
SOLUTION STATEMENT

- Balance is achieved between competing objectives



SOLUTION STATEMENT

- Balance is achieved between competing objectives



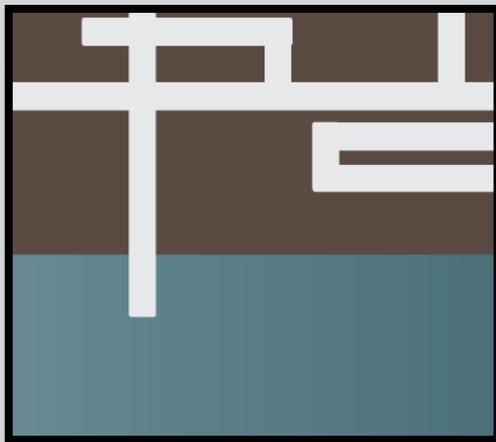
NO POLITICAL PAIN

NO FISCAL PAIN

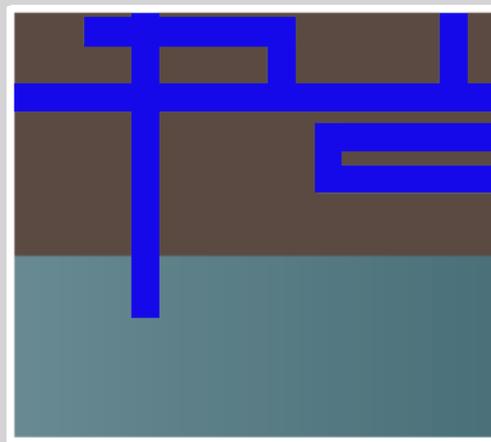


HOME OWNER PERSPECTIVE

- Fixed Costs + Variable Costs = Total Cost



+

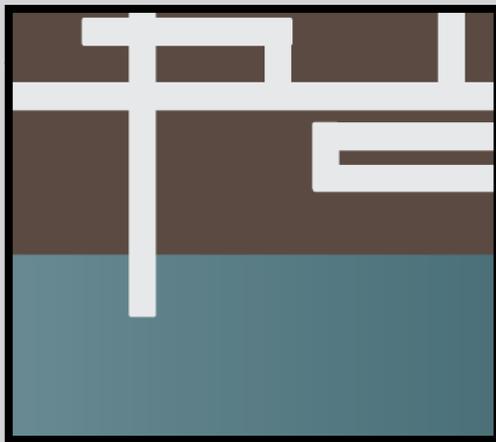


=

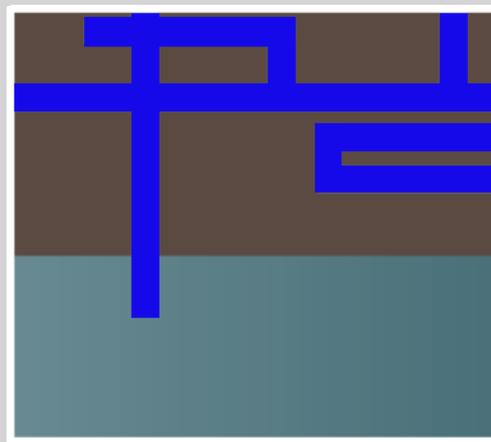


HOME OWNER PERSPECTIVE

- Fixed Costs + Variable Costs = Total Cost



+



=



FIXED FEES TRULY ARE FIXED

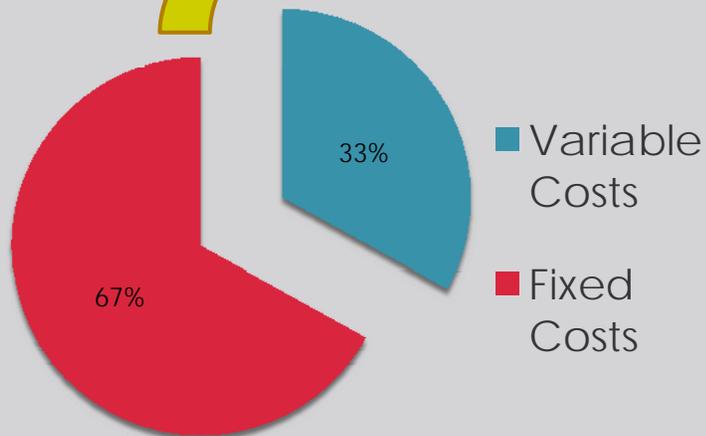


FIXED VS. VARIABLE ... COST VS. REVENUES

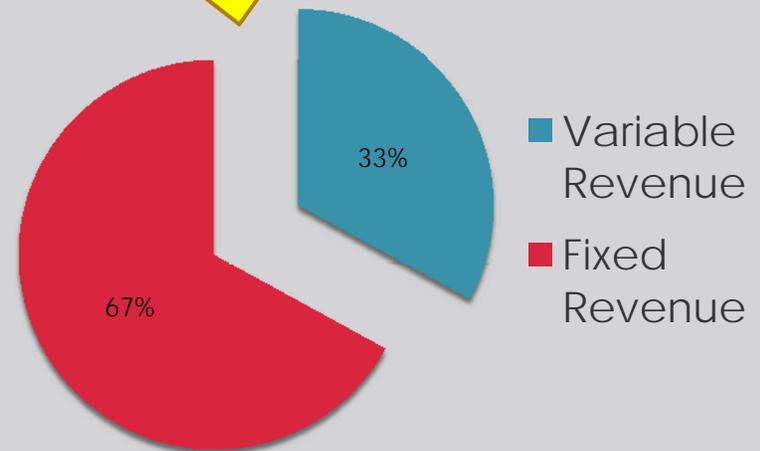
- For every \$1.00 of revenue lost to conservation...

PROPOSED RATE DESIGN

COST PROPORTIONS



REVENUE PROPORTIONS



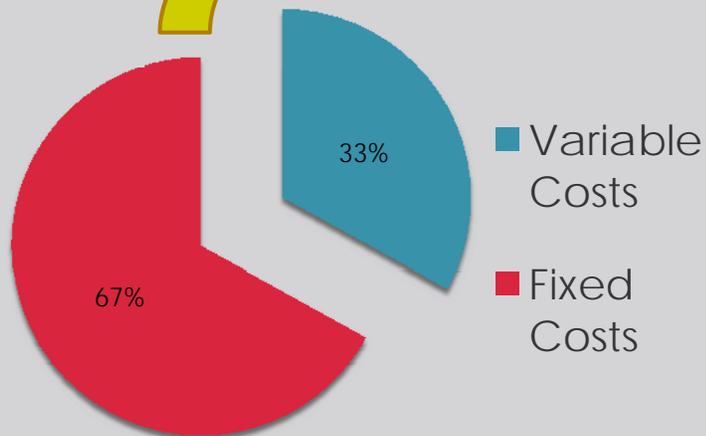
- The end result is no disconnect and NO STRUCTURAL DEFICIT

FIXED VS. VARIABLE ... COST VS. REVENUES

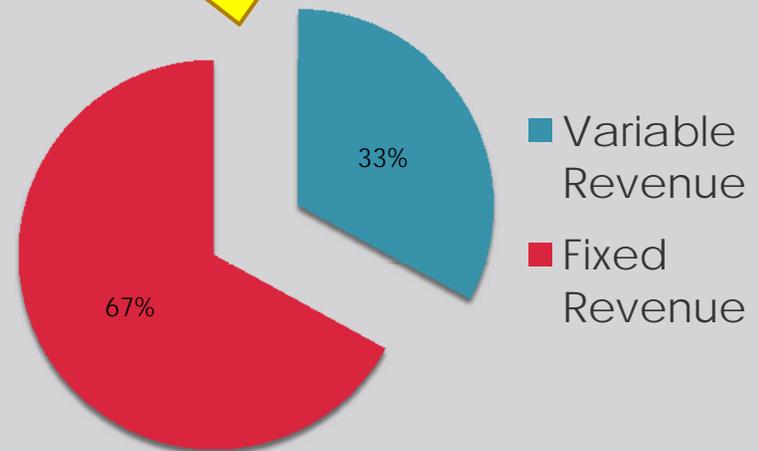
- For every \$1.00 of revenue lost to conservation...

PROPOSED RATE DESIGN

COST PROPORTIONS



REVENUE PROPORTIONS



- \$1.00 of cost is saved...

QUESTIONS?

