



System Development Fees

CWW Annual Event 2011

Equity Leads To Conservation
In Westminster

Stu Feinglas
City of Westminster, Colorado



What Are System Development Fees

- Tap Fees
- Water / Sewer
- Fund system
 - Infrastructure
 - Water resources
 - Rates cover treatment and maintenance
- Paid by Developers or new customers
- Structure developed when we knew little about our customers
 - Up to the meter
- Usually based on Single Family SFE



Growth Management And Tap Fees

- Use tap fees to keep the City from growing faster than the water supply
 - Service commitments
- Separate component values and sales
 - Water Resources
 - Infrastructure
- Base tap fees on current resource values
 - Ramp up
- Growth pays for growth



Assessing Fees

- Tap size method
- Component charge method



Assessing Fees

- Tap size method
 - Hydraulic capacity related to peak demand
- Assumed water requirements
 - Based on tap size
 - Easy to calculate

	Max GPM	Meter Size	Hydraulic Service Commitments	Connection Charge	Infrastructure Charge	Water Resources	Total Fees
	20	5/8"x 3/4"	1	\$ 310	\$ 8,667	\$ 7,077	\$ 16,054
	30	3/4"	1.5	\$ 310	\$ 13,000	\$ 10,616	\$ 23,926
	50	1"	2.5	\$ 248	\$ 21,667	\$ 17,693	\$ 39,608
	100	1-1/2"	5	\$ 248	\$ 43,335	\$ 35,385	\$ 78,968
	160	2"	8	\$ 310	\$ 69,336	\$ 56,616	\$ 126,262

Tap Sizing

City of Westminster Plumbing Data Sheet

Date of Submittal: _____
 Address of Building: _____
 Name of Builder: _____
 Contact Name and Phone #: _____

Please complete this data sheet and return to the City of Westminster Building Department.

Enter the number of each fixture to be included per water tap in the "Count" column.
 Enter the Fixture Rating (GPM) When Required.

Fixture Type	Count	PU per	
Automatic Clothes Washer - Individual	2	4.0	8
Automatic Clothes Washer - Large Capacity		4.0	
Bathroom - with or without shower head		0.5	
Collectors		0.5	
Dishwasher - commercial		0.5	
Drink Dispenser		0.25	
Drinking Fountain	6	0.5	3
Gas Fills		2.0	
Hose Bibb - 1/2"	1	2.0	2.0
Hose Bibb - each additional		1.0	
Ice Maker	7	2.0	14
Laundry	11	2.0	22
Shower - jet head		2.0	
Sink - bar and fountain		2.0	
Sink - barber and accompan		0.5	
Sink - bar		7.0	
Sink - flushing rim		7.0	
Sink - kitchen and food preparation	6	4.0	24
Sink - laboratory	17	2.0	34
Sink - medical exam and treatment		3.0	
Sink - service	6	3.0	18
Sink - surgeon wash-up		8.0	
3/4-inch Supply Urinal		10.0	
1/2-inch Supply Urinal		8.0	
Wall Hydrant - Hot and Cold - 1/2" dia		4.0	
Wall Hydrant - Hot and Cold - 3/4" dia		3.0	
Wash Fountain - Semi-circular		3.0	
Wash Fountain - Circular		3.0	
Water Closet - Flushometer type		10.0	
Water Closet - Flushometer Tank	11	2.0	22
Water Closet - gravity type flush tank		1.0	
Watersupply P. U. k. Valve		1.0	
Fixture Not on List			
Impactor Flow Restrictor - in each Zone			

Total PU: 133

Total GPM: 133

Pipe Zone Data (CF = Controlling Fixture Zone)
 May be used to size several zones or several sections of one zone.

Zone	CF	2	3	4	5	6
Pipe Size						
Zone Length						
Fixture Units						
Zone WC =						

Max GPM Pipe Size vs. Velocity

Pipe	GPM	Max Velocity 8 FPS	Max Velocity 10 FPS
1/2"	5.6	10.1	13.1
3/4"	12.0	22.3	29.3
1"	18.3	35.3	46.3
1 1/4"	30.3	58.3	76.3
1 1/2"	42.3	80.3	105.3
2"	76.3	145.3	190.3
3"	168.3	310.3	405.3
4"	291.3	548.2	718.2
6"	846.4	1210.2	1580.2

Max GPM per Meter Size

Meter Size	Max Peak Flow GPM
5/8" x 3/4"	20
1"	30
1 1/2"	100
2"	160
3"	300
4"	600
6"	1200

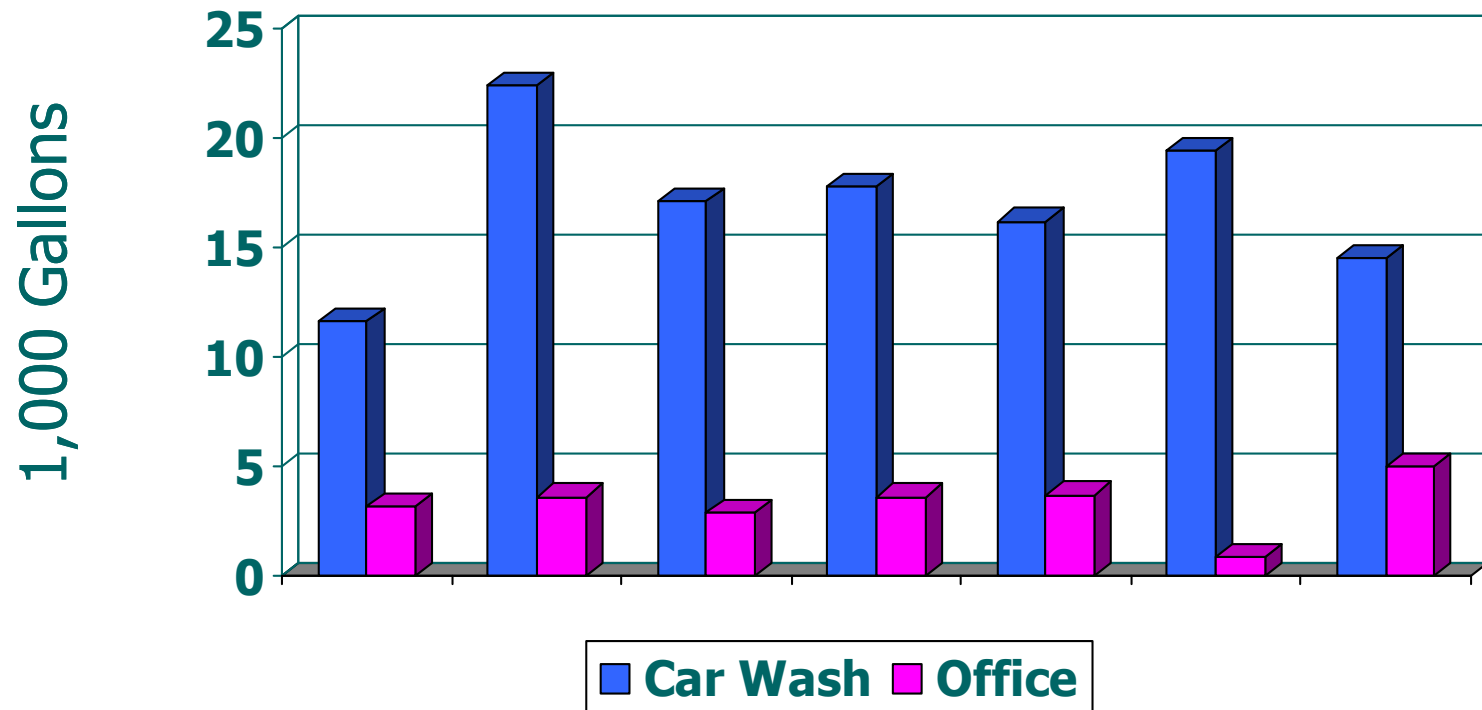
Cap velocities may not exceed 15 FPS
 Velocities after the service line are not recommended to exceed 3 FPS
 Meter and pipe size must be the same unless the City requests otherwise

Precommissary Tank Volume - L x W x H"
 Minimum Pressure at Main
 Tank Volume - Hot Water - 15, Cold Water - 35
 Controlling Fixture Elevation from Main
 Pipe Length Main to Meter
 Pipe Length Meter to Building
 Backflow PSI Loss
 Other Pressure Reduction
 Other Pressure Reduction

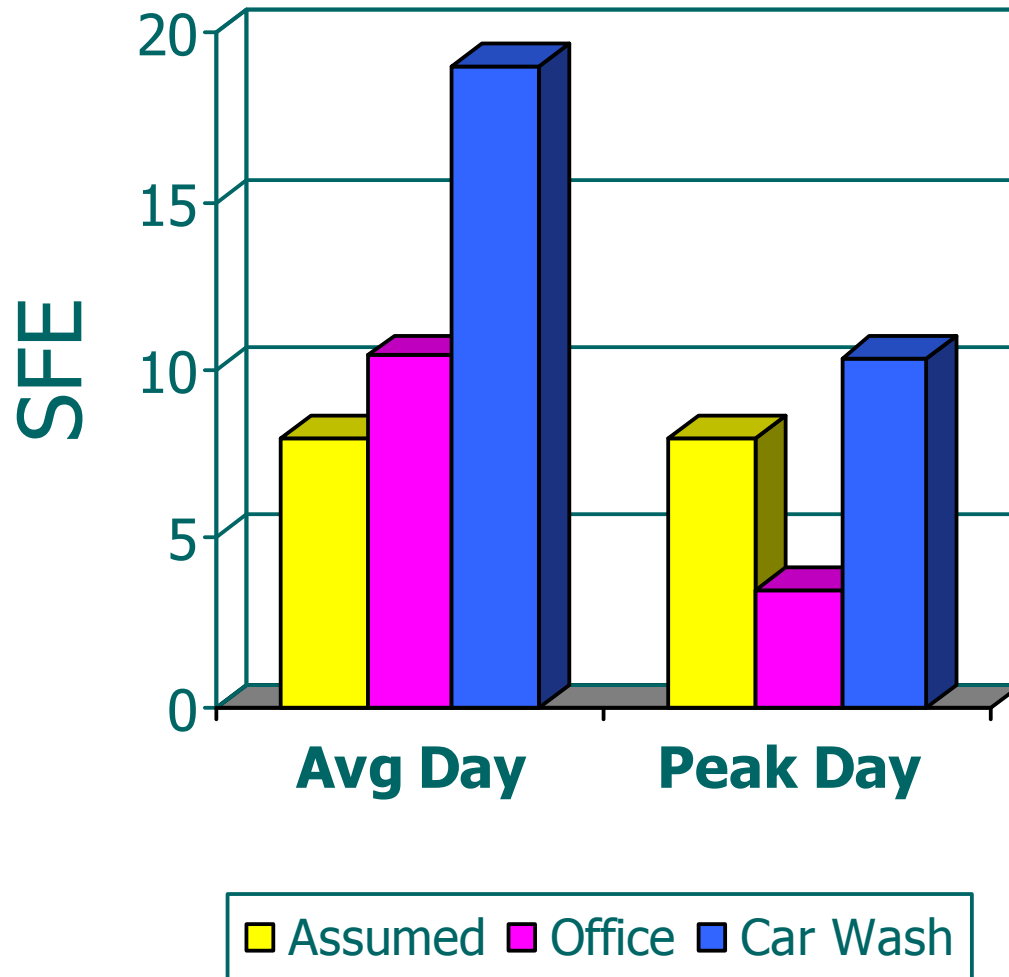
Comparison of Two Commercial Customers Each With 2" Meters



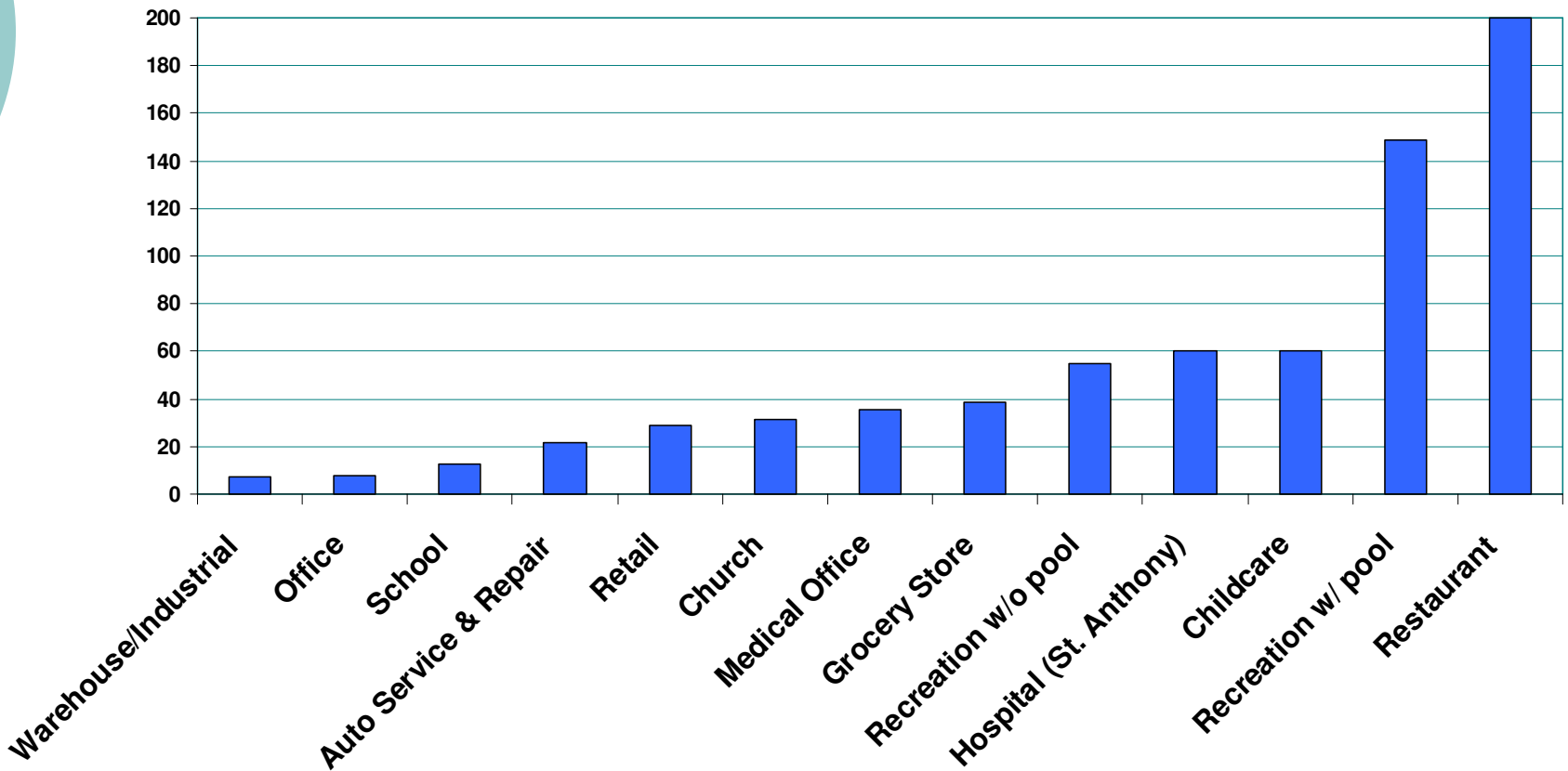
Comparison of 7-Day Water Use



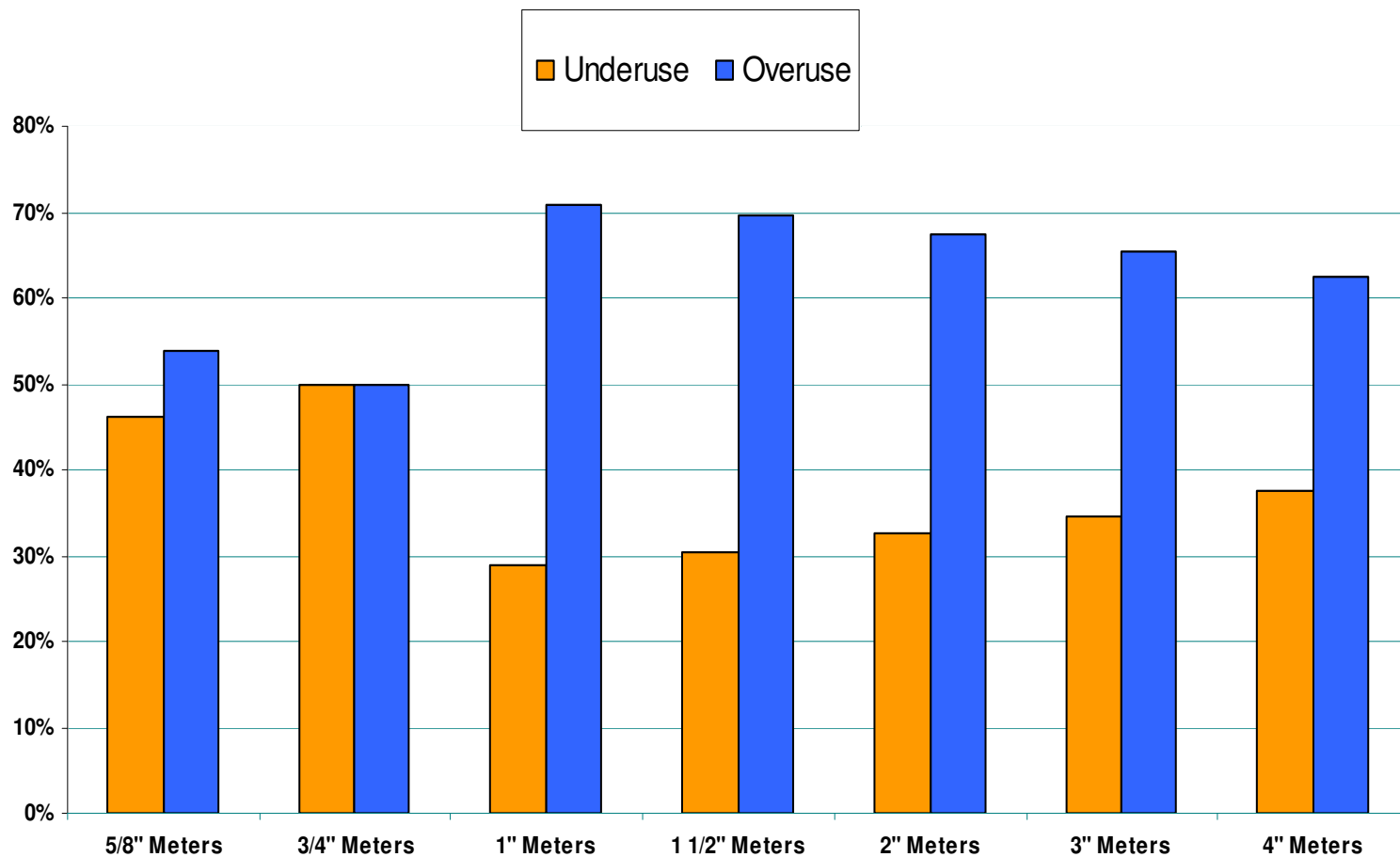
Comparison of Two Commercial Customers with 2" meters



Average Water Use By Category



ICI Accounts That Underuse vs. Overuse by Meter Size





Drawbacks of Tap Size Based Fee

- Inequitable
 - A 2" tap does not always equal a 2" tap
 - High peak flows \neq high water use
 - Low peak flows \neq *low* water use
- Low water users of a given tap size **or** ratepayers subsidize high water users
- Little incentive to reduce water use
 - Water saving equipment will not be installed
 - Developer does not pay for water use
- Incentive to install undersized taps



Assessing Fees

Component Costs

- Water use separate from the tap size
- Value of water (for municipal purchase) changes at a different rate than infrastructure costs
- Developers can affect water and peak demand
 - Fixture type
 - Landscape
 - Process
 - Conservation value



Water Resource Service Commitment

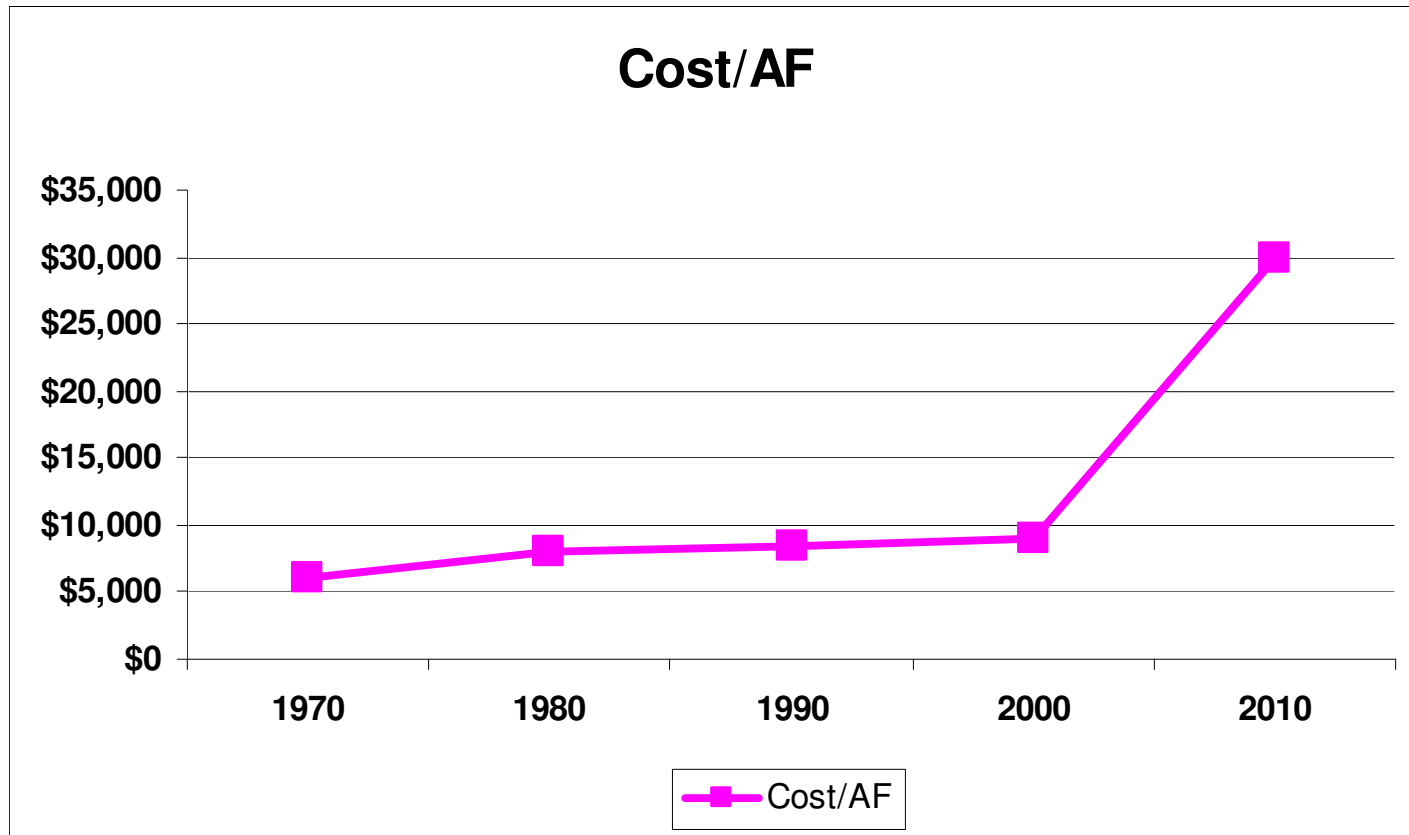
- Base unit of water sales
- Westminster = 140,000 gpy
 - Projected new single family
- Projected annual demand
 - Multiples of SC
- Market value
- Are there a societal values?
 - In stream flows
 - Aquifer depletion



Service Commitment History SFRE

- 163,000 gpy
- 140,000gpy
- 115,000gpy

Water Resources Cost History





Benchmarks

Category Name	Units	Unit Use * (gal/unit/yr)
Auto Service & Repair	sf	21.7
Car Wash	bay	96445
Childcare	sf	60
Church	sf	31.5
Clubhouse/Pool	unit	140000
Grocery Store	sf	38.5
Gas Station w/ Car Wash	sf	1447
Gas Station w/o Car Wash	sf	242
Hospital (St. Anthony)	sf	59.97
Hotel/Motel	room	23566
Medical Office	sf	35.7
Multi-family includes irrigation	unit	69925
Office	sf	8
Recreation w/ pool	sf	148.8
Recreation w/o pool	sf	55
Restaurant	sf	200
Retail	sf	29
School	sf	12.4
Senior Housing includes irrigation	unit	0
Warehouse/Industrial	sf	7



Benchmarks/Projected Use

- Research Local Customers
- C&I End Uses of Water
- NOCOICI
 - Schools-Restaurants-Hotel/Motel-Senior Living
- Research new or infrequent uses
- Customer provided business proforma
- Use established accounts and other utilities



Benefits of a Separate Water Resource Fee

- Pay for what you need
 - Easy to explain
- Equitable
 - Hard to argue
- Service commitment agreement
 - Quantifies water purchased
 - Future billing capability for overuse
- Incentive to install conservation measures

Infrastructure Costs

Peaking Factors

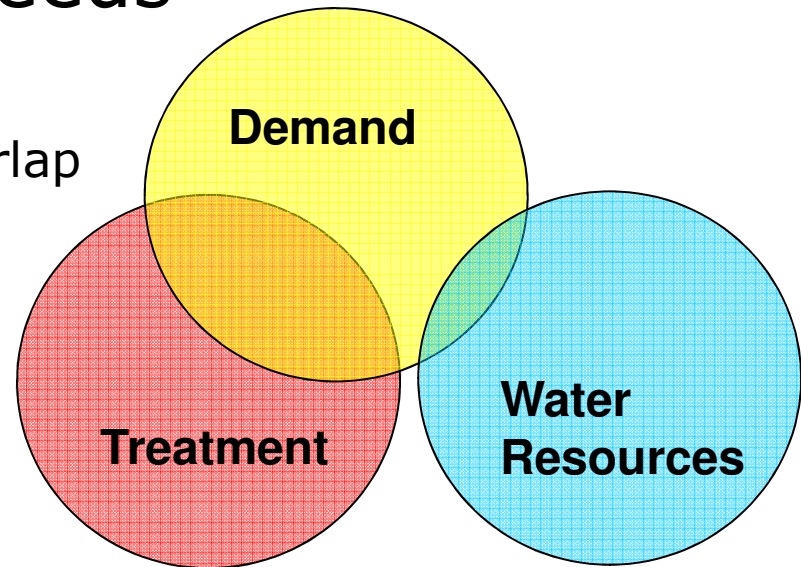
- Ratio of projected peak to average water use
- Higher peak factors have additional infrastructure demands
- Equipment and processes can be modified to reduce the projected peaking factor

Category Name	Peak Day Factor
Auto Service & Repair	1.16
Car Wash	1.16
Childcare	1
Church	1
Clubhouse/Pool	1
Grocery Store	2.2
Gas Station w/ Car Wash	1.16
Gas Station w/o Car Wash	1.16
Hospital (St. Anthony)	2
Hotel/Motel	2
Medical Office	2
Multi-family includes irrigation	1.9
Office	1.35
Recreation w/ pool	2
Recreation w/o pool	2
Restaurant	1.1
Retail	2
School	1.6
Senior Housing includes irrigation	1.9
Warehouse/Industrial	2.22

Peaking Factors

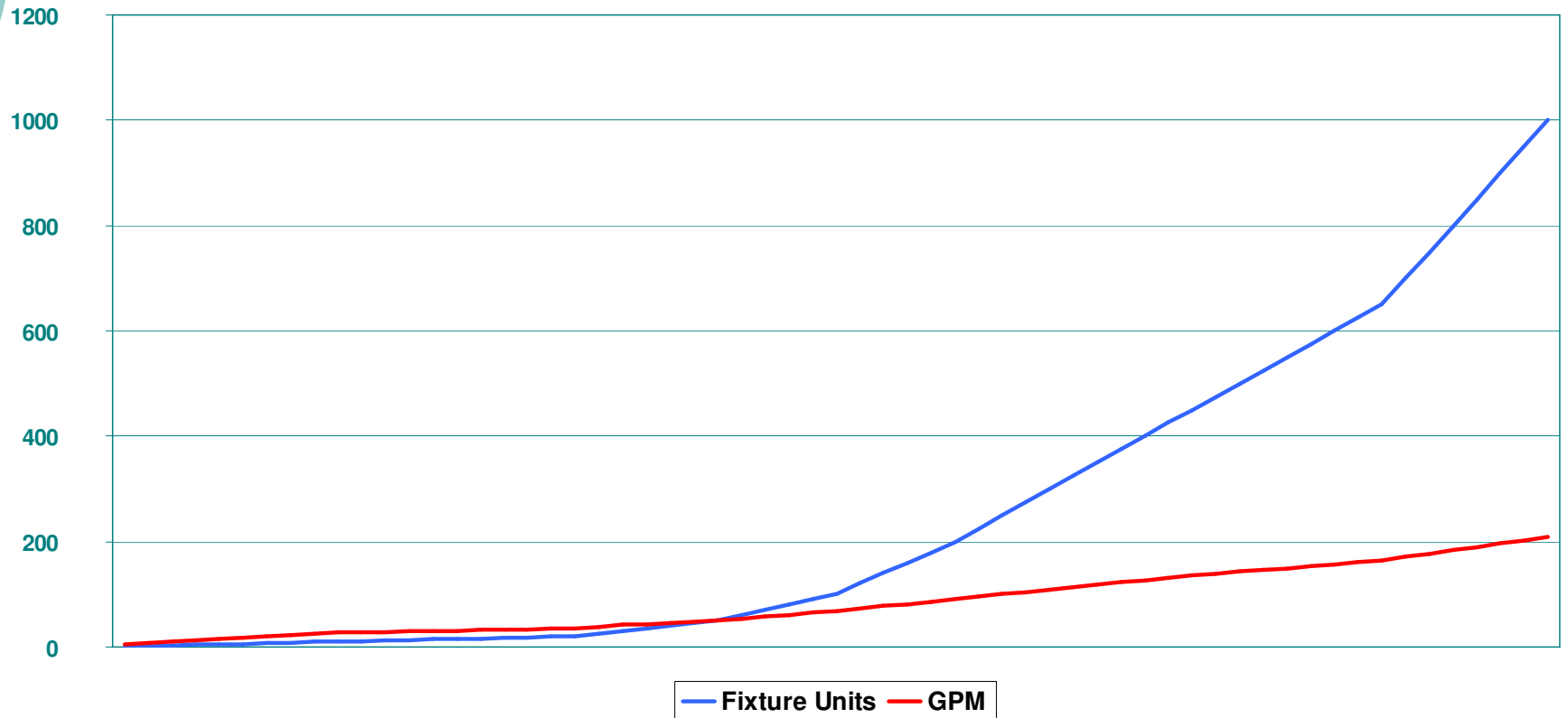
- Peak demands use most expensive resources
- Lower peaking factor can reduce infrastructure needs

Peak Overlap



Tap Sizing

Do efficient fixtures reduce infrastructure demand?





Fixture Units Can Lead To Conservation

- More fixture units = higher GPM = higher velocities = larger taps = higher tap fees
- Lower fixture units = lower tap fees
- Developers receive a benefit for conservation
- Assign fixture units based on real data
 - Currently broad categories
 - Technology type



Benefits of Using Fixture Units

- Part of an existing process
- Does not require a high skill level
- Engineers and building officials are familiar with the process
- Set in Code
 - IPC/UPC
- Easier for me



Irrigation Fees

- Typically based on tap size
- Developers often undersize
- Long term problems for owners
- Seasonal use
 - 0% winter
 - 75% summer
- Irrigation demand can drive the peak
 - Most expensive water

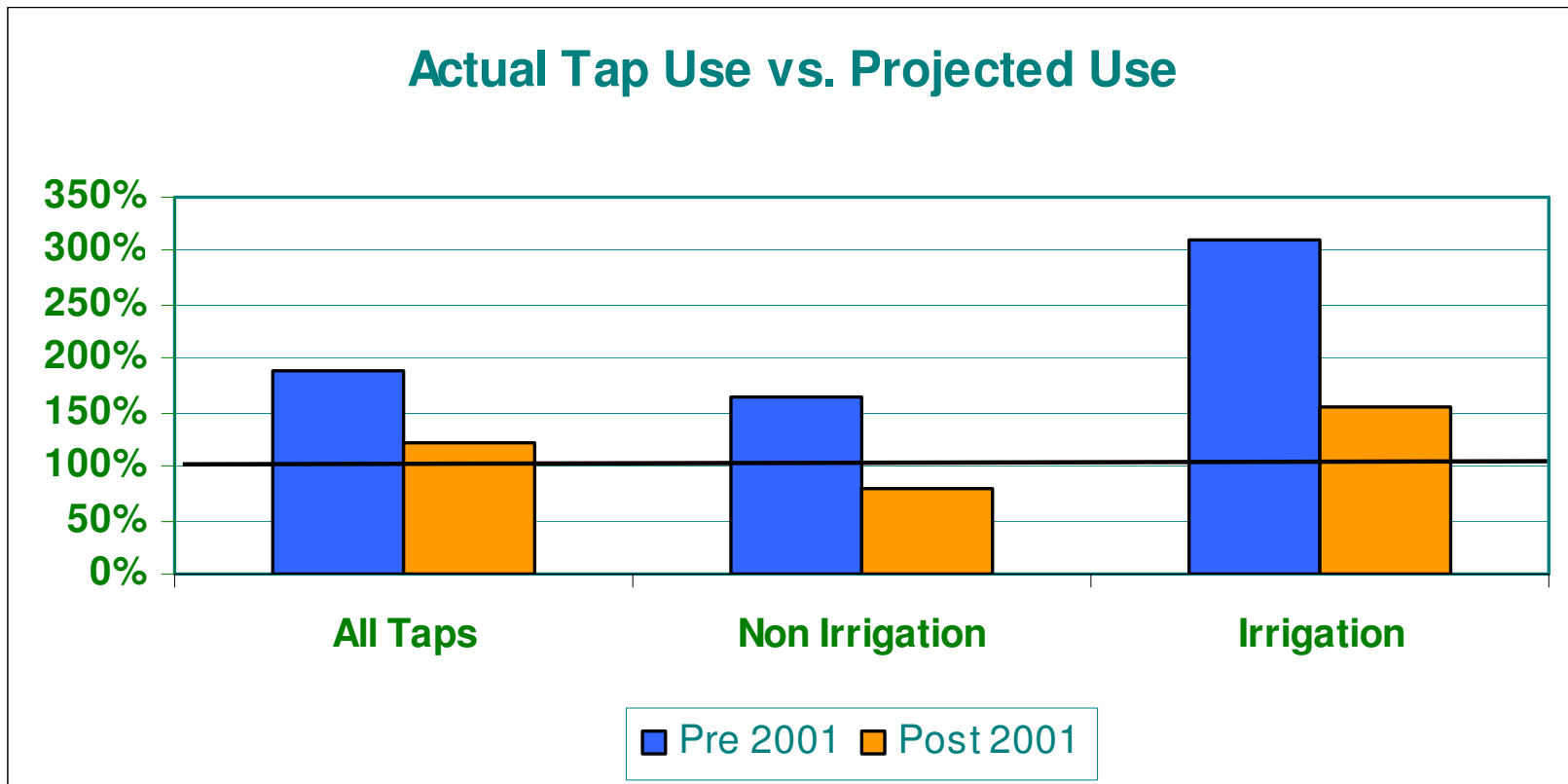


Irrigation Fees

- Base on Water Demand Budget
 - GSF
 - Landscape type
- Minimize tap size based charges
 - Irrigation window
- Separate irrigation fee for all taps
 - Even in combined domestic/irrigation taps
 - Residential lot sizes
- Separate irrigation taps
- Higher cost due to peaking factor

Right Sizing Taps

Paying For Actual Needs Places A Value On Conservation





Building In Conservation

- Always most cost effective to install upfront
- Incentives to install conservation
 - Lower Tap Fee
 - \$\$\$ for Developer
- No cost to utility
 - Less water resources or infrastructure required
- Better data for planning
 - Projected vs. actual water use



Challenges

- Developers don't know the process or benefits
 - Explain upfront
 - Doesn't hit until the developer orders the check
- Keeping the permitting process flowing is critical
- In line and spec spaces
- Redevelopment
- Community Development/Economic Development/Utility conflicting goals



Options

- Per fixture rebate funded through tap fees
- Annual water budget
 - Tap fee amortized surcharge for annual overuse
 - Purchase additional water resources or reduce use
- Peaking factor charge
- Single family tap fees variable by irrigated area
- Development competition points for conservation
- Require low water use fixtures



What's Needed

- Smart meters to provide information
- Benchmarks need to be researched
 - Water resources
 - Peaking factors
 - Fixture units
- Developers need to understand new methods and savings potential
 - Right priced taps produce real savings for developers
- Designers need to be educated
 - Designed in from the start
- We must incorporate other departments into the process



Summary

- **As more customer information becomes available, taps can be better sized and valued.**
- Right sized taps and fees are an incentive for conservation.
- **Developers do not pay for water consumed at a facility after the project is complete.**
- Tap fees are one of the few tools that provide incentives for conservation to developers.
- **Conservation installed at the time of construction is always the most cost effective.**
- Conservation is often value engineered out of projects as unnecessary if there is no benefit to developers.



Thank You

- Questions?

Stu Feinglas

sfeinglas@cityofwestminster.us