Indoor Water Conservation Strategies

Water Conservation Task Force

October 13, 2006

Stakeholder Process

- A stakeholder process will be initiated for each strategy that the Task Force decides to pursue
- Input from stakeholders is needed to minimize impact of these strategies on business processes
- Stakeholders will be invited to be partners in implementation of these strategies.
- Adopting water efficient strategies may integrate into the “sustainable” and/or “environmental” mission of stakeholders
- Some strategies will provide business opportunities to stakeholders and trade group

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Cost Effectiveness

- Compare City cost per gallon of peak day capacity to present day value cost of building new water plant capacity.

  City water plant construction cost is $3.40 per gallon (based on June 22, 2006 City Council Presentation)

- Customer cost effectiveness based on simple payback in years of out of pocket customer costs

- Additional benefit in delaying LCRA payment trigger is $3-4 per gallon saved depending on LCRA rate in effect

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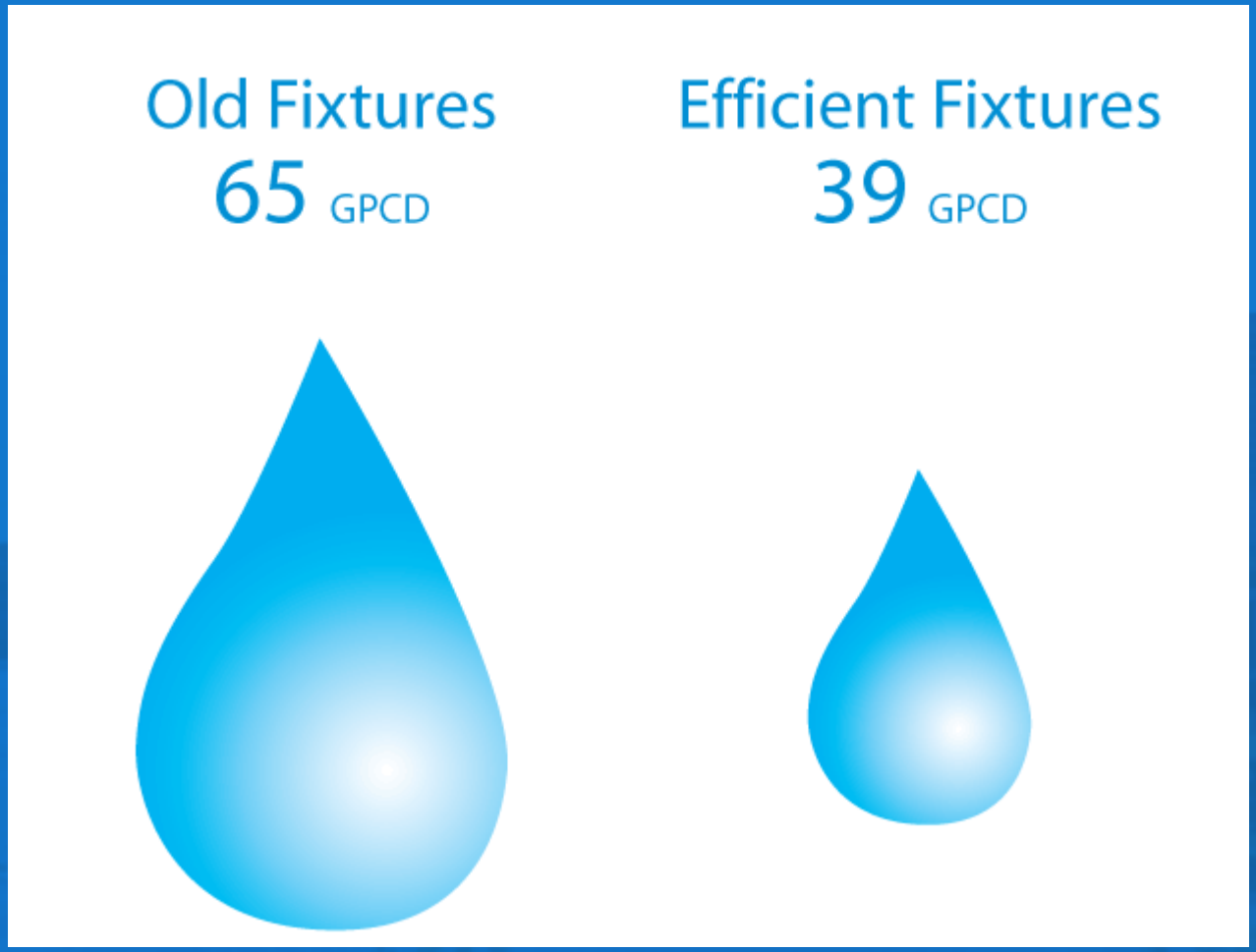
Residential Indoor Water Use



Source: EPA study of Seattle, Tampa, and East Bay MUD

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Indoor Strategies

- Mandatory toilet replacement
- Submetering for apartments and condos
- Plumbing code revisions
  - Toilets, showerheads, and aerators
  - Restaurant equipment
  - Waterless dental and surgical vacuum pumps
- Cooling tower management
- Car wash requirements
- Other potential opportunities

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Mandatory Toilet Replacement

- Background
  - Austin plumbing code changed in 1991; State and national standards set in 1992; Free toilets & toilet rebates offered since 1993
  - 94,000 toilets retrofitted with incentives
    - 18% of old single-family toilets
    - 40% of old multi-family toilets
    - 15% of old commercial toilets

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Mandatory Toilet Replacement

- The Problem
  - BUT many old toilets still installed as of 2006:
    - Single-family – 161,000
    - Multi-family – 41,000
    - Commercial – 26,500

Mandatory Toilet Replacement

- Solutions:
  - Increase toilet rebates
  - Require all properties to bring plumbing fixtures up to plumbing code on transfer of title
  - Require all properties to bring plumbing fixtures up to code upon transfer of utility account
  - Require all Multi-family and Commercial properties built before 1992 to bring plumbing fixtures up to plumbing code by Dec 31, 2009

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Mandatory Toilet Replacement

- Staff Recommendation:
  - Require all single family properties' plumbing fixtures to flush at current plumbing code volumes on transfer of title
    - Responsibility of seller – easy to identify and hold responsible
    - Toilet incentives could remain in place for a period to encourage early replacement

Mandatory Toilet Retrofit

- Staff Recommendation:
  - Require all Multi-family and Commercial properties plumbing fixtures to flush at current plumbing code volumes by Dec 31, 2009
    - Would require inspection for verification
    - Toilet incentives could remain in place for a period to encourage early replacement
    - Council required mandatory retrofit with efficient showerheads and faucet aerators in 1980s.

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Mandatory Toilet Replacement

- Process:
  - Certificate of Compliance would be required to confirm fixtures' efficiency. It can be applied for at any time - recommended before property is listed for sale
  - Can be transferred to buyer to accommodate remodeling with posting of completion bond
  - Exemptions could be granted for historic fixtures, demolitions, eminent domain, etc.
  - Verification inspection required

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Potential Water Savings
(MGD)

Single Family	0.7 - 0.9
Multi-Family	0.7 - 0.8
ICI	1.0
Total	2.2 - 2.7

Reliability: very high

- Hardware replacements, not behavioral changes

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Cost Effectiveness

- City costs: 2 FTEs, 1 vehicle, may need additional rebate funding
- City cost per gal saved: $1.01 - $2.23
- Cost for customers: $0 - $200 per toilet
- Savings for customers: $184/year for a 2 toilet household
- Payback: 0-2.2 years

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Cities and Utilities with Similar Requirements

- San Diego
- Marin Municipal Water District
- Los Angeles
- Santa Cruz
- Monterey Peninsula Water Management District
- Albuquerque - being considered
- LCRA - for homes on septic systems near Lake Travis

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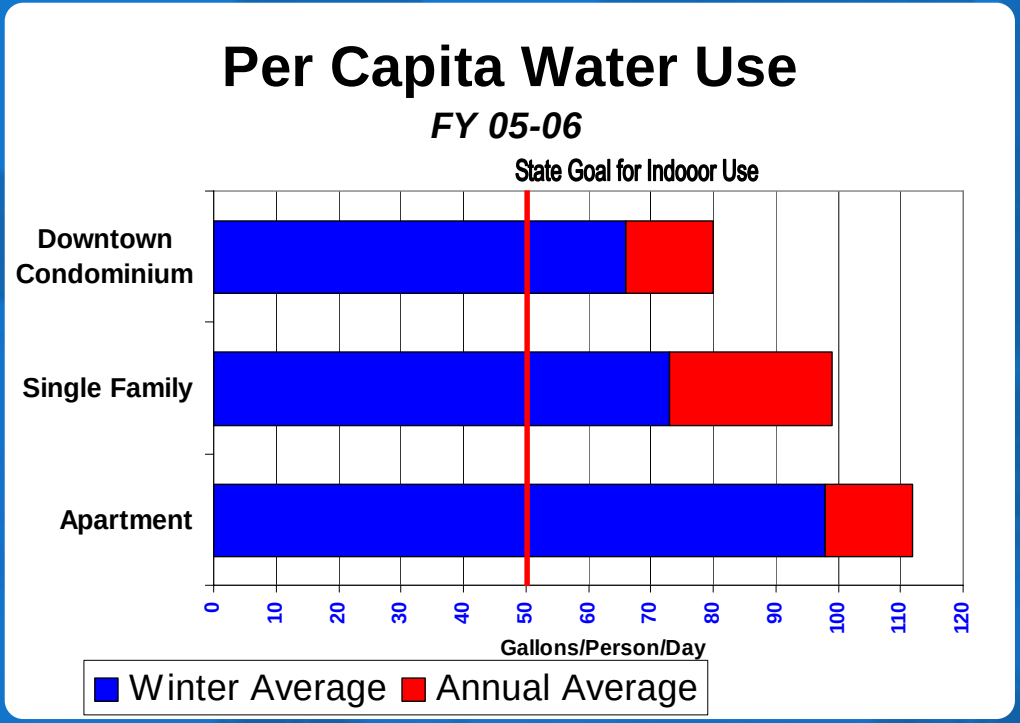
Submetering

- Background:
  - Water and Wastewater Criteria Manual was changed in 2003 to require that all multi-family and mixed use properties must be plumbed to allow for the installation of submeters
- The Problem:
  - Per capita water use in multi-family properties is higher than in single family properties
  - State indoor water use goal is 50 GPCD



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Submetering

- The Problem, cont.:
  - 2004 study by EPA, 2 major multifamily associations, and 10 water utilities showed that when customers are billed directly for the water they use, they reduce their use by 15%
  - Tenants who pay for their water use through allocated bills or homeowners associations do not reduce their water use
  - The City does not currently require that meters installed in new construction be used to bill tenants-approximately 50% are billing using submeters
  - Common for water and wastewater charges to be included in condominium HOA fees although they are required to plumb for meters
  - Mixed use commercial and residential properties also need separate metering to fairly apportion water costs

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Submetering

- Solutions:
  - Require that all properties built that already have plumbing for submetering install and use submeters to bill for water
  - Require all new multi-family and mixed use properties to use submeters or individual city meters to bill tenants for water
  - City rules are in place to provide metering services to individual units in multi-family properties
  - City would need to adjust capital recovery fees to be revenue neutral if City metering option was selected

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Submetering

- Staff Recommendation:
  - Require that all properties that have plumbing for submetering use submeters to bill tenants for water
  - Require all new multi-family and mixed use properties to use submeters or individual city meters to bill tenants for water

Water Savings

Total savings: 0.7 MGD by 2016

Reliability moderately high, dependent on price signals, backed by national study

Program Costs

- City costs: enforcement, 0.5 FTE - $30,000/year
- City cost/peak day gal saved: $0.45
- Property owner costs: ~$125/meter plus maintenance, $3 - $5 month service charge
- Cost for customers: none
- Savings for customers (includes reduced water and wastewater charges): ~$80/year/unit

Plumbing Code Revisions

- Problem:
  - Inefficient equipment is still being sold and installed, losing opportunities for increased savings
    - Toilets, showerhead and aerators
    - Multiple showerhead enclosures an issue
    - Restaurant equipment
    - Waterless dental and surgical vacuum pumps

Plumbing Code Revisions

- Solution:
  - Change plumbing code to require more efficient equipment

Plumbing Code Revisions

- Staff Recommendation:
  - Change plumbing code to require efficient equipment installation
    - Plumbing Fixtures - delay effective date until 2009 to allow time for manufacturers to get more product on the market and EPA's Water Sense specs to be developed
      - High efficiency toilets
      - Showerheads
      - Faucet aerators
    - Dry surgical/dental vacuum pumps
    - Conductivity controllers for steam boilers
    - Urinals: 0.5 gpf
    - Commercial dishwashers: 0.9 gal per rack or 180 gal per hour
    - Prohibit garbage grinders
  - Gather input on multiple showerhead enclosure issue and return with recommendation at a later meeting

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Plumbing Code Revisions

Water Savings (MGD):

Toilets and showerheads	1.5
Surgical/dental vacuum pumps	0.25
Urinals	0.2
Commercial dishwashers	0.6
Others	0.1
Total	2.65

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Plumbing Code Revisions

- City costs: 0.5 FTE
- City cost / peak day gallon saved: $0.03

Plumbing Code Revisions

Item	Cost differential	Water savings	Payback period
Vacuum pumps	$4500	0.25 MGD; 300 – 4000 gpd each	4 months – 4.3 years
Boiler conductivity controllers		0.01 MGD	Depends on size
High efficiency toilets	$50 - 100	1.5 MGD	4-8 years; cost will decline as more models become available
Urinals	None	0.2 MGD	0
Commercial dishwashers	Small	0.6 MGD	0 for most machines
Garbage grinders	None	400 GPD per grinder	0

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Cooling Tower Management

- The Problem:
  - Many cooling towers poorly operated
  - Cooling towers are contributors to peak day use

Cooling Tower Management

- Solutions:
  1. Require makeup and blowdown meters, conductivity controllers, and overflow alarms on new and existing cooling towers. This Equipment would allow operators to increase cycles of concentration, stop overflows, increasing efficiency
  2. Use RO technology to increase cycles of concentration
  3. Require minimum number of cycles of concentration
- Staff recommendation:
  - No 1.
  - Gather input on Nos. 2 & 3 and make a recommendation at a later meeting.

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Cooling Tower Management

- Water Savings:
  - 1.5 MGD
  - Moderate reliability; depends on some behavioral changes

Cooling Tower Management

- Costs:
  - City costs: 0.25 FTE
  - City cost / peak day gallon saved: $0.02
  - City cost/ year round day gal saved: $0.08
  - Customer costs: $1,000 to $7,000 installed, depending on the size of the tower
  - Savings will average $5,000 per year per tower

Car Wash Requirements

- The Problem:
  - Automatic car washes often set to use too much water per car
  - Automatic car washes provide an excellent opportunity for onsite reuse
  - Hand wand nozzles often use too much water

Car Wash Requirements

- Solution:
  - Require new car washes and equipment to use no more than 40 gallons per car
  - Require new car washes to install onsite systems to reuse rinse water in the wash cycle
  - Limit hand nozzles to 3.0 gpm for new and existing car washes.

Car Wash Requirements

Staff Recommendations:

- Require new car washes use no more than 40 gallons per car
- Limit hand nozzles to 3.0 gpm for both new and existing car washes
- Gather additional input on reusing rinse water in the wash cycle and make a recommendation at a later meeting.

Car Wash Requirements

- Savings: 0.8 MGD
- Reliability: low, due to adjustability of systems
- Cost:
  - City cost: 0.25 FTE for inspection and monitoring
  - City cost / peak day gallon saved: $.04
  - Customer cost: None for adjusting systems or buying efficient nozzles

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Other Potential Opportunities

- New Homes
- Hot Water on Demand
- Automatic Flush Sensors

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Water Efficient Homes

- Umbrella program incorporating indoor and outdoor specifications
- EPA is developing criteria for Water Sense Homes
- Could be modeled after or combined with Green Building program
- Further information will be provided at a later Task Force meeting

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Hot Water on Demand

- Several technologies to deliver hot water without wasting cold water
  - Recirculating systems
  - Instant water heaters

Automatic Flush Sensors

- Found in commercial facilities
- Could be leading to unnecessary flushing

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Total Indoor Savings

Program	Water Savings (MGD)	Cost per Peak day Gallon	Cost per Year Round Gallon	Customer Payback Time
Mandatory toilet retrofits	2.2 – 2.7	$1.01 - $2.23	$1.01 - $2.23	0 – 2.2 years
Submetering	0.7	$0.45	$0.45	Less than 1 year
Plumbing code changes	2.7	$0.03	$0.03	Varies by equipment
Cooling towers	1.5	$0.02	$0.08	0.2 - 1.4 years
Car washes	0.8	$0.04	$0.04	Varies by equipment chosen
Total	**7.9 – 8.4**			

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Questions or Comments?

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