The background of the slide is a blue-tinted photograph. It shows a city skyline with several tall buildings in the distance, and a body of water in the foreground. The water reflects the buildings and the sky. The overall scene is a panoramic view of a city from across a river or lake.

Outdoor Water Conservation Strategies Staff Recommendations

November 17, 2007

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

Enhanced Water Use Management Regulations

Problem:

- Current ordinance does not:
 - Restrict properties from over-watering
 - Restrict watering between 10 a.m. - 7 p.m. year-round
 - More water lost to evaporation and wind
 - Restrict daytime residential watering
- Current Water Use Management Ordinance needs greater enforcement

Water Waste Example



Revised Water Use Management Regulations

- Require ICI/MF and properties to water no more than once every 5-days year round
- Require residential properties with automatic irrigation systems to water no more than once every 5-days during the summer months (from May 1st to September 30th)
- Prohibit any irrigation between 10 am and 7 pm from May 1st to September 30th except for variances for newly installed landscape
- Prohibit automatic irrigation system use for all customers between 10 a.m. and 7 p.m. year round

Revised Water Use Management Regulations, cont.

- Require City approved rain shut-off devices on all automatic irrigation systems by a set date. Devices must be operational at all times and set to shut off after 1/8 inch of rain.
- Require all hose-end sprinklers to use a hose timer

Savings and Costs

Revised Water Use Management Regulations

- Peak day Water Savings: 6.2 MGD
- Projected Yearly Cost to the City: \$206,250
 - 3 FTEs, 3 vehicles
- Cost per gallon saved: \$0.33

Residential Irrigation System Standards and Permits (new installations)

- Problem:
 - Although Texas is one of the only states to license irrigators, there is still a lack of regulation, oversight and enforcement in residential irrigation system design and installation
 - AWU irrigation staff have observed water loss of 20 to 50 percent from inefficient system design
 - Irrigation system standards and permits would raise the quality of the whole industry

Sprays and Rotor Sprinkler Heads on the Same Zone



The rate at which different heads deliver water varies, so for even coverage, head types should not be mixed.

Sprinkler Head Misting



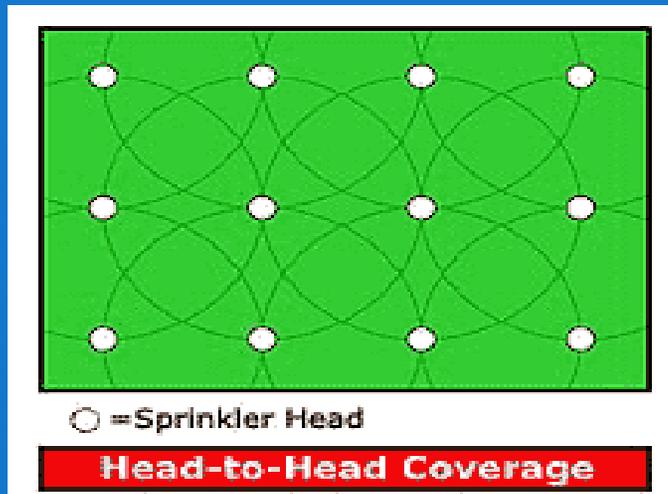
Increases in pressure can occur by improper design, such as by using pipe that is too small. Too much pressure in pipes can cause leaks by wearing down pipes and fittings

Poor Sprinkler Distribution



The term “head-to-head coverage” is used to describe proper placement of sprinkler heads to ensure even water coverage. Essentially, the water from one head should reach the closest neighboring heads.

Head-to-Head Coverage

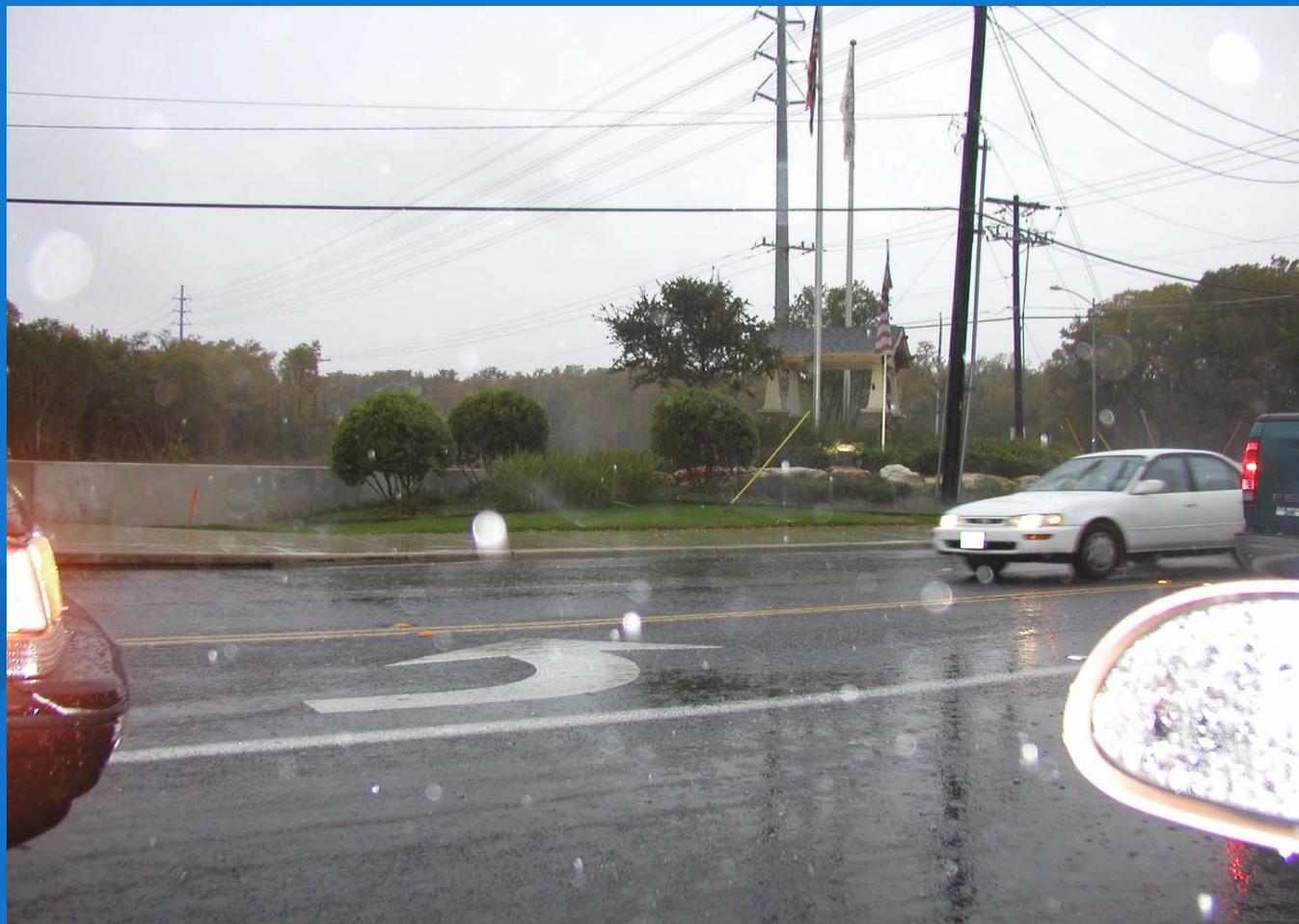


If the Distribution Uniformity (DU) is 60%, and the desired amount of irrigation is 1 inch, the required amount of watering would be $1 / 0.60 = 1.7$ inches

The lower the DU, the less efficient the distribution, and thus the more water that must be applied to meet the minimum watering requirement.

Graphics from: <http://www.irrigationtutorials.com>

Watering in the Rain



Importance of Water Budgets

- Customer notes from high bill complaints:
 - “customer called in inquiring on how she could consume so much water. She had her system set...to run everyday 3 times a day...She does not believe that watering everyday would consume 40 to 50,000 gallons per month.”
 - “customer upset at bill for water...states she waters 5 days a week 30 min-1 hour. Says bills are too high...”
 - “customer had 4 start times and multiple programs. He did not believe me that the system would run 4 times. If system ran 20 minutes per zone, 3x per week, 4x per night, that would equal 200,000 gallons per month, as consumption shows.”

Residential Irrigation System Standards and Permits (new installations)

- Require a new residential irrigation system to obtain a permit and submit a design plan adhering to defined standards before installation
- Irrigation design standards shall include valves and circuits separated based on water use (hydro-zoned), sprinkler head spacing designed for head-to-head coverage or heads to be spaced as per manufacturer's recommendations and adjusted for prevailing winds
- The system must meet a benchmark distribution uniformity percentage of 0.6, be designed for minimum run-off, with no direct over spray onto non-irrigated areas
- Pressure regulation components shall be required where dynamic pressure exceeds manufacturer's recommended operating range (30-60 psi)

Residential Irrigation System Standards and Permits, cont.

- A City approved weather based controller capable of dual or multiple programming, with at least three start times for each irrigation program, a water budgeting feature, and programmable to irrigate with a frequency of every one to ten days shall be required
- A City approved rain shut-off device or other similarly effective technology, and a master valve shall be installed
- Prohibit pop-up sprays to be set at least 6 inches back from impervious surfaces
- Prohibit spray irrigation on areas less than 6 feet in width

Residential Irrigation System Standards and Permits, cont.

- Require final inspection of new irrigation systems
- Require installers to provide the owner with an as-built design plan and water budget
- Require new irrigation systems to install an irrigation submeter with automatic read-outs near the controller to provide the customer oversight into the amount of water actually used

Savings and Costs

Residential Irrigation System Standards and Permits

- Peak Day Water Savings: 2.3 MGD
- Projected Yearly Cost to the City: \$245,000
 - 4 FTEs, 2 vehicles, and marketing costs
- Cost per gallon saved: \$1.07

Commercial Irrigation System Design Requirements (new installations)

Problem:

- Although there is a permitting program for commercial properties, new systems still waste a significant amount of water

Commercial Irrigation System Design Requirements (new installations)

- Require additional guidelines for new automatic irrigation systems:
 - Irrigation systems must be designed for zero runoff
 - The sprinkler arc must not pass across a paved area
 - Prohibit spray irrigation on areas less than 6 feet in width (such as medians, buffer strips, and parking lot islands)
 - The irrigation system must have a master valve, and meet the benchmark distribution uniformity percentage of 0.6

Commercial Irrigation System Design Requirements, cont.

- Require weather based irrigation controllers
- Permit in building inspection process or soil depth at the time of the tap fee
- Require 8" of soil depth with soil meeting City of Austin specifications
- Require pop-up sprays to be set at least 6 inches back from impervious surfaces

Commercial Irrigation System Design Requirements, cont.

- Require landscapes to be comprised of turfgrass with dormancy requirements and plant species from the City of Austin preferred plant list. Recently completed turf grass study by TAMU and Texas Turfgrass Producers will determine initial grasses approved.
- Require water budgets to include distribution uniformity percentages
- Require an as-built plan to be submitted to the property owner

Savings and Costs

Commercial Irrigation System Design Requirements

- Peak Day Water Savings: 0.7 MGD
- Projected Yearly Cost to the City: \$120,000
 - 2 FTEs
- Cost per gallon saved: \$1.71

New Residential Development Landscape Ordinance

Problem:

- Grasses are often planted that need frequent irrigation in summer months
- Native soil depth in Austin is often insufficient to support the types of landscape aesthetics homeowners desire, resulting in excessive irrigation.

Lack of Soil for New Homes



New Residential Development Landscape Ordinance

- Require all new turfgrass to meet dormancy requirements
- Ongoing testing of new varieties will allow new grasses to be approved as they are developed
- Require a minimum soil depth of 8” for new homes in the Drinking Water Protection Zone and areas with similar soil profiles.
 - A site with 8 inches of existing soil does not need to add any soil.
 - The soil must meet a soil specifications that will meet COA water quality standards and include a minimum amount of organic material.
 - The soil depth requirement could be achieved either through adding a new permit to the building permit process or through a soil depth deposit paid at the time the builder purchases a tap fee for water and wastewater service. The deposit would then be returned if the soil installation was installed in accordance with program guidelines.

Savings and Costs

New Residential Development Landscape Ordinance

- Peak Day Water Savings: 0.8 MGD
- Projected Yearly Cost to the City: \$185,000
 - 3 FTEs, 2 vehicles
- Cost per gallon saved: \$2.31

WaterWise Landscape Option for New Homes

Problem:

- Prospective homebuyers are not presented with low-water use landscape options

WaterWise Landscape Option

- Homebuilders must offer a WaterWise landscape option in any series of landscape options offered to prospective home buyers
- The WaterWise landscape option would be comprised of plants from the City of Austin preferred plant list or other plants with similar drought tolerant characteristics and no more than 50% of the landscape area would be turfgrass with dormancy capabilities

Savings and Costs

WaterWise Landscape Option

- Peak Day Water Savings: 0.2 MGD
- Projected Yearly Cost to the City: \$30,000
 - ½ FTE
- Cost per gallon saved: \$1.50

Annual Irrigation System Analyses

non-residential properties

Problem:

- Significant over-watering at large properties
- Inefficiencies go unchecked and are not repaired
- Irrigation maintenance contracts often do not provide for an overall analysis with projected water use amounts for property owners/managers

Annual Irrigation System Analyses

- Require properties over 1 acre with automatic irrigation systems to submit irrigation analyses once every 3 years. The analyses will be staggered, so that one third will be due the first year of the requirement.
- Require analyses to be done by licensed irrigators and submitted to AWU by May 1st of the year that it is due. The irrigator's license number must be included on the report.
- Irrigation analyses must be signed by the property manager or owner
- Applies to municipal properties
- If a property required to submit an irrigation system analysis fails to submit the analysis by the deadline, the customer will be assessed a fee or other penalty



Savings and Costs

Annual Irrigation System Analyses

- Peak Day Water Savings: 1.47 MGD
- Projected Yearly Cost to the City: \$132,000
 - 2 FTEs and marketing
- Cost per gallon saved: \$0.82

Annual Irrigation System Analyses for High Volume Water Users

- Many residences with high irrigation water use could benefit from audits
- Enhanced marketing campaign and additional seasonal staff to target homeowners with water use above 25,000 gallons per month during the summer and smaller commercial properties such as fast food chains and strip centers for irrigation evaluations

Savings and Costs

Expanded System Analyses for High Volume Water Users

- Peak Day Water Savings: 0.46 MGD
- Projected Cost to the City: \$137,5000
 - 2 FTEs, 2 vehicles and marketing
- Cost per gallon saved: \$2.72

Alternative Water Sources Ornamental Ponds, Wet Ponds, and Green Roofs

Will be discussed at the 12/1/06 Utility Strategies meeting

	Savings (MGD)	FTEs	Average Year City Cost	Total Cost per gallon saved
Enhanced Water Use Management	6.2	3	\$206,250	\$0.33
Residential Irrigation Standards	2.3	4	\$245,000	\$1.07
Commercial Irrigation Standards	0.7	2	\$120,000	\$1.71
Residential Landscape Ordinance	0.8	3	\$185,000	\$2.31
WaterWise Landscape Option	0.2	0.5	\$30,000	\$1.50
Annual Irrigation System Analysis	1.47	2	\$132,000	\$0.82
Expanded Irrigation System Analyses	0.46	2	\$137,500	\$2.72
<i>Recommended Indoor Strategies</i>	4.38 – 4.88	3.5		
Total	16.51 – 17.01	20		