



**LANDSCAPE WATER CONSERVATION STRATEGIES:
ALTERNATIVE COMPLIANCE PROGRAM**

PRESENTED TO

City of Austin, Texas

Defining the Problem

Prelude to Change.

The US Environmental Protection Agency Water Conservation Division leadership held an open forum for landscape water stakeholders at the WaterSmart Innovations Conference in 2009 that resulted in an overwhelming theme of fragmentation and disconnect amplified by all: water utilities demanding landscape professionals to step up conservation efforts; irrigation manufacturers being asked to provide documentation supporting savings claims; landscape professionals asking, “How did I get delegated responsibility for watering?”; irrigation professionals assuming control of the water while historically blamed for overuse; regulatory agencies wanting to hold someone else, anyone else accountable; and finally, water utilities wielding the hatchet to restrict landscape watering, and blaming new landscape installations and plants for excessive water use. Complete chaos – division and continued internal and external fragmentation amongst all stakeholders.

The landscape and irrigation industry has not prepared itself to deliver measurable, documentable data to support return on conservation investments for property owners, nor to support conservation efforts to water authorities. For decades, commercial property owners have looked to the landscape and irrigation professions for expertise and advice on maintaining their landscape investments. In many instances, property owners and managers have designated the landscape service provider as the responsible party for managing the site’s water by including irrigation water management in the scope of services for the general landscape maintenance package. This has resulted in a service that is devalued by awarding zero compensation and fostering little or no attention to the real issue of providing irrigation water in an efficient manner. Additionally, unaware of actual water costs and consumption, the service providers historically err to excessive water application, resulting in additional, unnecessary waste.

Because the landscape service business has become a commodity service, landscape and irrigation professions have been unable to sustain respect and trust of commercial property owners. To a large extent, the blame for excessive water use has landed squarely on the backs of these professions, while the real problem may actually rest on the manner in which business is conducted between the commercial property owner and the landscape service providers. By sheer nature of the business and as a commodity service, landscape service contracts are constantly changing; i.e., landscape service providers come and go, but the site and its context remain. Water management of these sites must be able to survive this fluctuation between commodity service providers in order to effectively sustain measurable water savings and preserve our landscapes.

Mandated Restrictions.

The City of Austin has consistently remained at the head of the pack in environmental stewardship and water conservation strategies, including landscape irrigation water use. Without the ability to rely on commercial landscape and irrigation industry and commercial property owners to uphold voluntary water conservation practices, the City Water Utility, like many other water utility providers around the country, had no option but to impose hatchet-restrictions as a primary component of their landscape water conservation ordinance. Commencing September 2007, the City Water Utility mandated two-day watering restrictions for all commercial properties.

The initial public reaction was very vocal and confrontational for City Water Conservation Department staff with most property owners feeling loss of control in managing and protecting their landscape investments. While the City Water Utility has documented program success from reduced landscape irrigation demand during peak pumping

periods, there remains significant waste due to non-compliance by property owners and landscape contractors, lack of system maintenance, loss of incentive for early adopters of privately funded conservation strategies, expanded cost of enforcement to secure program sustainability and removal of incentive for private investment in landscape water conservation. Additionally, excessive irrigation practices on “water days” far exceed the local soil moisture holding capacity and create significant run-off, while some commercial property owners opt out of water conservation investments all together in an effort to maximize their watering cycles.

Landscape Water Audits.

As one of the Landscape Water Conservation initiatives The City Water Utility staff provides free landscape irrigation system audits to their commercial consumers as a means of identifying and curtailing waste in landscape irrigation. Unfortunately without significantly more resources and point of measurability to meet the demand for audits the task is overwhelming to an internally run program within the Water Utility.

Many years ago State of Texas Licensed irrigation professionals began testing for accreditation and certification to provide landscape irrigation audits under the auspice that it would increase their revenues. It was also to be a differentiator between those “in the ditch” and those looking for a more professional role in the industry. However, in order to promote the benefits associated with the audit, most water utilities initiated their own irrigation internal audit programs providing “free” audits to consumers. The programs did get the ball rolling; however and unfortunately, these programs devalued the audit and pushed away an important stakeholder in the equation.

A landscape water audit provides a property owner with details of the state of operational condition of their irrigation system, but many property owners do not understand the true meaning as there is not a measurable comparison standard or “scoring” to acceptable performance levels or contemporary properties in the community.

A City Water Utility provided landscape water audit is also a prerequisite to any of the water conservation programs offered by the utility. In many cases the program initiatives are dissuaded to the public due to a significant back-log in ability to deliver the time-consuming audit. While the audit provides information on the integrity of an irrigation system “today”, there are not incentives for property owners to maintain the system condition long-term other than enforcement and fines.

Large Property Variance.

Certain commercial property irrigation systems designed before current State of Texas and City of Austin irrigation design specifications had severely limited or under-sized water sources that require extend run-times beyond one night water cycle. Some small commercial properties with minimal irrigation systems had an advantage of being able to continue to water excessively on their designated restriction days in an attempt to build up soil moisture to stretch to the next restriction day. Due to property owners concerns with the ability to water all of their commercial property within a given restrictions day the City Water Utility offered a “ Large Property Variance” enabling property owners to spread their watering schedules over a two consecutive day period. The variance requires designating half the irrigation controls to schedule watering on one night with the remainder watering on the second night, expanding the irrigation schedule run times for a variance property. All properties requesting this variance since 2007 have been approved by the City Water Utility Conservation Department. A reported violation of excessive irrigation outside of the restriction period is easily identified by enforcement officials as an “approved” variance property. Unfortunately, the commercial landscape service providers realize the inability to manage the enforcement and schedule irrigation for four nights weekly to evade the ordinance restrictions, typically at the property owner’s knowledge.

Identifying the Solution

Alternative compliance.

Creation of an alternative compliance addition to the existing water conservation program and ordinance can offer an acceptable and manageable solution to the City Water Utility for increasing water conservation compliance and public support without added incentive or enforcement costs. To assure increased water conservation and public acceptance and ownership the program must establish value, both in the requirements and incentive reward for performance and sustainability. An alternative compliance program would promote maximization of potential water savings in the urban landscape through a comprehensive approach resulting in substantial, measurable and sustainable savings.

Tighten restrictions.

Building upon the existing water conservation ordinance, an alternative compliance program would be supported by the City Water Utility through modification to existing water conservation policy to eliminate or minimize any weakness experienced under the restriction program in place such as;

- Approval of Large Property Variance only to properties able to demonstrate the lack of supply source capable of applying a normal summer irrigation application (75% ET) in a given one-day water cycle.
- Alternative Compliance variance to allow irrigation on any day of the week subject to conditions of the program.
- Require annual irrigation system audits for all commercial properties to assure operational integrity and optimal performance. Audits can be “scored” based on standards devised by industry professionals and approved the City Water Utility Conservation Department, citing poor performance through notice to complete required repairs and disconnection; acknowledging acceptable performance with rebate of audit expense as a water bill credit.
- Maintain two-day water restrictions with enhanced enforcement efforts.

Create Public Private Partnership (PPP).

The alternative compliance program’s success is dependant on a public private partnership (PPP) model to further incentivize private sector participation on part of commercial property owners and landscape irrigation professionals. The first partnership will provide assurance to commercial property owner water conservation strategy adopters of their investment recovery potential, giving them control & ownership in City Water Utility conservation initiatives, recognize their voluntary participation and reward their sustainability performance. This important partnership also provides the City Water Utility sustainable conservation strategies that maximize water return on investment over dollar return on investment, utilizes private investment capital for public water conservation program growth and support, while taking pressure off enforcement as the program grows public acceptance and support in the community.

The second Public Private Partnership component is the engagement of the landscape and irrigation professionals in the irrigation audit and maintenance of irrigation system integrity. A modification to water conservation ordinance and policy requiring annual audits for commercial irrigation systems to be preformed by Certified Landscape Irrigation Auditors (CLIA Certification, Irrigation Association) would create substantial water savings through enhanced system performance while creating Green Jobs in the landscape service sector which has suffered in the recent economic recession.

Program benefits.

A successful alternative compliance program will extend the current ordinance benefits by:

- Creating a model self-funding water conservation program
- Optimizing water savings in the urban commercial landscape
- Assuring a sustainable water conservation program
- Requiring measurable metrics and analytics in the water conservation initiative
- Accomplishing energy savings and reduced carbon emissions through energy/water nexus
- Preserving the benefits of landscapes to our environment and well-being
- Reduction of urban “heat island” effect
- Reduced enforcement obligation and costs to the City Water Utility
- Demonstration of City Council’s commitment to support sustainable conservation initiatives
- Utilizing private water conservation investment to mitigate sole public sector investment risk
- Exponential return on investment dollars and water savings
- Increased public awareness and education of potential water savings from a comprehensive approach
- Community, Landscape and Irrigation professionals and service providers engagement in measurable water conservation
- Supporting Green Job Growth opportunities
- Support of local landscape and irrigation service industry professional
- Provide operational benefits to early adopters

Building a model for landscape water conservation.

To size up the situation, the United States Environmental Protection Agency estimates this country’s daily potable water use in the landscape as greater than seven billion gallons, with over 50 percent of the water value unrealized; water lost in the landscapes due to inefficiencies, leaks and excess application beyond the plants water requirements. Given our Central Texas location, landscape water savings opportunity coupled with rising water rates provides ample financial incentive for PPP investment in water conservation strategies. An alternative compliance program provides the impetus to maximize water returns by setting the bar for participation high as the alternative remains the current restriction program.

Participation in the alternative compliance program would require a “Plan” consisting of any combination of the following as minimum requirements;

- Develop and adhere to Water Budget equal to no more than 75% of historical annual ET rate.
- Implementation of managed irrigation control with minimum capability requirements of:
 - Real-time communication (two-way)
 - Hourly environmental data (verifiable)
 - Rain collection & measurement for rate and quantity on-site
 - Flow management with daily alarm and reporting
 - Master valve at all points of connection
 - Daily scheduling engine operating range-based soil moisture depletion methodology at individual hydrozone level with optimization of water application by scheduling cycles to match soil infiltration, minimizing of storm water run-off.
- Maintenance of irrigation system operational performance

- Annual irrigation system and back-flow audits
- Monthly irrigation system inspections
- Responsive repairs or suspension of zone scheduling
- Enhance irrigation distribution efficiency
 - Delivery and distribution improvements (drip/ nozzles)
 - Modification of water bonding and utilization performance (ionic composure)
- Cultural modification in landscape management program
 - Reduce/ eliminate synthetic fertilization
 - Enhancements to improve soil moisture retention
 - Soil amendments
 - Polymer additions
 - Organic enhancement programs
 - Increased mowing height/ reduced mowing frequency; mulch all clippings
 - Reduce/ eliminate pesticide and herbicide applications
- Hydro-source non-potable sources where feasible
 - On-site reclamation packages
 - Connect recycled source
 - Rain water, storm water and condensate harvesting/ utilization

Results driven, performance based model.

The back-bone of this program is the measurability of program performance. For program participation, a commercial property owner must submit documentation of their “Plan” to the City Water Utility assigned program manager for approval prior to implementation. The Plan must support a minimum of 50% savings opportunity utilizing the minimal requirement of the alternative compliance program. As the Public Partner, the program manager will assist the Commercial property owner in retrieval historic water consumption data from the City Waster Utility and must assure prompt approval or return of Plan with approval requirements within fifteen working days of formal submittal.

At each one-year anniversary, the City Water Utility program manager will provide updated water consumption data to the program participant for their completion of annual report of program compliance and performance results. Based on the actual water savings results, the program manager will authorize the City Water Utility to issue a credit to the property owner water accounts equal to the incentive rate times the savings documented. Incentives for the alternative compliance program will be based on annual performance and tiered to reward long-term sustainability of the program benefits for up to five-years as follows:

- Year 1 - \$200/ Acre Foot
- Years 2 – 4 \$300/ Acre Foot
- Year 5 \$500/ Acre Foot (Final)

Minimize cost of program operation.

The alternative compliance program will provide income to the City Water Utility to defray costs of managing the program through the collection of an initial application or annual reporting filing fee from participating commercial property owners based on the number of irrigation zones included in the program. Proposed fee structures are as follows:

- Initial Application Fee - \$10.00 per irrigation zone/ valve to a maximum of \$1,000.00 per property application.
- Annual Reporting Fee - \$2.50 per irrigation zone/ valve.

Include early adopters.

Many commercial property owners were early adopters of landscape water conservation strategies that have had operational efficiencies affected by the water restriction ordinance. The alternative compliance program would allow these early adopters to participate in the operational components of the program

Program enforcement.

Participants in the alternative compliance program would be granted a variance from the existing watering restrictions, subject to emergency water restrictions. Each participant would be required to purchase and install a City Water Utility approved signage at a street-visible location or locations identifying the property participation in the alternative compliance program. The sign would include a phone number for the program manager for public verification.

The participants would agree to random inspections and audits of program progress no more than twice annually for program manager verification of program Plan compliance. Lack of compliance would result in termination of participation and loss of all financial incentives and benefits provided by the program.

Carrots taste better than sticks

In the end, landscape water conservation strategies involve much more than simple monitoring and controlling irrigation scheduling requiring dedicated commitment to best management practices by water managers, landscape service providers, irrigation professionals and property owners/ managers. Water utility providers play a significant role in the mass adoption of landscape irrigation conservation strategies through incentives based on sustained performance, satisfying their need for measurable success. Once these groups of key stakeholders align, “hatchet” restrictions can be converted incentives, as *carrots taste better than sticks*.