

This presentation premiered at WaterSmart Innovations

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Valuing Water and Landscape in the Urban West:

What is responsible water use?

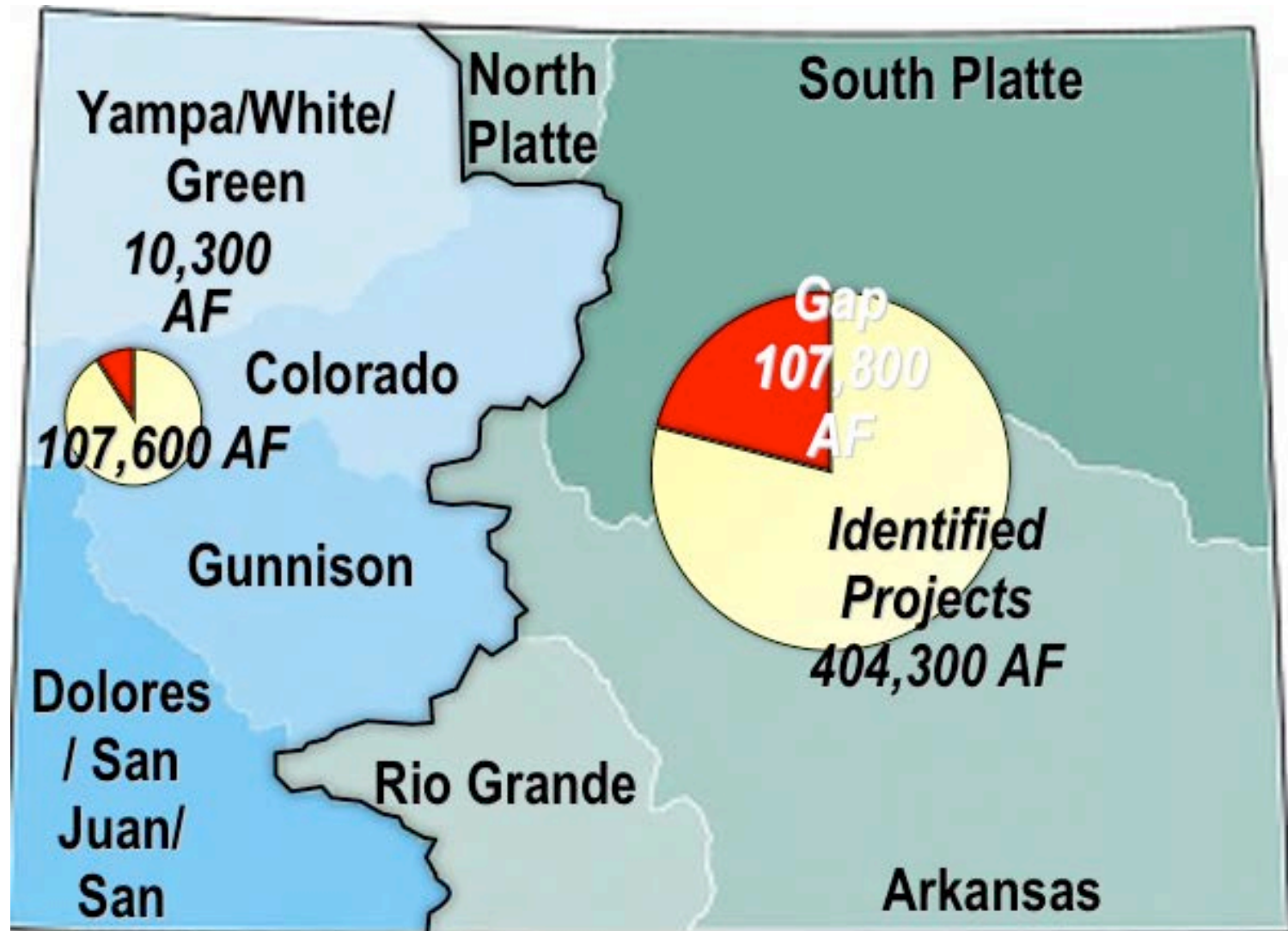
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American Society of
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Chair, Water Conservation Professional Network

2000 to 2030 Increase in Urban Water Demands



Colorado River Basin



30 million people
and growing

1.8 million acres of
irrigated land
=
15% of nation's
crops

high
evaporation rate

Why is water conservation not a major focus in the design and planning professions?

PRECIP

Mission:

Convene those working in landscape, water and land use to influence policy and ensure the responsible use of water in Colorado landscapes.

Vision:

Promoting the responsible use of water in Colorado landscapes by building a network that provides an educational forum and influences the development of effective water use policy, standards and guidelines.



PRECIP's goals:

1. To influence water use policy by providing expertise and advice on the responsible use of water in Colorado landscapes.
2. To build a professional network and cultivate relationships with decision-makers, interest groups, and the landscape and land development industry.
3. To develop and communicate knowledge about water as a resource, right of commodity, thereby promoting the responsible use of water in Colorado landscapes.
4. To promote the responsible use of water in Colorado landscapes.

What is responsible water use?

Typical projects evaluated.

- Sterling Ranch, Colorado
- Rancho Viejo, New Mexico
- Civano, Arizona
- High Desert, New Mexico
- Irvine Ranch, California
- GEOS, Colorado
- Green Streets Chicago, Illinois

Project Name: *Chicago's Green Alley Program*
Location: *Chicago, Illinois, USA*
Date Designed/Planned: *ongoing*
Construction Completed: *in process*
Construction Cost: *variable*
Size/Acreage: *+/- 1900 miles of alleys in the city (approx. 3500 AC)*
Client/Developer: *City of Chicago, CDOT*
Consultants: *CDOT – Janet Attario, AIA*
Hitchcock Design Group, landscape architect
Knight E/A, Inc., civil engineer
Hey and Associates, Inc., environmental engineer
S.T.A.T.E. Testing, LLC, material testing

Context

The City of Chicago wanted to reduce paving, localized urban flooding and heat island effects within the city right-of-ways of its immense and redundant alley system. This system is only redundant in the sense that it is a secondary series of paved roads meant to contain trash, recycling and back of house uses.

Site Analysis

The four prototype sites used for this project were all relatively dense neighborhood zones. They addressed using some traditional drainage with permeable pavement, full infiltration with permeable pavement, center alley infiltration, and green pavement materials with subsol filtration.

Project Background and History

Chicago has almost 2000 miles of small service alleys, approximately the equivalent of five midsize airports, according to city officials. Four main issues were identified by the city in need of solutions: 1: stormwater management, heat reduction, material recycling, and energy conservation and glare reduction.

Genesis of Project

Responsible water use was not a specific tenet of the project. Infiltration of up to 80% of the city's rainwater would reduce localized city flooding and would recharge groundwater, saving municipal funds that would otherwise be spent treating stormwater.

Design, Development and Decision-Making Process

Unknown

Maintenance and Management

CDOT is the primary maintenance mechanism for the alley interventions. Individuals who employ BMP's on their lots are expected to maintain their own lots.

User/Use Analysis

Locals wonder how alleys are a logical choice for a city straining to keep buses running and recycling efforts going. City officials say expediting building permits for alleys helps and that construction costs are offset costs the city would have incurred for maintenance and sewer improvements for old alleys. Maintenance for the new systems is unclear. Tax incentives to green construction and building code changes are having major effects on public policy and public perception.

Peer Reviews

Unknown

Criticism

Unknown

Significance & Uniqueness of Project

This project was spearheaded by former Chicago mayor, Richard Daley. The City of Chicago has coordinated multiple city, state and federal agencies to promote green practices within Chicago. It also calls for individual participation of Chicago residents to improve and continue implementing BMP's.

Limitations

Limitations to this work depend primarily on the willingness of municipalities and local citizens to implement the ideas and support the minor maintenance require. Some maintenance issues with the construction of alleys require an educational component.

Generalizable Features and Lessons

Green alleys implement a series of environmental devices to improve the local area they serve: shade trees, native landscaping, rain gardens, rain barrels, cisterns, permeable pavements, green roofs, dark sky lighting, naturalized detention and bioswales. Native landscaping requires little or no irrigation once established. Rain gardens filter silt, pollutants and debris, and recharges groundwater. Rain barrels and cisterns conserves water for later use and reduces storm water runoff. Permeable pavement reduces rate and quantity of runoff, and recharges and filters rain water. Naturalized detention and bioswales reduce erosion, runoff and pollutant load. These features are used together throughout the city to provide more consistent and overlapping results.

Future Issues/Plans

Continuing implementation of this project is ongoing.

Bibliography and Project Citations or References

Primary material for this review was collected from "The Chicago Green Alley Handbook : An Action Guide to Create a Greener, Environmentally Sustainable Chicago", published by CDOT, and "In Miles of Alleys, Chicago Finds Its Next Environmental Frontier" by Susan Saulny, The New York Times Nov, 25 2009.

Web Sites/Links

cityofchicago.org – CDOT, Chicago Dept. of the Environment, Chicago Center for Green Technology and Chicago Dept. of Water Management
permeable pavers - paversearch.com/permeable-pavers-menu.htm
high albedo pavement - eetd.lbl.gov/HeatIsland/
dark sky lighting – darksky.org
green roofs – cityofchicago.org/environment
bioswales – cfpub.epa.gov/npdes/stormwater/menupfbmps/index.cfm
rain gardens – raingardens.org
naturalized detention – cfpub.epa.gov/npdes/stormwater/menupfbmps/index.cfm
native landscaping – for-wild.org
rain barrels – rainbarrelguild.org
composting – compostguide.org, howtocompost.org

Typical Approaches to Determining Water Use

- Expectations Model
(BMP or subtractive process)
- Political Model
(based on water availability)
- Adopted National Standards
(LEED, Sustainable Sites Initiative)
- Climate Budget Model
(net zero budget)

Expectations Model



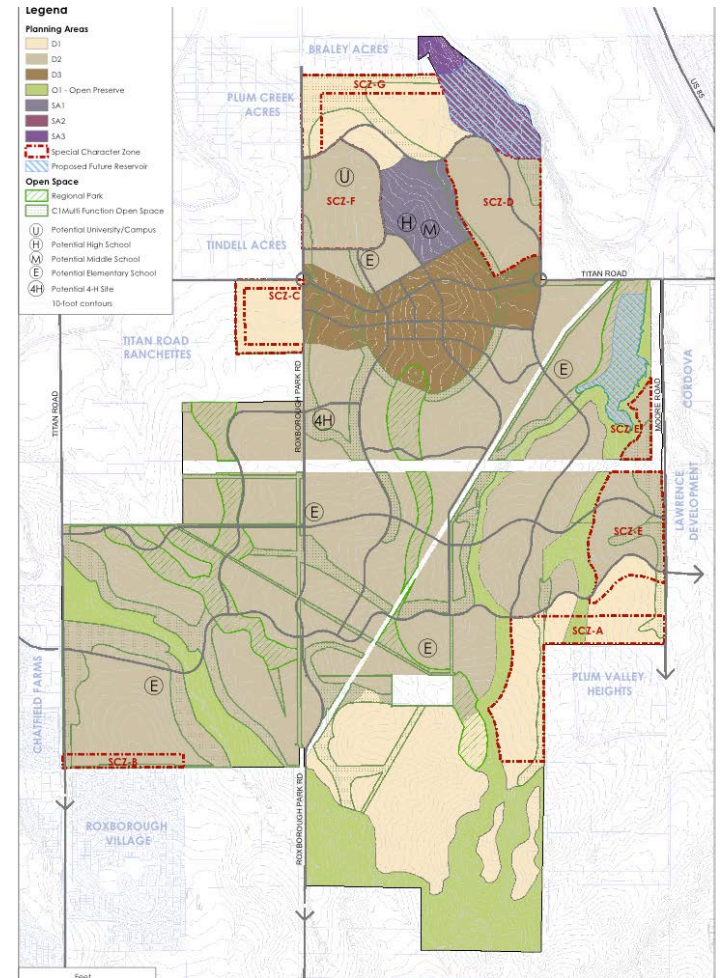
Civano - Tucson, Arizona

Political Model



“Sterling Ranch is a unique work in progress. We are continually refining our plans to achieve the best possible outcome for the growth Douglas County anticipates and will benefit from economically, as well as thoughtfully respect the natural landscape of the community.”

[Sterling Ranch website](#)



Sterling Ranch –Douglas County, Colorado

Hybrids



Landscape Performance Benefits

- ▶ Maintains 50% of the site's original juniper prairie ecotype by minimizing construction disturbance, cutting roads into the hillside instead of mass grading, and using a native plant palette for all public areas, right-of-ways and private areas outside of building envelopes.
- ▶ Uses only 20% of the city's annual water allowance in landscape areas, saving as much as 28.7 million gallons or \$300,000 each year.

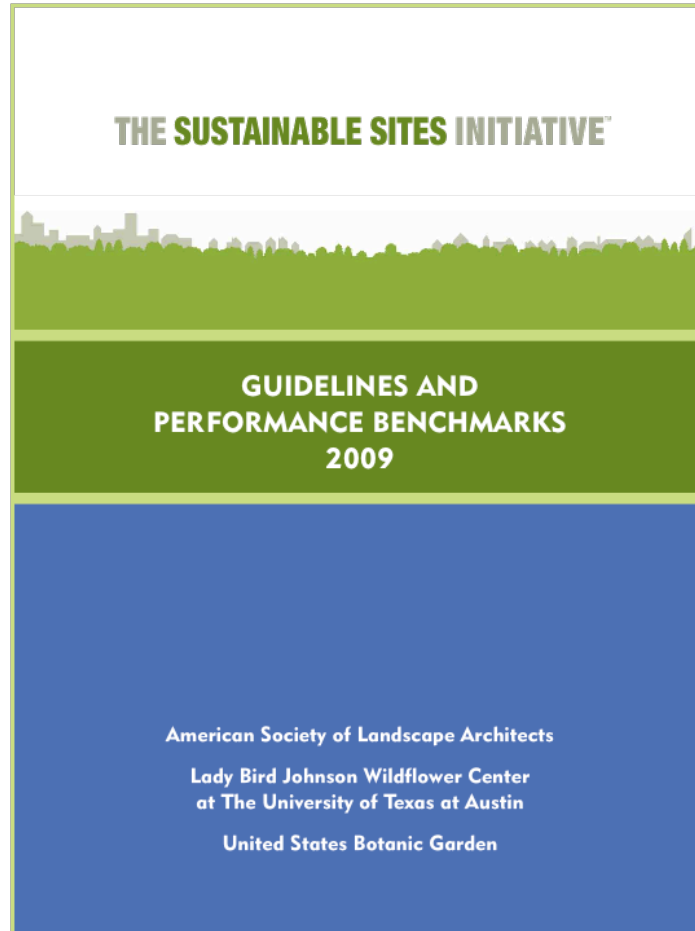
Designer
Design Workshop, Inc.

Land Use
Greenfield
Residential

High Desert – Albuquerque, New Mexico

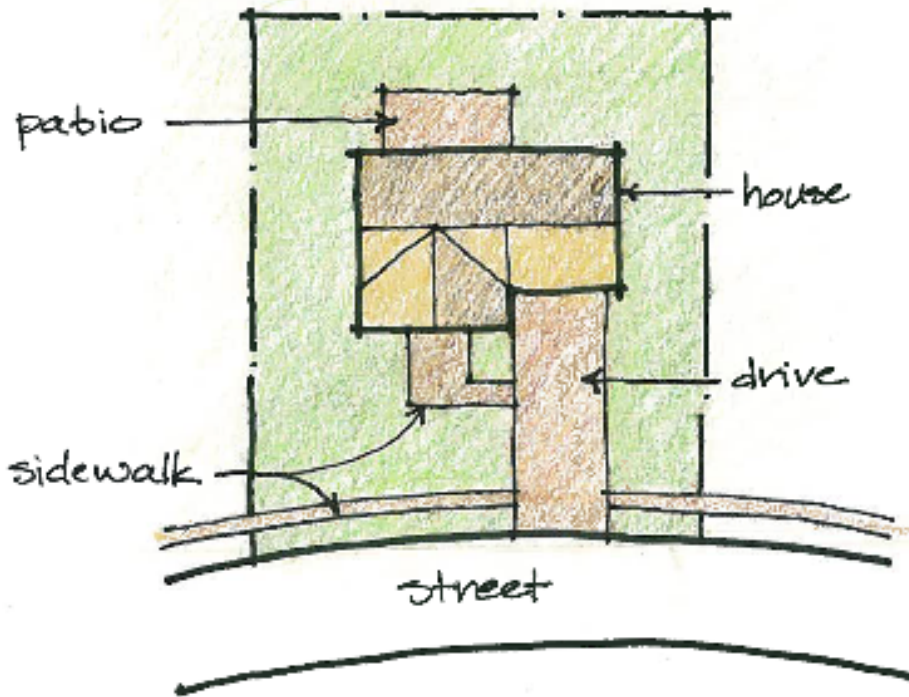
Adopted National Standards

Reduce potable water use for landscape irrigation by 50 percent from established baselines.



Sustainable Sites Initiative

Climate Budget Model



1 acre residential site

- ½ acre impervious (house/patio/driveway) 50%
- ½ acre landscape

assuming 10" of precipitation

10" + 10" = 20" over ½ acre of landscape

If the homeowner chose to mulch 50% of the ½ acre then 30" would be available for a ¼ acre.

Climate Budget Model



100 acre development

- 60 acres residential
- 10 acres commercial buildings and parking
- 10 acres roads and sidewalks
- 20 acres parks and streetscape

assuming 10" of precipitation

20 acres of impervious surface

(commercial/parking/roads/sidewalks)

$10'' + 10'' = 20''$ over 20 acres for parks and streetscape



desired uses



amount of water required



How does a water budget fit into this model?

Benefits of the Climate Budget Model

- Water use can be used to organize land use priorities.
- Region specific because it is based on the amount of precipitation that region receives.
- It is performance based and does not dictate aesthetics or style.
- Comparable.

Work in Progress...

How are the project goals measured?

How are the project goals enforced?

Final Thoughts and Questions

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