

### Objectives

- Introduction to form-based codes
- Discuss best practices & challenges relating to **integrating nature into the city** for new & re-development
  - Current methods of integrating nature into the city
  - Discussion of the current Landscape Ordinance’s objectives, strengths, and weaknesses
  - Integration of landscape with stormwater management, public right-of-way, and urban design concepts
  - Other national models

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### Agenda

Arrivals & Introductions	1:00
Staff presentation	1:10
Introduction to Form-Based Codes	
Existing Austin requirements	
Landscape Ordinance objectives, strengths, and weaknesses	
Other national models	
Integration of stormwater management, public ROW	
Small group discussion	2:15
Large group summary & recap	3:05
Future meetings	3:45

Note: There will be short breaks both before and after the small group discussion

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### Imagine Austin Priority Programs

1. **Invest in a compact and connected Austin**
2. **Sustainably manage our water resources**
3. Continue to grow Austin’s economy by investing in our workforce, education systems, entrepreneurs, and local businesses
4. **Use green infrastructure to protect environmentally sensitive areas and integrate nature into the city**
5. Grow and invest in Austin’s creative economy
6. Develop and maintain household affordability throughout Austin
7. **Create a Healthy Austin Program**
8. **Revise Austin’s development regulations and processes to promote a compact and connected city.**

### Imagine Austin Priority Programs

“Use green infrastructure to protect environmentally sensitive areas and **integrate nature into the city.**”

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## Form-Based Codes

See additional Form-Based Code presentation:  
<http://austintexas.gov/page/green-infrastructure-working-group>

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## Health and community benefits of green infrastructure

- Nature has pervasive and large effects on our **social, psychological, and physical well-being**
- Even small amounts important, just has to exist
- Needs to be visible
- Creates livable transitions between urban areas



No greenspace



With greenspace

(Kuo, 2001; Kuo, Sullivan, Coley, & Brunson, 1998; Coley, Kuo, & Sullivan, 1997)

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## Health and community benefits of green infrastructure

**Social**

- More social ties, generosity, sense of community, and social support
- Less aggression, violence, and crime

**Psychological**

- Better academic achievement, management of major life issues, and self-control
- Less ADHD, depression, and anxiety disorders

**Physical**

- Less stress, childhood obesity, disease, and mortality
- Better immune function and longevity

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## Health and community benefits of green infrastructure



**Dr. Frances Kuo's recommendations**

- Make everyday places and views greener.
- Provide nearby green spaces—at various scales.
- Make the most of green spaces.

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## Example regulations that promote nature in the city

- Landscape requirements
- Tree protections
- Hill Country Roadway requirements
- Stream & CEF\* setbacks + floodplain restrictions
- Open space requirements
- Parkland dedication
- Impervious cover limits
- Stormwater regulations
- Steep slope restrictions

\*CEF = Critical Environmental Features (e.g., springs, wetlands, karst features, etc.)

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## Landscape Ordinance

**Original intent (1982)**

<ul style="list-style-type: none"> <li>Air quality protection</li> <li>Natural hydrology maintenance</li> <li>Noise abatement</li> <li>Glare abatement</li> <li>Urban Heat Island mitigation</li> <li>Native vegetation protection</li> </ul>	<ul style="list-style-type: none"> <li>Visual buffering</li> <li>Beautification</li> <li>Property value enhancement</li> <li>Unique identity of Austin</li> <li>Energy conservation</li> <li>Protection of health, safety, and general welfare</li> </ul>
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Original Landscape Ordinance: <http://www.ci.austin.tx.us/edims/document.cfm?id=16939>

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## Landscape Ordinance

### Additional objectives (to add to 1982 ideas)

- Stormwater treatment
- Climate change resiliency & mitigation
- Water conservation

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## Landscape Ordinance

### Original intent language (1982)

1. To aid in stabilizing the environment's ecological balance by contributing to the
2. processes of air purification, oxygen regeneration, ground water recharge, and storm water runoff retardation, while at the same time aiding in noise, glare and heat abatement;
3. To ensure that the local stock of native trees and vegetation is replenished;
4. To assist in providing adequate light and air and in preventing overcrowding of land;
5. To provide visual buffering and enhance the beautification of the City;
6. To safeguard and enhance property values and to protect public and private investment;
7. To preserve and protect the unique identity and environment of the City of Austin and preserve the economic base attracted to the City of Austin by such factors;
8. To conserve energy; and
9. To protect the public health, safety and general welfare;

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## Current Regulations

- Existing tree protection
- Parking lot design
- Buffering
- Percentage of lot to receive landscape (streetyard)
- Stormwater infiltration

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## Current Regulations

### Tree Preservation



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## Current Regulations

### Tree Preservation



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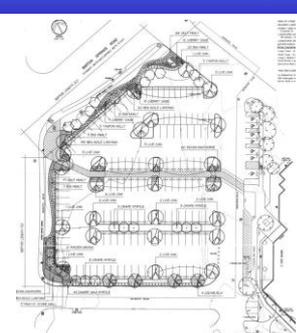
## Current Regulations

### Tree Preservation



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### Current Regulations Parking Lots



Tree within 50' of a parking space  
 Special requirements for large parking lots

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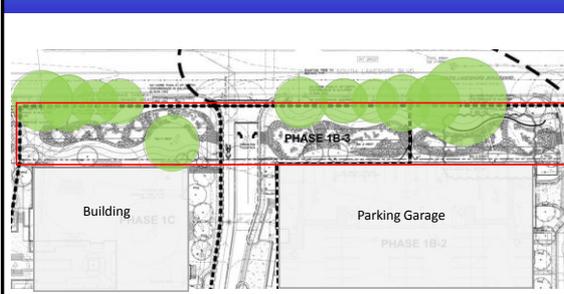
### Current Regulations Parking Lots



### Current Regulations Buffering



### Current Regulations Streetyard



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**South Shore District**

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LANDSCAPE CALCULATIONS		
STREET YARD		
	Required	Provided
Total Site Area	N/A	228,856 sq ft
Total Streetyard area	N/A	49,204 sq ft
Street-yard Landscape (20%)	9,841 sq ft	9,841 sq ft (20%)
<b>TREES</b>		
	Required	Provided
Existing tree credit	0	38 (including existing tree credit)
4" dbh or greater	1/16" dbh x 24"	1/16" dbh
<b>REPLACEMENT TREES</b>		
Phase 1B-1: Colper 100% replanted	15 = 2" Colper Trees	
12 = 4" Colper Trees (see below for other 4" trees)		
22 = 4" Colper Trees		
4 = 8" Colper Trees		
MIN. 15' per streetyard tree (4x16' @24"		
Phase 2 Colper 100% replanted		
14 = 4" Colper Trees = 14"		
<b>ISLAND, MEDIANS, OR PENINSULAS</b>		
	Required	Provided
Streetyard area	3/2" sq ft	3/2" sq ft
Non-streetyard area	3/2" sq ft	3/2" sq ft

No alternative compliance needed to incorporate rain gardens into landscape design.

### Analysis of potential improvements

- Different requirements for different contexts
  - Urban, suburban, transition
  - Ensure sufficient landscaped area
  - Remodeling/infill challenges
- Shade trees + functional pervious areas
- Water management, use, and irrigation
- Clarity and organization improvements

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### Context-Sensitive Solutions

Development in 3 contexts

**Walkable Urban**

Community Character Manual: [http://ftp.ci.austin.tx.us/GIS-Data/planning/CodeNext/Community\\_Character\\_Manual/](http://ftp.ci.austin.tx.us/GIS-Data/planning/CodeNext/Community_Character_Manual/)

**Transitional**

**Drivable Suburban**

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### Walkable Urban

Short blocks

High connectivity

Street network

Includes mid and high-rise multifamily

Commercial on ground floor in mixed-use and main street buildings

- High impervious cover
- High urban heat island
- Minimal landscape requirements

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### Transitional Urban-Suburban



Includes small multifamily



Commercial uses generally on neighborhood edges

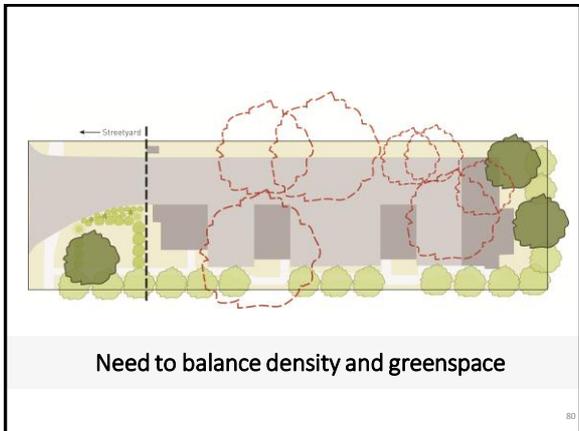
- Original landscaping sparse
- Little new landscaping with remodels
- Poor pedestrian environment



Wide lots – long blocks

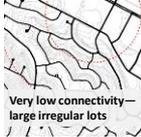


Less connectivity



### Driveable Suburban

- Current ordinance tailored for this environment
- Makes a provision for landscape
- Requires landscape for 20% of the streetyard



Very low connectivity – large irregular lots



Requires landscape in parking lots



Some large multifamily complexes



Commercial uses at edges, large strip shopping centers, or office parks.



## Beaufort, SC

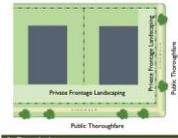
- Recently produced by Opticos
  - Can see integration with Form Based Code
- Coordinates landscape, stormwater, and other environmental regulations
- Extensive use of cross-references to more technical sections

Beaufort County Community Development Code:  
<http://www.bcgov.net/departments/Planning-and-Development/planning/cdc/>

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### 5.8.70 Private Frontage Landscaping (Transect Zones)

**Table 5.8.70 Private Frontage Landscaping (Transect Zones)**




A. Description	C. Plant Requirements (per 350 square feet)				
Private frontage landscaping is required in the area extending from the front of the primary structure and parking lot to the front property lines. On corner lots, private frontage landscaping is also required between the primary structure and parking lot to the secondary street property line.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Overstory Trees</td><td style="text-align: center;">2</td></tr> <tr><td>Shrubs</td><td style="text-align: center;">3</td></tr> </table>	Overstory Trees	2	Shrubs	3
Overstory Trees	2				
Shrubs	3				
<b>Notes</b> These planning requirements apply to structures utilizing Common Yard, Porch, Projecting Porch, Engaged, and Forecourt private frontages. Structures utilizing Stone, Dooryard, Shopfront, Terrace, Gallery, and Arcade private frontages are encouraged to incorporate planters, window boxes, hanging plants and posted plants.					

**Key:** T1 T2 T3 T4 T5

- Private frontage landscaping required in urban transects
- Does not apply to all frontage types

### 5.3.30.A: Private Frontages General (continued)

The private frontage is the area between the building facade and the lot line.

SECTION	PLAN
DOORWAY	DOORWAY
SHOPFRONT	SHOPFRONT
TERRACE	TERRACE
GALLERY	GALLERY

**Urban frontage types**

Private landscape not required

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## Stormwater Integration

- Stormwater control measures that are integrated with the landscape count towards civic and open space set asides
- Provisions for rain gardens, rainwater cisterns, bioswales, and green roofs in landscape section (cross-referenced to stormwater section)

**Rifle Pouch:** Connected bioswales provide retention of runoff by trapping suspended material during and during a storm event. The retained runoff is then allowed to infiltrate into the groundwater table or conveyed to further treatment.

**Planter-through Planters:** are landscape features that allow plants to grow through a concrete or masonry surface. They are used to provide a means for water to infiltrate into the ground. They are used to provide a means for water to infiltrate into the ground. They are used to provide a means for water to infiltrate into the ground.

**Infiltration Trenches:** are subsurface facilities designed to collect and infiltrate stormwater runoff into the ground. Trenches that perforate to improve water quality and contribute towards groundwater recharge. They are typically low maintenance and can be easily combined into existing sidewalk areas and medians.

**Green Roofs:** are a series of strategic interventions in urban areas with limited space for trees but extensive BMPs. Green roofs can also be used to reduce the runoff volume during rain events, helping to retain runoff. Some of the approaches will allow up to 10% of the runoff of the plants and soils with vegetation from the roof medium, reducing the amount of runoff from the roof.

**Permeable Paving Systems:** allow water to pass freely through the pavement surface throughout the paving process, thereby decreasing traditionally impervious surfaces. Several materials in permeable concrete and asphalt, interlocking pavers, and reinforced gravel and grass paving.

**Water Gardens:** are the intentional landscape features that can be used to store and filter stormwater. Also known as stormwater cells, they are designed to allow water to infiltrate into the ground. They are used to provide a means for water to infiltrate into the ground. They are used to provide a means for water to infiltrate into the ground.

**Bioretention Basins:** are shallow depressions that store stormwater and allow it to infiltrate into the ground. They are used to provide a means for water to infiltrate into the ground. They are used to provide a means for water to infiltrate into the ground.

**Key:** T1 T2 T3 T4 T5

## Miami, FL



Setback	T1	T2	T3	T4	T5
Minimum	10 ft				
Maximum	10 ft				
Minimum	10 ft				
Maximum	10 ft				
Minimum	10 ft				
Maximum	10 ft				

- 10 ft minimum setbacks in urban transects
- Impervious pavement is limited to 30% and 40% of the setback in T3 and T4
- T4: 10% of the setback must be landscaped
- T5: the setback must be paved and landscaped to match the public frontage

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## New Orleans, LA

- A minimum of 50% of all required landscaped areas shall be designed, constructed, and maintained as green stormwater infrastructure features
- Parking islands must be designed to allow the flow and access of stormwater




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## Tucson, AZ

### Commercial Rainwater Harvesting Ordinance

- All new commercial development must include a rainwater harvesting system constructed according to an approved rainwater harvesting plan
- No later than three years from the date of issuance of a final certificate of occupancy, 50% of the estimated yearly landscape water budget shall be provided by rainwater harvested on-site.
- A rainwater harvesting landscape water-use budget report is submitted annually to Tucson Water.

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## Seattle, WA & Washington D.C.

- Zoning establishes a minimum Green Factor or Green Area Ratio (e.g., 0.3)
- Desired landscaping elements are assigned weights and included in a “menu”
- A site calculates its Green Factor/Ratio by multiplying the square footage of each element by its weight, and then dividing the product by the site area

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**Seattle Green Factor**  
(Does not apply in all areas)

Green Factor Landscape Elements	Multiplier
<b>A. Planted Areas (choose one of the following for each planting area)</b>	
1. Planted areas with a soil depth of less than 24 inches	0.1
2. Planted areas with a soil depth of 24 inches or more:	0.6
3. Bio-retention facilities meeting standards of the Stormwater Code, <a href="#">Title 22</a> Subtitle VIII of the Seattle Municipal Code	1.0
<b>B. Plants</b>	
1. Match, ground covers or other plants normally expected to be less than 2 feet tall at maturity	0.1
2. Large shrubs or other perennials at least 2 feet tall at maturity	0.3
3. Small trees	0.3
4. Small/medium trees	0.3
5. Medium/large trees	0.4
6. Large trees	0.4
7. Preservation of existing large trees at least 6 inches in diameter	0.8
<b>C. Green roofs</b>	
1. At least 2 in but less than 4 in of growth medium	0.4
2. At least 4 inches of growth medium	0.7
<b>D. Vegetated walls</b>	
1. Vegetated walls	0.7
<b>E. Water features using harvested rainwater and under water at least six months per year</b>	
1. Water features using harvested rainwater and under water at least six months per year	0.7
<b>F. Permeable paving</b>	
1. At least 6 in and less than 24 in of soil and/or gravel	0.2
2. At least 24 inches of soil and/or gravel	0.5
<b>G. Structural soil</b>	
1. Structural soil	0.2
<b>H. Bonuses applied to Green Factor landscape elements:</b>	
1. Landscaping that consists entirely of drought- tolerant or native plant species	0.1
2. Landscaping that receives at least 50% of its irrigation through the use of harvested rainwater	0.2
3. Landscaping visible from adjacent rights-of-way or public open space	0.1
4. Landscaping in food cultivation	0.1

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## Questions for Group Discussion

- How do we integrate nature into the Walkable Urban and Transition contexts?
- Are improvements needed in the Driveable Suburban context?
- Discuss: Public vs. private provision of green areas.
  - In denser areas, is it acceptable to have landscaping only in the right-of-way?
  - What if green areas are provided off-site (e.g., open space at Mueller)?

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## Green Infrastructure Working Group Schedule

Kickoff	Jan. 30
Land Cover & Natural Function	Feb. 20
Integrate Nature into the City	Mar. 13
Beneficial Use of Stormwater	Apr. 10
Stormwater Options for Redevelopment & Infill	Apr. 24
Wrap Up	May 15

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