Parking and Trees in Cities and Towns: Legal & Design Approaches

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Project Goals

- **Inventory of Trees/Parking code and ordinances**
- **Image collection representing trees/parking conditions**
- **Planning document for municipalities - March 2004**
- **Future - visualization and economic valuation**

Parking and Trees in Cities and Towns

1. Policy - why are trees important?

2. Regulations - how to get more trees planted?

3. Design and Management - how to gain the most benefits?

1. Policy -
Why are trees important? Reduce local costs!

- **Parking Lot Impacts**
  - Parking lots ~ 10% of urban land cover
  - Urban heat island effect
  - Air pollutants
  - Impervious surface - water concentration and quality
  - Paving replacement costs

Tree-less
Parking Impacts

-local and regional
impacts -

- community
character -

1. **Policy** - why are trees important?

- **Trees and Parking Area Benefits**
    - **Trees are one of the most cost-effective means of mitigating urban heat islands (.5-1.5° C)**
    - **Hot climates - trees reduce surface asphalt temps by 36°F, vehicle interior by 47°F**
    - **Cooler air temps reduce "bad" ozone concentrations**
    - **Reduced hydrocarbon emissions from parked cars**

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1. Policy - why are trees important?

- **Trees and Parking Area Benefits**
  - **Pollutant uptake**
    bioremediation
    particle deposition

  - **Stormwater management**
    water retention/detention - less runoff
    soils filtration - better water quality

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Elements of Ordinances & Code

- **purpose statement**

- **definitions**

- **regulations and standards
(1 tree per 4 vs 20 parking spaces)**

- **administrative requirements (e.g. plan submittal)**

- **enforcement**

- **appeals**

1. **Policy** - Purpose Statements

- **broad references to benefits,**

- **list of community attributes that are served by the code,**

- **a philosophical perspective,**

- **and language that sets the tone of the law**

1. **Policy** - Purpose Statements

- **More Traditional**
  - adequate landscaping shall be provided to reduce intrusion into residential areas by glare, dust, noise and vibration caused by railroads, highways and industrial or commercial land use
  - improve the appearance of certain set-back and side yard areas, and including off-street vehicular parking and open lot sales and service areas, and to protect and preserve the appearance, character, and value of the surrounding neighborhoods
  - promote the general welfare by providing for installation and maintenance of landscaping and screening and aesthetic qualities

1. **Policy** - Purpose Statements

- **More Recent**
    - Modify the rate of stormwater runoff and increase the capability of groundwater recharge in urbanizing areas
    - Promote soil conservation by maintaining and controlling alterations of the natural terrain, and thereby reduce sedimentation
    - Promote energy conservation by maximizing the cooling and shading effects of trees
    - Filter pollutants from the air and assist in the generation of oxygen

Hilton Head, South Carolina

2. Regulations & Standards -
how to get more trees planted?

- **Landscape Codes - interior and perimeter planting**
- **Canopy Cover or Shading Requirements**
  - tree islands
  - landscape strips
  - tree/species choice
- **Stormwater Management**
- **Parking Demand Ratios**
- **Stall and Aisle Dimensions**

Perimeter and/or Interior Planting

- **aesthetic goals**

- **block views from/into adjacent land uses (e.g. residential)**

- **a traditional landscape code approach - few environmental goals**

Canopy Cover or Lot Shading Requirements

- **Environmental goals**
- **15 year attainment, 50% canopy cover**
- **Tree List - crown diameter**
- **Performance standard - tree locations not specified**
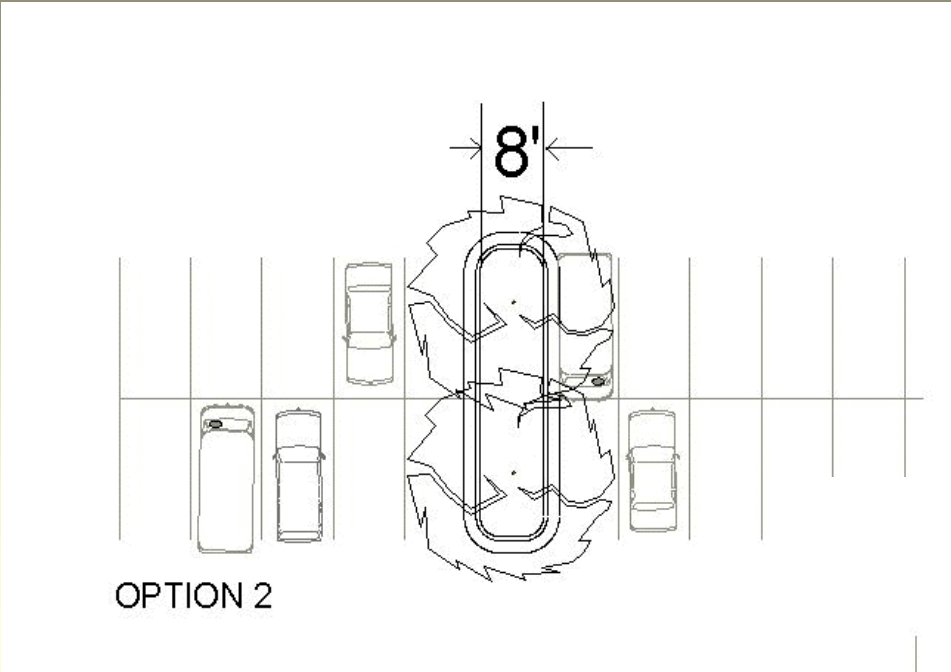- **Sacramento, Davis, LA**

Canopy Cover or Lot Shading - Strategies

- **frequent tree islands**

- **tree lawns or strips**

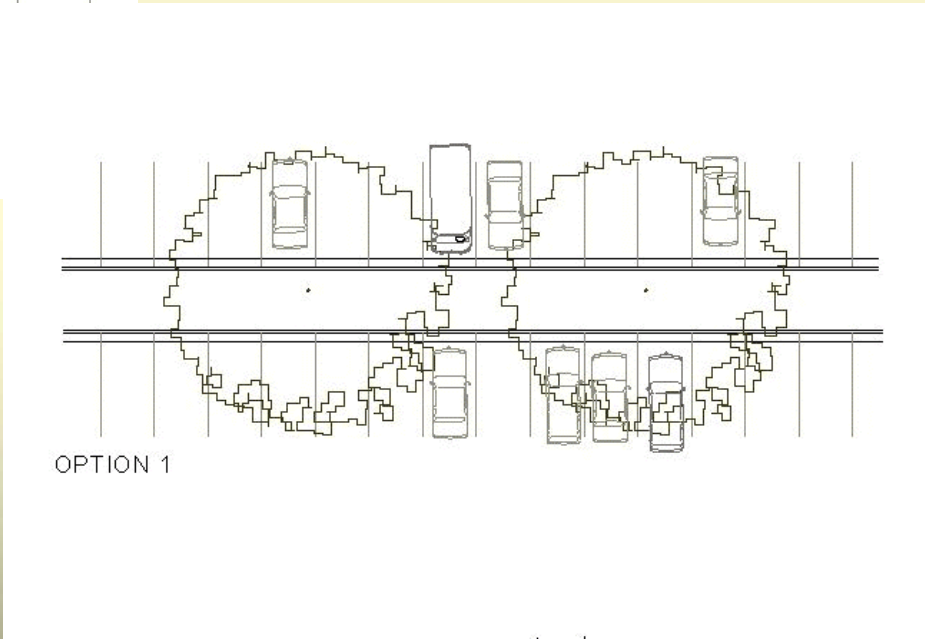- **can't do it with perimeter plantings!**

Interior Planting - frequency & size of planters

OPTION 2

Interior Planting:
tree islands
landscape strips

OPTION 1

Avoid tree pits, prevent "tree squeeze"

Better Shading -
tree lawns
landscape strips

Better Shading - tree selection & management

Mike Sherwood
Bartlett Tree Labs, SC

protect the trees!

Stormwater Management
(low impact development)

- **environmental goals**
- **reduce stormwater runoff (0% off-site)**
- **pollutant capture/detention**
- **biodiversity, habitat & native species**

Design Details

- "porous" curb
- collection swale
- careful plant choices
- mulch!
- pervious paving

Pervious Paving

- **water moving directly into sub-base or storage**

- **install in low volume areas (land use or outer edge)**
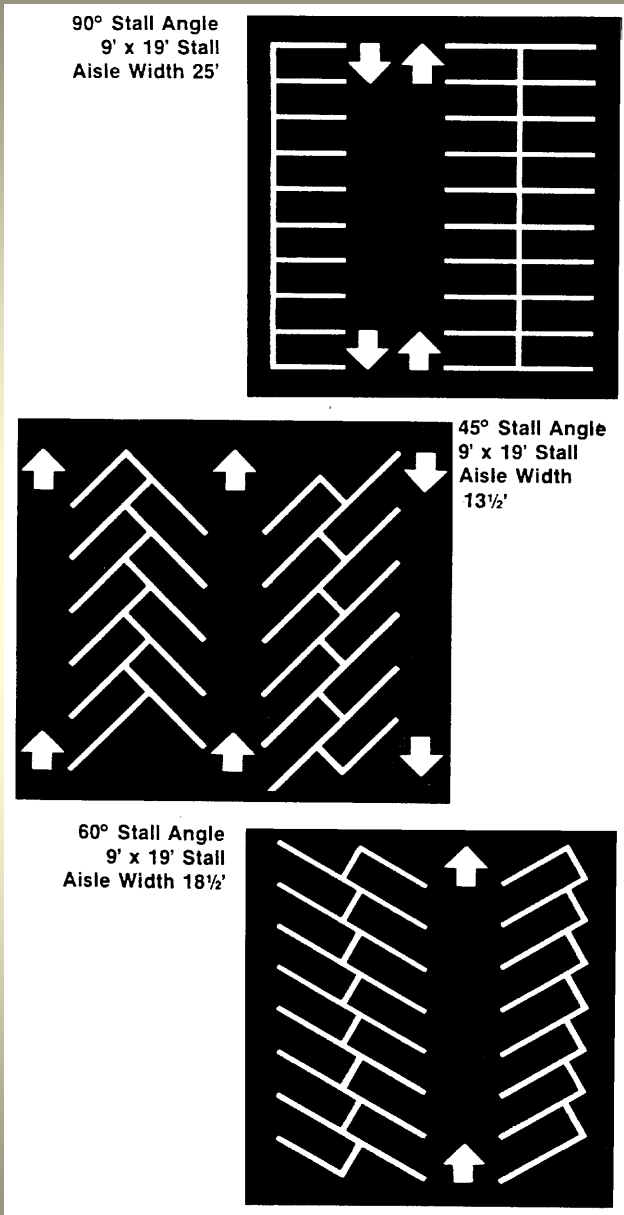
- **multiple materials**

Parking Demand Ratios

- **used to size parking lots**
- **specify # of parking spaces per building floor area**
- **varies by land use**
- **often designed to meet peak demand**
- **high vacancy rates (36% in Sacramento study)**

Minimum Stall and Aisle Dimensions

- standard 25 feet aisle
- compact vs. full size parking space ratios
- use one way aisles
- angle parking
- lot design "pick-up" space - recover impervious with trees

90° Stall Angle
9' x 19' Stall
Aisle Width 25'

45° Stall Angle
9' x 19' Stall
Aisle Width
13½'

60° Stall Angle
9' x 19' Stall
Aisle Width 18½'

Minimum Stall
and Aisle Dimensions

- **Angle parking reduces aisle width**

- **90° suitable for high volume, constant use**

- **45° or 60° suitable for low volume, light use**

3. Design & Management
how to gain the most benefits?

- **Details of selection, installation & management**

- **May be in code,
but also guidelines or project review**

- **Species Selection - master tree list, species diversity**

- **Tree Installation - proper soils, avoid compaction**

- **Tree Establishment - good care early on, irrigation & pruning**

- **Enforcement - staff training, monitor tree replacement and management**

- **Other Site Materials - address conflicts with signs, buildings, and lighting**

Summary -
Parking and Trees
in Cities and Towns

- **Reconsider impervious surface specifications - required spaces, aisles**

- **Performance purpose for tree planting - environmental benefits or aesthetic**

- **Strategic tree materials - species choice, installation, maintenance, crown size**

no model green law!

Create "cool" Parking Lots!