



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

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March 2009

TreeLogic: Urban Forests: Striving for a natural balance







Project Goals

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

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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 20°C, vehicle interior by 26°C
 - Cooler air temps reduce “bad” ozone concentrations
 - Reduced hydrocarbon emissions from parked cars

Center for Urban Forest Research - USFS Pacific SW Research Station



1. Policy - why are trees important?

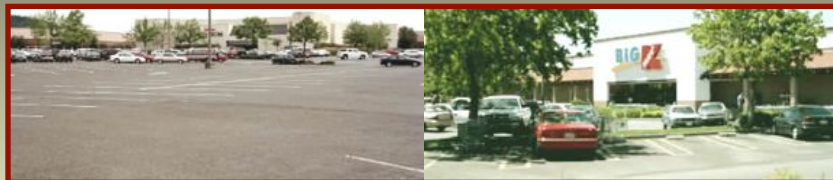
- **Trees and Parking Area Benefits**
 - Pollutant uptake
bioremediation
particle deposition
 - Stormwater management
water retention/detention - less runoff
soils filtration - better water quality

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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

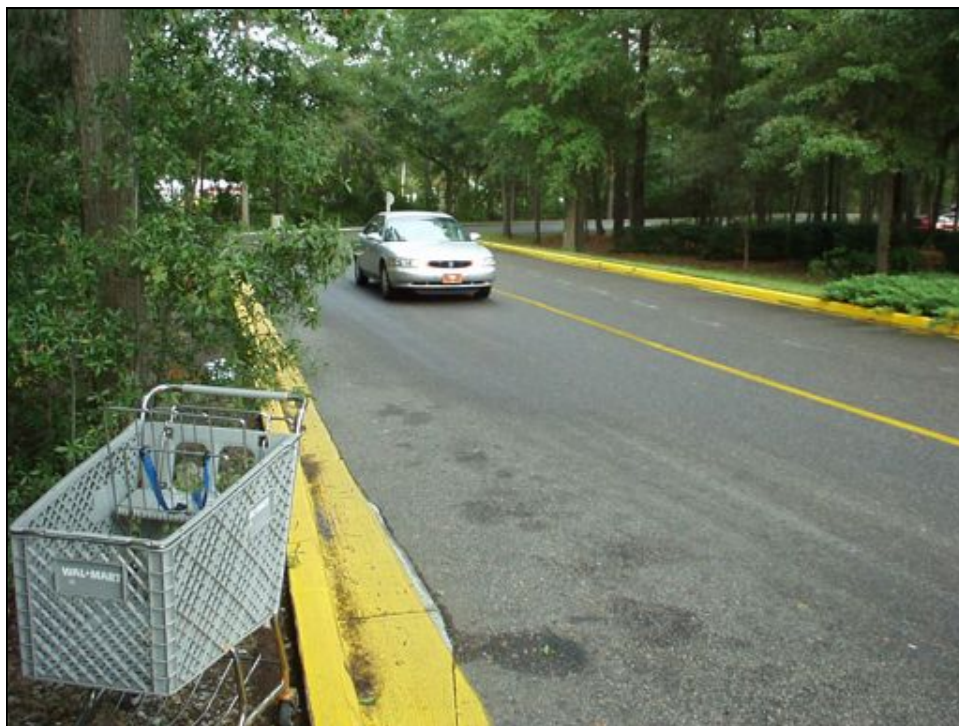


1. Policy - Purpose Statements

- **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

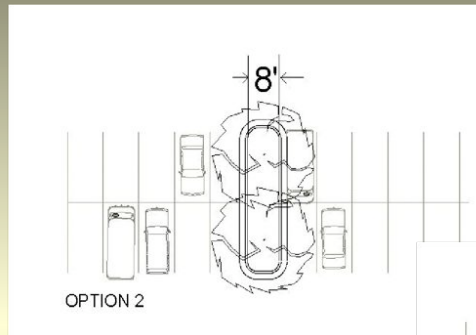


Canopy Cover or Lot Shading - Strategies

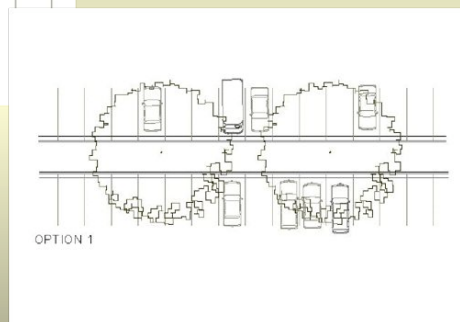
- frequent tree islands
- tree lawns or strips
- can't do it with perimeter plantings!



Interior Planting -
frequency & size
of planters



Interior Planting:
tree islands
landscape strips





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



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Pervious Paving

- water moving directly into sub-base or storage
- install in low volume areas (land use or outer edge)
- multiple materials

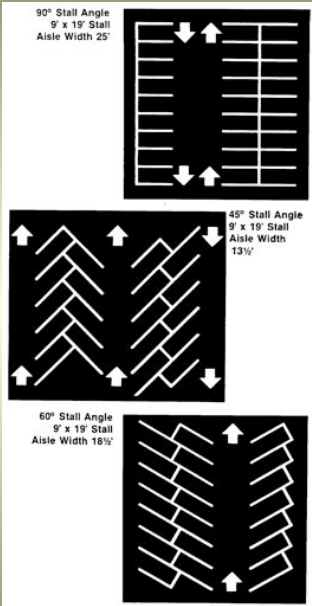
Parking Demand Ratios

- 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



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!



College of Forest Resources University of Washington

Human Dimensions of Urban Forestry and Urban Greening

featuring research on peoples' perceptions and behaviors regarding nature in cities

What's New?

- Nature and Consumer Environments**
Research about how the urban forest influences business district visitors.
- Trees and Transportation**
Studies on the value of having quality landscapes in urban roadsides.
- Civic Ecology**
Studies of human behaviors and benefits when people are active in the environment.
- Policy and Planning**
Integrating urban greening science with community change.
- Urban Forestry and Human Benefits**
More resources, studies and links . . .

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