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

Kathleen Wolf, Ph.D.
University of Washington
USDA Forest Service

Utah in Bloom: 2011 Utah Green Industry Conference
Trees and Transportation

Transportation systems have traditionally been designed for traffic mobility and driver safety. Road systems and roadways are now being designed to address a variety of other functions, including aesthetic, environmental, and community interests.

Context Sensitive Design is a new approach in transportation planning that recognizes community values. Roads, vegetation and green spaces are often valued as transportation corridors. The studies below are inv of public values regarding trees and vegetation in vehicular use areas.

Studies

Urban Trees and Traffic Safety

Across our nation, transportation policy and practices regarding urban livability of cities and towns. Professed reasons of driver safety and being removed or precluded in commercial streetscapes and along u investigating the scientific basis of no-tree transportation policy. Analyzing the circumstances and attributes of tree collisions in urban trees can be designed into streetscapes more safely. (See bottom of

www.naturewithin.info
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

Sponsored by USFS Southeast Region, GA Forestry Council & SE States
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
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
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
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)
Safe Urban Form

Revisiting the Relationship Between Community Design and Traffic Safety

Eric Dumbaugh, Ph.D.
Assistant Professor
Program Coordinator, Graduate Certificate in Transportation Planning
Texas A&M University
### Focused Parking Requirements

<table>
<thead>
<tr>
<th>Zoning</th>
<th>Parking Area</th>
<th>Parking Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Building</td>
<td>250 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>Personal Service Shop</td>
<td>250 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>Priv. School or Comm. Studio</td>
<td>100 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>Retail Sales &amp; Service: C-1</td>
<td>250 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>C-2</td>
<td>350 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>C-3</td>
<td>250 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>Restaurant (w/o drive-through)</td>
<td>65 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>(w/ drive-through)</td>
<td>100 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>Rooming/Boarding House</td>
<td>Person</td>
<td>1.0</td>
</tr>
<tr>
<td>Sales Display</td>
<td>250 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>Single-family Dwelling</td>
<td>DU</td>
<td>2.0</td>
</tr>
<tr>
<td>Shopping Center*: C-1</td>
<td>250 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>C-2</td>
<td>350 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>C-3</td>
<td>250 s.f.</td>
<td>1.0</td>
</tr>
<tr>
<td>Townhouse</td>
<td>DU</td>
<td>2.0</td>
</tr>
</tbody>
</table>

- What are the effects on site development?
Example 1: Urban Building/Compact Units

- 50 sf x 100 sf = 5000 sf footprint
- 5 stories = 25,000 sf
- 1 space per 250 sf = 100 parking spaces
- Stall = 9x20 = 180 sf
- Min area = 18,000 sf
- Aisles and stall reqmt’s – typically require same area as parking
- Parking area = 36,000 sf
- Area = 0.83 acres.
- Equivalency is the area of 8 of the shown buildings
Example 2: What about the Louvre?

- 3 million sf
- 12,000 parking spaces
- 4.3 million sf parking + aisles
- 100 acres of parking
What if the Louvre met conventional parking standards in the US?
Parking Demand Ratios

• specify # of parking spaces per building floor area?

• consider parking district rather than site-by-site

• ratio reductions: Seattle, Portland (compact density, transit)
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 green Parking Lots!
www.naturewithin.info

Human Dimensions of Urban Forestry and Urban Greening

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

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 . . .

Projects Director
Kathleen L. Wolf, Ph.D.

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