

# MORE IN STORE

## Research on City Trees and Retail

By Kathleen L. Wolf

Analysis using canopy mapping and tree inventories helps communities recognize the environmental benefits of urban forests. However, many stakeholders may rely on direct experiences to shape their perceptions of trees.

Retailers are often influential people in communities; their attitudes can affect political support for urban forestry. Merchants may overlook the indirect and long-term benefits of a quality urban forest, instead focusing on direct costs (such as pruning and debris clean up). These attitudes can set the tone for program and budget decisions in local government.

What are the benefits of trees in consumer environments? This article summarizes a research program that has explored consumer response to trees in business districts. Investing in trees does pay! Results across several studies are highlighted and additional design guidelines are offered.

### The Research

Largely funded by the U.S. Forest Service, a series of shopper surveys were designed to assess if visual quality, place perceptions, shopper patronage, and pricing perceptions were influenced by trees.

For these studies, visual quality describes settings that people find more pleasing and desirable. Place perceptions were defined as the mental representations or assumptions one holds for a place. Shopper patronage describes the frequency and duration of consumers' actions, such as the length of a visit. Lastly, pricing perceptions measured consumers' willingness-to-pay for products and services.

Individual survey projects have covered central business districts for large cities (populations greater than 250,000) (Wolf 2003), a downtown shopping district for a mid-sized city (Athens, Georgia—population of approximately 100,000) (Wolf 2004a), and main street shopping districts in smaller cities and towns (having 10-20,000 populations) (Wolf 2005). Two additional surveys measured the affect of trees on businesses at the freeway edge (Wolf 2006), and small open-air or strip mall shopping centers (found on arterials) (Wolf 2008).

All of the surveys were structured similarly. Each started with a preference ratings exercise, using images that depicted streetscapes with varying forest character. Each survey also contained a scenario that portrayed a shopping place and asked the respondent to project their shopping behavior using rating scales and categorical responses [see *shopping behavior*]. Scenarios basically differed as to whether they were “with trees” or had “no trees” in the streetscape. Those with trees portrayed a quality, well managed urban forest throughout a shopping district, rather than scattered or haphazardly placed trees. Surveys were randomly distributed to respondents by mail or during sidewalk intercepts [see *survey method*], using accepted social science practices of sampling and respondent recruitment, followed by data analysis.

### Visual Quality

People were asked to rate up to 30 scenes per survey in response to “how much you like the image?” on a scale of 1 (low) to 5 (high).

### What were the results?

#### *shopping behavior*

Respondents were asked to respond to perceptual verbal items using rating scales, and to specify likely patronage behavior within categorical indicators of time and distance. Both sets of metrics were derived from prior urban forestry perception and retail marketing studies.

#### *survey method*

In each study, a sample frame of potential shoppers was identified within geographic range of study sites, and included cities of the northern and central U.S. Surveys were distributed by random sampling using commercial mailing lists or sidewalk intercepts. Survey mailings ranged in number from several hundred to several thousand, depending on the scope of each study. Response rates ranged from 10 to 80 percent across studies.

After sorting the images into clusters, mean ratings ranged from 1.65 to 4.00. Across all studies, consumer ratings increase steadily with the presence of trees. Visual preference scores were lower for places without trees, and much higher for places with trees. Image sets depicting business district settings having tidy sidewalks and quality buildings, but no trees, were at the low-end of the scores. Images having well-tended, large trees received the highest preference ratings, particularly when large trees form an orderly canopy over the sidewalk and street.

### Place Perceptions

In a second survey section, respondents were asked to rate their level of agreement with statements while viewing one scenario. Means were compared between the forested and “no tree” conditions.

Again, trees were associated with higher ratings of amenity and visual quality across the studies. Moving beyond the obvious visual content the respondents made inferences about the settings. Positive scores for maintenance were given to districts with trees, despite efforts to present the same level of building care and street tidiness.

Judgments of products and merchants were more positive in forested places, as were inferences about product value, product quality, and merchant responsiveness. A consumer's expectations about shopping experiences are initiated long before entering a store.

### Patronage Behavior

Study participants indicated their probable patronage behavior while considering the street and sidewalk scenarios. Higher responses were found for places having trees, compared to no-tree settings, across cities of different sizes. Potential shoppers claim they are willing to travel more often, for more time, and over greater distance, and once arriving will spend more time in a retail district having trees.



**HIGH**  
Green Streets  
Mean 4.00 (sd 0.60)



**MEDIUM**  
Enclosed Sidewalk  
Mean 3.32 (sd 0.83)



**LOW**  
No Trees  
Mean 1.65 (sd 0.72)

KATHLEEN WOLF

Why is patronage behavior important? For example, respondents claimed they would travel farther to visit a business district having trees. This could translate to an expanded trade area radius that adds thousands of people within urban population centers. Once there, they report they will stay longer, which could mean greater sales revenue (Underhill 1999).

### Product Pricing

Wildland forests are harvested for market products, such as timber, but the urban forest is a public good, rarely generating products that can be readily bought and sold. Contingent valuation [see *street tree valuation*] was used to understand the impact of streetscape trees on local economics.

### *street tree valuation*

Economists utilize several strategies, including contingent valuation methods (CVM), to value nonmarket goods and services provided by nature and ecosystems. CVM surveys have been used to assess public willingness-to-pay for use, conservation or restoration of natural resources, with most applications in wildland or rural settings. Issues of CVM reliability and validity were carefully considered in the research design.

Respondents were presented with a list of goods and services and were asked to state prices for each. There was some variability of price response between different sized cities and retail locations, yet trees were consistently associated with higher price points.

Consumers claimed they were willing to pay 9 percent more in small cities and 12 percent more in large cities for equivalent goods and services in business districts having trees. Visitors also claim they will pay more for parking on streets with trees.

### Demographic Differences

The surveys included demographics questions. Survey participants in the large and small city studies were generally slightly older, somewhat more affluent, and less culturally diverse than the general U.S. populace. Respondents in Athens, the midsize city, were younger and had lower household incomes, not surprising for a college town.

There were some minor differences in response associated with respondent traits. Yet the high degree of consistency across all studies has been remarkable.

### Business People Differ from Customers

One study assessed response differences between shoppers and merchants (Wolf 2004b). Trees were highly preferred by both groups, although business people expressed slightly lower liking for visual categories containing trees. Differences in attitudes regarding tree benefits and annoyances were found, with business people rating tree benefits significantly lower than shoppers.

Merchants have different, and lesser, appreciations for trees, and may assume that shoppers share their attitudes.

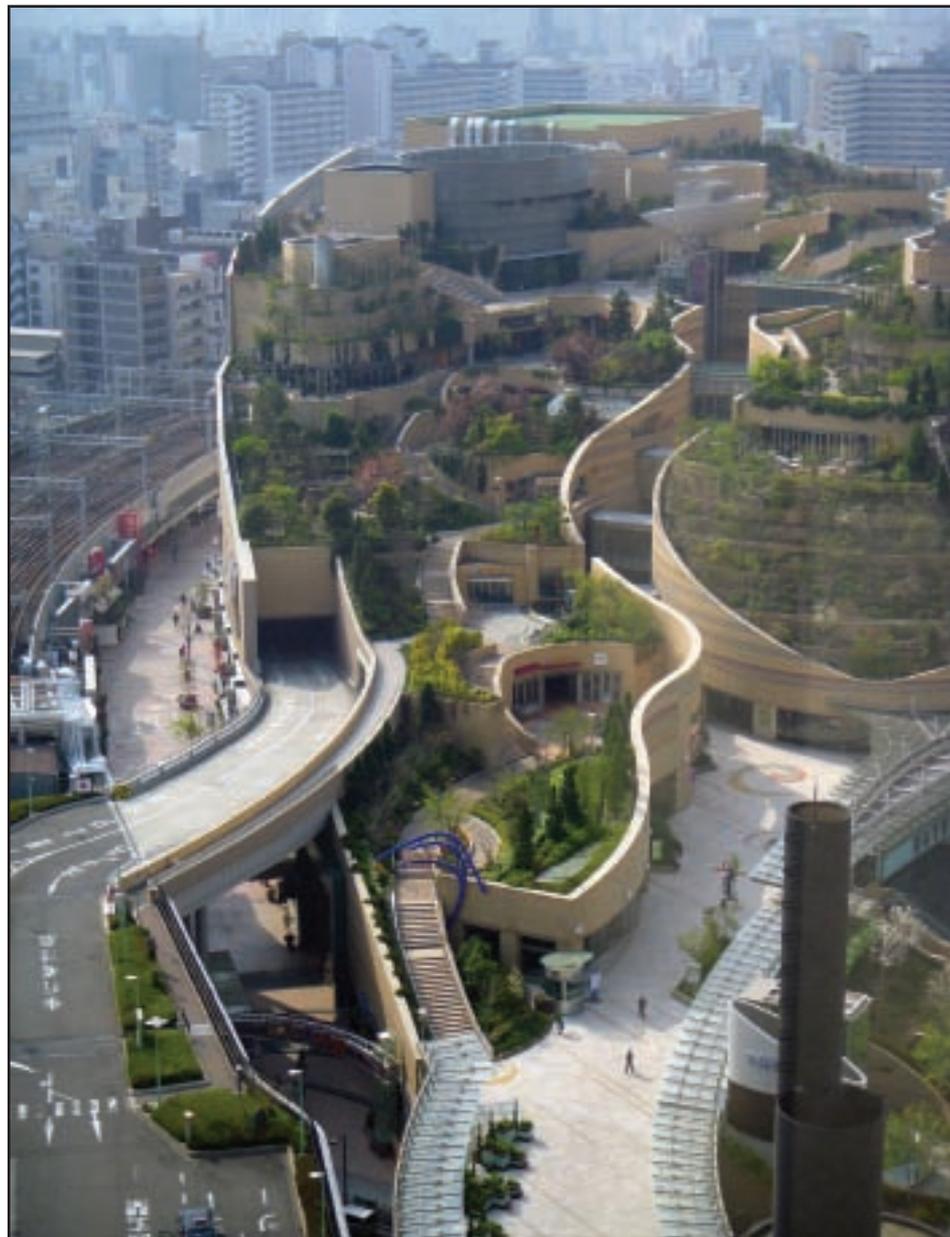
### Why These Results?

We are in the throes of economic downturn. People may curb their spending, but commerce must continue as people shop to meet everyday needs.

## More in Store: Research on City Trees and Retail (continued)

Positive response to street trees is part of the broader pattern of people's appreciations for nature. Studies of the past 40 years about humans and landscape generally find that people of all ages and cultural backgrounds prefer natural views to built settings, and that trees enhance public judgment of visual quality in cities (Ulrich 1986; Swardon 1988).

Business districts face many retail challenges, including giant discount stores and online or catalog purchasing. Retail managers and merchants must work together to create vibrant, memorable shopping experiences that attract and retain shoppers (Pine and Gilmore 1999). Effective retail planning addresses the full range of conditions that help a shopper to discover, enjoy, and then repeatedly return to a shopping area.



Namba Parks (Osaka, Japan) is an extraordinary example of nature in a retail environment. It is a 120 tenant shopping mall containing offices, shops, and restaurants. The eight-level complex is draped with terraced rooftop forests and gardens.

Retail research about *atmospherics* examines how consumers' store perceptions are affected by environmental cues. Light, sound, color, and product placement are all potential influences. General perceptions, in turn, influence reactions and behaviors. For instance, numerous studies find the music played in a store can have a significant impact on sales, perceptions of and actual time spent in the environment, in-store traffic flow, and response to visual stimuli.

Atmospherics research is largely limited to store interiors (Turley and Milliman 2000). Outdoor conditions deserve greater attention, as store and shopping center exteriors present initial perceptual cues to consumers. Features such as storefronts and sidewalk character can create favorable or negative impressions that subconsciously affect what shoppers do.

Trees in the streetscape are an important district improvement. Shoppers do not purchase goods and services just to meet needs. Many shoppers pursue positive experiences while shopping. The streetscape is an important part of creating a welcoming, interesting shopping place.

## Design Ideas

The studies tested the effects of having tree and canopy throughout a business area or district. Places with scattered or neglected trees may not evoke such positive responses. A district-wide canopy helps create a sense of place for shoppers.

As with any large-scale improvement, a comprehensive plan will guide a tree and landscape project to successful completion. When planned well, trees and associated plants can create a unique character or identity for a business district that will last for decades.

A comprehensive plan also helps garner support from community members, helps support project fund-raising, and ensures that details of the project are thought through and resolved in the best way.

Following planning and planting, on-going maintenance is needed to assure maximum benefit, and to control costs. Careful planning and maintenance of trees can prevent nuisances—such as reduced sign visibility, debris, and sidewalk damage.

Trees are a living resource and change in character and form over time, providing many opportunities for positive shopper experiences. Here are design guidelines for integrating trees into the retail streetscape.

“Trees are Good for Business” is an ISA Pacific Northwest Chapter publication, and is an urban forest planning guide for merchants and business districts managers: <http://www.cfr.washington.edu/research.envmind/CityBiz/BizTech.pdf>

## Place Branding

Each species or cultivar has a distinct mature form, size, and other attributes. Plant selections can “brand” a place through subtle, yet observable, distinctions of texture, seasonal color, and plant massing.

Within a shopping district, diverse tree groupings and arrangement help a person distinguish sub-zones, thereby providing cues for orientation and wayfinding. Working within a selected plant palette, the landscape designer can promote a mood of “variety within unity,” or a place perceived to be coherent overall and having attractive features.

Conventional planting patterns have one tree for every 30 linear feet (or more) of sidewalk. Variations on this basic pattern make a shopping district more interesting and unique. For instance, double rows of trees can be planted if sidewalks are wide enough. Mixed species provide interesting visual patterns. Understory plantings of flowers and shrubs add color and focal points.



KATHLEEN WOLF

Place design using trees, planters, and accessory vegetation.



KATHLEEN WOLF

Place design using trees and accessory vegetation (curbside planting complements tree planting on adjacent private property).

## Order and Tidiness

Respondents preferred scenes where vegetation is presented in patterns, and where there is order within the street scene. Careful and routine maintenance is also important as tidiness improves preference ratings across all landscapes. Again, there is more to this than meets the eye. In interviews shoppers claimed that the level of care for plants in the sidewalk zone provided cues about the level of care and customer service they might expect from nearby merchants.

## Signs and Trees

Merchants have concerns about trees and visibility of signs, awnings, and storefronts. Extra attention to design is needed to prevent tree and sign conflicts. Here are a few general principles.

First is tree choice. Trees with a more open and airy canopy, rather than a thick, dense canopy will permit better views. Tree species having mature heights that are ultimately higher than sign heights are good choices.

Trees take time to grow. Ongoing maintenance should include pruning to guide the shape of the tree's canopy and remove any limbs that might be hazards. Once the tree grows, the canopy can be “limbed up” to raise branches and foliage above signs and storefronts. The canopy can also be opened up with selective pruning to allow sunlight to filter down onto the sidewalk, making the street more pleasant for pedestrians.

Topping is not the answer since it causes a flush of new branch and leaf growth that becomes a more dense visual obstruction. Repeated shearing of tree-tops often causes poor tree health in the long run.

Consider signage design. Color and materials choices for signs should contrast with foliage, drawing the eye to visual accents. Monumental signage can be used to consolidate multiple, scattered signs into a single streetside structure that is readily seen and understood. Perhaps “iconic” signage, using quickly interpreted symbols for goods and services, could be placed, reducing the need for multiple, large, highly individualized signs that take more time for passing motorists to understand. Indeed, traffic calming approaches may be another solution, as drivers moving through a business district at high speeds may not notice signs no matter how visible.

## Create Social Spaces

Many consumers consider shopping to be a social and recreational experience, shared with family or friends. Outdoor seating areas should be given careful thought. Randomly placed benches on the sidewalk may not be comfortable or visually appealing. Benches and custom-made seating can wrap around a tree pit or planter to give customers a sense of shelter while watching activity on the street.

Trees and planters can also be used to perceptually break up a large paved area into a series of “rooms,” making the space feel more human in scale and friendliness. Such small spaces offer places of respite for extended district stays, or used for outdoor dining.

## Trees Make Dollars and Sense

City trees provide many environmental benefits, the usual justification for urban forestry investment, and an important concern as the public gains greater interest in urban sustainability. We now know that trees serve other functions, particularly for retail and commercial interests.

A multi-study research program has investigated how consumers respond to trees in various business settings in cities and towns. ▶



KATHLEEN WOLF

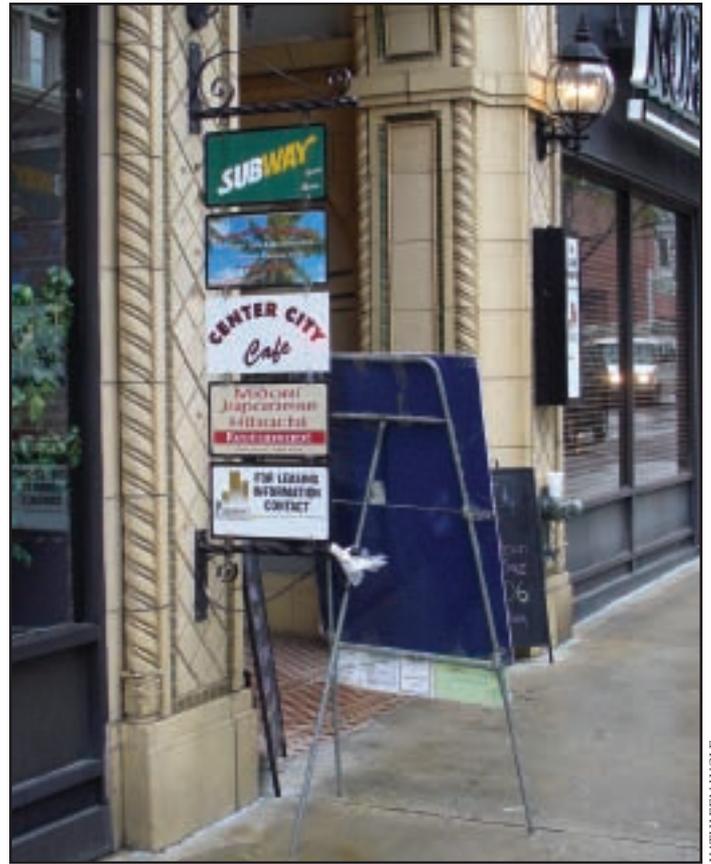
Streetscape tree pruned for high, open canopy.

Results have been remarkably consistent. Trees positively affect judgments of visual quality, but more significantly, appear to influence other consumer responses and behaviors.

Survey respondents from all regions of the U.S. favor trees in retail settings, and this preference is further reflected in positive perceptions, patronage behavior, and product pricing. It is important to note that the highest ratings were granted to places having full, mature tree canopy, the result of careful maintenance across decades.

Trees and landscapes can be significant elements in place marketing. Economists have noted that shopping was once a utilitarian activity to fulfill needs and wants, but today shoppers are pursuing places that offer social, memorable experiences. Trees help create place and connect to deeply felt preferences and appreciations that people have for nature. The urban forest is an important part of the vibrant, satisfying places that shoppers enjoy.

The full text of this article, with all citations included, can be downloaded online (at [www.cfr.washington.edu/research.envmind/CityBiz/Summary.pdf](http://www.cfr.washington.edu/research.envmind/CityBiz/Summary.pdf)).



KATHLEEN WOLF

Combined signage below tree canopy.



KATHLEEN WOLF

Small areas in the streetscape.

### Acknowledgement

Several of the trees and retail studies were funded by the USDA Forest Service on recommendation of the National Urban and Community Forestry Advisory Council.

### Literature Cited

- Pine, B.J., and J.H. Gilmore. 1999. *The Experience Economy: Work is Theatre and Every Business a Stage*. Harvard Business School Press, Boston.
- Smardon, R.C. 1988. Perception and aesthetics of the urban environment: Review of the role of vegetation. *Landscape and Urban Planning* 15:85–106.

Turley, L.W., and Ronald E. Milliman. 2000. Atmospheric effects on shopping behavior: A review of the experimental evidence. *Journal of Business Research* 49:193–211.

Ulrich, R.S. 1986. Human responses to vegetation and landscapes. *Landscape and Urban Planning* 13: 29–44.

Underhill, P. 1999. *Why We Buy: The Science of Shopping*. Simon and Schuster, New York, NY.

Wolf, K.L. 2003. Public response to the urban forest in inner-city business districts. *Journal of Arboriculture* 29, 3:117-126.

Wolf, K.L. 2004a. Trees and business district preferences: A case study of Athens, Georgia (USA). *Journal of Arboriculture* 30, 6:336–346.

Wolf, K. L. 2004b. Nature in the retail environment: Comparing consumer and business response to urban forest conditions. *Landscape Journal* 23, 1:40–51.

Wolf, K.L. 2005. Trees in the small city retail business district: Comparing resident and visitor perceptions. *Journal of Forestry* 103, 8:390–395.

Wolf, K.L. 2006. Assessing public response to the freeway roadside: urban forestry and context sensitive solutions. Transportation Research Record: *Journal of the Transportation Research Board*, No. 1984: 102–111.

Wolf, K.L. 2008. Community context and strip mall retail: Public response to the roadside landscape. Transportation Research Record: *Journal of the Transportation Research Board*, No. 2060: 95–103.

---

*Kathleen Wolf is a research social scientist at the University of Washington, Seattle. Her work focuses on the human dimensions of urban forests and ecosystems. Information about Her research program can be found online (at [www.cfr.washington.edu/research.envmind](http://www.cfr.washington.edu/research.envmind)).*

# SMA ANNOUNCES 2009 URBAN TREE OF THE YEAR

By Michelle Buckstrup

The Society of Municipal Arborists (SMA) has chosen Chinkapin oak (*Quercus muehlenbergii*) as its 2009 Urban Tree of the Year. The winner must be adaptable to a variety of harsh conditions and have strong ornamental traits. The contest has been running for fourteen years, and past winners include black tupelo (2008), baldcypress (2007), Kentucky coffeetree (2006), ‘Chanticleer’ flowering pear (2005), and ‘Autumn Blaze’ red maple (2004).

SMA has 1300-plus members who practice urban forestry all over North America and beyond. Members submitted nominations for this year’s Urban Tree of the Year, and the majority voted for Chinkapin oak.

“Here is an oak that prefers alkaline soil, is drought resistant, and is hardy to zone 5 or below,” Nina Bassuk, Director of the Cornell Urban Horticulture Institute, commented. “We have several years of experience with *Quercus muehlenbergii* in Ithaca, New York and we have been amazed.”

“I estimate that it is in the middle range of oak transplant

ease—not as difficult as a white or bur oak, but not as easy as a swamp white oak. After the obligate ‘sleep, creep, leap,’ it truly seems to grow rapidly. With this accolade, I hope that Chinkapin oak will become a fixture in the nursery industry and on our streets.”

Chinkapin oak has handsome, shiny, chestnut-like leaves with coarse marginal teeth. The fall foliage can be a showy yellow to orange-brown.

Municipal arborists from Albuquerque, New Mexico to Lansing, Michigan, sing the praises of Chinkapin oak, a tough, adaptable tree for urban use. Of course, there is no one perfect tree for every situation, and Chinkapin oak has its limitations. It doesn’t tolerate wet soils well, and it should be given adequate space to grow; with proper tree care, the tree’s expected mature crown height and spread would be 40 to 60 ft. (12 to 18 m) tall and 50 to 60 ft. (15 to 18 m) wide, respectively.

---

*Michelle Buckstrup is the editor of City Trees, the journal of the Society of Municipal Arborists.*



STEVE BASKAUF