

RETAIL AND URBAN NATURE: CREATING A CONSUMER HABITAT

**Submitted for the 2002 People/Plant Symposium
Amsterdam, Netherlands**

Kathleen L. Wolf, Ph.D.
Center for Urban Horticulture
University of Washington
Box 352100
Seattle, WA 98195
kwolf@u.washington.edu

Abstract

The relationship of trees and consumer response in retail settings has been investigated in a program of studies. While plants of store interiors may contribute positive affects to individual businesses, this research has focused on the role of the urban forest in creating the connective habitat of a pedestrian-oriented retail district. Interviews and surveys evaluated public preferences, perceptions, patronage behavior intentions and product willingness-to-pay in relationship to varied presence of trees in outdoor retail environments. Consumer response is positively associated with streetscape greening on all of these evaluative and behavioral dimensions.

Since the beginning of history people have gathered to exchange goods and services. From the agora, to the market, to "main street," places of commerce have been sites of complex interpersonal interaction. The multiple, daily human contacts of market centers are a part of the social fabric of any city or town. Commerce is a unique situation of human ecology, and one that has rarely been explored in studies of plant and nature benefits.

In *Street Reclaiming* Engwicht (1999) observes that "streets were historically a place of 'spontaneous exchange' – defined as the sharing of goods, culture, knowledge, friendship and support – all the commodities that make up our commercial and social economy."

The life and commerce of city streets has been altered radically with the development of strip malls, shopping malls, mail order alternatives, and the electronic shopping options provided by the computer, telephone, and fax. As U.S. growth management practices are implemented local retail districts are making efforts to revitalize and regain their competitive retail position. Physical improvements are made to recreate pedestrian-friendly, human scale streetscapes, in addition to restoring shops and infrastructure.

In a vital pedestrian-oriented retail center the streetscape provides habitat for shoppers and consumers who have diverse needs and goals. Habitat can be defined as the "place where an organism or a community of organisms lives (and exists), including all living and nonliving factors or conditions of the surrounding environment (Encyclopedia Britannica, 2002)."

Habitat, in the ecological sense, provides the basic needs of food, water and shelter for any given species. Retail business districts must also provide basic consumer needs in order to

be successful. Consumers are likely to gravitate to “habitats” that offer favorable climate, high potential for social interaction, perceptions of safety, and a large, diverse selection of goods and services (Bloch et al. 1994).

Landscape ecologists have teamed with wildlife biologists to study the spatial configuration of landscape that is conducive to habitat and biodiversity. The connectivity of basic needs is as important as their availability. As the world becomes more urbanized wildlife corridors and land patches are essential for providing animal access to life’s necessities.

In an analogous way spatial access to consumer needs is just as important as primary shopping destinations in a business district. The streetscape provides connectivity among shops, enabling (and encouraging) consumers to pursue their retail interests in multiple settings.

Natural elements – the urban forest and accessory vegetation – probably impact consumer habitat on many levels. Generally, research has revealed that urban forests provide extensive benefits for city residents. One vein of benefits research focuses on environmental improvements and enhancement such as surface water management and air quality (McPherson 1995). In addition, passive and active encounters with nature in cities generate psychosocial benefits. Scientific evidence confirms that experiences of nature are associated with enhanced worker productivity (Kaplan 1992), traffic stress reduction (Parsons et al. 1998), emotional stress mitigation (Ulrich 1986) and restoration of cognitive capacities needed for basic functioning and productivity (Kaplan and Kaplan 1989).

Emerging understanding of urban nature benefits yields insight on plants and retail. Economists typically regard direct consumption of goods to be the primary motivations of shoppers. Optimal consumer habitat has opportunities for experiential consumption of a setting, in addition to goods purchases.

Retailers have long understood the importance of store environment in enhancing the shopping experience. Marketers have studied the situational influences of product packaging and store layout on the behavior of shoppers (Engel et al. 1990). While business people are keenly interested in the presentation of their product and store they often overlook "macro" level settings - the district that surrounds their shop or office. Mattila and Wirtz (2002) extend the notion of Gestalt to consumers' perceptions of retail environments and demonstrated that consumers perceive service-scapes holistically. The outdoor landscape can be a seamless extension of shop interiors, providing indoor/outdoor continuity for a positive shopping experience.

Urban forestry can play an important role in business districts. Interior plants and landscape may create store interiors more favorable for retail activity. Meanwhile the streetscape provides connectivity within a retail habitat, providing the experiential setting that generates initial customer appeal in the pedestrian-oriented shopping zone.

Yet some merchants and business associations are reluctant to invest in green improvements, as they are uncertain about what level of return will ensue from the commitment of fiscal resources. Urban nature is deemed a public good by economists. Easily observed measures of value, such as those expressed through market pricing dynamics, do not exist for such public goods (Prato 1998). Exclusive ownership and use is rare making active sales and

purchase of the commodity difficult. Indirect valuation approaches, such as hedonic pricing or contingent valuation, can be employed to assess public and individual value for the presence or absence of plants in urban settings.

The evidence of tree-based environmental or psychosocial benefits in cities, while contributing to urban sustainability, may not be salient to the direct fiscal interests of merchants and retail associations. Improvements needs are many - building upgrades, street and sidewalk improvements, sanitation, security – and place extreme demands on limited fiscal resources. The role of the urban forest as human habitat is complex yet can be investigated empirically, providing the evidence for informed public decision-making that optimizes returns from green investment.

Research Approach

A multi-phase research project was conducted to learn about tree impacts in consumer habitat. Three questions were addressed:

1. Do consumers prefer certain plant conditions in the outdoor retail setting?
2. Does the presence of trees influence consumer place perceptions?
3. Does the urban forest have an affect on consumer behavior (e.g. patronage and product pricing)?

Both qualitative interview and quantitative survey methods were employed in the studies. The interview phase was conducted in urban neighborhoods of the Pacific Northwest region of the United States. The survey phase compared business peoples' and consumers' responses. Data was collected in multiple U. S. cities: Seattle (Washington), Portland (Oregon), Austin (Texas), Los Angeles (California), Chicago (Illinois), Pittsburgh (Pennsylvania) and Washington DC.

The research survey evaluated several facets of public response to trees in retail settings using psychometric and econometric measures. In one section respondents (merchants and residents of nearby neighborhoods) were asked to rate varied streetscape scenes for visual quality. The scenes showed retail settings with differing amounts and arrangements of vegetation. The survey also contained sections of questions about shopper perceptions of places that have or don't have trees. Respondents were then asked to express what they were willing-to-pay for goods in three different retail settings, each having different urban forest conditions. Demographic questions revealed the traits and characteristics of respondents.

Figure 1: Preference Categories - * statistically significant differences



Sparse Vegetation - mean 2.04, .64 SD (resident 1.95, merchant 2.17*)



Naturalistic Flora - mean 2.98, 1.09 SD (resident 3.17, merchant 2.70*)



Canopy with Planters - mean 3.52, 0.74 SD (resident 3.59, merchant 3.42*)



Low, Dense Canopy - mean 3.58, 0.84 SD (resident 3.68, merchant 3.42*)



Formal Foliage - mean 3.65, 0.76 SD (resident 3.70, merchant 3.57)

Streetscape Preferences

Statistical analysis for visual quality produced five visual categories (Figure 1)¹ based on preference ratings of thirty-two images. Comparisons of category means reveal that categories containing scenes with no vegetation or scattered small plants are valued the least. Meanwhile, larger trees are associated with higher preference; both open and dense tree canopies are valued.

Finally, categories with the highest visual ratings have multi-layered vegetation and are more ordered. Trees and accessory vegetation are placed and managed to create distinct visual patterns within the streetscape.

Differences were noted in how consumers and business people react to the appearance of business settings. Business ratings of districts without trees are higher than visitor ratings, despite the grim, hard-featured character of the street setting. Then, in response to places with trees, business people consistently rated such places lower than visitors. Merchants may have less appreciation for trees than consumers, the people they wish to welcome to their shops.

Place Perceptions

Interviews with merchants and business association staff revealed strong attitudes about the values of trees and their suitability in the retail environment. These stakeholders shared some perceptions about trees, but differed widely on many issues. Thematic analysis of the interview content generated categories of both tree annoyances and benefits.

Costs and annoyance perceptions centered on specific issues or problems that impact business profits. Small businesses with marginal profitability feel unable to extend their operating expenses to curbside. The most frequent complaint about trees is reduced visibility, implying reduced consumer access. Trees are blamed for screening signs, awnings, storefronts, and window displays from both pedestrian and automobile traffic. Engineering impacts are another category of costs. On-site exhibits of structural damage included buckled sidewalks, cracked curbs, and heaved road edges, as well as trees entangled in utility lines.

Merchants described loss of functional space as another annoyance. Trees are perceived to reduce usable outdoor space, particularly parking. A direct cost to businesses is removal of tree debris. Flowers, twigs, fruit and leaves are all materials perceived to dirty sidewalks, parked cars and even pedestrians. Security was the final annoyance category. Perceived threats to personal security of both business customers and staff is a common justification for removal of small trees and shrubs.

Rather than attending to tree by tree issues, as with annoyances, benefits reports focused on generalized psychological and perceptual dimensions. Lewis (1996) wrote that "landscaping tells stories and defines settings." Dwyer et al. (1994) report that extensive preference assessments for urban forests have revealed the "deep emotional ties between people and trees," including sensory, symbolic and human community dimensions. Business organization staff, in particular, recognized that powerful messages of trees can be harnessed to create more profitable retail settings.

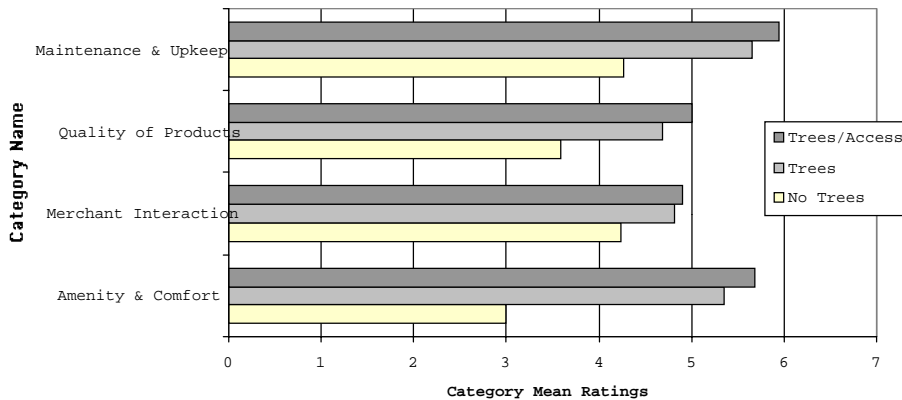
The first of four benefits categories was Positive Mood. Plants and trees, if properly selected and maintained, create a positive experiential and sensual space. The second category, Visual Identity and Unity is about creating an imageable, distinctive place through the use of plants. These efforts are often combined with display of local cultural heritage, using murals and window displays. A distinct plant palette can also define the boundaries of the district, encouraging visitors to shop within a specific area.

A Message of Care is the outdoor extension of a business' customer service commitment. Nassauer (1995) reports that an image of care enhances visual preference for farm and residential landscapes. This also can apply to business districts. A well-designed and maintained street landscape suggests the level of attention that a consumer can expect from a business.

The last benefits category, Signal of Change, is about the visual transformations that occur in revitalizing retail centers. Trees may deliver upbeat messages to prospective customers and potential new businesses. One respondent noted that, "If things look nice . . . it sends a message to new businesses; they see it as being proactive."

Place perceptions were also explored in the quantitative survey. Respondents viewed images and graphics of three different shopping districts that varied on the character and quality of tree canopy. Respondents' answers about the qualities of shopping places statistically sorted into four categories: Amenity and Comfort, Interaction with Merchants, Quality of Products, Maintenance and Upkeep (Figure 2).² Consumers' ratings on each of the perceptual categories was significantly higher for districts that had street trees and other landscape improvements. For instance, Amenity and Comfort ratings were about 80% higher for a tree lined sidewalk compared to a non-shaded street. Also, Quality of Products ratings were 30% higher in districts having trees over those with barren sidewalks. Interaction with Merchants items included customer service issues; ratings were about 15% higher for districts with trees.

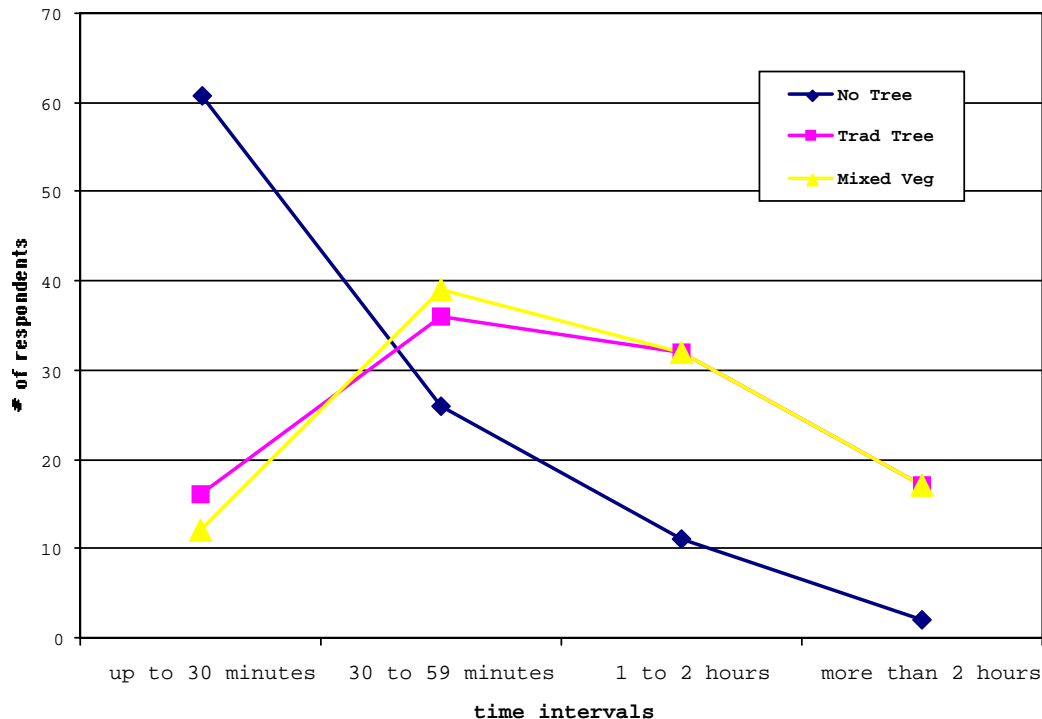
Figure 2: Perceptions Categories



Patronage Behavior

Psychologists have debated the relationship of attitudes and behavior; both were explored in these studies. Respondents were asked to give projections of their behavior within the three hypothetical shopping districts, including travel time, travel distance, duration of visit, frequency of visits and willingness-to-pay for parking. On all categorical response scales, higher measures were reported in the districts having trees.³ For instance, Figure 3 demonstrates the inverse response pattern seen in all scales; people are less willing to spend more time in unvegetated settings while greater visitation times are associated with the presence of trees. The higher response (for settings with trees) at the mid-array categories may represent a threshold typical of

Figure 3: Duration of Visi



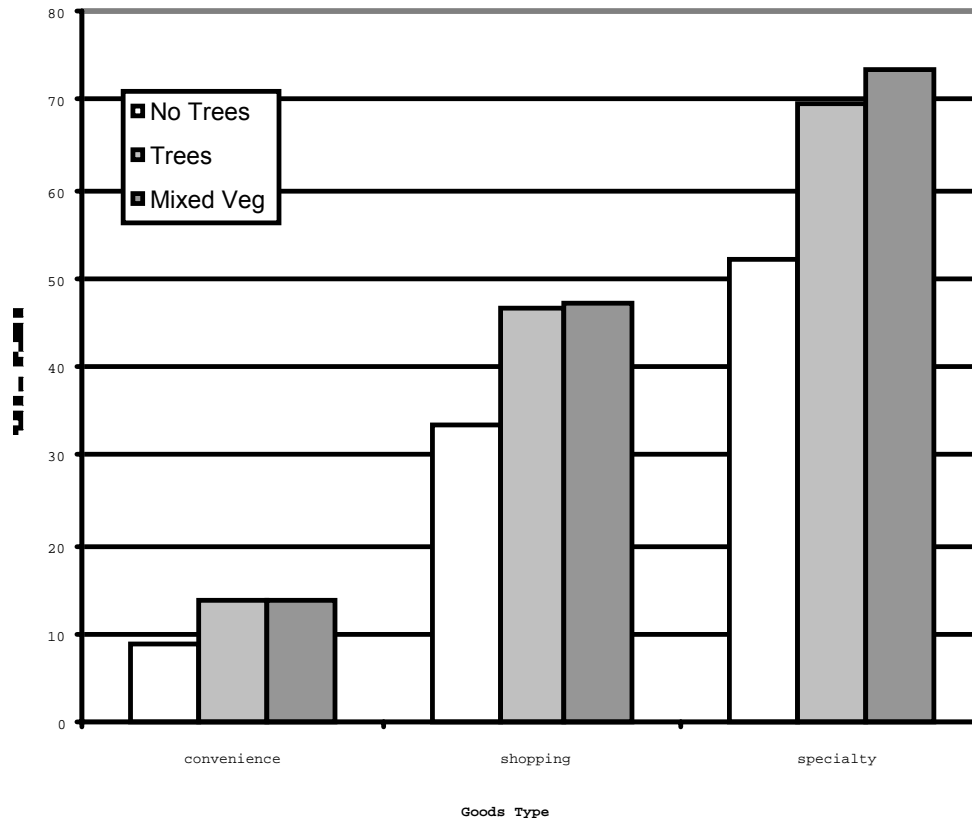
local shopping areas. In addition, respondents claimed they would be willing to pay more for parking in a well-landscaped business district. This suggests greater revenues from shaded parking could offset the costs of parking space loss, a frequent objection to trees by merchants.

The inverse response pattern was consistent across all patronage behavior variables. No trees responses are concentrated at the low end of each of the variables' categorical arrays and diminish in frequency moving toward the high end of the arrays. Conversely, responses based on the presence of trees are less frequent at the lowest end of the arrays, increase in frequency, then slightly decline at the variables' higher value levels but remain at higher frequencies than the no-green settings.

Product Pricing

The bottom line is the top interest of most business people. Do trees influence how much people are willing to pay for goods? Contingent valuation methods were used to assess how natural amenities relate to customers' price valuations.

Within each district shopping goods (e.g. watch, light jacket) mean values are greater than convenience goods (e.g. lunch sandwich, flower bouquet), with specialty goods (e.g. new glasses, art print) commanding the highest stated values (Figure 4)⁴. These pricing trends are consistent with marketing literature (Kinnear et al. 1995) in that the goods classes typically contain products of ascending value, quality and consequently, price.



Respondents reported willingness-to-pay less for equivalent goods in business districts without trees. Price differences between tree and no-tree conditions are considerable: approximately fifty percent for convenience, forty percent for shopping and thirty-five percent for specialty goods. Analysis using weighted standard scores across all products generated a more conservative 11.95% difference between tree and no-tree conditions. Given the low profit margins of most retail businesses, trees provide a significant “amenity margin.”

Discussion

Marketing studies have evaluated the role of "atmospherics" on consumer intentions and behavior, finding that indoor environmental elements such as music, product layout and lighting all contribute to store image (Zimmer and Golden 1988). In turn, store image influences consumers' perceptions (Dodds et al. 1991).

This combination of studies was an initial effort to understand atmospherics of the pedestrian-oriented retail streetscape and learn more about the indoors/outdoors interface and consumer response. The results reveal a surprisingly consistent relationship between green streets and consumer response.

In terms of preferences, shoppers favor trees and accessory vegetation that is well-kept and orderly. The public appears not to distinguish different tree canopy configurations in their preference for trees (though more study is needed, as this may be an instrument artifact).

The presence of trees has been favored in visual assessment studies of sites throughout the urban to wildland landscape gradient. An interesting outcome of this study is that inferences about many aspects of the shopping environment are made based on vegetation character. Respondents interpret traits of the district beyond that revealed in the test images, including interaction with merchants, probable service levels and product quality.

The array of judgments made about a setting may be explained by a concept derived from social psychology, "attribution theory." Social perceivers assemble various bits of information, and mediated by perceiver dispositions, form impressions of other people they encounter. Leyens and Fiske, (1994) note that, "people continuously build impression theories and use them in their commerce with other people."

Diverse information about a person is integrated to form a coherent impression and guide decisions about how to interact with a person (Wyer and Lambert 1994). Observed traits are the indirect cues used to interpret feelings, personality, character and likely behaviors. Consequent information and experience will be used by the observer to confirm or modify the impression. Rapid cognitive assessment of others provides a basis for inference and evaluation of new acquaintances.

Built settings appear to evoke similar evaluative responses. Respondents' open-ended descriptors of retail settings go beyond physical traits and include inferences about social and psychological interactions. Social psychological concepts of "social attribution" and "impression formation" readily translate to consumer/environment interactions.

Prior research on nature and city streets supports the finding that both evaluative appraisals (Nasar 1987) and affective response (Sheets and Manzer 1991) are enhanced by the presence of trees. Economists once proposed that purchase choices are driven by rational considerations such as the utility function of one product over another. Research of indoor settings has shown that shopping environments can evoke emotional responses in consumers and that such emotions, in turn, influence shopping behaviors and outcomes (Machleit and Eroglu 2000).

Another study examined how various characteristics of retail environments influence consumers' emotional responses in the shopping environment, and how these emotions, in turn, influence consumers' store attitudes. Store characteristics have a pronounced effect on consumers' in-store emotions, and these emotional experiences serve as critical mediators in the store characteristics-store attitudes relationship (Yoo et al. 1998).

Perceptual responses appear to be related to patronage behaviors and price acceptance thus having implications for business revenue. The patronage variables specify consumer behaviors that can potentially enlarge a customer base for districts having trees, thus generating additional revenues. For instance, greater travel distances were reported for the with-trees districts; an expanded trade area radius within dense urban populations suggests a larger customer pool. Also, higher reported prices for goods in business districts with trees (12% or more) is a substantial amenity margin given that retailers operate on a 1-2% profit margin.

Conclusions

Cost-benefit analysis premised on consumer expressed values will be a future research focus. Contingent valuation studies of wildland or open space natural resources typically aggregate reported price statements across a selected population, region or households to assess non-market benefit values (Tyrväinen and Väänänen 1998). Comparing direct costs of installation and management of a streetscape to the summed indirect benefits valuation reveal net public goods value. These can inform decisions about allocating funds for tree installation and stewardship (Prato 1998).

As in natural habitats, diverse living and nonliving factors are needed for a viable retail system. Pedestrian-based retail centers must contain an aggregation of a wide variety of businesses in a short six to twelve block distance (Starkie 2002). Regional economic conditions must be favorable for small business capitalization and start-up. Sanitation services and parking availability must be planned.

Once a foundation of positive conditions is in place streetscape improvements can enhance the desirability and attractiveness of consumer habitat. In the United States retail consolidation of the 1990s by regional malls and “big box” stores has driven shoppers to turn to unique, identity shopping zones that are more integral to their communities (Starkie 2002). Smart growth urban planning practices are encouraging people to return to cities; many new residents enjoy the conveniences and variety of urban living. Traditional Euclidean land-use zoning has given way to mixed-use developments that blend residential and commercial functions.

Retail settings are part of an emerging interest in community-oriented development, that is, human habitat at the macro scale. Civic commerce includes the amenities that create space and place, and provides the appealing environment that links and supports member retailers. This research suggests that the urban forest is an essential component of a viable, vital retail place. Extensive evidence of the benefits of trees has been documented but most of the science has been conducted in residential settings (Dwyer et al. 1994). This research extends understandings of the human dimensions of trees to the retail context. Additional interpretations of results can enable better planning and management of streetscape nature to better serve retail needs and interests.

¹ Preference ratings in response to the question, *how much do you like this image?* spanned from 1=not at all to 5=very much. Sample sizes for respondent groups: resident n=258, business n=172. Principal axis factor analysis with Varimax rotation was used to extract underlying common dimensions based on observed covariation of individual item ratings. Several decision rules were employed to determine inclusion of any item within a specific category: an item factor loading of at least .40, category eigenvalue of 1.00 or greater, exclusion of items with .40 loading on more than one category, and all recognized categories must have at least two items. New variables were constructed by aggregating mean values across all category items for each respondent. Means comparisons of image categories were conducted using Independent Samples t-tests, alpha < 0.05.

² A set of twenty-five Likert scaled response were rated by respondents using a scale from "1" indicating *strongly disagree* to "7" specifying *strongly agree* with "4" as a neutral point. Data reduction entailed principal axis factor analysis with Varimax rotation with four categories emerging accounting for 65% of the total variable variance. Aggregate values variables were created for each category. Category means were compared between three streetscape urban forest conditions using one-way ANOVA and Bonferroni *post hoc* tests, alpha <0.05.

³ Patronage behavior variables consisted of five categorical response questions. Participants were asked to specify travel time, travel distance, duration of visit, frequency of visits and parking fee willingness-to-pay. Based on response distributions some variable categories were collapsed. Two-way contingency analysis tables evaluated the relationship of variables to streetscape conditions using X^2 tests and Cramer's V statistics, alpha <0.05.

⁴ Respondents were asked to indicate the price they would be willing-to-pay for each of 15 items. Three index variables were constructed by aggregating stated values for all items within each product index class (convenience, shopping and specialty) for each participant (after removing outlier values to avoid strategic behavior effects). Means comparisons between district conditions (one-way ANOVA and Bonferroni *post hoc* tests) disclosed significant differences, alpha < 0.05.

Acknowledgments

This research was supported by a grants from the National Urban and Community Forestry Advisory Council (U.S. Forest Service, Projects No WAUF-95-001 and No WAUF-99-001). Correspondence concerning this article should be addressed to the author at kwolf@u.washington.edu Additional project information can be found at: www.cfr.washington.edu/research.envmind

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