

## **COMMUNITY CONTEXT AND STRIP MALL RETAIL: PUBLIC RESPONSE TO THE ROADSIDE LANDSCAPE**

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## **COMMUNITY CONTEXT AND STRIP MALL RETAIL: PUBLIC RESPONSE TO THE ROADSIDE LANDSCAPE**

### **ABSTRACT**

Strip malls (aka mini-malls) are a common land use, historically promoted by U.S. zoning practices that concentrate retail and commercial development in a narrow band along urban arterials and major streets. Mini-malls are an entry-level retail niche offering opportunity for independent, start-up businesses that serve a limited market range. More recently, communities have begun to call into the question land uses that enable efficient ingress and egress of vehicles in retail and commercial districts, but gave little attention to multi-modal motility. Some communities are redeveloping small mall zones based on “complete street” principles, expanding landscape plantings, and redeveloping the character of a business district. The study assessed public response to one element of small mall (re)development – landscape and vegetation options. A series of prior studies indicate that consumer behavior is positively associated with city trees (the urban forest) on multiple cognitive and behavioral dimensions. Using mail surveys that depicted varied roadside treatments, residents of three major cities in the Pacific Northwest were asked to indicate their preferences and perceptions regarding proposed changes. Survey stimulus materials addressed concepts of visual quality, retail perceptions, patronage behavior, wayfinding, and willingness-to-pay for goods and services. Combined econometrics and psychometrics indicated that respondents prefer landscaped roadsides, and report positive retail behavior, such as willingness to pay 8.8% more for goods and services in well landscaped malls. Redevelopment and roadside management guidelines are proposed based on the research results, with implications for the economics of local communities.

**Key Words:** urban, roadside, strip mall, retail, visual quality, preference, public perception

## INTRODUCTION

Strip malls have become a prevalent commercial land use throughout the United States. They offer small-scale retail and commercial services and products, often focused on serving local communities. These commercial hubs are often deplored for their inefficient use of space and lack of visual quality. Nonetheless, strip malls are often the product of local zoning practices that encourage concentration of small businesses in centers with shared parking and ingress/egress.

Many communities are interested in either improving the visual quality of new commercial corridors or redeveloping existing commercial streets to align with community values. Context sensitive solutions in new and retroactive development may entail a “complete street” approach that better integrates bicycle and pedestrian access, and improves the aesthetics of retail land uses.

Survey research was done to learn more about public perceptions of urban strip malls and to suggest horticultural and landscape practices for communities or developers who wish to improve the visual quality of a strip mall setting. Positive shopper inferences about businesses are associated with central business districts having a quality landscape (1). This study utilized the principles and methods of these prior studies to explore public response to strip mall landscape alternatives.

This article starts with a brief overview of strip mall purposes and public response to urban landscapes. Then the research is introduced - a project that utilized psychometric and econometric approaches. Results of the statistical analysis are presented. Finally, results are discussed as applied guidelines for vegetation planning and management, useful for developers or business associations who would like to employ landscape improvements for transportation, aesthetic, and marketing purposes.

## BACKGROUND

### Mini-Malls

Strip malls (aka plaza or mini-mall) are found throughout urbanized North America, and in many developed nations around the world. A strip mall is typically developed as a small commercial unit, consisting of a row of multiple (usually connected) storefronts, set just off a highway or other major arterial road, and having associated parking spaces. A strip mall usually contains somewhere between 4 and 10 distinct storefronts, though one section of road may feature multiple strip malls. Traffic ingress/egress is controlled, and there are usually few pedestrian connections to surrounding neighborhoods.

The first shopping center (strip mall) in the U.S. was the Country Club Plaza in Kansas City, Missouri, built in the 1920s (2) While fairly new in human history the strip mall reflects ancient commercial principles; a road focuses the movement of people on a regular basis, and some of those passers-by will want to buy something. With the adoption of single-use zoning in cities, retail and commercial zones are often focused in a narrow band along major roads, with residential communities placed nearby.

Given the separation of residential and commercial areas, convenient location of strip malls offer significant advantage. Mini-malls are service-oriented and usually contain small-scale stores that serve everyday needs of nearby residents (such as a video store or small restaurant). Strip mall businesses are usually small, privately operated “mom and pop” enterprises.

Thus strip malls serve dual purpose of convenience for residential communities and providing relatively inexpensive retail spaces for start-up and small businesses. Therein lies the tension. Built at fairly low cost, and visible to thousands who drive by each day, strip malls are criticized for being ugly, contributing to the demise of traditional business districts, and reducing social interactions among shoppers. Nonetheless, strip mall architecture is simple and sturdy, maximizing usable space while keeping real estate costs low. Businesses having slim profit margins and low capital reserves are able to rent or lease affordable retail space, and offer basic goods and services to a community.

### **Urban Landscape Assessment**

Strip mall development will continue because they serve a definite utilitarian food and convenience role (3). Nonetheless, some communities have more stringent expectations for the visual impact of strip malls. And widespread adoption of “complete street” values are influencing the functions and character of roads that front strip malls (new and redeveloped). What is the potential role of urban vegetation in these situations?

Landscape assessment studies have been used in natural resource management since the 1960s to explore public perceptions and values associated with landscapes. Generally, people of all ages and cultural backgrounds prefer natural views to built settings. The presence of trees generally enhances public judgment of visual quality in cities (4, 5, 6). Trees are highly valued components of urban settings, and unkept nature in urban settings is less preferred than well-maintained nature.

Roadside plants contribute to roadside visual quality. In a California study (7) people judged simulations of proposed residential development for scenic quality. Drivers described roadside development as “cluttered” and “ugly,” while “pleasant” and “beautiful” were descriptions of highly vegetated highway corridors. Van passengers recorded attractiveness ratings for urban roadside views in Minnesota (8); highest values were awarded to road segments having nature features, and well-designed plantings and structural elements. A national study found that drivers prefer urban expressway landscapes having large trees that screen adjacent commercial properties; scenes with “commercial windows” were less preferred but provide a compromise for business owners who desire visibility (9, 10).

Positive response to urban nature is more substantial than usually considered. Psychological assessments of urban landscapes suggest that aesthetic response is more than a mere reaction to what is beautiful or pleasant, but is one expression of a complex array of perceptual and cognitive processes (11). Urban scenes containing trees (particularly large ones) are consistently highly preferred (5), and the general public rates the benefits of urban trees highly (12). Urban natural elements also contribute to impressions of place. Evaluative appraisals (13) and affective responses (14) in city streets are boosted by tree presence.

### **Community Economics**

Well designed and managed urban landscapes contribute to community economics in a number of ways. Talented workers and firms are attracted to places that have high levels of amenities and environmental quality (15). More detailed economic assessments show that real estate values are enhanced by landscape and vegetation. Market prices of homes is increased about 7 percent by the presence of trees in yards and at the property edge, and those homes near a naturalistic open space gain 10 to 20 percent in value (16).

Trees and nature generate economic benefits for commercial and retail enterprises as well. In one study rental rates were 7 percent higher for commercial office properties having a

quality landscape (17). In a series of studies of downtown business districts, shoppers report increased patronage and purchasing behavior in districts having a quality urban forest. Consumers report being willing to pay 9 to 12 percent more for goods and services in business districts having a mature tree canopy (1). Merchants pay close attention to the quality of indoor features such as product layout, music, and store lighting, and these contribute to store image, which influences patrons' perceptions. Shoppers accept higher prices for goods in stores having attractive settings and positive staff. Visual quality of the outdoor environment appears to also impact price behavior (18).

## **METHODS & PROCEDURES**

### **Research Questions**

Given community concerns about retail visual quality, and emerging Context Sensitive Solutions approaches, several research questions were derived to learn more about public response to the presence of plants in strip mall environments. These research questions guided a social science research effort:

- 1) How does vegetation influence public response to visual quality of strip mall developments?
- 2) Are there any differences in consumers' patronage behavior related to a mall's visual amenities?
- 3) Does landscape character influence what consumers would be willing-to-pay for goods and services?

### **Survey Construction**

Survey methods were selected to conduct the research. An eight-page photo-questionnaire began with a photo-preference exercise. Several additional banks of variables were provided to test consumer perceptions and behavior associated with varied landscape scenarios. Demographic variables elicited information about respondent age, gender, race and household characteristics.

A photographic image sample was generated for the survey using a combination of photography of actual strip mall settings and digital editing. Three base images were judged to be building and parking conditions typical of strip malls in temperate North American cities. Base images contained foreground views of arterial, mid-ground views of the road edge and mall parking lot, and one story "small box" architecture with mounted vendors signs. Image selection was done to reduce variability of visual content, and known confounds in public preference response were avoided, such as overhead utility lines, tidiness, and upkeep (19, 20).

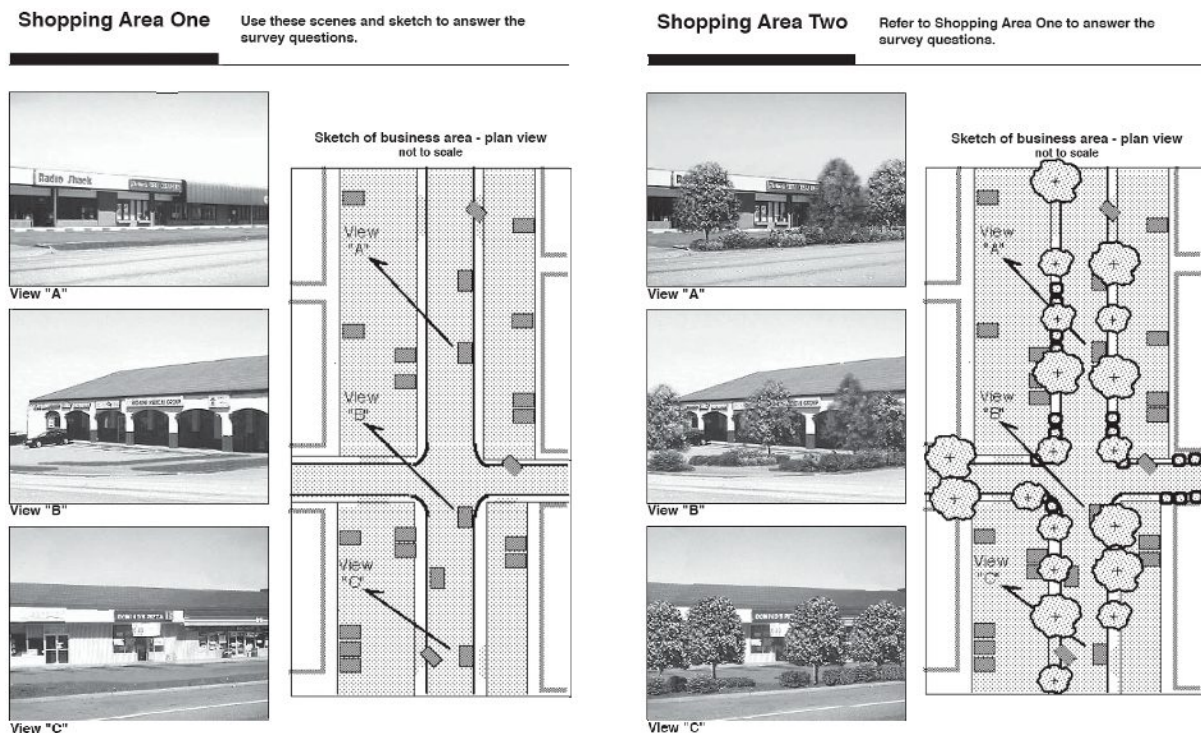
Each base image was digitally edited to include eight conditions of varied landscape treatment. Variations included vegetation structure (tree and shrub combinations), management approach (whether manicured or naturalistic) and spacing (linear equidistant or random). The final presentation set contained twenty-six black and white images (one base image was excluded due to content similarity and survey space limitations), randomly presented. Respondents rated how much they liked each image on a Likert scale from 1=not at all to 5=very much, and high preference.

Two hypothetical scenarios of business districts were constructed using photographic composites and plan sketches (Figure 1). Scenarios differed with respect to quantity and arrangement of vegetation. Secondary visual distractions (such as litter, building age and utility lines) were avoided. The *No Vegetation* district scenes contain no trees or shrubs, showing uninterrupted rows of storefronts. The *Mature Vegetation* scenario depicts a similar street scene

with street trees of mature height and associated shrubs. No conflicts of trees with structures or infrastructure are apparent.

While the scenarios did not represent places with which respondents had direct experience, the constructions were intended to capture the features and character of a generic retail mall environment common to many shoppers' everyday experience. In addition, the problems of scenario-based survey design have been widely discussed and guidelines for improved reliability were followed (23). Respondents were asked to project their shopping behavior using rating scales and categorical responses. Each respondent saw both scenarios, but responded to one (by random assignment).

Three sets of variables measured consumer response. Respondents provided ratings on perceptual descriptions of the district, and reported their likely behavior on five patronage variables. A final section presented a contingent valuation method exercise, asking respondents to indicate their willingness-to-pay (WTP) values for a list of goods and services. Contingent valuation is an economic analysis tool typically used to assess values for non-market, environmental public goods (such as wildlife conservation, clean air, and environmental protection). In this study the tool was applied to an urban environment.



**FIGURE 1** Visual descriptions of survey scenarios.

**Respondent Sampling**

Residents of three major cities in the Pacific Northwest region of the U.S. were sent surveys: Seattle (WA), Tacoma (WA), and Portland (WA). These cities were chosen as they are the three greatest population centers in the geographic region, and places that have extensive strip mall development. A random list of mailing addresses was purchased from a commercial list broker, generated within specified zip codes of the target cities.

After pretesting, 1200 self-administered surveys were mailed. A cover letter introduced the purpose of the study and encouraged prompt response. A self-addressed, stamped return envelope was provided. Reminder post cards were sent two weeks after the survey mailing.

Mailing procedures generated 165 reasonably complete responses, and given that 63 were nondeliverable or were returned without response, the response rate was 14.5%. A 20 to 25 percent return was expected of urban mail surveys decades ago (21), but response rates have fallen (22). A low response rate may have been due to the more difficult task of assigning prices in the survey (23), or a lack of public interest in the retail landscapes being studied. The possibility of non-response bias must be considered. No non-response assessments were conducted.

### **Respondent Traits**

The last section of the questionnaire contained several demographic and background items. 33% of respondents were in their 20s and 30s, 44% were in their 40s and 50s, and 24% were in their 60s or older. The majority of respondents were male (60%), and Caucasian (85%). 12% of responding households contained a single person, while 36% were two person households, with 46% claiming to be composed of 3 or more persons. 47% of households had persons 18 years or younger in age.

Stated annual family income varied considerably. 21% claimed \$35,000 or less per year, 49% selected the \$35-50,000 range, while 30% earn greater than \$75,000 annually.

Generally, respondents are mixed male and female, and are white. The majority of respondents were in the 40-59 age span, and have children, most younger than 18 years of age. While similar on other demographic traits they represent diverse income groups, and their earnings are slightly higher than the U.S. national median for the study year (\$38,885).

### **ANALYSIS AND RESULTS**

Data analysis involved several approaches. Descriptive statistics, followed by factor analysis, revealed categories of response in the preference ratings. For scenarios, individual response items were first tallied, then combined using data reduction methods to look for underlying categories, then compared for differences in response between conditions of streets having and not having trees. In some instances comparisons were also made between respondent subgroups.

#### **Visual Quality/Preference**

Does the presence of vegetation affect visual quality of small mall retail settings? Several analytic procedures were used to interpret data meaning. Images were edited to depict a gradient of vegetation treatments. Descriptive statistics for images reveal mean preferences at about 1.4 for scenes having only lawn in the foreground, and thus uninterrupted views of the mall buildings. Ratings of 2.4 were associated with low shrub borders. Images having both trees and shrubs that create filtered views of parking and building to drive-by viewers registered means of approximately 3.5. Meanwhile, scenes that portrayed dense, tall vegetation that blocked views of buildings registered at about 3.0. Figure 2 depicts high and low rated scenes.

Principal axis factor analysis with Varimax rotation was used to extract underlying common dimensions based on observed covariation of individual items. Several decision rules were employed to determine inclusion of any item within a specific category (11): an item factor loading of at least .40, category eigenvalue of 1.00 or greater, and all recognized categories had to have at least two items. Three categories emerged from the analytic procedure, accounting for



**FIGURE 2** Image mean ratings, high and low.

66% of the total variable variance, and included 25 images. One image double-loaded on a factor and so was excluded from further analysis.

Each group was assigned an assemblage epithet to depict their principal vegetation and site features. Following dimensional analysis new variables were constructed by aggregating mean values for each variable across all category items for each respondent. The result was a set of dependent variables (Figure 3), later used for independent samples t-Test comparisons.

The images of *Mixed Screen* display a combination of trees and shrubs planted at the property edge. The vegetation composition is varied, depicting mixed species and irregular placement of plants. The foreground landscape obscures views of midground buildings. *Ordered Trees* images contain large trees, planted in regular order at the property edge with the ground plane planted in grass. Category 3, *Shrub Edge* depicts a border plantings of both sheared and naturalistically maintained low-growing shrubs. Unlike the two other categories, background buildings are in full view behind the vegetated edge. The base images, containing *No Vegetation* in the foreground, formed a fourth category, with uninterrupted views of parking area and buildings.

The gradation of vegetation composition and structure used to digitally construct the three image series is reflected in the response patterns. The lowest rated category contains views of strip mall buildings visually unmitigated by landscape vegetation, unfortunately a condition seen too often in America's commercial corridors. From the most barren scenes of buildings and parking lots, category preference means increase with increased quantities and structure of vegetation. Of note when considering installation and maintenance costs, preference ratings take a major step up with the addition of shrub and hedge plant materials. Another preference increment is added when trees are planted, with the highest visual quality values being assigned to tree plantings having associated shrub materials.

Comparisons of response to visual categories by respondent demographics indicated no significant differences, with one exception. Respondents with higher household income rated *Mixed Screen* higher for visual quality ( $df=2$ ,  $F=4.470$ ,  $p=.013$ ).



**Preference Category 1: Mixed Screen - mean 3.18, 0.91 SD**



**A10: load .767, mean 2.97**



**A15: load .737, mean 3.25**

**Preference Category 2: Ordered Trees, mean 3.09, 0.78 SD**



**A5: load .778, mean 3.27**



**A18: load .742, mean 3.03**

**Preference Category 3: Shrub Edge, mean 2.35, 0.96 SD**



**A25: load .854, mean 2.20**



**A19: load .840, mean 2.38**

**Preference Category 4: No Vegetation, mean 1.39, 0.83 SD**



**A3: load .647, mean 1.37**



**A21: load .585, mean 1.41**

**FIGURE 3 Image preference categories.**

Perceptions Categories & Items	Factor Loading	Item Mean*	Mall Scenario		Ind Samples T-test
			No Vegetation	Mature Vegetation	
<b>Category 1: Business Quality</b>			Mean	Mean	t=-3.552
shop-keepers are informative	0.767	3.70	3.76	4.30	p=.001
products are well-made and reliable	0.738	3.91	0.88 SD	0.93 SD	df=144
wide selection of products and services	0.733	3.50			
merchants will do special orders	0.641	3.18			
diverse businesses and services	0.486	4.27			
goods and services are fairly priced	0.477	4.01			
<b>Category 2: Amenities &amp; Attractions</b>			Mean	Mean	t=-10.902
attractive to tourists	0.824	2.50	2.97	5.23	p<.001
would like to live near here	0.798	2.20	1.31 SD	1.21 SD	df=147
positive image	0.710	2.81			
has a pleasant atmosphere	0.708	2.72			
clean and litter-free	0.549	4.67			
<b>Category 3: Positive Merchants</b>			Mean	Mean	t=-5.107
good customer service	0.745	3.97	3.82	4.77	p<.001
businesses are friendly and approachable	0.462	3.67	1.07 SD	1.18 SD	df=144
<b>Category 4: Wayfinding</b>			Mean	Mean	t=9.003
able to see stores from the street	0.646	6.35	5.90	4.27	p<.001
easy to find what one is looking for	0.615	5.78	0.81 SD	1.31 SD	df=149
easy access to shops from street	0.590	5.57			

\* item ratings: 1=strongly disagree thru 7=strongly agree

**TABLE 1 Place Perceptions – Categories and Means Comparisons**

**Place Perceptions**

While viewing two scenarios, respondents were asked to rate their level of agreement with statements about one of the locations using a series of Likert scales with ratings ranging from 1=“strongly disagree” to 7=“strongly agree.” Categories were statistically derived and described using analytic approaches described for visual preference data. Four categories contained 16 of 25 original items, and accounted for 60 percent of the total variable variance. Individual variables were combined to construct dummy variables, and responses were compared between the mall scenarios (Table 1) using alpha levels that were adjusted for multiple comparisons (.05/4=.0125).

The presence of mixed trees and shrubs enhances judgments of *Amenities and Attractions*. Respondents strongly inferred that the green mall was associated with more positive atmosphere, cleanliness, image, and to be a more favorable place for residents and tourists alike. Such findings not surprising as prior studies about nature and city streets found that evaluative appraisals (20) and affective response (15) are boosted by the presence of trees.

Perhaps less anticipated would be the results for categories *Business Quality* and *Positive Merchants*. Despite there being no obvious indication of the condition of stores nor merchants, respondents attributed significantly better business conditions and interactions for the scenario that differed only in landscape character. Quality and selection of products, level of customer service, and merchant helpfulness were all judged to be more positive in the vegetated mall. This finding is consistent with positive judgments of merchants and shops found in studies of central business districts that have quality urban forest canopy (1). A consumer's cognitive

interpretations and representations of place extend to include the quality of social interaction and response that he/she expects.

An inverse relationship was found for the *Wayfinding* category. Responding to the survey visual prompts, study participants highlighted the common complaint of business people that vegetation can restrict visibility of signage and storefronts. Generally, drive-by views and the search for a particular store could be hindered by lot edge landscape.

Patronage Variable	Scenarios	
	No Vegetation	Mature Vegetation
<b>Time willing to travel to reach place?</b>		
Pearson X <sup>2</sup> =11.310, p < .004, Cramer's V=.271		
less than 10 minutes	55	32
10 to 20 minutes	41	53
more than 20 minutes	4	15
Total	100%	100%
	n=82	n=72
<b>Distance willing to travel?</b>		
Pearson X <sup>2</sup> =5.185, p < .075, Cramer's V=.183		
up to 2 miles	40	24
2 to 5 miles	32	36
more than 5 miles	28	40
Total	100%	100%
	n=82	n=72
<b>Time would spend during visit?</b>		
Pearson X <sup>2</sup> =11.327, p < .003, Cramer's V=.272		
up to 10 minutes	29	12
10 to 30 minutes	54	49
more than 30 minutes	17	39
Total	100%	100%
	n=81	n=72
<b>Frequency or how often return?</b>		
Pearson X <sup>2</sup> =17.664, p < .000, Cramer's V=.354		
less than once a month	54	20
once a week to once a month	33	51
once a week or more	13	29
Total	100%	100%
	n=76	n=65

response frequencies expressed as %s

**TABLE 2 Patronage Variables – Scenario Comparisons**

**Shopper Patronage**

Respondents were queried about potential patronage behavior by judging likely travel time, travel distance, duration of visit, and frequency of visits when considering their mall scenario. Variables presented an ordered array of categorical response choices. Tables of response frequencies were analyzed to again evaluate the relationship of reported actions to mall character. Responses on all but one patronage variable were found to be significantly higher when comparing *Mature Vegetation* to *No Vegetation* conditions (Table 2).

An inverse pattern of response was evident. Responses for *No Vegetation* settings are concentrated at the low end of each of the patronage variable's values and become less frequent moving toward the high end. *Mature Vegetation* malls exhibit fewer low value responses, and response frequencies increase across higher values. Associations of positive patronage response to landscaped malls are not linear; responses to vegetated conditions exhibit a slight decline at the variables' highest response levels but generally remain at higher frequencies than for the more barren streetscape.

Why is patronage behavior important? Many businesses in strip malls are small, independent start up enterprises. Increasing the amount of time spent by returning customers, and having more people who have traveled greater distances to a mall site may translate to greater sales revenue (24) and perhaps a higher success rate for new entrepreneurs. For instance, respondents claimed greater travel times for a mall that is landscaped, suggesting an expanded trade area radius that includes thousands of people within dense urban population centers.

### Product Pricing

The urban forest is a public good, rarely generating products that can be directly exchanged on markets. A pricing assessment was done using contingent valuation method (23) to assess the impact of site landscape on local economics. Respondents were presented with a list of goods and services that would be available in a strip mall, representing product classes generally used by marketers. Convenience goods are widely available and purchased with little deliberation. Shopping goods are purchased after planning and comparison and are selectively distributed. Finally, specialty goods have high brand recognition and consumer loyalty thus little comparison shopping is done before purchase.

Respondents were asked to state the price they would be willing-to-pay for each of fifteen items. Three index variables were constructed by combining values across product classes for each participant (Table 3). Significant differences were found when comparing means across the types of goods. Respondents reported lower values for goods in the *No Vegetation* mall. Price differences between scenarios are considerable: approximately 34 percent for convenience, 40 percent for shopping, and 23 percent for specialty goods. Analysis using weighted standardized scores across all products generated a more conservative 8.8 percent difference, a finding consistent with the 9 to 12 percent range found for central business districts (1). An "amenity margin" in pricing represents potential revenues that can offset landscape investment and management costs.

Index & Items	Scenarios		Ind Samples
	No Vegetation	Mature Vegetation	T-test
<b>Convenience Goods</b>	Mean	Mean	t=-3.840
ice cream cone, desk clock, flower bouquet	7.74	10.34	p < .000
bread loaf, lunch sandwich, appointment book	3.23 SD	4.10 SD	df=116
<b>Shopping Goods</b>	Mean	Mean	t=-4.650
sports shoes, watch, light jacket,	37.88	52.96	p < .000
pots & pans, camera, gallon of paint	16.60 SD	17.68 SD	df=110
<b>Specialty Goods</b>	Mean	Mean	t=-2.220
new glasses, art print,	54.64	67.24	p < .03
gift for spouse/partner	26.25 SD	24.58 SD	df=79

**TABLE 3 Products Pricing – Scenario Comparisons**

### DISCUSSION

This and prior studies indicate that public response to retail landscapes extends from what is visually pleasing to implications for shopper actions. Consumer behavior is quite complex from a psychological perspective. Economists traditionally considered the primary behavior of consumers to be utilitarian and oriented to satisfying needs through purchases. Recent retail research has expanded to considerations of cognitive (or information processing) functions in consumers, and to how emotion and attitude inform judgments about retail places (25).

The four-concept framework for this research program - visual quality, place perceptions, shopper patronage and product pricing – guided a comprehensive measures approach that demonstrates the value of a green consumer environment. The product pricing results are often of greatest interest to merchant audiences, but other measures yield insights as to why shoppers may be willing to pay more for products in malls having better landscape quality.

Study images displayed modest streetscape revisions. Yet in this study, as in several similar investigations, public judgments of visual quality were much enhanced by the presence of trees and associated vegetation. Landscape influences obvious place qualities, and provide cues of retail experiences for which there is no direct information. While preference ratings were higher for landscaped settings, it is interesting to note that ratings of this study fell short of the highs in studies of central business districts – attaining ratings of up to 4.0 on a 5.0 scale (1), confirming community concerns about reduced visual quality of strip malls.

Positive judgments about maintenance and image were also associated with the presence of landscape, despite the scenario base images having the same levels of building care and site tidiness. Respondents also attributed social traits and characteristics of the in-store experience based on vegetation conditions. Judgments of products and merchants were more positive in heavily landscaped places as are inferences about product value, product quality, and merchant responsiveness.

Urban greening advocates are often challenged to demonstrate fiscal benefits from trees and other vegetation in urban settings. Responses on patronage variables relate directly to revenue potential, as they indicate a potentially expanded customer base. For instance, greater travel times were reported for the scenario with landscape, indicating an expanded trade area radius. Both indications higher frequency of visits and spending more time once arrived suggest business patrons may spend more in an extended period of time.

Many benefits of urban natural resources (such as air and water quality improvements) cannot be bought or sold because of incomplete or nonexistent markets. Contingent valuation was used in this study to estimate the values of public good associated with trees in retail settings. Respondents consistently reported greater willingness-to-pay values for goods and services in the landscaped mall – at an overall rate of 8.8 percent.

A quality landscape at the road edge appears to be an important part of the “curb appeal” of small mall retailers. The increased revenue due to pricing and patronage behavior is of benefit to small businesses. Another level of useful analysis would be to determine whether increased returns offset the costs of planting and managing plants.

### **Limitations**

Several research limitations present opportunities for follow up studies. Potential non-response bias is one concern. Considerable effort was made to construct a comprehensive sampling frame, but response outcomes limit generalizability of the results. Response may have been reduced by the difficulty of the contingent behavior questions, the taken-for-grantedness of small mall settings, or unfamiliarity with the survey task.

Of greatest interest is the correlation between stated behavior in the survey and actual behavior in shopping areas. Questions of both reliability and validity are important (26). Verbal expressions of how people would behave differ consistently and significantly between the two scenarios. Such findings indicate that there could be real behavioral effects, but the magnitude of the differences expressed may not accurately predict actual behavioral differences. Marketing research methods could be used in future research to observe and track shopper behaviors in comparable places that do, and do not, have a landscaped streetscape.

## **Planning and Management**

The results of this study have several implications for vegetation planning and management in urban streets and corridors.

### *Planting Spaces and Care*

Based on public preferences the space allocations for vegetation should be reconsidered. Municipal and county code may require perimeter landscape, but the widths of the planting zones are usually inadequate. Narrow planting strips that contain inadequate quantities and quality of soil cause plant stress, and force plant-to-infrastructure conflicts, such as heaved paving. Better site design may be able to achieve identical functional requirements (e.g. building footprint and parking) yet provide consolidated spaces more suited to plants. Healthier plants may provide more customer appeal.

Too often landscapes are neglected once installed. Optimal benefits are gained from landscapes through ongoing maintenance and care. Strip malls offer some efficiencies as building managers or associations of merchants could pool resources for a comprehensive approach to landscape management.

Many local governments are promoting or requiring Low Impact Development practices to improve stormwater management. LID physical features (such as bioswales and rain gardens) can be carefully designed to serve multiple functions. While they may be installed for water control purposes, their quality and character can also serve as a customer amenity.

### *Visibility and Vegetation Configuration*

Reduced visibility of storefronts and signage due to vegetation is a major concern of merchants. The reduced ratings on *Wayfinding* perceptions confirmed that customers are not as likely to see internal businesses if a mall is surrounded by trees. Two solutions are possible.

Large trees were associated with the highest visual ratings. Careful pruning and management for building views can enable greater street level visibility while sustaining the amenity values that big trees provide for shoppers. Limbing-up and canopy thinning of large trees is a better management strategy for visual quality enhancement than topping at sign levels or planting smaller trees whose mature canopy height is the same as business windows and signage.

Mid range visual responses offer a compromise in planting design. Larger, more upright vegetation can be planted intermittently to create a green “frame” to momentarily focus a driver’s eye. Presenting businesses and their products using vegetation frames may help drivers to more easily distinguish individual retailers within an unceasing stream of complex roadside stimulus, and reduce visual distractions that can influence driver response and safety.

### *Signage Design*

Signage may be the ultimate point of tension concerning tall vegetation and business visibility. Individual businesses typically have large signs above their storefronts, ideally visible from the road, and may have individual signs closer to the road. These signs are often placed at considerable cost.

In many communities there is an inherent conflict between perimeter or property edge plantings, often required by commercial zoning code, and sign requirements on buildings. If a small mall owner complies with both sets of requirements, sight lines are soon conflicted. Local requirements may inherently lead to customers not being able to identify businesses and products.



Revisiting zoning code is necessary in many communities. One design solution is to move signage to the front of or in midst of landscape vegetation. Monument signs are an example (Figure 4). This style of sign serves two purposes. First, it enables a business community to steward a full landscape complement of trees, understory shrubs and groundcover. Second, it reduces visual distraction of signage as drivers come to expect foreground visual targets that quickly convey the entire complement of merchants, goods, and services that they will find within a mini-mall. Colorful low growing vegetation at the base of the sign can further direct a driver's attention to the business listing.



**FIGURE 4** Streetside monument signage.

Small malls are ubiquitous in American cities, frequented by many, and held in disdain by some. They are the places where many small business dreams begin, then grow or fail. Communities are ever more interested in creating transportation corridors that enable expanded use by cars, bicyclists and pedestrians, and enhance the experience of place. This study explored one element of retail space – the roadside landscape of mini-malls. The results demonstrate that the presence of trees and plants positively influences public response to strip mall settings, including aesthetic and economic dimensions. Roadside landscape and vegetation contributes to the sustainability of the urban environment and retail vitality.

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