ABSTRACT

Title of Dissertation: LIVELY STREETS: EXPLORING THE RELATIONSHIP BETWEEN BUILT ENVIRONMENT AND SOCIAL BEHAVIOR

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Streets constitute a significant part of open public space and are the most important symbols of the public realm. Streets that cater to the functional, social, and leisure needs of people have been positively associated with economic growth, physical health of people, and a sense of community. Increasingly, scholars suggest thinking of the street as a social space rather than just a channel for movement. Despite such suggestions, few studies have addressed the relationships between social behavior and the environmental quality of the street. Moreover, the studies that have, tend to separate the study of physical features from land uses, and hence do not deal with the interrelationships between behavioral patterns and the physical features of the street, and its sociability.

This dissertation was an empirical examination of behavioral responses, perceptions, and attitudes of people to the physical characteristics, use, and management of the neighborhood commercial street in two cities and one town in the Boston metropolitan area. It used methods based in environment-behavior sciences involving

extensive observations of these streets over eight months, and interviews with people using these streets to understand their behaviors and perceptions.

The biggest competitive advantage of neighborhood commercial streets is their ability to support social interaction. The findings reveal that people were equally concerned with the social and physical dimensions of the street. The presence of community places and the street's landuse and physical character determined the use of the street. People preferred settings that had stores that were community-gathering places, which held special collective meanings for the people of the neighborhood and were thus destinations to meet friends and to see other people and activities; that had a variety of stores on the block, particularly those that served daily shopping needs; that had unique independently operated stores with friendly service, a distinctive character and ambience, and personalized shop-windows and entrances; that were pedestrian-friendly with ample sidewalk space with seating and other street furniture, and shade and shelter; and that had buildings with permeable and articulated street facades providing sheltered small-scale spaces.

LIVELY STREETS: EXPLORING THE RELATIONSHIP BETWEEN BUILT ENVIRONMENT AND SOCIAL BEHAVIOR

by

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CHAPTER 1: INTRODUCTION

Urban design literature stresses the role of and need for meaningful public space for the experience of public life and social interaction (Jacobs, 1961; Lynch, 1984; Gehl, 1987; Crowhurst-Lennard and Lennard, 1987, 1995; Vernez-Moudon, 1991; Carr et al., 1992; Tibbalds, 1992; Sorkin, 1992; Zukin, 1996; Cooper-Marcus and Francis, 1998, among others). Urban areas in the last few decades have seen only a marginal expansion in public open spaces such as parks, neighborhood sports facilities, open park systems, and greenways; cities, especially in the United States, are struggling to keep up with the demand for these types of public open spaces (Banerjee, 2001). At the same time, there has been a growing demand and resurgence in the investment in, and use of, existing and new pedestrian oriented streets, squares, plazas, and other traditional types of open public spaces in cities (Whyte, 1980; Crowhurst-Lennard and Lennard, 1987, 1995; Gehl, 1989; Carr et al., 1992; Gehl and Gemzoe, 1996, 2000; Dane, 1997; Cooper-Marcus and Francis, 1998; PPS, 2000).

In urban areas, streets constitute a significant part of the open public space and are seen as the most important symbols of the public realm (Jacobs, 1961; Appleyard, 1981; Vernez-Moudon, 1991; Jacobs, 1993; Chekki, 1994; Southworth and Ben-Joseph, 1996; Lofland, 1998; Hass-Klau et al., 1999; Carmona et al., 2003). People depend on streets for functional, social, and leisure activities. Streets that cater to these needs have been positively associated with economic growth (Florida, 2002), physical health (Frank et al., 2003), and a sense of community (Smith, 1975; Whyte, 1988; Christoforidis, 1994;

Langdon, 1997). Increasingly, scholars suggest thinking of the street as a social space rather than just a channel for movement (see, for example, Jacobs, 1961; Appleyard, 1981; Vernez-Moudon, 1991; Gehl, 1987; Brower, 1988; Jacobs, 1993; Loukaitou-Sederis and Banerjee, 1998; Hass-Klau et al., 1999). Some argue that the social affordances offered for the presence of people in public spaces such as streets might be more important than the physical affordances that the environment offers (Gibson, 1979; Knowles and Smith, 1982; Heft, 1989; Stokols, 1995). However, not all streets are able to equally afford social activities. Some streets are certainly livelier than others.

This dissertation is an empirical examination of behavioral responses and attitudes of people to the physical characteristics, use, and management of neighborhood commercial streets in two cities and one town in Massachusetts. The focus is to determine relationships between micro-scale physical characteristics and uses, and people's patterns of social activities on neighborhood commercial streets. The underlying objective of the study is to aid policymaking, planning, and design processes in creating new streets or modifying existing ones such that they are able to better afford social interaction. The study uses a theoretical framework and methods based in environment-behavior sciences. It attempts to provide rich and detailed information on the relationships between the street environment and human behavior while also aiming at some generalization of this information. By employing a mixed-method strategy using qualitative and quantitative methods, the research attempts to be exploratory and inductive, as well as confirmatory and deductive.

Public Space

Public space is only one part, a physical manifestation, of the public realm (Thomas, 1991). Yet, it plays an important role in sustaining the public realm (Sennett, 1971; Thomas, 1991; Lofland, 1998). There are various definitions of public space largely distinguished by issues of ownership, control, and access. Some authors define it strictly as the "space that is not controlled by private individuals or organizations, and hence is open to the general public. This space is characterized by the possibility of allowing different groups of people, regardless of their class, ethnicity, gender and age, to intermingle" (Madanipour, 1996, p. 144-145). For the purpose of this study, such a definition may be at the same time both limiting and too broad. For example, there are indoor and outdoor spaces owned and operated by private trusts and conservancies that are just as open to the public as publicly owned libraries and parks. At the same time, there are spaces that are publicly owned, such as the offices of government employees, which offer very limited access to the public. Hence, ownership and control are inadequate criteria to define public space in the context of this study.

Another basis for defining public space focuses on the issues of access and use. In this sense, public space is defined as "publicly accessible places where people go for group or individual activities" (Carr et al., 1992, p. 50). In the physical dimension, public space is "all the parts of the urban fabric to which the public has physical and visual access. Thus, it extends from the street, park, square of a town or city into the buildings which enclose and line them" (Tibbalds, 1992, p. 1).

For the purpose of this study, the term public space is used to refer to the access and use of the space rather than its ownership. Hence, privately owned spaces that are

accessible to the public qualify as public space and those publicly owned spaces that are not accessible to the public do not. Therefore, public space is the space that is open to the general public and subject to the regulations that govern the use of the space.

The Role of Public Space

This intent of this study is not to produce an extensive list of the roles of public space through history. Many of these roles, such as the collection of water and the disposal of garbage, the dissemination of news, and the display of public punishments and executions (Lofland, 1998) no longer pertain in present times. Rather, the intent is to identify the roles of public space in highly privatized contemporary societies.

There is a growing belief that while modern urban societies no longer depend on the town square or the piazza for basic needs, good urban public space is required for the social and psychological health of modern communities (Poppink cited in Cooper-Marcus and Francis, 1998). Recent research in urban studies indicates that public space in contemporary times is important to generate, enhance, and sustain a sense of community (Boyer, 1994; Hayden, 1995). Local residents attach meaning to everyday public spaces and places as valuable "sacred structures" in their daily life (Hester, 1993). Public spaces where people regularly meet their friends and watch daily life play a critical role in people's lives (Low, 2000). Crowhurst-Lennard and Lennard (1987, 1995) engage the literature from sociology, psychology, psychiatry, political science, architecture, urban design, and planning to develop a list of social functions served in public spaces. This list includes learning, the development of social competence, the exchange of information, the facilitation of social dialogue, the fostering of social awareness, the enhancement of social integrative functions, and the encouragement of ethical conduct. Scholars in

various fields related to urban studies contend that it is the streets, plazas, squares, parks, and other urban public spaces that have the potential to be "the stage upon which the drama of communal life unfolds" (Carr et al., 1992, p. 3). It is argued that such spaces are "… our great scenes of the civic, visible and accessible, our binding agents"(Sorkin, 1992, p. xv). Public space offers various possibilities for social contact to experience diversity and creative disorder, which, as Sennett (1971) suggests, enhances personal growth.

> For if the multiple points of social contact once characterizing the city can be reawakened under terms appropriate to affluence, then some channels for experiencing diversity and order will again be open to men. The great promise of city life is a new kind of confusion possible within its borders, an anarchy that will not destroy men, but make them richer and more mature (p. 108).

Meaningful urban public space has the ability to support, facilitate, and promote public life, adeptly characterized by Oldenberg (1981) as an essential counterpart to our private, home and work spaces, to satisfy our need for contact, communication, play, and relaxation.

The dichotomy of private and public, the duality of life man leads, is recalled by Berman (1986) interpreting Marx's (1840) concept of an "egoistical individual" and a "communal being" or "a man and a citizen." Making a case for public space, Berman suggests that to resolve the differences and inner contradictions between the private and the public self, and to lead more integrated lives true to democratic societies, people not only need radical change in the political and social systems but a place to "come together freely to do it on their own" (Berman, 1986, p. 476). Similarly, Arendt (1958) argues that public space provides the ability for people to come together, to discuss, and to recognize each other's presence, which is crucial to democracy. Thomas (1991) expands on this

role of public space and suggests "that public space is an essential arena which provides opportunities for individuals and communities to develop and enrich their lives" (p. 222). He identifies four roles for public space:

> i) as an arena for public life;
> ii) as a meeting place for different social groups;
> iii) as a space for the display of symbols and images in society;
> iv) as a part of the communication system between urban activities (p. 210).

Further, Walzer (1986) argues that public space is the "space we share with strangers, people who are not our relatives, friends or work associates. It is the space for politics, religion, commerce, sport; space for peaceful coexistence and impersonal encounters. Its character expresses and also conditions our public life, civic culture and everyday discourse" (quoted in Thomas, 1991, p. 215). Advocating for public space in the city center, Whyte (1988) describes the multiple roles of public space as being the

> place for news and gossip, for the creation of ideas, for marketing them and swiping them, for hatching deals, for starting parades. This is the stuff of the public life of the city-by no means wholly admirable, often abrasive, noisy, contentious, without apparent purpose. But this human congress is the genius of the place, its reason for being, its great marginal edge. This is the engine, the city's true export (p. 341).

Lofland (1998) adds yet another dimension of tolerance and argues that active and passive social contact in open public space such as streets provides the setting for the "learning of cosmopolitanism" and citizens

> … must, in the normal course of their everyday lives, rub shoulders with – accomplish uneventful interactions with – persons of whom they disapprove, with whom they disagree, toward whom they feel at least mild antipathy, or who evoke in them at least mild fear. That means that any city that is capable of teaching urbanity and tolerance must have a hard edge. Cleaned-up, tidy, purified, Disneyland cities (or sections of cities) where nothing shocks, nothing disgusts, nothing is even slightly feared may be pleasant sites for family outings or corporate gatherings, but their public places will not help to create cosmopolitans (p. 243).

Crowhurst-Lennard and Lennard (1995) argue, “urban public space is the single most important element in establishing a city’s livability” (p. 25). From their research in European cities, they suggest that good urban public space provides easy and safe access for all, facilitates a variety of activities, fosters self-esteem and sense of belonging, increases awareness and interest in the environment, and provides enjoyment and social contact.

Open Public Space

As a part of an overview of public space, Carr et al. (1992) have compiled a typology of contemporary urban public spaces. The authors suggest that these different urban public spaces cater to different needs and various physical and social aspects of human functioning including comfort, relaxation, passive and active engagement, and discovery. By the nature of their type, access, and use, these spaces are likely to satisfy one or more of the aspects mentioned above.

Much of the literature on public space does not distinguish between enclosed and open public space, as open public space constitutes a substantially larger portion of the typology of public space. Historically, open public spaces have constituted a majority of public space where public life occurred in cities. As a contrast, in contemporary times, indoor public spaces that are often semi-privatized house a majority of public life. However, there is currently a renewed interest in traditional open space typologies. For the purpose of this study, then, open public space will connote not only the spaces between buildings but also the objects and artifacts therein, and the buildings that help define the physical boundaries of the spaces. Hence, open public space is more than merely the exterior open space of a street or square. It includes the interface between the

exterior public open space and both private and public interior space. This study, however, is limited to the study of one type of traditional open public space – the neighborhood commercial street.

Streets as Primary Urban Public Space

> Think of a city and what comes to mind? Its streets. If a city's streets look interesting, the city looks interesting; if they look dull, the city looks dull (Jacobs, 1961, p. 29).

Streets are an important part of open public space in the city. For many urbanites, it is the streets that represent the outdoors (Jacobs, 1993). People depend on streets for functional, social and leisure activities, for travel, shopping, play, meeting, and interaction with other people, and even relaxation (Jacobs, 1961; Appleyard, 1981; Gehl, 1987; Vernez-Moudon, 1991; Carr et al., 1992; Jacobs, 1993; Southworth and Ben-Joseph, 1996; Lofland, 1998; Hass-Klau et al., 1999; Carmona et al., 2003). "Streets and their sidewalks, the main public spaces of the city, are its most vital organs. Sidewalks, their bordering uses, and their users, are active participants in the drama of civilization…" (Jacobs, 1961, pp. 29-30). In urban areas, streets represent a majority of the area of public space (Vernez-Moudon, 1991; Jacobs, 1993; Southworth and Ben-Joseph, 1996) and the efforts to revitalize the public realm are often efforts to revitalize streets – to generate activity and to make streets lively (see, for example, NMSC). Streets are a very significant part of the informal *external public realm*. "Accessible to all, these spaces constitute public space in its purest form" (Carmona et al., 2003, p. 111). Scholars suggest that if "… we do right by our streets we can in large measure do right by the city as a whole – and, therefore and most importantly, by its inhabitants" (Jacobs, 1993, p. 314). Streets hold a special place in the literature on public space and are both literally

and metaphorically the most fitting symbol of the public realm (Jacobs, 1961; Rudofsky, 1969; Jacobs, 1993; Chekki, 1994; Lofland, 1998). Hence, the discourse about the public realm or urban public space is often a discussion of the street.

It is noted that with the privatization of public space, shopping malls, corporate plazas, and the like have replaced traditional public spaces and Main Streets (Rybczynski, 1993; Kowinski, 1985 from Banerjee, 2001). The same consumer culture and the need for active and passive engagement and interaction, relaxation, and leisure also supports the concept of public life in coffee shops, bookstores, theaters, health clubs, etc. on traditional public spaces such as streets (Banerjee, 2001). In mixed-use neighborhoods, much of this public and social life now occurs at such venues on neighborhood commercial streets.

Neighborhood Commercial Streets

Mixed-use neighborhoods are predominantly residential neighborhoods that also include work, retail, cultural, and/or light industrial uses. Urban design and planning literature in the last few decades has suggested that mixed-use neighborhoods are a desirable pattern of physical development in urban regions. It is expected that by mixing various land uses we can achieve a more vital, vibrant, attractive, safe, viable, and sustainable pattern of urban lifestyle (Jacobs, 1961; Bentley et al., 1985; Whyte, 1988; Krier, 1992; Calthorpe, 1993; Kunstler, 1994; Ewing, 1996; Coupland, 1997; Llewelyn-Davis, 2000; Duany et al., 2000, among others). Previous studies have shown that one of the most important characteristics that people look for in mixed-use neighborhoods is the liveliness and diversity of the predominantly core areas - the neighborhood commercial streets (Brower, 1996). Hence, one of the most important components of mixed-use

neighborhoods is the planning and design of neighborhood commercial streets to support the functions, activities, and ambience desired by the people who will live or work there.

Considerable work has been done to establish the relationship between the level of pedestrian activity and macro-scale physical factors such as socioeconomics, location, accessibility, major destinations, density, major natural features, and so on (see, for example, Cervero, 1996; Messenger and Ewing, 1996; Cervero and Kockelman, 1997; Vernez-Moudon, Hess, Snyder, and Stanilov, 1997; Kitamura, Laidet, and Mokhtarian, 1997; Kasturi, Sun, and Wilmot, 1998; Greenwald and Boarnet, 2000; Crane, 2000; Boarnet and Crane, 2001; Ewing and Cervero, 2001; Frank and Engelke, 2001; Handy, Boarnet, Ewing, and Killingsworth, 2002; Saelens, Sallis, and Frank, 2003, among others). However, even when these macro-scale factors are similar there are distinct variations between the use of streets even within one mixed-use neighborhood. Some streets are certainly livelier than others.

Defining Lively Streets

Dictionary meanings of liveliness vary immensely, connoting such feelings as full of life and energy, animated, exciting, full of activity and stimulating, and even bright and colorful, bouncy, or springy, to name just a few (Webster's Dictionary, 1996). Based on these definitions many kinds of streets may qualify as lively. However, for this study liveliness is exclusively associated with people and activities. Hence, in this context liveliness may be attributed to the presence and amicable interaction of people in their surrounding environment. Variations in activities result in differences in the kinds of perceived liveliness of a street. Hence, a street may appear lively because of a number of people walking through it: a dynamic activity. Alternatively, the appearance of liveliness

of a street may be the result of a number of people engaged in various activities while seated, lingering, or standing in it: a predominantly static or stationary activity. Further, the appearance of liveliness may be a result of a combination of both static and dynamic forms of activities. For the purpose of this study, a lively street is defined as a street with the presence of a number of people engaged in a variety of predominantly stationary and sustained activities, particularly those activities that are social in nature.

The idea of lively streets as defined for this study is not new. Urban Planning literature in the past has often referred to these types of streets and similar spaces. Lively streets are synonymous with the qualities that Jacobs (1961) appreciated on Greenwich Village streets and sidewalks, and they are what Walzer (1986) has described as

> *open-minded* space, designed for a variety of uses, including unforeseen and unforeseeable uses, and used by citizens who do different things and are prepared to tolerate, even take interest in, things they don't do. When we enter this sort of space, we are characteristically prepared to loiter (Walzer, 1986, pp. 470-471).

Lively streets are a desired component of any good mixed-use neighborhood and therefore of any good city (Jacobs, 1961; Lynch, 1984; Gehl, 1987; Whyte, 1988; Montgomery, 1998; Coupland, 1997; Llewelyn-Davis, 2000; Carmona et al., 2003, among others).

Streets as Social Space

Historically, streets in cities were used as spaces to serve basic survival, communication, and entertainment needs and to perform several political, religious, commercial, civic, and social functions (Rudofsky, 1969; Lofland, 1973, 1998). In contemporary developed societies, many of these functions have moved to private or virtual realms or to different types of parochial and public spaces (Brill, 1989, 1990;

Chidister, 1989; Rybczynski, 1993; Banerjee, 2001). However, especially in many center-city and mixed-use neighborhoods, people still depend on streets for functional, social and leisure activities, for travel, shopping, play, meeting, and interaction with other people, and even relaxation (Jacobs, 1961; Appleyard, 1981; Gehl, 1987; Vernez-Moudon, 1991; Carr et al. 1992; Jacobs, 1993; Southworth and Ben-Joseph, 1996; Lofland, 1998; Hass-Klau et al., 1999; Carmona et al., 2003). The notion of the street as a space for social interaction that may occur as a result of any of these activities is the focus of this study.

Research in shopping behavior and why people go shopping provides valuable information on people's needs in the public realm and has relevance to neighborhood commercial streets. Studies show that besides the primary activity of acquiring goods and services, people go shopping to meet and spend time with their friends, to look around and people-watch, and to walk around. Sociologists and environmental psychologists have identified social affiliation and interaction, sensory stimulation, and other leisurely activities among important and basic motives for shopping behavior (Tauber, 1972; Jansen-Verbeke, 1987; Bloch, Ridgway and Sherrell, 1989; Bloch, Ridgway and Dawson, 1994; Falk, 1997, among others).

Scholars in various fields related to urban studies suggest thinking about the street as a social space rather than a channel for movement (see, for example, Jacobs, 1961; Appleyard, 1981; Vernez-Moudon, 1991; Gehl, 1987; Brower, 1988; Jacobs, 1993; Loukaitou-Sederis and Banerjee, 1998; Hass-Klau et al., 1999). Streets provide opportunities for short-term, low-intensity contacts that constitute easy interactions with other people in a relaxed and relatively undemanding way (Jacobs, 1961; Gehl, 1987). It

is suggested that these short-term, low-intensity contacts or weak ties are possible beginnings of deeper and more long-term social interactions and engagements between people (Jacobs, 1961; Granovetter, 1973; Greenbaum, 1982; Gehl, 1987). Jacobs (1961) argues that through repeated short-term contacts people grow to trust their fellow city dwellers who may otherwise be total strangers.

> The sum of such casual, public contact at a local level – most of it fortuitous, most of it associated with errands, all of it metered by the person concerned and not thrust upon him by anyone – is a feeling for the public identity of people, a web of public respect and trust, and a resource in time of personal or neighborhood need. … Lowly, unpurposeful and random as they may appear, sidewalk contacts are the small change from which a city's wealth of public life may grow. (Jacobs, 1961, pp. 56 & 72)

The street is an environment that offers multiple lessons for children just by watching people and their activities. Experiences in public space are not only a source for the education of children in learning how to cope with new situations in real life (Jacobs, 1961; Gehl, 1987; Francis, 1988; Moore, 1991), but also for the education of adults in learning, by observing the way people do things differently (Lofland, 1998). Additionally, seeing other people engaged in activities can be an inspiration to engage in new activities. Hence, even in contemporary times, the street, as a social space, can play multiple roles and offer social contact and interaction, social awareness and learning, and social cohesion.

Research Question and Theoretical Basis for Study

This study is an empirical investigation of peoples' behavioral responses and attitudes toward the physical characteristics, use, and operation of neighborhood commercial streets in cities. The specific research question is: *What micro-scale physical characteristics, uses, and their management strategies are able to support stationary and*

social activities on neighborhood commercial streets? This study therefore examines neighborhood commercial streets in an attempt to ascertain what attributes of street design are associated with stationary, sustained, and lingering activities, especially social activities that make the street lively. It focuses on determining relationships between micro-scale physical characteristics and uses, and people's patterns of social activity on neighborhood commercial streets.

As a basis for inquiry, the study uses a theoretical framework and methods based in the field of environment-behavior sciences. The study builds on Barker's (1968) concept of *behavior setting* which examines everyday human behavior with relation to its physical settings; Gibson's (1979) theory of *environmental affordances,* which suggests that the physical characteristics of a setting affords activities and aesthetic experiences; and Canter's (1977) *theory of place,* which proposes that a setting is understood as a combination of its physical characteristics, the activities associated with it, and the meanings that it holds for people.

Using this theoretical framework, this study analyzes neighborhood commercial streets in the context of Maslow's (1943, 1954) hierarchy of human needs and Steele's (1973) dimensions of physical settings. The study identifies and engages only those human needs and dimensions that are pertinent to the public realm and may be satisfied in public space.

CHAPTER 2: LITERATURE REVIEW

Camillo Sitte (1889) sensed the boredom and inhumane qualities of the modern city. In his treatise he elaborated on Alberti's idea of a 'science of art' which suggests that in order to provide aesthetic pleasure the built environment must follow a set of rules that are imposed by the human body (Choay, 1997). Sitte was aware of Alberti's concern with commodity and he acknowledged its importance in his work. He scientifically formulated universal principles for the design of urban fabric by basing his work in the realm of psychology and urged city planners not to overlook the visual, experiential, and public use dimensions of the historic city. Of these, the former, the visual and artistic aspects, became the focus of urban design in the twentieth century. As Cullen (1961) suggests, "We turn to the *faculty of sight*, for it is almost entirely through vision that the environment is apprehended" (p. 8). As a result, traditionally the "visual-aesthetic tradition" has been the dominant urban design paradigm (Jarvis, 1980; Carmona et al., 2003), and the process of design has been largely governed by the personal tastes, intuition, and aesthetic criteria of professionals trained in the fields of design. Even liveliness and vitality were associated with the appearance of buildings and their formal and spatial composition. Cullen (1961) suggests that when, "… buildings have been put together in a group so that one can get inside the group, then the space created between the buildings is seen to have a life of its own over and above the buildings which created it …" (p. 7). The visual needs and personal tastes of the few trained professionals became the benchmark for the design of the environment. As a result, a substantial source of

literature on streets and other public spaces emerges from architectural and design circles and is largely conceptual, theoretical, and inspirational in nature (see, for example, Rudofsky, 1969; Rowe and Koetter, 1978; Krier, 1979; Rossi, 1982). This kind of literature is often engaged in the evolution of new and creative methods to analyze form and space, rather than the understanding of issues of use and meaning for everyday users of these spaces.

Advances in environmental psychology, behavioral sciences, and social sciences provided an alternative to the traditional visual-aesthetic approach. It was suggested that for the planning and design of the environment, the study and analysis of human behavior provides a more appropriate, relevant, and richer view of human needs in the use of space, form, and artifacts than the traditionally intuitive visual-aesthetic approach (Lynch, 1960, 1984; Jacobs, 1961; Alexander, 1964, 1965, 1977; Studer, 1969; Perin, 1970; Jarvis, 1980; Lang, 1987). This study builds on theories that resulted from these advances, and develops a theoretical framework and methods based in the field of environment-behavior sciences.

Theoretical Framework

As stated earlier, Barker's (1968) theory of *behavior settings*, Gibson's (1979) theory of *environmental affordances*, and Canter's (1977) *theory of place* form the theoretical framework for this study. All three theories were developed in the fields of environmental and ecological psychology in the last four decades and have been recognized as foundations for environment and behavior research (Lang, 1987) also known as environment-behavior studies or EBS (see, for example, Rapoport 1990). All three theories have overlapping concepts. Gibson particularly, more than Canter, has built

upon Barker's work in ecological psychology. This study attempts to synthesize the three theories and use the synthesis as a theoretical base for investigation.

Behavior Settings

Barker's (1968) concept of *behavior setting* and the creation of the field of *Ecological Psychology* focus on the study of everyday human behavior with relation to physical settings. This concept of a *behavior setting* examines the relationship between a physical environment (setting) and the patterns of behavior that may possibly take place in it (Lang, 1987). A *behavior setting* consists of a *milieu* (a particular layout of the environment), a *standing pattern of behavior* (a recurrent activity), and a *synomorphy* (a congruent relationship between the two) (Barker, 1968; Bechtel, 1977, 1997; Lang, 1987). The greater the congruent relationship between the particular layout of the environment and the activity, the better the *behavior setting* is able to afford human behaviors and needs. Allan Wicker further enhanced the concept of ecological psychology by placing it in the context of larger social contexts and issues. His work emphasized the importance of behavior settings as the most immediate and "behaviorally significant, human environments" (Wicker, 1979), and the importance of the theory of "*manning*": the dependency of the behavior setting to operate with an optimal number of people. Wicker suggests that in the case of undermanning or overmanning adjustments must be made in order for the behavior setting to operate normally.

The present study of neighborhood commercial streets uses the concept of a *behavior setting* and identifies a block and a block-segment as the *milieu* (see Methods chapter for details). The relationship between the layout and characteristics of the block-segment and the behaviors and activities taking place there is examined to determine how

well it is able to support stationary, sustained, and lingering activities and social interaction.

Environmental Affordances

The term "affordances" coined by Gibson (1979) refers to the physical properties of an object or environment (setting) that enable it to be used for some activity. Unlike the concept of behavior settings, *affordances* do not possess "coercive" or "invitational qualities" (Gibson, 1979; Lang, 1987). Gibson further developed Barker's (1968) work on behavior settings and proposed that the physical properties are characteristics and configurations of the object or setting that not only afford behaviors but aesthetic experiences as well. By physically altering an object or setting, we can, and constantly do, change its affordances. Even if do not alter the affordances of an object or setting, their usefulness and meaning may change with the needs, and the cultural and individual background of the individual who perceives them (Lang, 1987). However,

In addition, similar to the idea of a behavior setting, the various affordances of an object or setting do not imply that it will be used. Affordances may either support or limit activities; they do not necessarily generate or "trigger" an outcome (Heft, 1997). "The affordances of the environment are what it offers … what it provides or furnishes, either for good or for ill" (Gibson, 1979, p. 129).

Place Theory

Canter's (1977) *theory of place* adds another dimension to the concept of behavior setting in environmental psychology. According to Canter, environments or places are defined by, and understood as, the physical characteristics of the place, the activities in them, and the meanings that they hold for people. Unlike for Tuan (1977), Relph (1976),

Norberg-Schulz (1982), or Hiss (1990), this concept of *place* does not imply a quality of a setting. Instead it makes "… available a unit of study that encapsulates a mixture of processes that create our experience of our socio-physical surroundings" (Canter, 1991, p. 118). Therefore, in essence, Canter suggests that our understanding of a setting depends on what we *do* in places and how we *feel* about them.

Human Behavior as a Basis for Design

Environmental psychologists have developed new research methods in order to test their theories. These methods involve studying real life situations and engaging common users of the environment. It is suggested that an effective way to study human behavior and to understand human needs and preferences is by empirically observing human behavior (Studer, 1969; Craik, 1970; Michelson, 1975).

> The most commonly accepted unit for design purposes is 'human need'. Such a concept has relevance perhaps; what it lacks is empirical substance. That is, we cannot observe need, but we can only infer its existence through observation of its empirical counterpart, <u>behavior</u> … Human behavior to be more correct unit of analysis, it has characteristics, which are relevant, empirically verifiable and operationally definable (Studer, 1969, quoted in Joardar, 1977).

Based on theories in ecological psychology and criticizing the results of architectural designs, Perin (1970) developed the concept of *behavior circuits* suited to the field of environmental design. A *behavior circuit* implies "… an anthropological ergonomics, tracking people's behavior through the fulfillment of their everyday purposes at the scale of the room, the house, the block, the neighborhood, the city, in order to learn what resources - physical and human - are needed to support, facilitate or enable them" (p. 78). However, following Canter (1977) and Gibson (1979), it is suggested that the criteria for selection of place encompass more than its ability to afford

behavior. The role that aesthetic responses and affective qualities play in selection of place is equally important in understanding the use of space (Hull and Harvey, 1989; Kaplan et al., 1989; Nasar, 1994).

Hence, following the theories in ecological psychology and understanding of place, an effective way to better understand human needs and preferences on neighborhood commercial streets would be to empirically study the interrelationships between the characteristics of the street (including its uses, physical characteristics, and the management of the uses and the street space) and the behaviors (actions) as well as attitudes (feelings) of the users through both observational techniques and user evaluation.

Human Needs: A Sense of Comfort and Pleasure on the Street

Establishing a hierarchy of human needs, Maslow (1943, 1954) identified physiological needs, safety, belonging, esteem, self-actualization, and cognitive and aesthetic needs in the built environment. Similarly, Steele (1973) suggested six purposes or dimensions of the built environment that influence the functioning of individuals or groups: shelter and security, social contact, symbolic identification, task instrumentality, pleasure, and growth. Maslow's (1954) and Steele's (1973) concepts of human needs in the environment may be understood as elaborations on the Vitruvian concerns for *utilitas* and *venustas* – commodity and delight. In essence, it is argued that if the built environment can house and support desired activities, human patterns of interaction, and human patterns of movement, it can satisfy most of the range of human needs (Lang, 1987).

Hence, a responsive environment is one that provides physiological comfort, affords standing patterns of behavior, provides pleasing sensory experiences, and has positive symbolic associations for its users (Lang, 1987; Santayana, 1896 from Lang, 1987). However, both Maslow and Steele address human needs in both private and public realms. This study only encompasses those needs and dimensions that may be satisfied in public space.

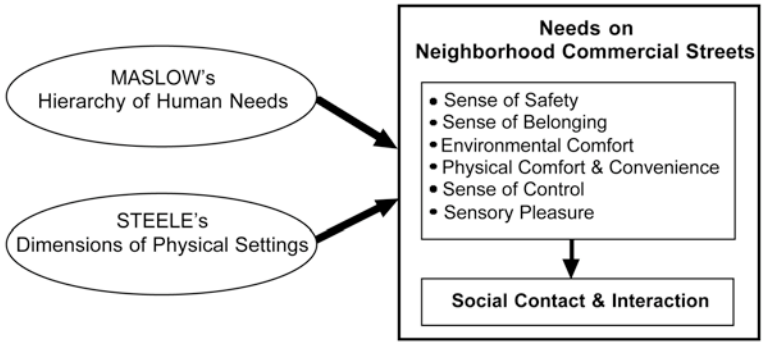

Figure 1. Framework of Needs on Neighborhood Commercial Streets

Seven categories of human needs on neighborhood commercial streets are identified based on this theoretical framework. It is suggested that desirable neighborhood commercial streets would be ones that provide a sense of safety, a sense of belonging, environmental comfort, convenience and physical comfort, a sense of control over the environment, sensory pleasure, and opportunities for social contact and interaction. Streets that cater to the first six categories of human needs in public space are likely to attract more people, and are therefore likely to create possibilities for satisfying the need for social contact and interaction (see Figure 1). The following sections

summarize the theoretical and empirical literature in these categories and reveal the voids in the existing literature.

Sense of Safety on the Street

Maslow (1943, 1954) classified safety needs as second only to physiological human needs. While the sense of real and perceived safety is affected by the characteristics of the environment, it also affects the use of the environment. Previous research has shown that the sense of safety on the street is affected by these environmental characteristics: the physical condition and maintenance of the environment; the configuration of streets and spaces; the types of land uses; the alterations and modifications made to the environment; and the presence or absence of, and the kind of, people. Some recent studies show that people perceived streets to be safer where there were trees, and the grass was maintained (Kuo, Bacaicoa and Sullivan, 1998) and also where there was a presence of stores and other non-residential properties on the street (Perkins, Wandersman, Rich and Taylor, 1993). Jacobs' (1961) treatise on city streets identified stores, bars, restaurants, and other "third places" (Oldenburg, 1981) as basic components of surveillance and safety throughout the day.

> The basic requisite for such surveillance is a substantial quantity of stores and other public places sprinkled along the sidewalks of a district; enterprises and public places that are used by evening and night must be among them especially. Stores, bars and restaurants, as the chief examples, work in several different and complex ways to abet sidewalk safety (Jacobs, 1961, p. 36).

Perkins (1986) found that personalization of property made the street environment appear safer, as did the presence of street lights, block watch signs, yard decorations and private plantings (Perkins, Meeks and Taylor, 1992). Conversely, a lack of territorial

control made the street environment perceptibly less safe (Taylor, Gottfredson and Brower, 1984). Various other studies have found the perception of safety to be negatively affected by the presence of litter, graffiti, vandalism, and poorly maintained buildings (Skogan and Maxfield, 1981; Hope and Hough, 1988; Perkins, Meeks and Taylor, 1992).

Sense of Belonging: Community Places

Sociologists have for long emphasized the significance of symbolic dimension of shared experiences of people in a neighborhood. Both Maslow (1954) and Steele (1973) recognize the need for a sense of belonging and shared symbolic identification, as basic human needs. A sense of belonging and emotional attachment along with an ability to influence and fulfill certain needs is required to achieve a sense of community in a neighborhood and to define it as a community rather than a just a group of people (McMillan and Chavis, 1986). It is suggested that associations with people, places, and events contributes to a sense of familiarity and belonging to the community (Oldenburg, 1981; Hester, 1984). Places that help shape community attitudes, that provide a continuity from past to present, that may often cater to mundane but essential everyday functions, that help in establishing their community's identity become significant to the neighbors and achieve a social value and meaning (Johnston, 1992; Lofland, 1998). Johnston adds that these are places that "loom large in the daily comings and goings of life" and "are accessible to the public and offer the possibility of repeated use to build up associations and value to the community of users." Often these are small local businesses or informal community gathering places in the neighborhood and are what Oldenburg (1981) has termed "third places." Hester (1984), contends that in neighborhoods these places are usually "public and ambiguously owned private spaces" and among many

others, are likely to be favorite spaces, streets, sidewalks, storefronts, alleys, parks, and so on. His research suggests that these places attain a sense of "collective-symbolic ownership" and are ones that people in the neighborhood hold most "sacred" (Hester, 1984, 1993). As Hester suggests, because often these places appear to be ordinary, their loss is realized only when their existence is threatened or when they no longer exist (Lofland, 1998).

Environmental Comfort on the Street

Environmental comfort through protection from the natural elements and the provision of shelter is the most basic human need, and this is a primary role of the built environment (Maslow, 1954; Steele, 1973). While humans are known to sometimes function in very challenging environmental conditions, the satisfaction of basic physiological needs, including environmental comfort precedes the accomplishment of higher order needs such as belonging, esteem, cognitive and aesthetic needs (Maslow, 1943, 1954).

Existing literature on the effects of environmental factors on human behavior shows that comfortable microclimatic conditions, including temperature, sunlight and shade, and wind, are important in supporting outdoor activities (Pushkarev and Zupan, 1975; Cohen, Moss and Zube, 1979; Bosselmann et al., 1984; Gehl, 1987; Arens and Bosselmann, 1989; Khisty, n. d. from Rapoport, 1990). In a recent study of 20 towns and cities in Europe, Hass-Klau et al. (1999) found that social activities occurred in places that had "plenty of sunshine" and were protected from the wind. Sunlight has been found to be a major attraction in the use of open public spaces (Share, 1978; Liebermann, 1984; Whyte, 1980; Banerjee and Loukaitou-Sederis, 1992). However, Whyte's (1980) study of

plazas in New York City showed that while sunlight was an important factor in the spring, people sought shade provided by trees, awnings, canopies, and overhangs during the warmer summer months. Similarly, Zacharias et al. (2001) found that in Montreal's public open spaces at temperatures above 20° Celsius (68° Fahrenheit) people preferred to move to areas under shade.

Hence, good microclimatic conditions that may largely be a consequence of man-made conditions altering the natural climate become a prerequisite for supporting outdoor activities in open public spaces.

Physical Comfort and Convenience on the Street

Beyond offering protection from sun, wind, and rain, and providing a physiologically suitable setting, the street environment as a milieu needs to afford the various activities and standing patterns of behavior that may potentially occur on the street within its cultural context (Barker, 1968; Rapoport, 1969, 1977). In doing so, the design of the street environment needs to be anthropometrically and ergonomically sensitive (Croney, 1971; Kanowitz and Sorkin, 1983, from Lang, 1987).

Physical characteristics and uses identified as contributing to retaining people in public spaces and possibly supporting social behavior include sitting space (DiVette, 1977 from Rapoport 1990; Joardar and Neill, 1978; Linday, 1978; Share, 1978; Whyte, 1980; Hass-Klau et al., 1999); other street furniture and physical artifacts (Prieser, 1971; Cooper-Marcus, 1975; Joardar and Neill, 1978; Gehl, 1987); generous sidewalk width (Whyte, 1980); trees (Share, 1978; Joardar and Neill, 1978; Whyte, 1980; Coley et al., 1997; Sullivan et al., 2004, among others); a high degree of articulation with nooks, corners, small setbacks in adjacent walls, and landscape elements such as ledges,

planters, and so on (De Jonge, 1967-68; Stilitz, 1969, 1970 from Joardar, 1977; Alexander et al., 1977; Joardar and Neill, 1978; Whyte, 1980; Gehl, 1987); eating establishments such as restaurants and cafes (DiVette 1977 from Rapoport 1990; Alexander et al., 1977; Whyte, 1980; Banerjee and Loukaitou-Sederis, 1992; Montgomery, 1997; Hass-Klau et al., 1999); a variety of shops (Jacobs, 1961; Alexander et al., 1977; Montgomery, 1998; Hass-Klau et al., 1999, among others); and the presence of retail (Whyte, 1980; Banerjee and Loukaitou-Sederis, 1992);

Studies of plazas in Vancouver and New York City showed that choice of sitting space in the form of benches, ledges, low walls, and so on was the most important factor in retaining people (Joardar and Neill, 1978; Whyte, 1980). Additionally, movable chairs were the most desired due to the choice, flexibility, and comfort they offered (Whyte, 1980). De Jonge (1968) observed that in public spaces the open parts of the space are occupied only after the edges have been fully occupied. This he termed the "edge effect." It is suggested that if the edge fails, the space is also likely to fail.

In sum, the literature suggests that the characteristics of landuse and the physical environment are both important to provide a useful, convenient, comfortable, and meaningful setting to attract and retain people in urban public spaces such as streets.

Territory, Personalization, and Control on the Street

First recorded in animals, territoriality or territorial behavior in humans is a kind of spatial behavior that involves permanently or temporarily laying claim to ownership of an area by personalizing it with the use of physical and/or symbolic barriers, markers and artifacts (Hall, 1966; Altman, 1975; Brower, 1980; Lang, 1987). Although territorial behavior is a critical mechanism for achieving private needs such as intimacy and

solitude (Brown, 1987), of concern to this study is the role territorial behavior plays in "stabilizing social relationships" (Altman, 1975). According to El-Sharkawy's four-part model, it is the *supporting* and *peripheral* territories, which address semipublic and public spaces that are pertinent to this study (El-Sharkawy, 1979, from Lang, 1987). By personalizing a space, people change the environment to meet their needs and specific activity patterns. This provides psychological security, a symbolic aesthetic, and the marking of territory (Lang, 1987, p. 148). Further, these gestures and objects, as manifestations of personalization suggest the presence of people and activity, and therefore of life, adding a human touch to the environment.

> Signs associated with occupancy can do more than announce the existence of territorial claims; they can also be seen as visible evidence of caring. They can represent a feeling of attachment between the occupant and the physical setting, and as such they will be felt to add "warmth" or "intimacy" to a setting, which, in the absence of such signs, would be too "monumental" or "sterile" or "inhuman"(Brower, 1980, p. 189).

Thus, personalization and sense of occupancy act as a sign of communication and a proxy to the presence of people and activity. "The concept of territoriality deals, then, with behavior that directly affects the security and maintenance of the physical environment. Because of this, it has much to offer to the city planners and urban designers, …" (Brower, 1980, p. 183). Increased opportunities for personalization add those elements in the environment that are of prime interest to people (Gehl, 1987). Territorial flexibility and opportunities for defining personal space are especially important in public spaces that are designed for supporting casual leisure behavior (Hall, 1966; Sommer, 1969 from Joardar, 1978). Hence, settings those offer the ability for people to personalize and territorialize space transfer a level of control, which provides freedom and comfort to the users.

Sensory Pleasure on the Street

Pleasure derived through a sensory experience of the street depends on various stimuli perceived from the environment –from the lights, sounds, smells, touches, colors, shapes, patterns, textures, and so on, of the fixed, semi-fixed, and movable elements that make up the street (Lang, 1987; Bell et al., 1990; Rapoport, 1990; Porteous, 1996). It is argued that to achieve sensory pleasure pedestrians prefer a high level of complexity resulting from variety and novelty (Platt, 1959; White, 1959; Berlyne, 1960; Parr, 1965, 1966; Rapoport and Kantor, 1967; Lozano, 1974; Alexander et al., 1977; Bentley et al., 1985; Gehl, 1987; Rapoport, 1990, among others); as well as order and coherence (Smith, 1980; Herzog et al., 1982; Kaplan and Kaplan, 1989; Nasar, 1998). Scholars note that sensory stimuli at the street are perceived from, but are not limited to, the characteristics of the edges of buildings that define the street, including fenestration, shop windows and the goods in them, canopies, awnings, signage, and so on; the street and sidewalk, including vehicles, street furniture and all other physical artifacts on it; natural features, such as landscape elements and trees; and people and their activities, including movements, sounds, etc. (Cullen, 1961; De Wolfe, 1966; Sharp, 1968; Gehl, 1987; Jacobs and Appleyard, 1987; Rapoport 1990; Arnold, 1993; Jacobs, 1993; Elshestaway, 1997; Lofland, 1998; Stamps, 1999; Heath et al., 2000, among others).

Specifically, empirical studies of streets and plazas show that sensory stimuli identified in contributing to the retention of people in public spaces include other people and activities (DiVette, 1977 from Rapoport 1990; Ciolek, 1978; Share, 1978; Whyte, 1980; Gehl, 1987; Hass-Klau et al., 1999); building features and shop windows (Ciolek, 1978; Whyte, 1980); personalized shop windows and signs (Gehl, 1987); trees (Joardar

and Neill, 1978; Share, 1978; Whyte, 1980); and the density and variety of form, texture, and color of shrubs and plants (Grey et al., 1970; Joardar and Neill, 1978; Share, 1978; Coley et al., 1997; Sullivan et al., 2004, among others).

In sum, studies conclude that people prefer open public spaces that provide a high level of culturally acceptable sensory stimuli resulting in a complexity that heightens interest without becoming over-stimulated and chaotic.

Opportunity for Research

In a literature review of both static and dynamic pedestrian activities, Rapoport (1990) found that most studies were done at a macro-scale and engaged "geographic literature" and "history of urban form"; were "based on personal, intuitive, and aesthetic criteria"; dealt more with traffic than pedestrian movement; that only a few dealt with perceptual characteristics of spaces; and that studies from the field of social sciences ignored the physical environment (p. 254). Additionally, there is rich literature on the history of the street that engages the subject of the historically changing cultural meaning of the street (Girouard, 1985; Celik, et al., 1995; Fyfe, 1998). However, there is limited research on the street as a behavior setting for everyday activities and social interaction.

Behavioral studies of open public spaces have been in use for the last four decades. Social activities in urban open spaces have been used as a measure of the town's vitality and liveliness, and as an indicator of the satisfaction of people with their physical surroundings (see, for example, Jacobs, 1961, Alexander et al., 1977; Gehl, 1987; Hass-Klau et al., 1999). However, a review of the literature reveals that there are only a handful of empirical studies that address the stationary and social behavior of people in urban open public spaces. Even among these that do, most are studies of plazas (see, for

example, Cooper-Marcus, 1975-1988 from Cooper-Marcus and Francis, 1998; Dornbush and Gelb, 1977; Joardar & Neill, 1978; Linday, 1978; Miles et al., 1978; Share, 1978; Whyte, 1980; Liebermann, 1984; Banerjee and Loukaitou-Sederis, 1992; Loukaitou-Sederis and Banerjee, 1993). Other studies have focused on predominantly residential streets and spaces (Appleyard, 1981; Eubank-Ahrens, 1991; Skjæveland, 2001; Sullivan, Kuo and DePooter, 2004). More noticeable is the fact that most studies deal with the macro- and meso-level aspects of the environment. Others categorically separate the study of the physical features of the environment from the land uses and the businesses and places that hold special meanings for the community. Hence, such studies do not deal with the interrelationships between the uses, the community places, and physical features of the street and the strategies in place to operate and manage these uses and the street space (see, for example, Hass-Klau et al., 1999; Joardar and Neill, 1978). At the same time, however, urban designers and planners realize that "… it remains difficult to isolate physical features from social and economic activities that bring value to our experiences …" (Jacobs, 1993, p. 270).

There is opportunity for research to view the experience from a user's perspective by focusing on the physical features, the uses and facilities, their operation and management, the meanings these hold for the users and, most important, the interrelationships between these that make the street lively. The current study attempts to analyze the neighborhood commercial street environment as a behavior setting that constitutes patterns of behavior as well as patterns of the physical layout of the environment. By simultaneously focusing on the physical features, the uses, and their operation and management, the meanings the have for the users and the interrelationships

between these, the study attempts to discover what makes the experience comfortable, interesting, and meaningful for stationary activity and social interaction.

Conceptual Framework

Figure 2 shows a conceptual framework for the study based on the theoretical framework discussed earlier and the review of the literature. The conceptual framework suggests that three factors - physical, landuse, and community places - constitute the characteristics of the street. These characteristics of the street influence a user's attitudes and perception, which also depend on the user's individual associations and background, and the presence of other people and activities. Together, user perceptions and street characteristics affect the overall perceived quality of the street, which, based on Maslow's (1954) and Steele's (1973) concepts, is presented here as a set of six categories discussed in detail in the preceding pages. The liveliness of a neighborhood commercial street, defined as the presence of stationary[1], sustained, and lingering activities[2], and social activities[3], and measured by the number of people, the number of people in groups, and their duration of stay, depends on the overall quality of the street.

[1] Stationary and Sustained Activities were defined as activities where a person was standing, sitting, or lying down in one place in the outdoors at the street for a duration of more than 15 seconds. **"Stationary activities" is used throughout the document to mean stationary, sustained, and lingering activities**.

[2] Lingering Activities were defined as activities where a person was moving around in the outdoors at the street within the 50 to 60 foot block-segment for more than 15 seconds, but not just passing through the block-segment.

[3] Social Activities were defined as activities where there were two or more persons engaged in stationary, sustained, or lingering activities and interacting with each other either actively or passively.

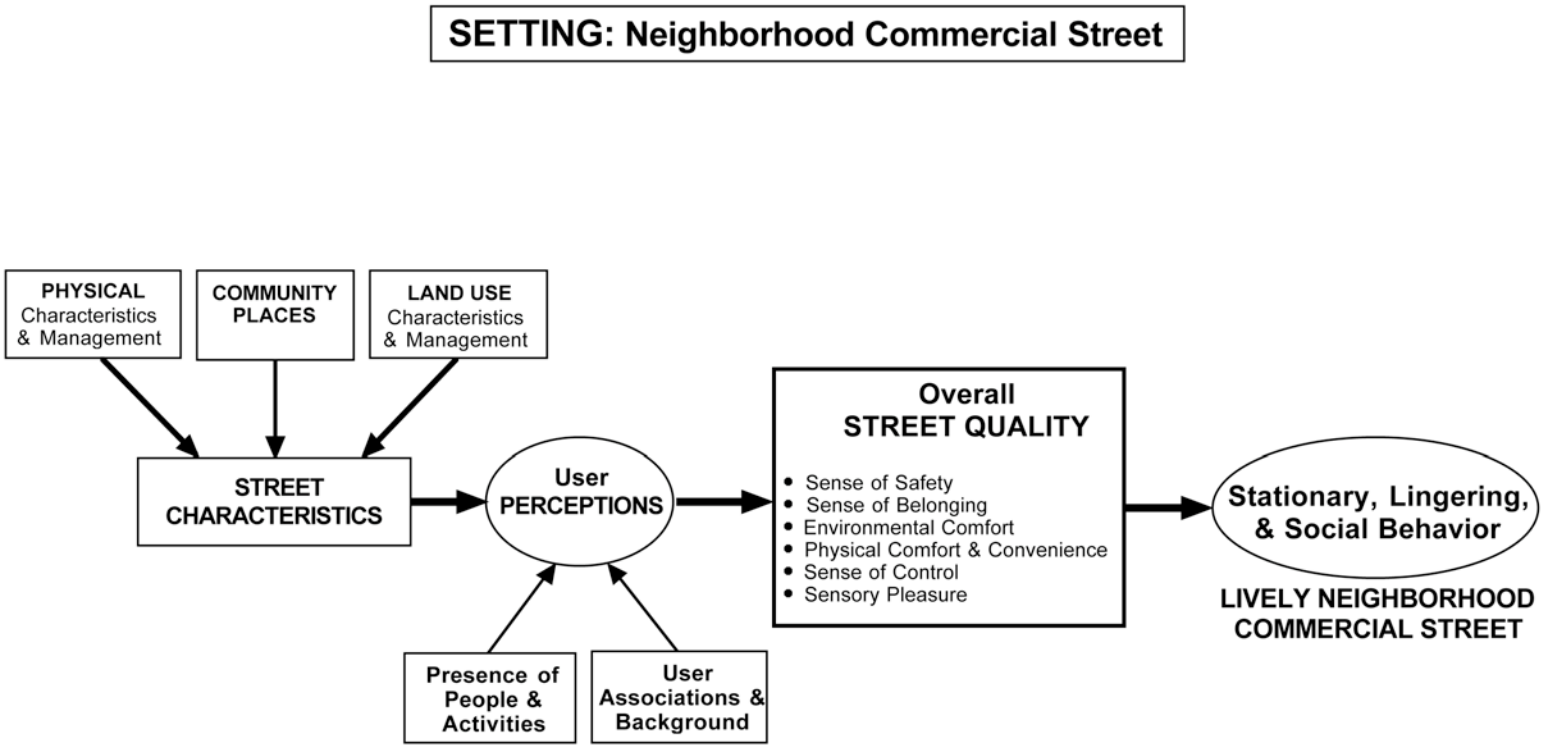

Figure 2. Conceptual Framework for the study

CHAPTER 3: METHODS

Concurrent Transformative Mixed-Method Strategy

A Concurrent Transformative Mixed-Method Strategy of inquiry consists of both qualitative and quantitative methods of inquiry to collect and analyze data (Creswell, 2003). In this study, qualitative and quantitative data were collected simultaneously and merged during the analysis phase to add dimension to the findings (see Figure 3).

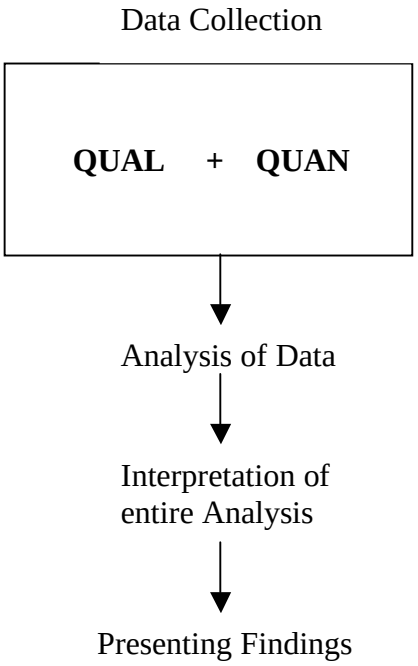

Figure 3. Concurrent Transformative Mixed-Method Strategy (adapted from Creswell, 2003)

As stated in the introduction, the primary objective for this study was to determine what environmental characteristics of neighborhood commercial streets support stationary, sustained, and lingering activities, especially those activities that are social in nature. As a part of the mixed-method strategy, the inquiry employed a multiple-method

survey involving a variety of techniques, including direct observation (with extensive field notes and photography), walk-by observation, pedestrian counts, a survey, and interview, to collect data on the behavior of people on the neighborhood commercial streets. Simultaneously, the three locations of study were used as case study areas for detailed observations of behavior. A face-to-face interview with residents, workers, and visitors of the three study areas provided information on people's attitudes and perceptions toward the street environment. Hence, both qualitative and quantitative data were collected, analyzed, and presented simultaneously in the study. It is suggested that a "survey design is useful when investigators want to find out in detail about a phenomenon, …" (Zeisel, 1981, p. 67). Additionally, although it is difficult to base generalizations on a few cases, case studies provide useful knowledge to suggest possible relationships between various factors (Yin, 2003; Zeisel, 1981). Miles and Huberman (1994) reiterate this view by stating that "… qualitative research lives and breathes through seeing the context; it is the particularities that produce the generalities, not the reverse" (p. 34).

The study also aimed to provide some generalization of this rich and detailed information. Structured visual surveys and other quantitative techniques provided data that could be analyzed using quantitative methods. Hence, by employing a mixed-method strategy using qualitative and quantitative methods, the research attempted to be exploratory and inductive, as well as confirmatory and deductive. "Quantitative research excels at summarizing large amounts of data and reaching generalizations based on statistical projections. Qualitative research excels at 'telling the story' from the

participant's viewpoint, providing the rich descriptive detail that sets quantitative results into their human context." (Trochim, 2004)

The Study Areas

Data presented in this study were collected on Massachusetts Avenue in the Central Square neighborhood in the City of Cambridge (population: 101,355[*]); Harvard Street in the Coolidge Corner neighborhood in the Town of Brookline (population: 57,107[*]); and Elm Street in the Davis Square neighborhood in the City of Somerville (population: 77,478[*]). All three town/cities are in the Boston metropolitan area in Massachusetts, and are on the MBTA transit system – the "T" (see Figure 4).

All three streets studied are the major commercial streets in the neighborhoods. The main transit ("T") stops are located on or adjacent to these neighborhood commercial streets that are promoted as pedestrian-friendly areas. All three are historic streets that comprise mostly older building stock with only a few new buildings constructed in the last 40 years. Almost all buildings are built to the sidewalk leaving no setbacks. Aside from a few newer buildings with commercial space, all buildings range from one to four stories in height. All three neighborhood commercial streets have a combination of small independently owned local businesses and national chain stores.

Central Square, Coolidge Corner, and Davis Square, may be classified as predominantly residential neighborhoods with most of their daily commercial, cultural, entertainment, and other needs and amenities catered for by the businesses and other uses

[*] Source: US Census Bureau – Year 2000 data
[*] *Ibid.*
[*] *Ibid.*

on the neighborhoods' commercial streets. In addition, the people of Boston metropolitan area consider these destinations for shopping, dining, and entertainment.

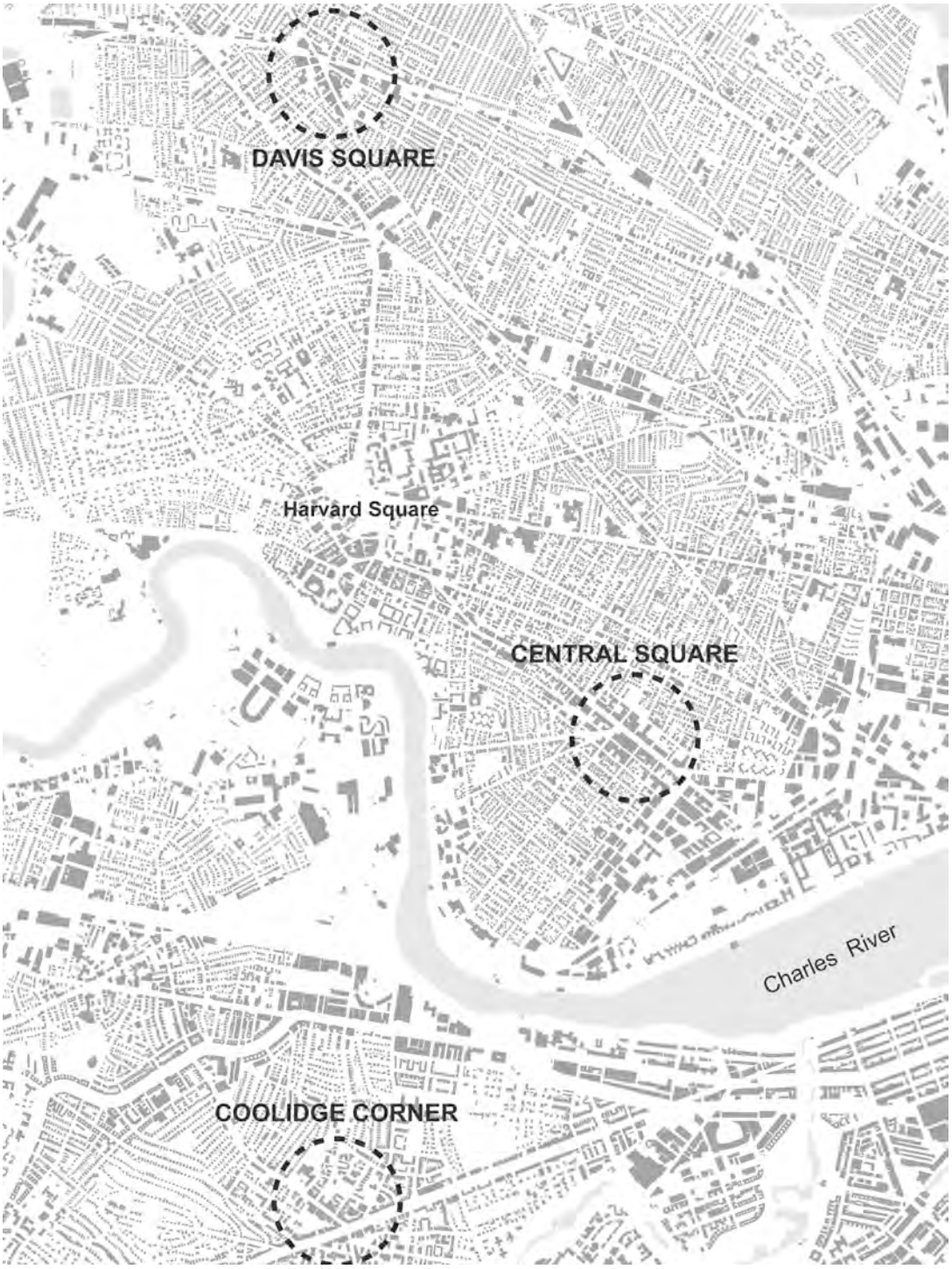

Figure 4. Location Plan – three study areas in the Boston metropolitan area

Figure 5. Massachusetts Avenue – main commercial street of Central Square neighborhood

Massachusetts Avenue, Central Square, Cambridge, MA.

The Central Square area is a diverse, vibrant, and lively mixed-use area in Cambridge. A myriad of uses, including a wide range of housing from single to multi-family, various types and scales of retail, offices, public institutional uses and some industrial uses, can be found in and around Central Square. Within close proximity to the south is the campus of the Massachusetts Institute of Technology; to the north is the main campus of Harvard University.

Massachusetts Avenue is the main north-south connection and the primary public street. Central Square itself is located at the southwest corner of the intersection of Massachusetts Avenue and Prospect Street. Major retail and commercial uses are located on Massachusetts Avenue, two blocks north and four blocks south of Prospect Street (see Figures 5 and 6). On this stretch of approximately six blocks on either side of Massachusetts Avenue, there is a variety of commercial establishments, some small independently owned or local chains, and some chain stores. These include a variety of restaurants, coffee shops, bars, fast food restaurants, grocery stores, convenience stores, hardware stores, pharmacies, electronics stores, cleaners, apparel stores, barbershops, hair and beauty salons, bookshops, video rental stores, teaching institutes, banks, offices, apartments, and so on (see Figures 5 and 6). The intersection of Massachusetts Avenue and Prospect Street is also a major transit node for this part of Cambridge, with numerous bus stops and subway ("T") entrances and exits located around the square on Massachusetts Avenue. The five blocks studied here are located on the northeast side of Massachusetts Avenue (see Figures 7 and 8).

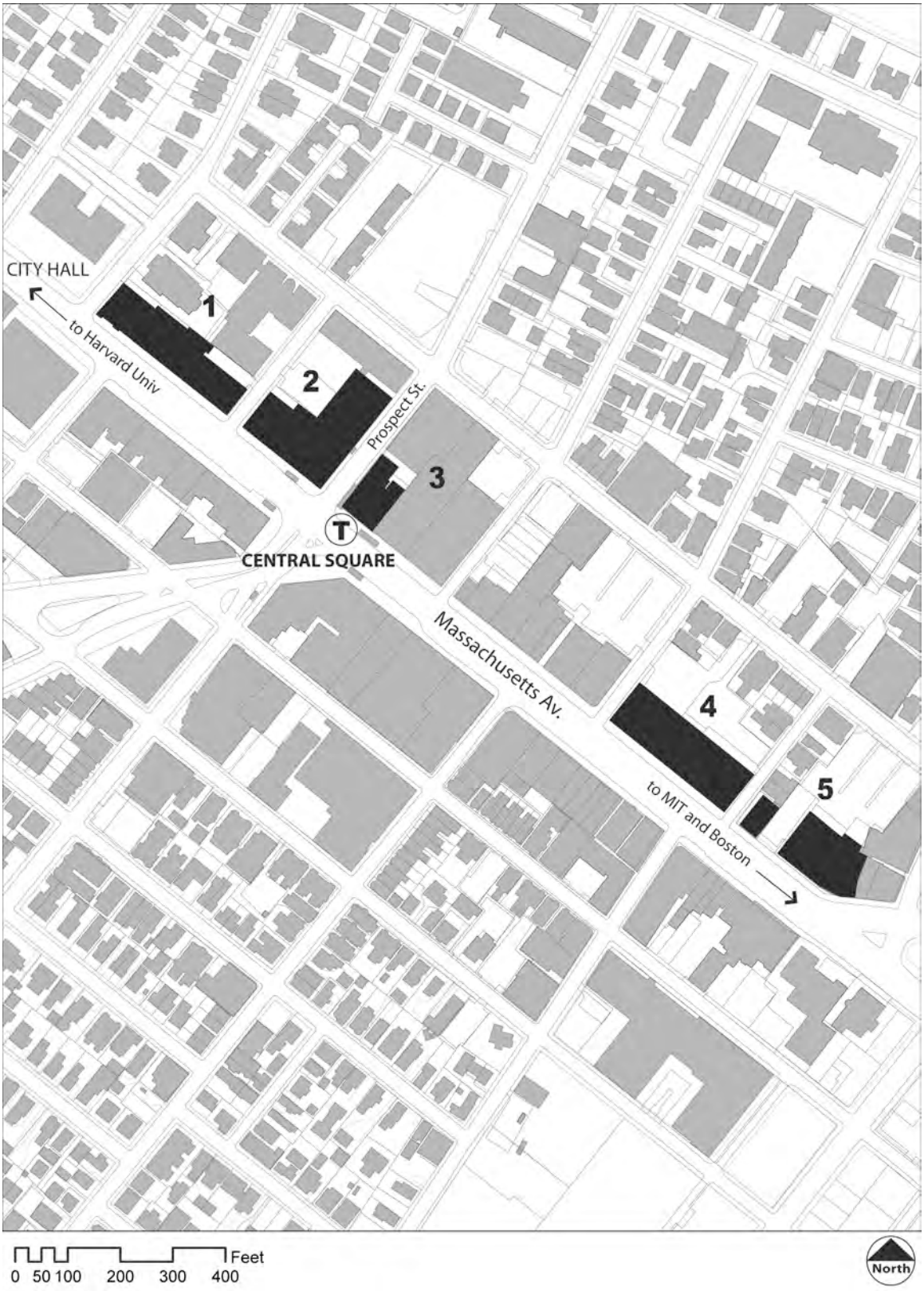

Figure 6. Map showing the five blocks studied on Massachusetts Avenue in the Central Square neighborhood of Cambridge, MA.

Figure 7. Views of the five blocks studied on Massachusetts Avenue

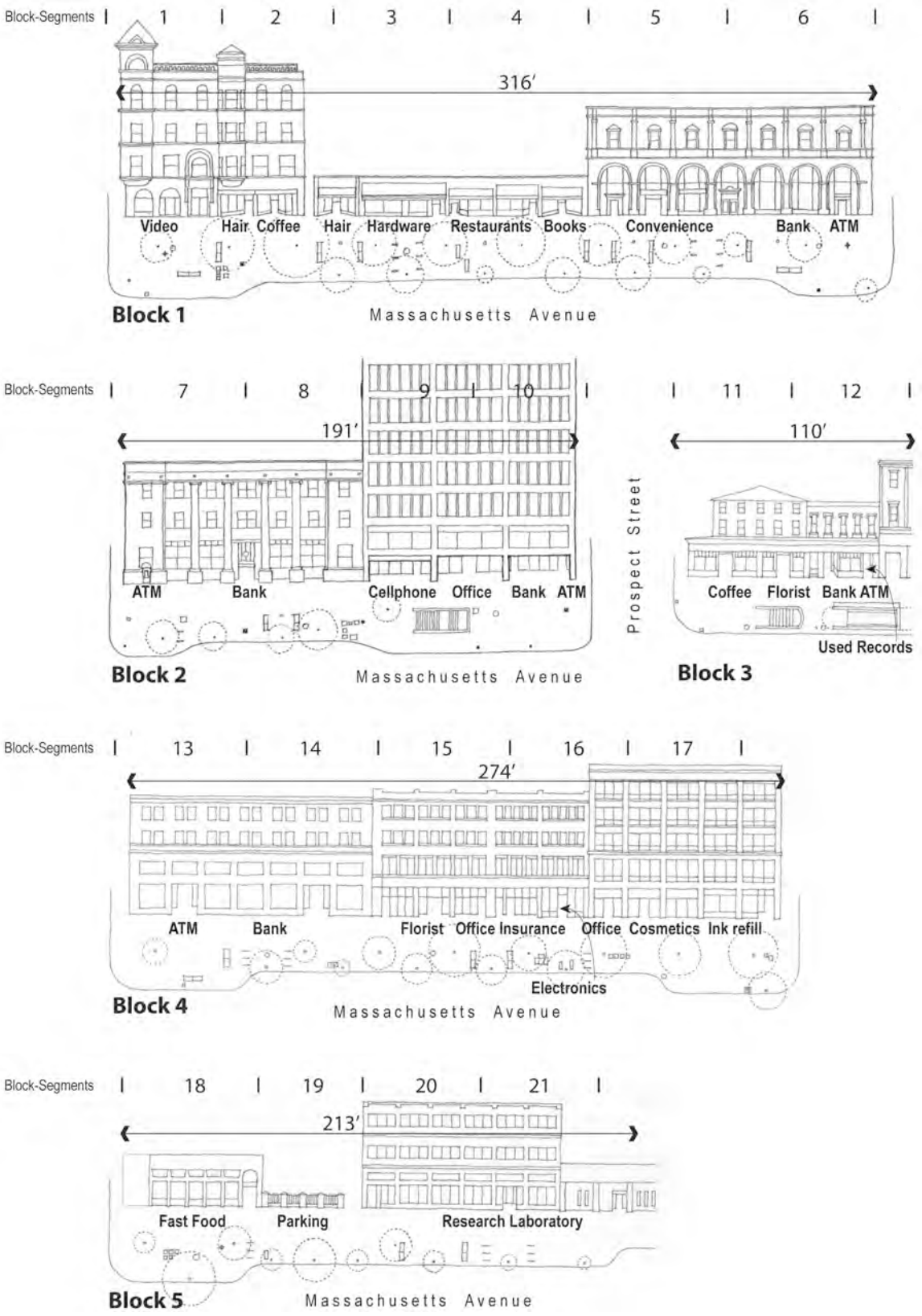

Figure 8. A combined plan and elevation of five blocks studied on Massachusetts Avenue

Figure 9. Harvard Street – main commercial street of Coolidge Corner neighborhood

Harvard Street, Coolidge Corner, Brookline, MA.

Coolidge Corner is the center of the historic town of Brookline. The neighborhood supports a mix of uses, including a variety of housing options, different scales of retail, commercial, public institutions, and cultural uses. The MBTA's on-grade Green Line runs on Beacon Street connecting what were once streetcar suburbs of Boston. Beacon and Harvard Streets are major commercial corridors with businesses located in the majority of the buildings located on both streets. The core of Coolidge Corner's commerce is concentrated on a few blocks in all directions at the intersection of Beacon and Harvard Streets. The six blocks studied here are located on Harvard Street, just north of where it intersects Beacon Street (see Figures 9 and 10). The S. S. Pierce building, erected in 1899, stands as a landmark at the northwest corner of the intersection, and is part of the six blocks studied. On these blocks on either side of Harvard Street, there are a variety of commercial establishments, some small independently owned or local chains, and some chain stores. These include a combination of delis, restaurants, coffee shops, a bar, fast food restaurant, grocery stores, convenience stores, pharmacies, cleaners, apparel stores, opticians, shoe shops, a boutique, a gallery, a gift and antique store, florists, hair and beauty salons, bookshops, video rental stores, a theater, teaching institutes, banks, offices, apartments, and so on (see Figures 11 and 12). The intersection of Harvard and Beacon Streets is also a major transit node for this part of Brookline with the "T" stop and a few bus stops.

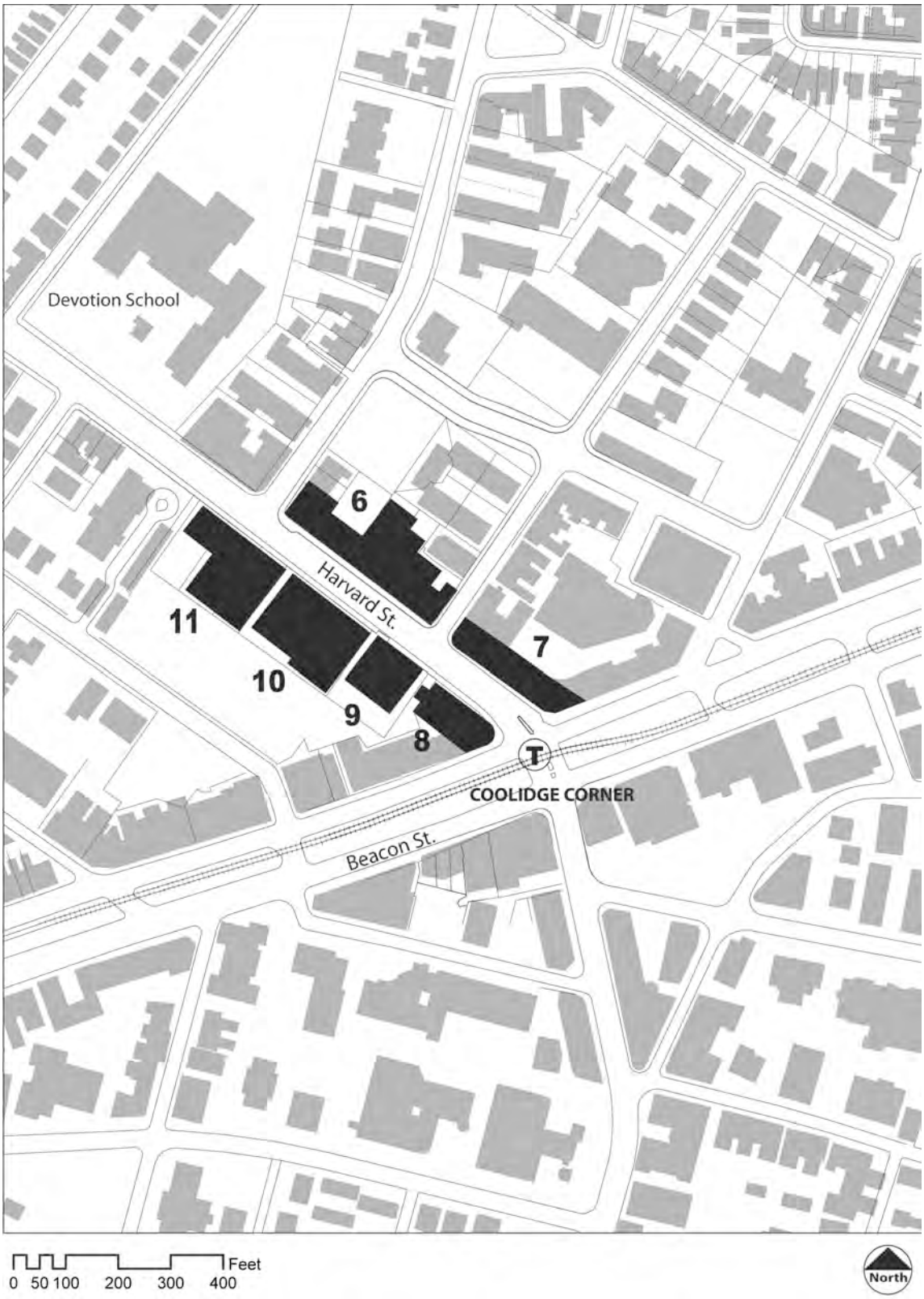

Figure 10. Map showing the six blocks studied on Harvard Street in the Coolidge Corner neighborhood of Brookline, MA.

Figure 11. Views of the six blocks studied on Harvard Street

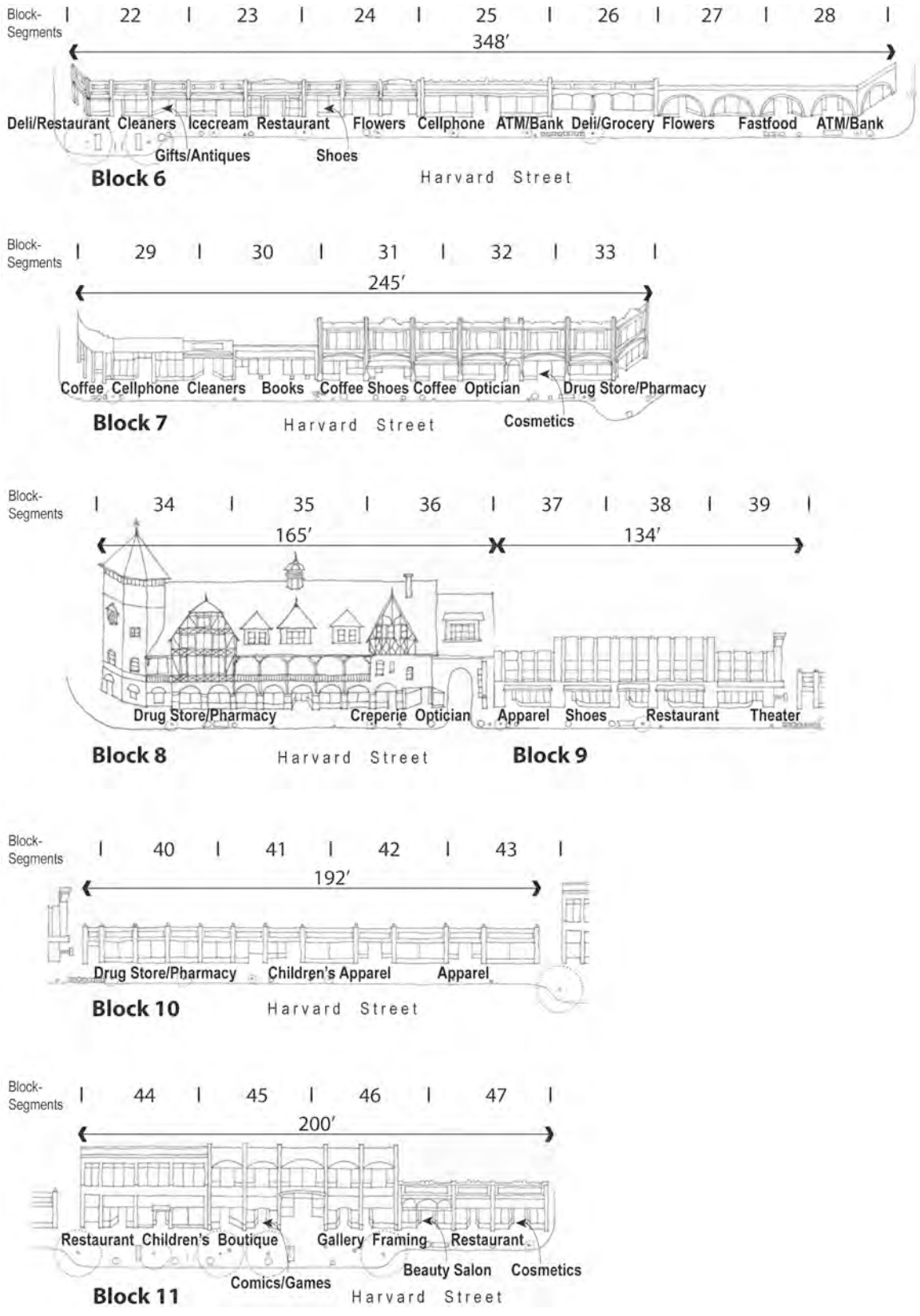

Figure 12. A combined plan and elevation of six blocks studied on Harvard Street

Figure 13. Elm Street – main commercial street of Davis Square neighborhood

Elm Street, Davis Square, Somerville, MA.

Davis Square is one of the bustling commercial and entertainment centers of Somerville. The MBTA's Red Line "T" stop is located here, as is a major bus terminus. The Davis Square area is comprised of a mix of residential and commercial streets. Elm Street is the main commercial corridor of the neighborhood. The surrounding neighborhood is mostly residential, bounded by Highland Avenue on the northeast and Massachusetts Avenue on the southwest. The campus of Tufts University is located within close proximity to the northeast.

A variety of commercial, cultural, and entertainment establishments are located on Elm Street. The eight blocks studied here are located on Elm Street, just south of where it intersects other streets at Davis Square (see Figures 13 and 14). On these blocks on either side of Elm Street there is a variety of commercial establishments, some small independently owned or local chains, and some chain stores. These include a combination of restaurants, a diner, coffee shops, ice-cream shop, pubs, bars, fast food restaurants, grocery stores, a dollar store, a liquor store, cleaners, a newspaper store, florists, hair and beauty salons, used books and records shops, video rental stores, photography stores, banks, offices, and so on (see Figures 15, 16, and 17). Additionally, there are two theaters (a movie and an off-Broadway) located on these blocks of Davis Square, along with some apartments over commercial establishments.

Figure 14. Map showing the eight blocks studied on Elm Street in the Davis Square neighborhood of Somerville, MA.

Figure 15. Views of the eight blocks studied on Elm Street

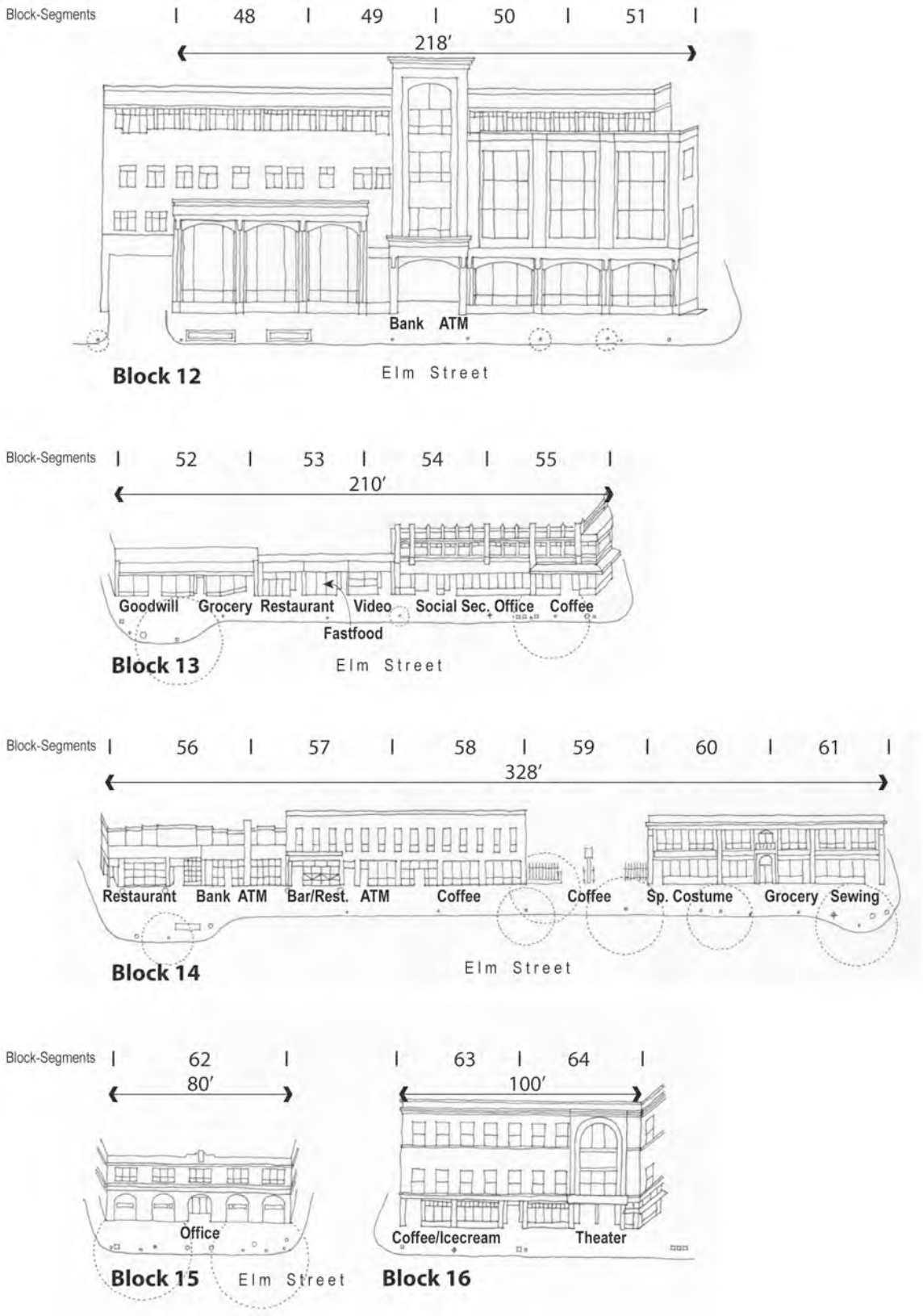

Figure 16. A combined plan and elevation of eight blocks studied on Elm Street

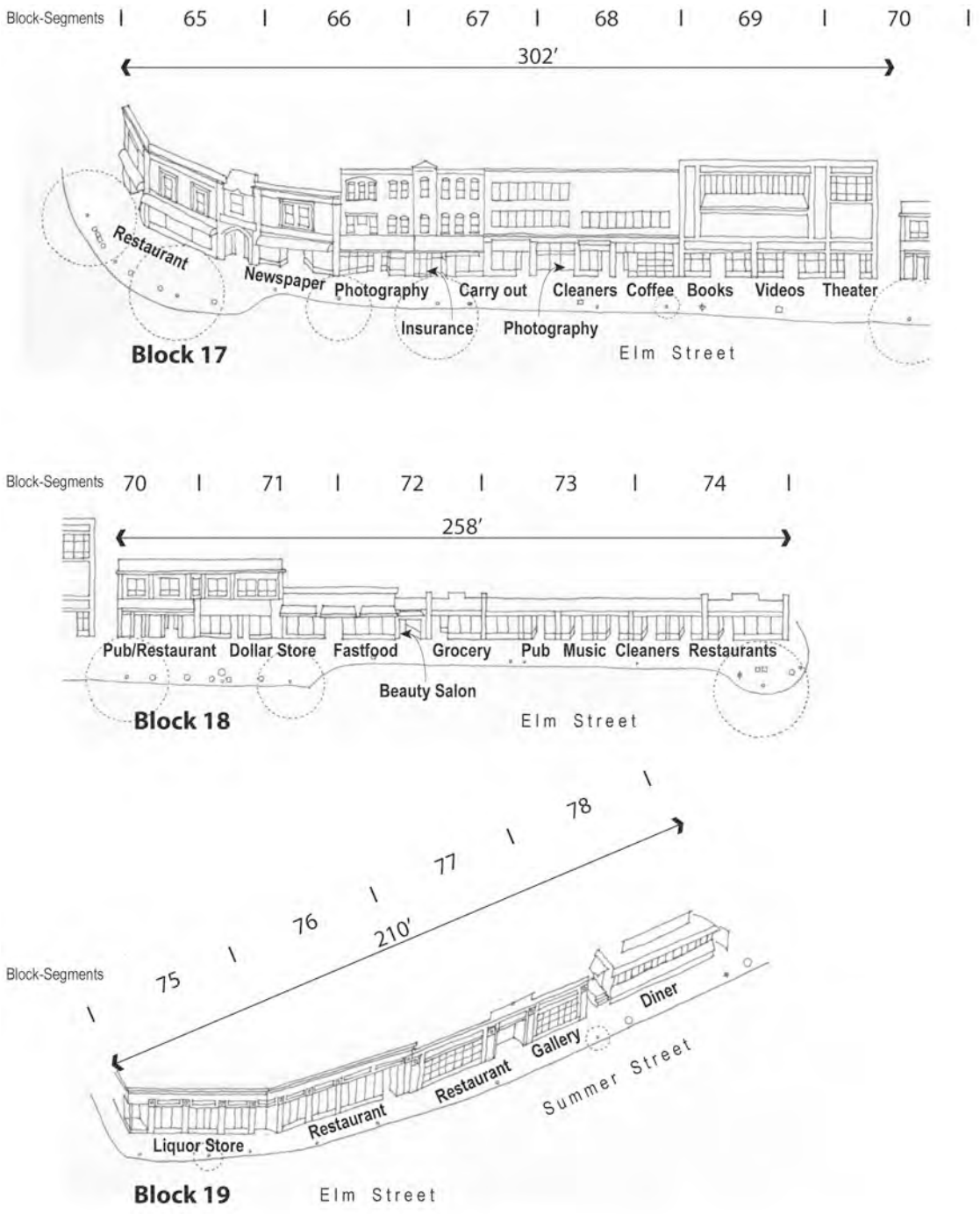

Figure 17. A combined plan and elevation of eight blocks studied on Elm Street

(Continued from Figure 16)

Units of Study

Data presented in this study were collected at two levels – the street block and segments of the street block approximately 50 to 60 feet in length - within the three study areas. These are referred to as “blocks” and “block-segments” respectively. The “blocks” to be studied were selected first. The “block-segments” constituted smaller units of study within the selected “block.”

Selection of Blocks. The author conducted several drive-bys and walk-bys at each of the study areas and selected six to ten blocks in each area in which to make preliminary observations. The blocks were selected based on the presence or absence of street furniture; the difference in the number, physical size, and type of businesses; and the range in the variety of businesses on a block. Hence, some blocks had more street furniture than others, fewer stores than others, larger stores than others, and more variety in the businesses than other blocks.

Ultimately, 19 blocks were selected for the study. Five blocks were on Massachusetts Avenue at Central Square in Cambridge, six on Harvard Street at Coolidge Corner in Brookline, and eight blocks on Elm Street at Davis Square in Somerville. An attempt was made to select blocks within a study area where macro-scale characteristics would remain common. These macro-scale characteristics included the housing and commercial density of the area, the type of people living in the area, and the proximity to major natural features such as a water’s edge; major uses such as a university or a cultural institution, a transit hub, and so on. The distance between the different blocks and a major subway station ranged from zero and 1080 feet. Thus, the selected blocks in each of the three study areas were part of the same urban context with similar macro-scale

characteristics of the environment. All the blocks within a study area were within 1600 feet of each other. This allowed for minimum variation in the macro-scale factors among the selected blocks in a study area.

Fifteen of the 19 blocks selected were between 191 and 348 feet long. The four remaining blocks were 80, 100, 134, and 165 feet in length. See Figures 8, 12, 16, and 17 for detailed descriptions of the physical characteristics, and types of businesses on each block.

Procedures

Observation: Behavioral Mapping

The purpose of this part of the study was to understand the relationship between the temporal and spatial forms of the physical setting and people's behaviors (social actions and interactions) – to examine how people use the streets. It provided information on what people did on streets and where they walked, sat, stood, gathered, and socialized, and what facilities they used, either as a part of their daily functional activities and/or for recreational purposes. This part of the study also provided information on the duration of the various activities in which people engaged on the streets.

Behavioral mapping links the design features of the setting or location with behavior in both time and space (Bechtel and Zeisel, 1987). In this study, it included Pedestrian Counts, Walk-by Observations, and Direct Observations. Behavioral mapping was conducted in accordance with five elements suggested by Ittelson (1970): (1) "A *graphic* rendering of the area (s) observed; (2) A clear *definition* of the human behaviors observed, counted, described, and diagrammed; (3) A *schedule* of repeated times during which the observation and recording takes place; (4) A *systematic procedure* followed in

observing; (5) A *coding* and *counting* system, which minimizes the effort required in recording observations" (Bechtel and Zeisel, 1987).

Observation Period. Data were collected on days with temperatures between 55°F and 85°F from late April through early October in 2005. While the cloud cover and wind conditions varied during the observations, no observations were made when it was raining. Observations were carried out between 7:00 AM and 11:00 PM spread out on weekdays and weekends. Blocks and block-segments were surveyed randomly.

Pilot Study

A pilot study was conducted on two blocks on Massachusetts Avenue in Central Square, Cambridge to test and improve the data-gathering instruments, including pedestrian counts, walk-bys, and direct observations.

Sample Size. The sample size for the study was initially intended to be two adjacent blocks at Massachusetts Avenue, one of the three neighborhood commercial street study areas. However, the pilot study showed that only two adjacent blocks at each study area would be inadequate to capture all the physical design and landuse variables intended for study. Upon the suggestion of one of the committee members, the sample size was increased from the initially planned six blocks (two at each study area) to 19 blocks.

Direct Observation and Observer Fatigue. During the pilot study, for the purpose of observation, the author divided the two street blocks into segments of approximately 100 feet in length. The observations included 1) recording users' location, grouping, and duration of stay, 2) tracking users to record their movements to see which parts of the street, furniture, and businesses they used, and 3) taking field notes. Each

observation was 30 minutes long. The pilot study showed that in areas of high activity it was not possible to observe and record all the requisite information. Tracking users consumed most of the observer's attention and compromised the accuracy of other information. Often users moved out of the 100-foot observation zone to use another business or amenity and this information could not be recorded accurately. The task of recording all this information for 30 minutes led to observer fatigue that compromised the quality of the gathered data. As a result, and in the interest of improving the quality of data, the time of observation was reduced from 30 to 15 minutes to address the problem of observer fatigue. Additionally, user tracking was eliminated from the observation and a question was added in the interview to gather information on the businesses that people used when they visited the block.

Duration of Stay Intervals. The literature review of similar studies of human activities and behavior in public places showed that the duration of activities is often recorded in five-minute intervals (see, for example, Eubank-Ahrens, 1991). During the pilot study, the author noticed that a significant number of people observed on neighborhood commercial streets stayed there for a short duration of less than a minute. It was considered important to record this duration of stay as a separate category. As a result, 15 seconds to less than one minute was added as one of the categories to record duration of stay.

Determining Optimal Size of Block-segment. If the observer locates him/herself to get a good view of the street block, it is possible to record observations of a 100 to 150 foot segment of a street block. However, during the pilot study the author noticed that there was significant variation between the characteristics and activity levels

within a segment of this length. The more active parts of the block helped to determine an optimal size for the block-segment that could be observed for users' duration of stay without loss of valuable information. A 50 to 60 foot block-segment was determined to be the optimal size for observation. Further, where there were two adjacent 50 to 60 foot block-segments with very low activity, duration of stay data for both these block-segments was recorded simultaneously to save time.

Improving Survey and Interview Questionnaire. Flyers were posted on community boards at businesses on the two blocks and at a campus family housing nearby for the pilot study. Five people were interviewed for the pilot study. After the interview, the interviewees were asked to comment on the questionnaire and suggest changes. Based on their comments and the suggestion of one of the committee members, words and phrases that seemed ambiguous or confusing to participants were revised. Specifically, during the pilot study, photographs were used as a basis for responding to two visual scales in the survey (see Questions 7 and 9 in Appendix I). Upon the suggestion of a committee member, these were replaced by two sketches representing the same place. Hence, the two sketches showed the same environment and differed only in the specific aspects addressed in each question. Lastly, two questions asked the participants to suggest characteristics or aspects that they would like to retain on the block and to suggest those they would like to change. As a response, some participants made only one suggestion, not realizing that they could make more. Revising the questions to read, "… the three most important things you would like to …" made the question unambiguous and provided a more definite and consistent number of responses.

Reliability of Observations

For the purpose of determining the reliability of the observational data, another researcher, a city-planning student, occasionally conducted observations. The author and the second researcher independently conducted pedestrian counts, walk-by observations, and direct observations of the same setting at the same time and compared them to check for discrepancies. This crosscheck was conducted more frequently at the beginning of the study, after the pilot study was complete. It was repeated randomly at all three study areas.

Two types of discrepancies were noted. First, there was a maximum of 2-3% variation between the two researchers' pedestrian counts during the busiest hours of the day. Second, there were occasional discrepancies in gauging apparent age of users on the street, especially between a teenager (5) and adult female (2) (see Table 1). Both these discrepancies were considered within acceptable limits and hence inconsequential to their effect on the research.

Pedestrian Counts

The author counted all pedestrians crossing a randomly selected imaginary line in both directions at various locations on each block for 10 or 15 minutes. On several occasions, pedestrian counts were conducted more than once within a time-slot and the results averaged. Results of the 10- or 15-minute counts were then converted to estimate hourly pedestrian volumes at each block. Skateboarders and roller skaters were included in the count, as were people walking pets or pushing strollers.

Table 1. Codes used in pedestrian counts, walk-by observations, and direct observations

Code	Description
1	Adult male (approximately 20 to 60 years)
2	Adult female (approximately 20 to 60 years)
3	Older adult male (approximately over 60 years)
4	Older adult female (approximately over 60 years)
5	Teenager (approximately 13 to 19 years)
6	Child (approximately less than 12 years)

Table 2. Symbols used in recording pedestrian counts

Symbols	Description
J	Running/jogging
C	Cycling (on the sidewalk)
P	Walking pets
Sk	Skateboarding or rollerblading
Pr	Pushing a stroller

Apparent age, gender, and activities such as walking pets, pushing stroller, and so on were coded for ease of recording (see Table 1 and 2). The size of the walking user-group such as solitary person, dyads, triads, and so on were noted. Pedestrian counts were conducted at eight times each on weekdays and weekends (see Table 3).

Table 3. Schedule of behavioral mapping for the three study areas

Pedestrian Counts		Walk-bys Observations		15-minute Direct Observations	
Weekday	**Weekend**	**Weekday**	**Weekend**	**Weekday**	**Weekend**
		7 AM – 8 AM		7:30 AM – 9:00 AM	
8 AM – 9 AM		8 AM – 9 AM	8 AM – 9 AM		8:30 AM – 10:00 AM
9 AM – 10 AM	9 AM – 10 AM	9 AM – 10 AM	9 AM – 10 AM	9:00 AM – 10:30 AM	
	10 AM – 11 AM	10 AM – 11 AM	10 AM – 11 AM		10:00 AM – 11:30 AM
		11 AM – 12 PM	11 AM – 12 PM	10:30 AM – 12:00 PM	
12 PM – 1 PM	12 PM – 1 PM	12 PM – 1 PM	12 PM – 1 PM		
1 PM – 2 PM	1 PM – 2 PM	1 PM – 2 PM	1 PM – 2 PM	12:00 PM – 2:00 PM	12:00 PM – 2:00 PM
		2 PM – 3 PM	2 PM – 3 PM		
		3 PM – 4 PM	3 PM – 4 PM		
		4 PM – 5 PM	4 PM – 5 PM		4:30 PM – 6:00 PM
5 PM – 6 PM		5 PM – 6 PM	5 PM – 6 PM	5:00 PM – 6:30 PM	
6 PM – 7 PM	6 PM – 7 PM	6 PM – 7 PM	6 PM – 7 PM		6:00 PM – 8:00 PM
	7 PM – 8 PM	7 PM – 8 PM	7 PM – 8 PM	6:30 PM – 8:00 PM	
8 PM – 9 PM	8 PM – 9 PM	8 PM – 9 PM	8 PM – 9 PM		8:00 PM – 9:30 PM
9 PM – 10 PM	9 PM – 10 PM	9 PM – 10 PM	9 PM – 10 PM	8:00 PM – 9:30 PM	
			10 PM – 11 PM		10:00 PM – 11:00 PM

Walk-by Observations

Walk-by observations were used to record stationary, sustained, lingering, and social activities. The author slowly walked past the complete length of each block in the study area and recorded the total number of stationary people encountered, their locations, the activities they were engaged in, and their postures.

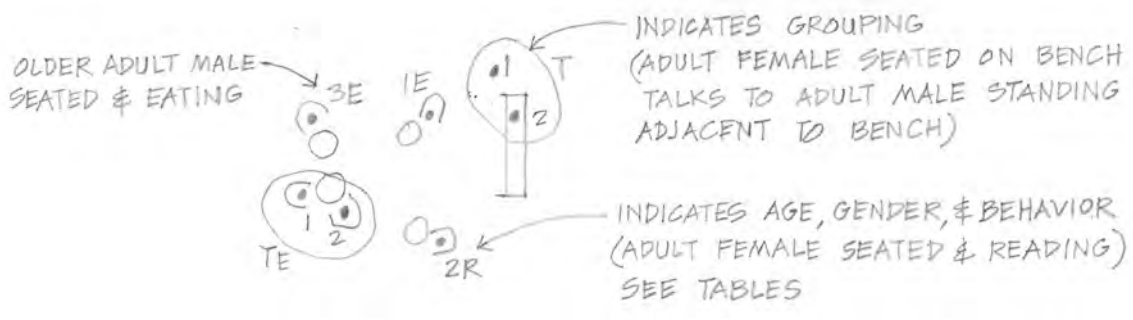

Figure 18. Notations used in Walk-by Observations to record behavior and activities

Walk-by observations were recorded on coding sheets consisting of a detailed plan and elevation of the block. People that just passed by or entered a premise without stopping were not recorded in the walk-by observations. There were three bus stops at three blocks in the study areas. People waiting for a bus were not recorded in the observations. Each person was represented by a dot on the coding sheet. People who were engaged in an activity as a dyad, triad, and so on were circled on the coding sheet to indicate that they were in a group. Sitting, standing, and lying or sleeping, were recorded as variable postures (see Figure 18). Apparent age, gender, activities, and postures were coded for ease of recording. Apparent age was recorded under four categories - children, teenagers, adults (approximately 20 to 60 years), and older adults (approximately above 60 years). Activities were recorded under the categories shown in Table 4 and were described in detail where required.

Table 4. Symbols used in recording walk-by observations and direct observations

Symbols	Description
L	Lying/sleeping
P	Walking pets
Sk	Skateboarding or Rollerblading
T	Conversing
Pr	Pushing a stroller
E	Eating/drinking
R	Reading or using a Laptop computer
Sh	Shopping
Ws	Window-shopping
G	Playing a game or Performing
Sm	Smoking
V	Vending

In most cases (74 of 90), the walk-by observations of all the blocks within a study area were conducted contiguously with the author starting the walk-by observation at one end of the study area and continuing to the other end. Walk-by observations were conducted at every hour between 7:00 AM and 10:00 PM on weekdays and between 8:00 AM and 11:00 PM on weekends on each block (see Table 3). Thus, there were 15 walk-by observations conducted on weekdays and 15 walk-by observations on weekends for each study area and hence each block.

Direct Observations and Field Notes

Direct observation was the most important of all the techniques employed to collect behavioral information, and was used in both a structured and unstructured manner. Human behavior may be studied at different scales ranging from global or molar to molecular (Bechtel and Zeisel, 1987). Molecular human behavior deals with minute gestures and expressions whereas molar behavior is concerned with observing the actions of a limited number of people engaging with their environment. Environmental behavior research is concerned with the scale of molar behavior as it involves observing people in their environment. Direct observations were made to record molar behavior that included details about the types of activities and postures, kinds of social interactions and contacts among people, interactions of people with the physical features of the environment, and their duration of stay.

Structured Direct Observations. As previously noted, each block was divided into equal block-segments of approximately 50 to 60 feet in length to conduct direct observations of behavior. Hence, there were a total of 78 block-segments - 21 on Massachusetts Avenue at Central Square in Cambridge, 26 on Harvard Street at Coolidge

Corner in Brookline, and 31 on Elm Street at Davis Square in Somerville (see Figures 8, 12, 16, and 17).

The author located himself at a discreet vantage point for maximum visibility of activity at each of the block-segments for 15 minutes. People just passing by or entering a premise without stopping were not included in the observations. As in the walk-by observations, people waiting at bus stops were not recorded.

Figure 19. Notations for recording Duration of Stay of people on the street

Table 5. Assigned Score for Duration of Stay

Duration of Stay	Assigned Score
15 seconds to < 1 minute	1
1 minute to < 5 minutes	3
5 minutes to < 10 minutes	7.5
10 minutes to < 15 minutes	12.5
> 15 minutes	15

Activities were recorded in detail on observation sheets containing plans and elevations of each 50 to 60 foot long block-segment and were supplemented with

extensive field notes. Persons interacting with each other or engaged in a common activity were indicated on the observation sheets as a group. Duration of stay was recorded under five categories: 15 seconds to less than one minute, one minute to less than five minutes, five minutes to less than 10 minutes, 10 minutes to less than 15 minutes, and over 15 minutes (see Figure 19), and a corresponding score was assigned (see Table 5). The assigned scores were aggregated to arrive at a total score for duration of stay for each block-segment. The author repeated this at all the 78 block-segments to capture the behaviors and activities along the full length of every block. Direct 15-minute observations of activities were conducted seven times each on weekdays and weekends at each block-segment in the three study areas (see Table 3).

Unstructured Direct Observations. The author observed the three study areas from April through late October, 2005, and recorded activities and behavior patterns using field notes. In addition, photographs and short videos (30 seconds to three minutes) were utilized to record behavioral patterns. During this period, the author acted as a participant observer, using the businesses and street space in the study areas.

The combination of pedestrian counts, walk-by observations, and direct observations provided a kind of "snap-shot" of the behavior on the selected blocks on the street at various times from morning to late evening on weekdays and weekends from late April to late October 2005 in good weather. In understanding environment-behavior relationships it is suggested that the research provides "…answers to these five questions: what was done (act), when or where was it done (scene), who did it (agent), how he did it (agency), and why (purpose)" (Burke cited in Asplund, 1979, p. 12). The observations provided the main body of information on human behavior in the study areas – especially

on four of the five questions: what, when or where, who and with whom, and how, leaving only "why" as the unknown (see Figure 20).

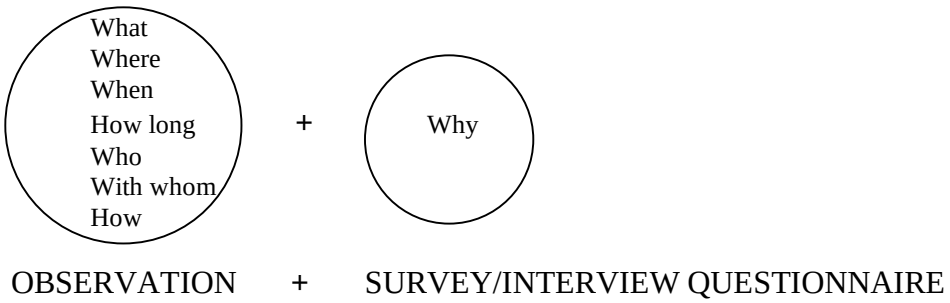

Figure 20. Understanding behavior & perceptions - observations, surveys, and interviews

Survey and Interview

Researchers have various options for gathering data on people's attitudes and perceptions about the environment. Telephone surveys, mail surveys, personal diaries, focus groups, and face-to-face interviews are among the commonly used techniques. Although telephone surveys and interviews are efficient, they could not be used for this study as the survey involved visual material. Mail-in surveys can include visual material, but they were not used in this study because they cannot accommodate an interview component. Additionally, the purpose of the survey and interview was to obtain information from people who actively used the neighborhood commercial street. Hence, a face-to-face survey and interview was considered the best method to provide in-depth information to help understand the users' feelings, perceptions, and attitudes toward the street environments that were being observed in the three study areas. Further, by posting and distributing flyers about the research at the study areas, the author was able to target the neighborhood residents, workers, and visitors who actually used the neighborhood

commercial street on a regular basis. The survey and interview instrument was used to reinforce and confirm the findings from the observations - to get answers to "why" people did what they were observed doing (see Figure 20).

Design. As mentioned earlier, five, six, and eight blocks respectively were observed in the three study areas. However, as a result of learning from the pilot study, the four blocks that were most representative of each study area were selected for the purpose of the survey and interview. Hence, each participant responded to four standard questionnaires that included a survey and open-ended interview questions. The instrument was designed to obtain information on why users of these neighborhood commercial streets preferred to use certain blocks or block-segments more than others. This included getting insight on users' perceptions and attitudes toward the businesses and other uses on the blocks, their location, operation and management, and the physical characteristics of the environment including its management and upkeep (see Appendix I for the survey and interview instrument).

Sampling. A flyer seeking participation in the survey and interview was designed for each study area (see Appendices II and IIa). These were regularly posted at stores and shops in the study areas that had space for community notices and announcements. Each study area had five to six such community notice boards. Flyers were given to all the businesses on the first floor and were also distributed to people passing by in the study areas at several occasions. A total of 51 people were surveyed and interviewed – 21 for Massachusetts Avenue at Central Square in Cambridge, 17 for Harvard Street at Coolidge Corner in Brookline, and 13 for Elm Street at Davis Square in Somerville. See Appendix III for a detailed description of the participants. Most people were surveyed and

interviewed on the street or at one of the stores in the study areas. Three people chose to be interviewed at their residences or libraries that were not in the study area. The time for survey and interview ranged from 30 minutes to two hours, with an average time of 50 minutes. The survey component of the questionnaire took approximately the same time with all participants. However, some people, especially ones that have lived in the neighborhood for a long time, spent more time answering the open-ended questions.

Measures

Measuring Liveliness

For the purpose of this study, a lively neighborhood commercial street was defined as a street with the presence of a number of people engaged in a variety of predominantly stationary, lingering, and sustained activities, particularly those activities that are social in nature. Using the data collected from walk-by and direct observations, a Liveliness Index was determined for each of the 78 block-segments by calculating 1) the number of people engaged in some stationary and sustained activity at the setting, 2) the number of people in groups of two or more engaged in some social activity, and 3) their duration of stay. As discussed earlier, observations were conducted and analyzed at the scale of a block-segment that was 50 to 60 feet in length of block of the neighborhood commercial street. The survey and questionnaire solicited user responses at the scale of a street block. Hence, a Liveliness Index was also calculated for each street block to enable correlation between the user attitudes and perceptions and the liveliness of the street at the scale of the block. The results of the following measures were adjusted for the length of block[4]: 1) the number of people engaged in some stationary and sustained activity at

[4] Almost all blocks in a study area were of different lengths. Most blocks were approximately 200 feet long. Hence, a 200 foot long block was established as a datum and all data collected at each block were

the block, 2) the number of people in groups of two or more engaged in some social activity, and 3) their duration of stay.

Selection of Street Characteristics

Physical characteristics of the built environment have long been of interest to urban designers and architects (Sitte, 1889; Zucker, 1959; Cullen, 1961; Bacon, 1967; Krier, 1979, among others). More recently, by bringing the knowledge from research conducted in the social and behavioral sciences and environmental psychology, urban designers have emphasized numerous perceptual qualities that affect peoples' selection of environments. With the growing body of literature in urban design there is an increasing number of characteristics of the built environment that are deemed important in determining the quality of the built environment, and hence its use. These characteristics now include physical and landuse characteristics and aspects of control and management of the environment. Rapoport (1990) identified technology, safety, environmental variables, climate and weather, topography, distance, presence and availability of services, culture, and physical and perceptual characteristics as factors affecting the pedestrian use of streets (pp. 248-249). In a review of literature on only the perceptual factors, Ewing, et al. (2005) identified 52 qualities of the environment. Working with an expert panel of urban designers, they studied nine of the most comprehensive perceptual qualities that may be pertinent to walking behavior, each of which was a result of tens of physical characteristics of the built environment. From this and other similar studies it is

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proportionately reduced or increased. For example, say on three blocks of 200, 300, and 400 in feet length the number of seated people observed was 42, 66, and 70 respectively. The 66 people observed on the 300 feet block were reduced to two-thirds (200/300) as if this block was only 200 feet long. Similarly, the 70 people observed on the 400 feet block were reduced to half (200/400) as if this block too was only 200 feet long. Hence, the final data considered for the three blocks were - 42 people seated on the 200 feet long block, 44 people on the 300 feet block, and 35 people on the 400 feet long block.

apparent that many characteristics affect the way in which the environment is perceived by people, which is only one aspect determining peoples' decision to use the environment. In sum, there are likely scores of macro- and micro-scale characteristics that affect people's attitudes, preferences, and decisions to use an environment.

This study is concerned with the micro-scale characteristics of the environment. Consequently, the blocks in the three study areas were chosen so that, as far as possible, the macro-scale characteristics would be similar to all. In order to identify the characteristics for study, the following sequence was used. As discussed in chapter 2, a review of literature helped identify numerous characteristics that are known to be important to users of public spaces. The literature review acted as a guidance tool that directed the inquiry. Next, extensive direct observations were carried out at the three study areas to map user-behavior supplemented with field notes, photographs, and short videos. Observations revealed that people interacted with several characteristics of the street, and certain qualities supported their activities and behaviors on the street. These qualities and characteristics were often physical characteristics, but they also involved the type of businesses on the street and how these businesses and the street space were managed and operated. This was followed by a survey and interview of users of the street environment to complement the data from the observations. Together they provided a body of empirical information on the aspects of the street environment that contributed to retaining people on neighborhood commercial streets and supporting social interaction.

While the literature covered many aspects of the environment, user behavior and attitudes showed direct engagement and interest with only certain aspects of the environment. Observations and interviews clearly pointed to certain characteristics that

were the most important in making the users' experience comfortable, interesting, and meaningful in using the street environment, engaging in stationary, sustained, and lingering activities, and social interaction.

As an example of one of the characteristics, a sense of enclosure, defined as a certain desirable proportion of the vertical elements and the horizontal street space, is noted as an important quality of a street (Cullen, 1961; Alexander et al., 1977; Jacobs, 1993; Lynch and Hack, 1984, among others). The proportion of the height of buildings, walls, trees, and other vertical edge elements to the street space is critical in creating a sense of enclosure. However, some other studies have suggested that the pedestrian's visual attention and focus is usually limited to eye-level in enclosed spaces (Rapoport, 1977) and ground floor buildings, floor surface, and the activities going on in the street are most important (Gehl, 1987). Observations and interviews in this study concur with the latter and hence, without underestimating the importance of the sense of enclosure and overall height of vertical elements, etc., the present study limited its attention to the characteristics related to this realm of user-attention. Similarly, only those characteristics that the majority of users engaged with or discussed in the interview were included in the study.

Measuring Characteristics of Settings

Eleven specific characteristics of the street environment were identified based on the literature review and the observations and interviews conducted by the author (see Table 6). They are described in detail in Appendix IV.

Table 6. Selected characteristics of the street environment.

	Street Characteristic
1	Variety of goods and services on the block
2	Number of independent businesses on the block-segment
3	Degree of permeability of street-front on the block-segment
4	Degree of personalization of storefront on the block-segment
5	Number of community places on the block-segment
6	Percentage articulation of street front on the block-segment
7	Number of public (non-commercial) seating on the block-segment
8	Number of commercial seating on the block-segment
9	Average sidewalk width on the block-segment
10	Percentage shade and shelter from trees and canopies on the block-segment
11	Number of other street furniture and physical artifacts on the block-segment

These characteristics were measured in order to understand which physical features of the street and its adjacent buildings, and the type and management of uses in the buildings influence and support stationary, sustained, and lingering activities, especially those activities that are social in nature. Eight of the eleven characteristics were largely objective and were measured by the author. For example, the author counted the number of seats at the sidewalk provided by the public agencies at each block-segment. “Degree of personalization of the storefront” and “degree of permeability of the street-front” were subjective characteristics. Four urban designers (two female and two male), including the author, independently rated these two subjective characteristics by visiting all the blocks at the study areas, and a mean score was calculated. “Community places on the block-segment” was determined by the interview responses from the participants. The units for measurement of the characteristics were either numeric counts or percentages. Since Liveliness Index was calculated within a range of one to ten for all block-segments, percentages were converted to scores ranging from one to ten for ease of

correlation. For example, 68% was converted to a score of 6.8. Thus, there was a score for all eleven characteristics at each of the 78 block-segments in the three study areas.

CHAPTER 4: FINDINGS AND DISCUSSION

Observations and visual surveys provided a kind of "snapshot" of the activities and human behavior on the streets in the three study areas from morning to late evening from April to late October in 2005. Surveys and interviews with people in these areas provided information on their feelings, perceptions, and attitudes toward the street environment. The sample of blocks and block-segments observed and surveyed in the three study areas, as well as the people interviewed, have already been described in the Methods chapter.

This chapter consists of five sections that present the findings of these observations, surveys, and interviews. The first section presents the results of the Liveliness Index calculated for each block-segment and block. This is followed by a section on the findings from observations in the field and a detailed discussion on the use of the street as a behavior setting for interaction, play, and relaxation. The third section combines the results of observations, surveys, and interviews and discusses them in the context of the theoretical framework developed on the basis of Maslow's (1954) hierarchy of human needs and Steele's (1973) dimensions of physical settings. Section four discusses the results of multivariate regression and factor analyses. The chapter concludes with a section on the summary of findings.

Calculating Liveliness: Behavioral Maps of People and Activities

The three measures of liveliness were mentioned in the last chapter. The following is a description of the findings relating to these three measures by elaborating

on: 1) where most of the stationary and sustained activities occurred; 2) where most people were seen engaging in social activities; and 3) where people spent the most amount of time. Based on these three measures, a Liveliness Index was calculated for each block-segment (see Table 7). A Liveliness Index was also calculated for each block on the streets in the three study areas to examine correlations between user attitudes and perceptions and the liveliness of the street at the scale of the block (see Table 8).

Stationary Activities

Observations and pedestrian counts throughout the hours of study from 8.00 AM to 11.00 PM on weekdays and weekends showed that all of the 19 blocks in the three study areas were used as concourses for pedestrian movement. However, the results of the walk-bys and observations revealed that the presence of a large number of people on the street does not necessarily generate stationary and sustained use of, or social activity, on the street.

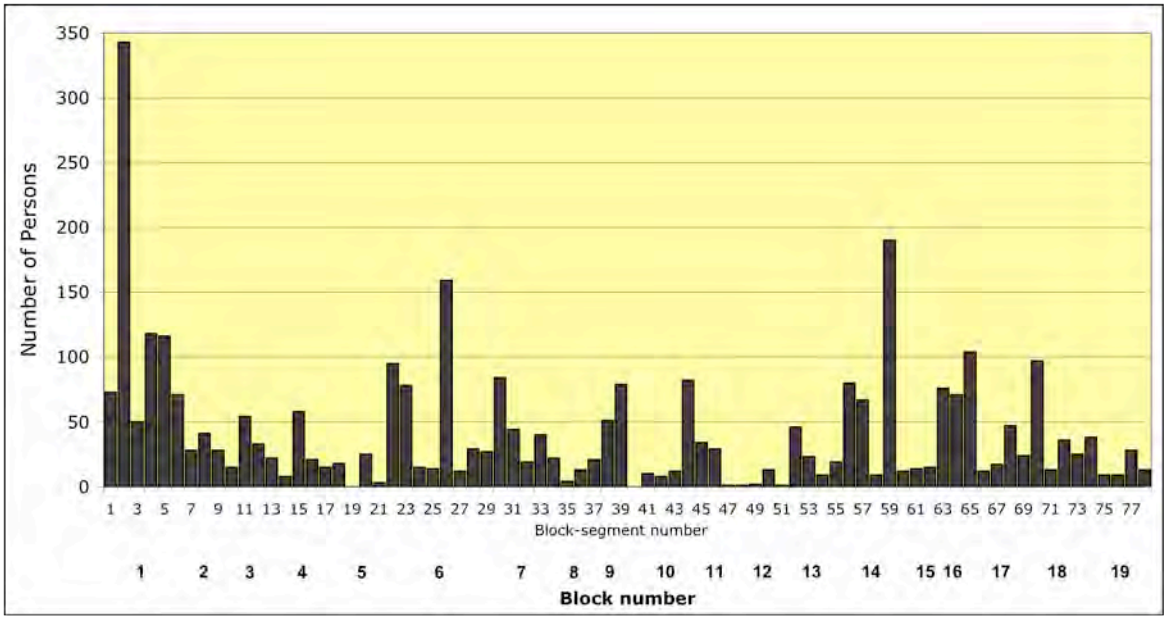

Figure 21. Number of people engaged in some type of stationary activity on weekdays and weekends on 78 block-segments in 19 blocks in three town/cities in the Boston metropolitan area. Data from 30 walk-bys on each block spread throughout the day and evening

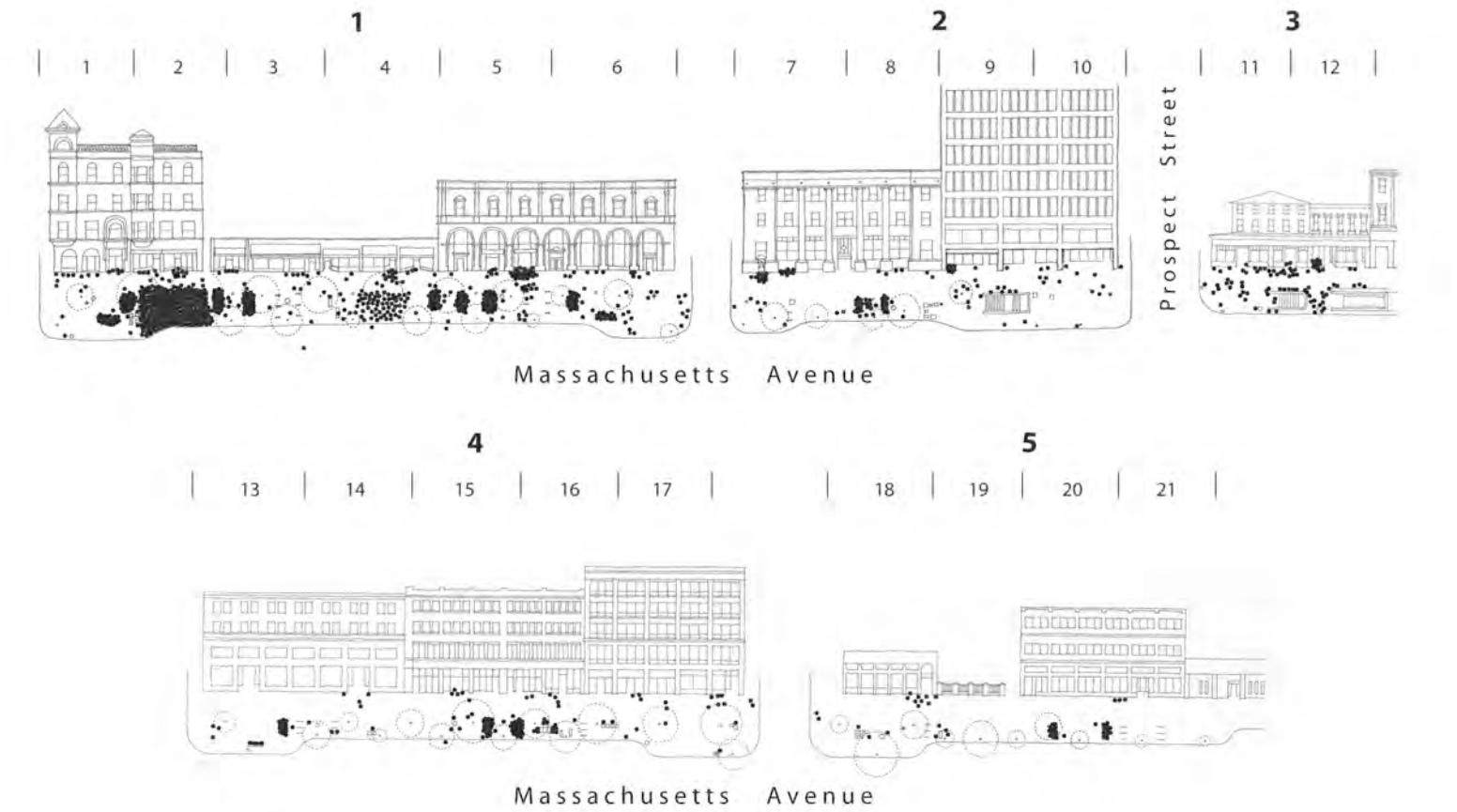

Figure 22. Behavioral map of people engaged in some stationary activity on weekdays and weekends on five blocks on Massachusetts Avenue at Central Square, Cambridge, MA.
Data from 30 walk-bys on each block spread throughout the day and evening. Each black dot represents a person

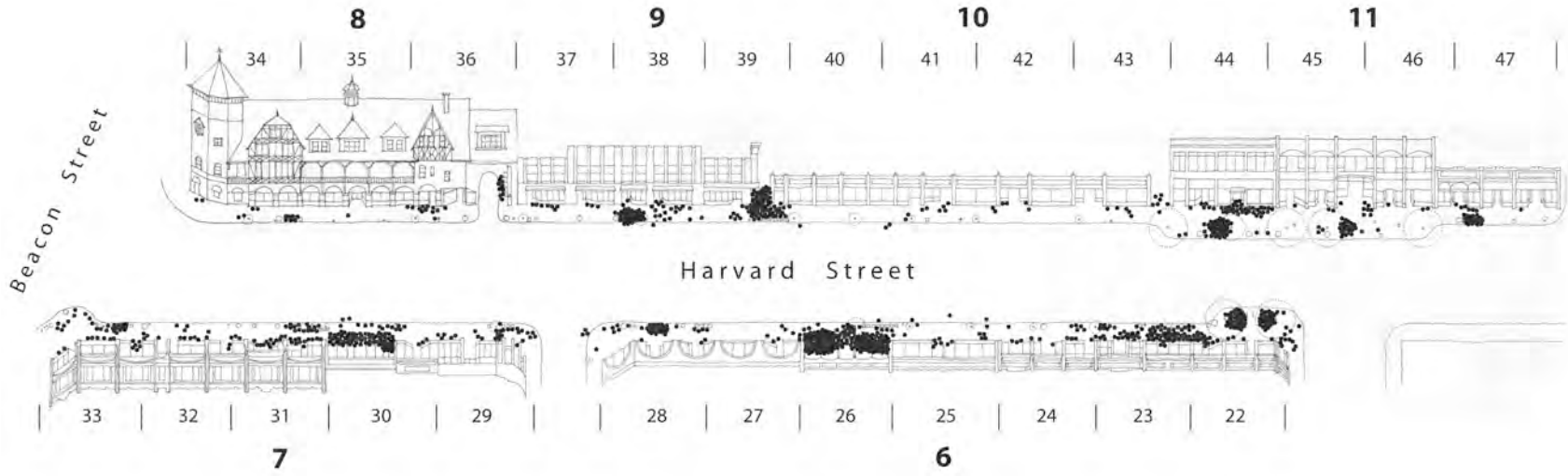

Figure 23. Behavioral map of people engaged in some stationary activity on weekdays and weekends on six blocks on Harvard Street at Coolidge Corner, Brookline, MA.
Data from 30 walk-bys on each block spread throughout the day and evening. Each black dot represents a person

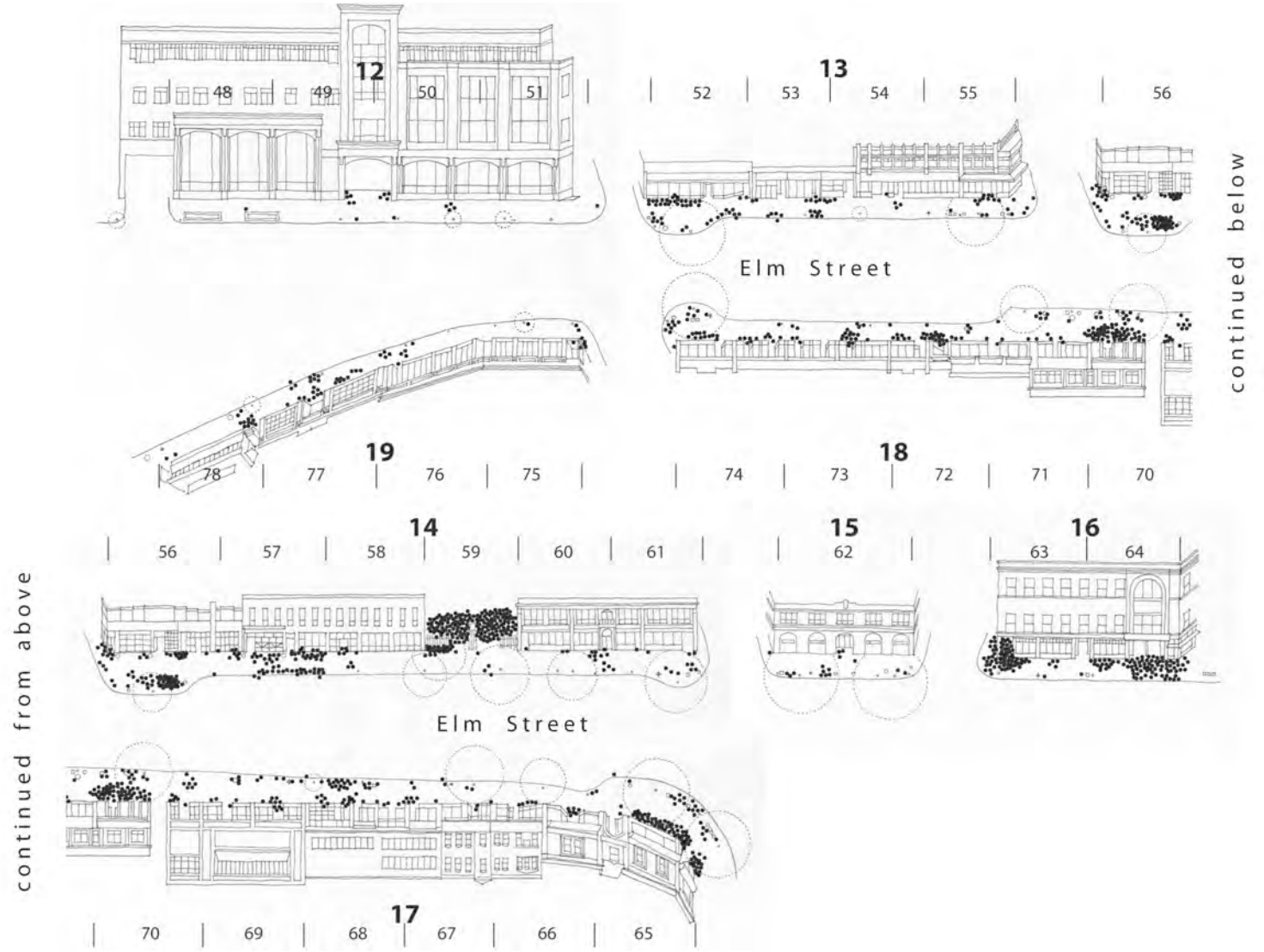

Figure 24. Behavioral map of people engaged in some stationary activity on weekdays and weekends on eight blocks on Elm Street at Davis Square, Somerville, MA.
Data from 30 walk-bys on each block spread throughout the day and evening. Each black dot represents a person

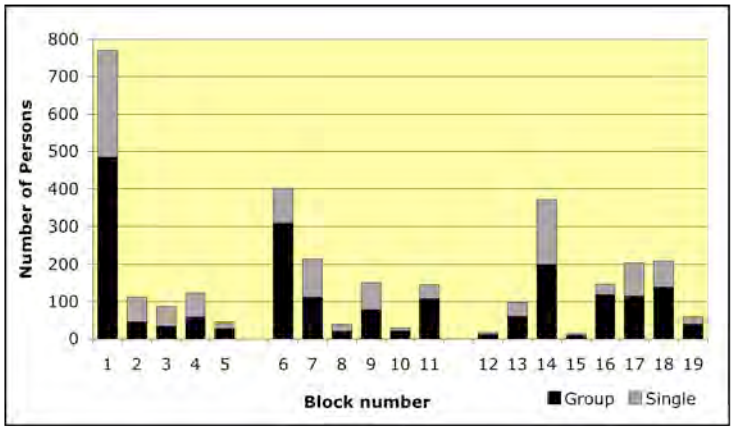

Figure 25. Number of people engaged in some type of stationary activity on weekdays and weekends on 19 blocks in three town/cities in the Boston metropolitan area.
Data from 30 walk-bys on each block spread throughout the day and evening

Using the walk-by technique, 3242 persons were recorded engaged in some kind of stationary activity on all the 78 block-segments on 19 blocks in the three study areas. While all the 19 blocks were concourses for pedestrians, over half of the stationary activities were found on blocks 1, 6, 7, and 14 [1759 (54.26 %) of 3242 persons]. Further, block 1 exhibited the highest number of stationary activities throughout the day. Seven hundred and seventy one (23.8 %) of all 3242 people engaged in stationary activities recorded in the walk-by observations on weekdays and weekends were on block 1. Results of walk-by observations also provided a valuable spatial recording of people engaged in various activities, and clearly indicated their preferred locations on the 19 blocks. 343 (10.6 %) of all the 3242 people engaged in stationary activities on all the 78 observation block-segments on the 19 blocks were located on block-segment 2, followed by 190 (5.9%) on block-segment 59, 159 (4.9%) on block-segment 26, 118 (3.6%) on block-segment 4, 116 (3.6%) on block-segment 5, 104 (3.2%) on block-segment 65, 97 (3%) on block-segment 70, and 95 (2.9 %) on block-segment 22 (see Figures 21, 22, 23, and 24)

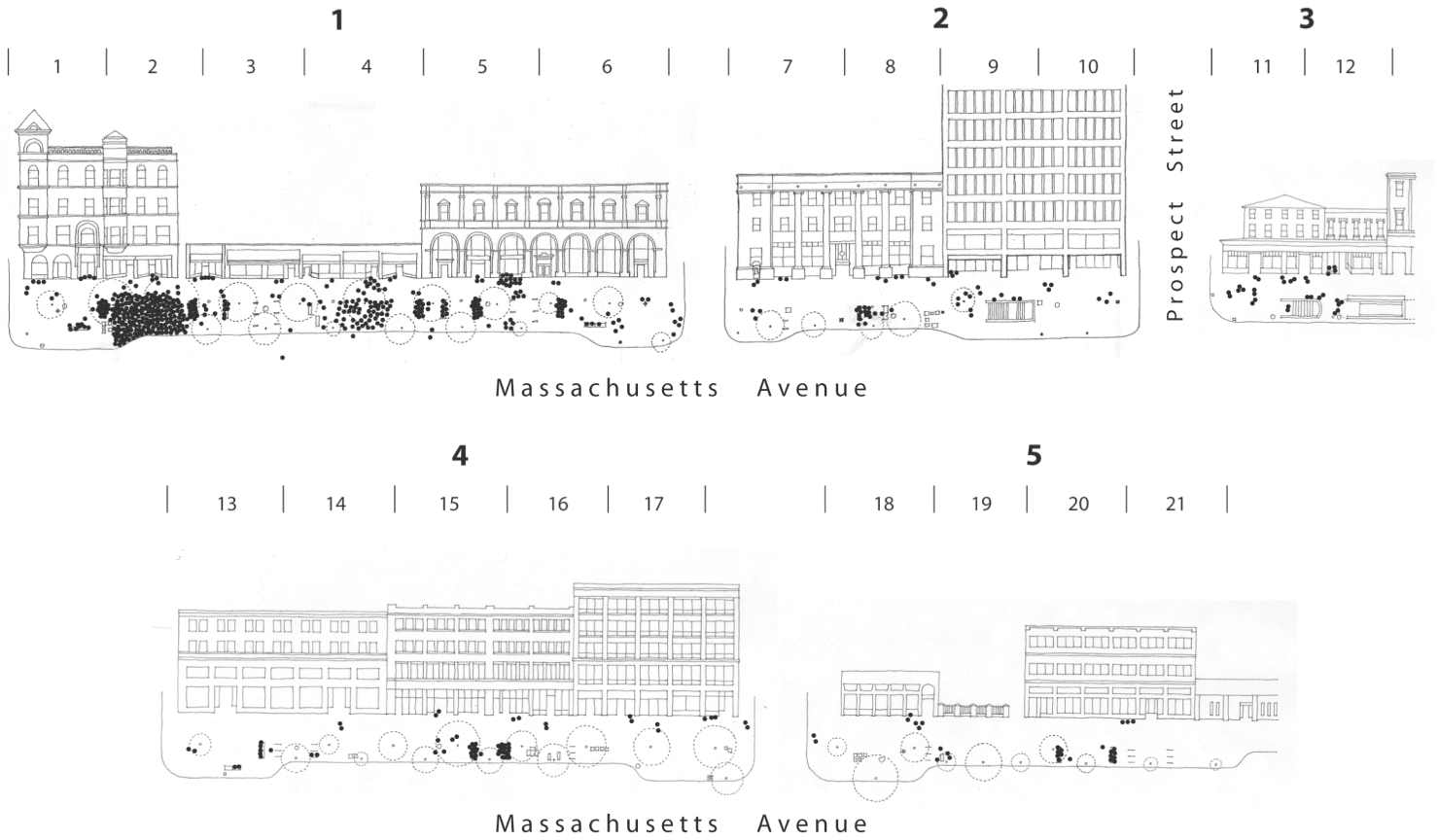

Figure 26. Behavioral map of people in groups engaged in some stationary social activity on weekdays and weekends on five blocks on Massachusetts Avenue at Central Square, Cambridge, MA.
Data from 30 walk-bys on each block spread throughout the day and evening. Each black dot represents a person

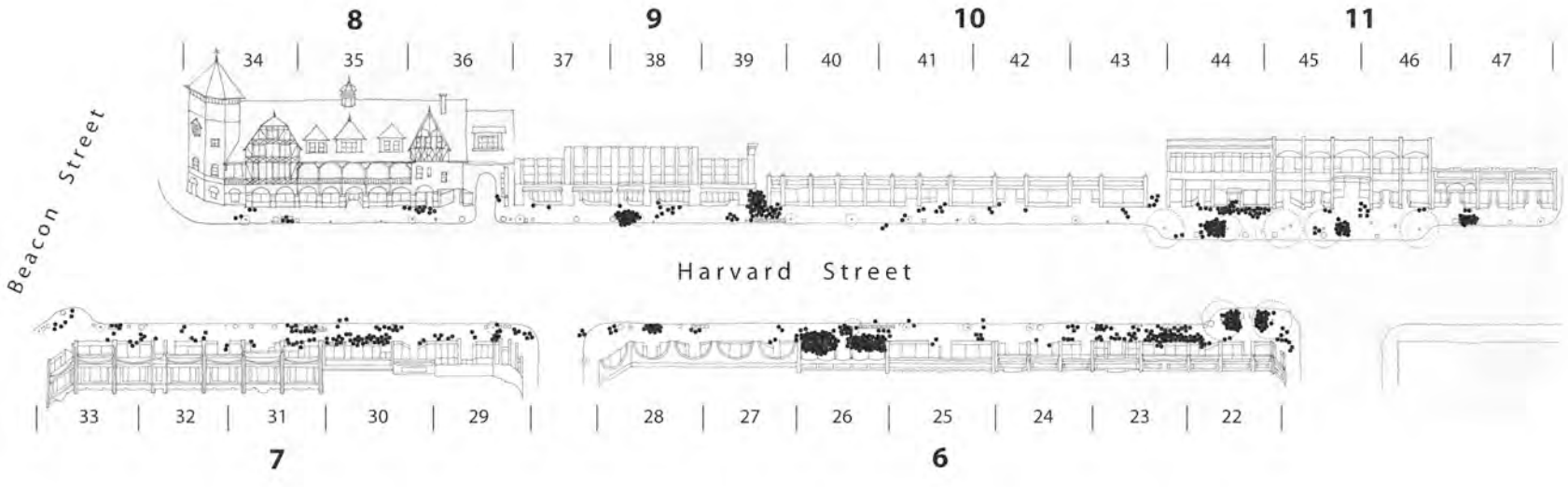

Figure 27. Behavioral map of people in groups engaged in some stationary social activity on weekdays and weekends on six blocks on Harvard Street at Coolidge Corner, Brookline, MA.
Data from 30 walk-bys on each block spread throughout the day and evening. Each black dot represents a person

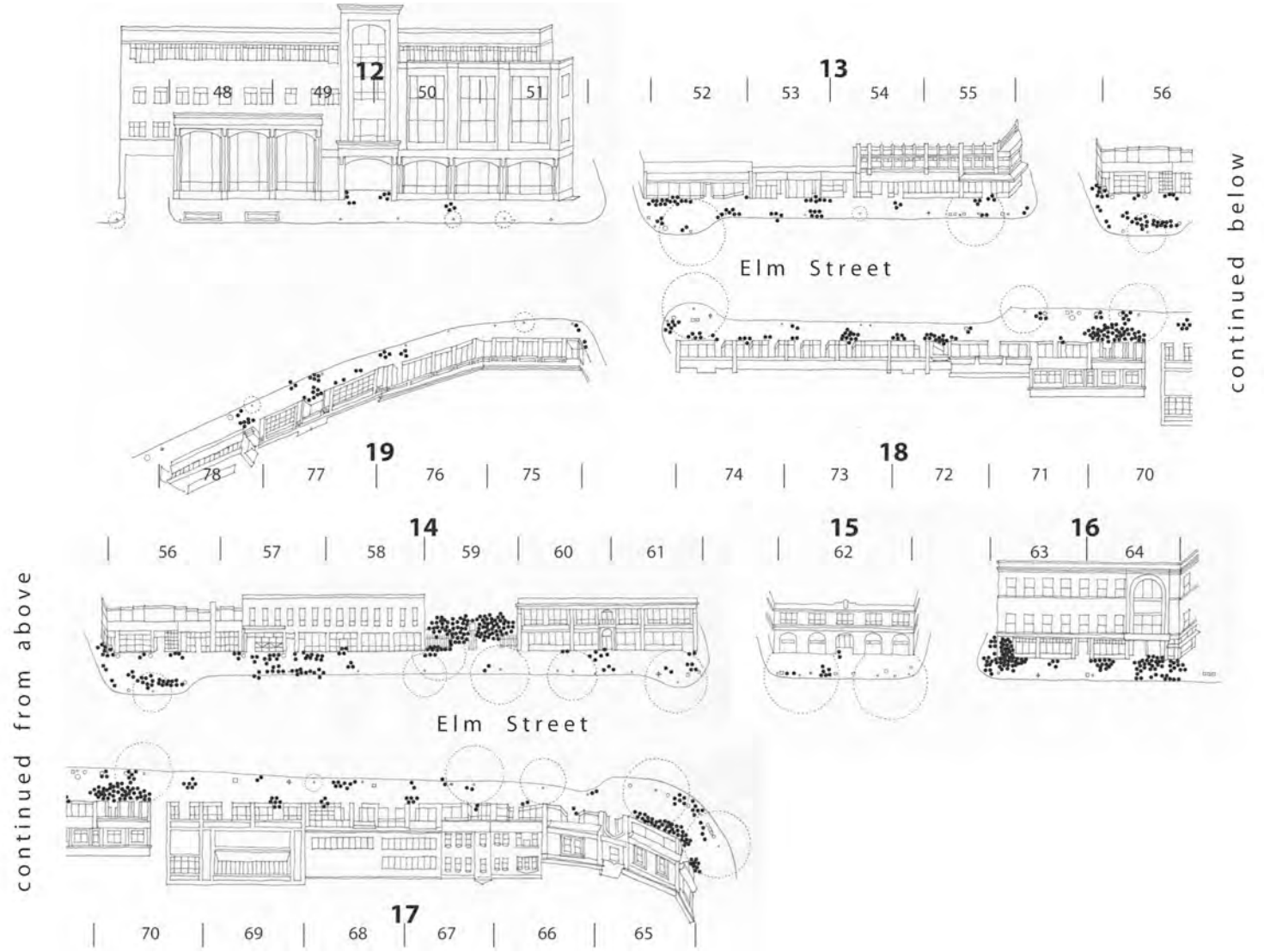

Figure 28. Behavioral map of people in groups engaged in some stationary social activity on weekdays and weekends on eight blocks on Elm Street at Davis Square, Somerville, MA.
Data from 30 walk-bys on each block spread throughout the day and evening. Each black dot represents a person

Social Activities

Walk-bys on weekdays and weekends showed that almost two-thirds of the stationary people in the three study areas were engaged in some kind of social activity [1996 (61.6%) of 3242 persons]. Social activities included talking, eating or drinking, walking pets, window-shopping, playing a game, and performing or watching a performance on the street with one or more companions, and were not mutually exclusive. Four hundred and eighty five (24.3 %) of all 1996 people engaged in social activities on weekdays and weekends were on block 1 (see Figure 25). Further, 253 (12.7%) people were engaged in some sort of social activity at the street on block-segment 2, 126 (6.3%) on block-segment 26, 104 (5.2%) on block-segment 59, 90 (4.5%) on block-segment 4, 76 (3.8%) on block-segment 22, 72 (3.6%) on block-segment 70, and 70 (3.5%) on block-segment 65 (see Figures 26, 27, and 28).

There was a strong relationship between the locations with stationary activities and locations with stationary social activities. Neighborhood commercial streets that were designed to support stationary activities were better able to afford social activities.

Duration of Stay

The 78 block-segments on 19 blocks with a wide variation in the number of people engaged in some type of stationary activity were also tested for people's duration of stay. Walk-by observations showed concentrations of people along many block-segments on the 19 blocks in the three study areas (Figures 21 through 28). The results of structured direct observations on weekdays and weekends highlighted the difference in their duration of stay.

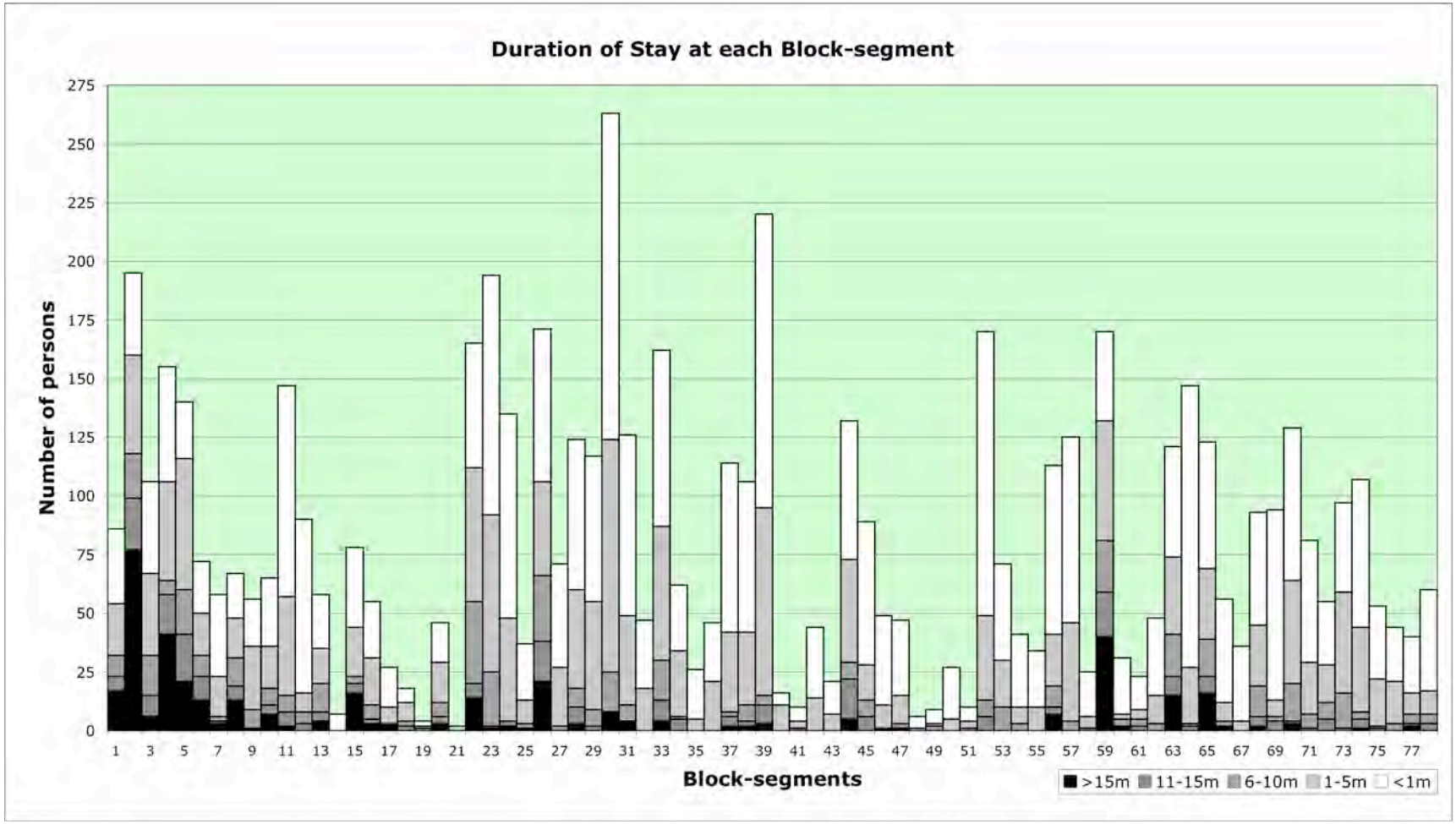

Figure 29. Duration of Stay of people in stationary and social activities on weekdays and weekends on 78 block-segments on 19 blocks in the three study areas. Data from 14 observations of 15 minutes each at each block-segment spread throughout the day and evening

Figure 29 shows that the block-segments 2, 59, 26, 4, 22, 5, 63, and 65 were the ones with the greatest number of people spending the maximum amount of time on the street. All these eight block-segments had places to sit – either benches installed by a public agency or chairs provided by the stores at these block-segments. Seven of the eight block-segments had stores that sold goods that could be consumed outside on the street near the stores: coffee shops, restaurants, or a convenience store. The eighth block-segment acted as a spillover area for an adjacent eating establishment that did not have any outdoor seating.

Block-segments 23, 30, 39, 52, and 64 also had a large number of people but they spent very little time on the street (15 seconds to less than a minute). None of these block-segments had any fixed or movable seating. Two of these five block-segments were locations of movie theaters, which attracted many people who stayed at the street for very short durations before entering or after leaving the theater. One block-segment had an ice-cream shop that attracted many people who moved to the adjacent block-segment, which had public seating. The remaining two block-segments had stores with large show-windows that often changed displays. Both these block-segments had one store each that very frequently brought goods out on the street for display and sale. Observations showed that a large number of people were attracted to the changing show-window displays as well as the goods outside the store. However, most users at these two block-segments spent no more than five minutes at each block-segment. The nature of the businesses and/or lack of seating may be an explanation for their limited duration of stay.

Liveliness Index

A Liveliness Index was calculated for each of the 78 block-segment by using the results of observation of stationary activities, social activities, and people's duration of stay at each block-segment (see Table 7).

Table 7. Liveliness Index

A measure of the combination of: 1) the number of people engaged in stationary activities; 2) the number of people in groups of two or more engaged in some stationary social activity and; 3) their duration of stay. Each block-segment is approximately 50 to 60 feet in length in a neighborhood commercial street block. N=78

Block-Segment #	Liveliness Index
2	10.00
59	5.50
26	5.15
4	4.80
22	3.73
5	3.60
65	3.09
63	3.01
44	2.82
30	2.80
23	2.77
70	2.50
39	2.33
1	2.18
6	1.99
33	1.89
15	1.85
3	1.76
56	1.75
64	1.73
8	1.62
52	1.58
11	1.53
28	1.44
38	1.38
57	1.31
31	1.31
29	1.22
68	1.21
73	1.18
45	1.15
74	1.14
72	1.02
10	0.98
13	0.97
24	0.97
37	0.93
53	0.82
20	0.82

Block-Segment #	Liveliness Index
9	0.76
77	0.75
34	0.72
12	0.72
69	0.70
16	0.65
71	0.62
46	0.61
7	0.60
78	0.56
27	0.52
62	0.46
32	0.46
36	0.45
61	0.43
76	0.43
18	0.42
66	0.40
25	0.40
75	0.40
60	0.40
55	0.39
67	0.38
17	0.38
50	0.34
42	0.33
54	0.31
47	0.28
43	0.26
58	0.26
41	0.24
40	0.11
35	0.10
14	0.10
21	0.08
49	0.07
51	0.06
19	0.04
48	0.02

The Liveliness Index was determined for each of the block-segments by aggregating the score for: 1) the number of people engaged in some stationary activity at the setting; 2) the number of people in groups of two or more engaged in some social activity; and 3) their duration of stay. A Cronbach's Alpha was calculated to test the reliability of the scales and to determine if these three measures reflected the same underlying construct. The value of the Cronbach's Alpha was 0.97, suggesting that the Liveliness Index was reliable using these three measures. The three measures were standardized and given equal weighting in determining the Liveliness Index.

Liveliness Index for each Block

As discussed in the methods chapter, a Liveliness Index was also calculated for each street block to be able to examine the relationships between user attitudes and perceptions gathered through surveys and interviews, and the liveliness of the street at the scale of the block (see Table 8). Theaters were located at Coolidge Corner and Davis Square on blocks 9 and 16. Both these blocks were also among the smallest blocks. As expected, large numbers of people were observed at these blocks just before and after the show times, especially in the evenings. As a result, data for these blocks multiplied exponentially when they were adjusted for length of block$^{4.}$ Thus, they achieved a very high Liveliness Index. For example, block 16 was 100 feet in length and results of Liveliness Index doubled when adjusted for length of block. It is most unlikely that if block 16 were 200 feet in length, there would be two independent theaters located on it. Hence, both block 9 and 16 were excluded from the final results.

Table 8. Liveliness Index at Block level

A measure of the combination of: 1) the number of people engaged in stationary activities; 2) the number of people in groups of two or more engaged in some stationary social activity and 3) their duration of stay.
* Each Block was of different length. Hence, data were modified to adjust for the length of the block (see Methods chapter for more detail). N=19
** Theaters were located on blocks 9 and 16 and these were excluded from final results

Block* #	Liveliness Index
1	10.00
16**	6.44
6	5.63
9**	4.37
7	3.88
14	3.85
18	3.30
11	3.22
2	2.49
17	2.49
3	2.33
13	1.92
4	1.79
19	1.30
8	0.97
5	0.83
15	0.76
10	0.65
12	0.31

Lively Sites: Behavior Settings for Interaction, Play, and Relaxation

The *affordances* of an environment are properties that allow it to be used in a specific way (Lang, 1987). The concept of *behavior setting* (Barker, 1968) has been introduced earlier. Using Barker's definition of a *behavior setting*, it was observed that many block-segments lacked a *milieu* (particular layout of the environment) to afford a *standing pattern of social behavior* (a recurrent activity) and as a result, there was little or no *synomorphy* (a congruent relationship between the two).

The streets in all the three study areas have been upgraded and modified within the last eight years. This has included sidewalk widening, and/or curb extensions, reconfiguration of traffic lanes, addition of bicycle lanes, traffic calming, tree planting, new street lighting on sidewalks, and the provision of benches and other street furniture in some cases, and so on. There has been an attempt to modify the street environment to afford certain pedestrian oriented activities and make it more pedestrian-friendly. However, only certain block-segments on the street served as good behavior settings for stationary and social activities and behaviors. Observations showed that not all block-segments on the streets were able to equally afford stationary activities and behaviors, especially those activities that were social in nature.

Behavior settings often contain other nested and overlapping behavior settings (Lang, 1987). Certain stores at the street created behavior settings that supported social activities and behaviors, which could be extended to the street. Such nested behavior settings at these block-segments, along with the patterns of organization and configuration of buildings, floor, landscape, street furniture and artifacts, and the materials, textures and colors of these, provided the affordances for social activities and behaviors on the street.

Location of Activities and Use of Physical Elements

Zones of Activity. There were three distinct zones of activity on the sidewalk in most of the blocks in the three study areas (see Figure 30). The first zone was along the edges of buildings and was essentially used for entering and exiting, window-shopping,

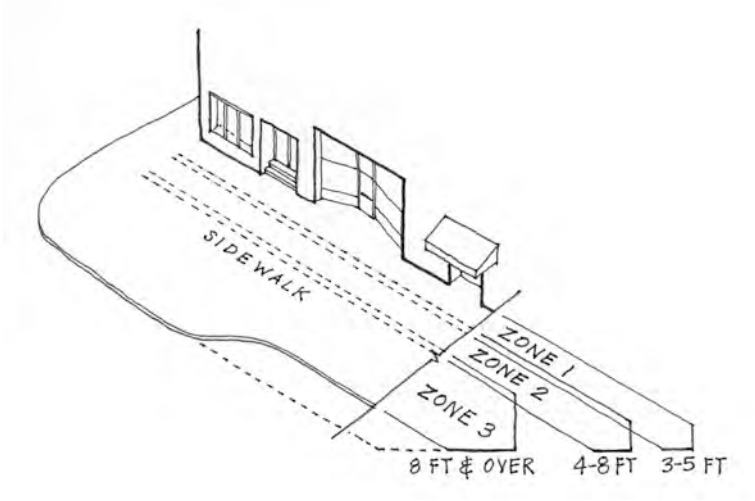

Figure 30. Axonometric showing the three zones of activity on the sidewalk

reading signs displayed by the stores, standing and often leaning on the building façade while taking a smoke-break or talking on the mobile phone, using a public phone or ATM, or for decision-making and/or talking while standing before entering a door or after exiting one. Panhandlers and performing street musicians also used the first zone. There was greater use of this zone wherever the building design and the uses in them created favorable conditions for people to perform these activities; where the building façade was articulated creating nooks and corners and steps for people to stand and sit (see Figure 31 and 32); where there were canopies or awnings to provide shade and shelter; where there were show-windows that provided useful and interesting opportunities for window-shopping; and where there were utilities such as a public phone or an ATM. Children were attracted to this zone on the street to look into buildings where possible or to use the undulated façades of buildings to go in and out, or to use it as a surface to drive miniature toy vehicles on.

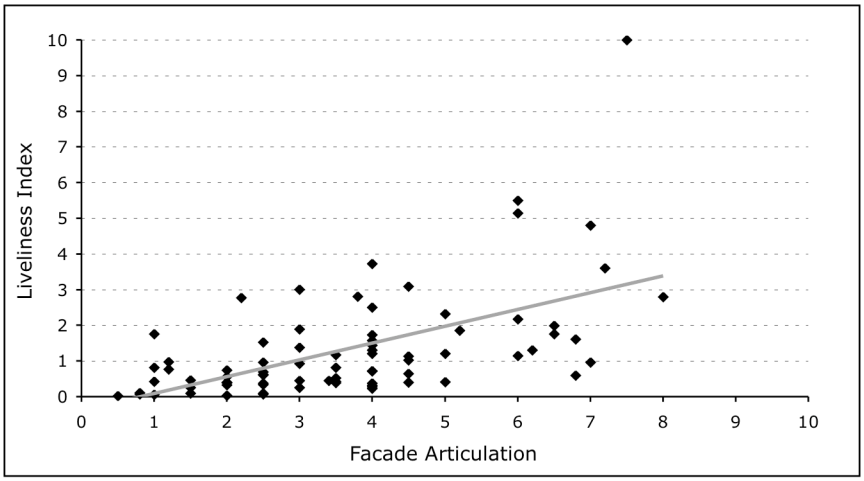

Figure 31. Relationship between articulation of the street wall façade and liveliness
Data from 78 block-segments on 19 blocks in three study areas
(Pearson's Correlation r = 0.561 p=<0.001)

The second zone was primarily for pedestrian movement, although bicyclists and skateboarders sometimes used it. People did not hesitate to stop in the middle of this zone, especially for short periods, in the midst of the pedestrian flow.

Figure 32. The different uses of the three zones of activity on the street

The third zone was used to perform the majority of the stationary and social activities observed on the street, such as sitting, people-watching, reading, eating and drinking, talking, socializing, sleeping, playing a game, children playing, listening to

music, using a laptop computer, and so on. This zone was the most richly furnished with street furniture and other physical artifacts including fixed benches and movable chairs, planters, magazine and newspaper dispensing boxes, advertisement signs on the sidewalk, bicycle stands, trashcans, light poles and sign posts, tree trunks, railings, fire hydrants and electrical panel boxes, parking meters, and vehicles parked adjacent to the sidewalk. The size of this zone varied on the blocks in the study areas. Some blocks did not have a wide enough sidewalk to have a distinctly defined third zone that could accommodate street furniture and other physical artifacts. Other blocks had wider sidewalks at the ends of the block designed as curb-extensions. Wherever available, these curb-extensions served as the third zone or its extension for that block.

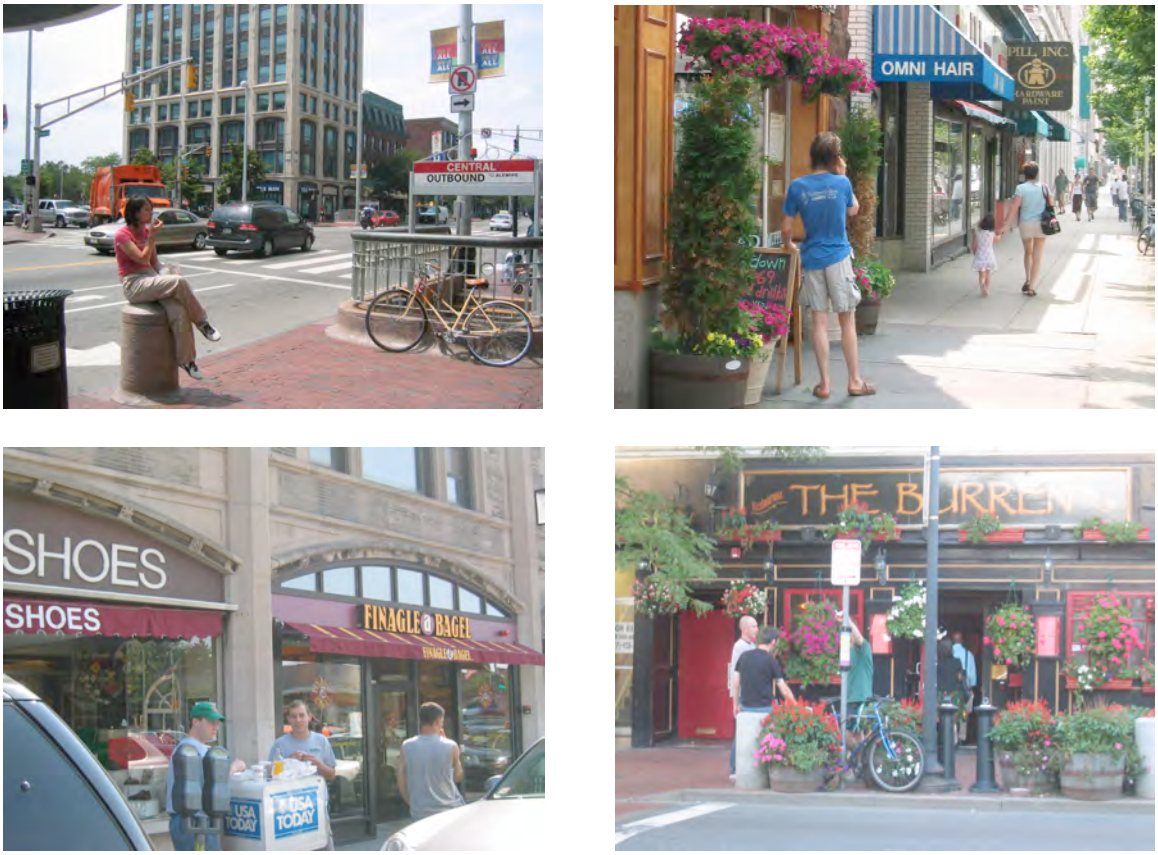

Figure 33. The different and often unforeseeable uses of various physical artifacts and street furniture

Use of Physical Artifacts. Observations showed that less than 10 percent of over 13,000 users carried out any stationary or social activities in the open part of the sidewalk away from physical artifacts. Physical artifacts on the sidewalk included building walls, show-windows, steps, fences, gates, benches, tables and chairs, planters, advertisement signs on the sidewalk, magazine and newspaper dispensing boxes, bicycle stands, trashcans, light poles, sign posts, tree trunks, railings, fire hydrants, electrical panel boxes, mailboxes, parking meters, vehicles parked near the sidewalk, and so on. These were objects on which the users sat or leaned or just stood next to (see Figure 33).

People as Attractors. People attracted more people. The observations showed the maximum use of the physical artifacts that were in close proximity to active businesses that retained people on the street for long periods. Benches or other integral seating options such as steps, ledges, and low walls that were near other commercial seating, such as seats provided by a coffee shop, were occupied more frequently than other benches or integral seating options. Users of these benches and integral seating were frequently not patronizing the coffee shop or a nearby restaurant but were attracted to the presence of people and resultant activities. The same areas on the street that had the maximum number of people throughout the day on weekdays and weekends attracted other activities such as musicians who then attracted even more people, especially on weekends. Responses to open-ended questions in the interview clearly indicated that the ability to meet or just see people was one of the important factors that determined the locations on the streets that people visited (see Figure 50).

Types of Postures and Activities

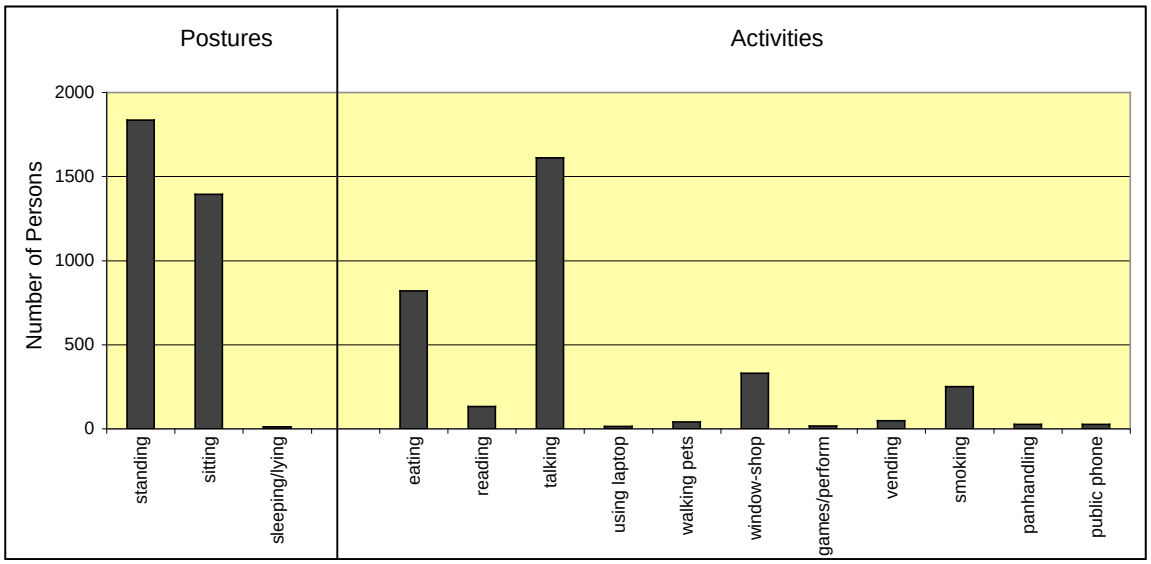

Figure 34. Various postures, and stationary and social activities that people engaged in at 78 block-segments in the three study areas. Postures and activities were not mutually exclusive. Data from 30 walk-bys at each block-segment

Table 9. Amount of Outdoors Seating

	Mass. Ave.		Harvard St.		Elm St.		TOTAL	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Public[5]	42	57	30	65	3	10	75	49
Commercial[6]	32	43	16	35	29	90	77	51
TOTAL	74	100	46	100	32	100	152	100

Postures. Figure 34 shows the various types of activities and postures observed on the street. As mentioned earlier, most of the activities recorded for this study were stationary and sedentary in nature. Results of observations of stationary behavior demonstrate that a greater number of people were standing rather than sitting or lying.

[5] Public seats were outdoor seating opportunities provided by a public agency in the form of benches, chairs, and so on. Anyone would be able to use these seats.

[6] Commercial seats were outdoor seating opportunities provided by private businesses, usually in the form chairs. Generally, only patrons of these businesses were permitted to use these seats.

Sitting was much more popular on block-segments on Massachusetts Avenue at Central Square, where there was more public and commercial seating in the form of benches and chairs (see Table 9). There was also some integral seating (steps, ledges, low walls, etc.) available at all the study areas.

Table 10. Distribution of mean Liveliness Index across stores where goods may be consumed outside. Data from 78 block-segments on 19 blocks in three study areas (t=-3.41, p<0.01)

	Number of stores on the Block-segment where goods can be consumed outside		
	0	1	2
Mean Liveliness Index	0.87	2.61	4.78
N (Block-segments)	59	18	1

Active Social Interaction. Over 40 % of the social interaction was associated with eating and/or drinking. All the lively block-segments on the streets were in close proximity to eating and drinking establishments. 343 (10.6 %) and 190 (5.9%) of all the 3242 people engaged in stationary activities on all the 78 observation block-segments on the 19 blocks were located outside two coffee shops, followed by 159 (4.9%), 118 (3.6%), and 97 (3%) outside restaurants, 116 (3.6%) outside a convenience store, 104 (3.2%) outside a pub, and 95 (2.9 %) outside an ice-cream shop. Hence, the block-segments with the highest levels of social interaction were ones which had food establishments such as a coffee shop, restaurant, a deli, an ice-cream shop, even a convenience store, and so on. However, it is important to note that while the block-segments with the highest social interaction were the ones with some food establishment, not all block-segments with eating and drinking establishments were lively. Well-

established coffee shops and restaurants exist on block-segments that scored low on the Liveliness Index. For example, only 36 people at a block-segment with a coffee shop, and 11 people at another block-segment with a restaurant, were engaged in any social activities on the street during the weekdays and weekends. Nevertheless, block-segments that had stores that offered goods and services that users could consume outside the store were livelier (see Table 10).

Among all the social interaction, talking was the most frequent (see Figure 34). Most of it occurred at block-segments that provided opportunities for other supporting behavior activities such as sitting, eating or drinking, window-shopping, and so on. The next common social activity observed was eating and/or drinking. Playing a board game or a musical instrument in the company of other people was recorded infrequently; however, even the infrequent presence of these activities was a sign of a sense of comfort and enjoyment that people were able to derive from the street space.

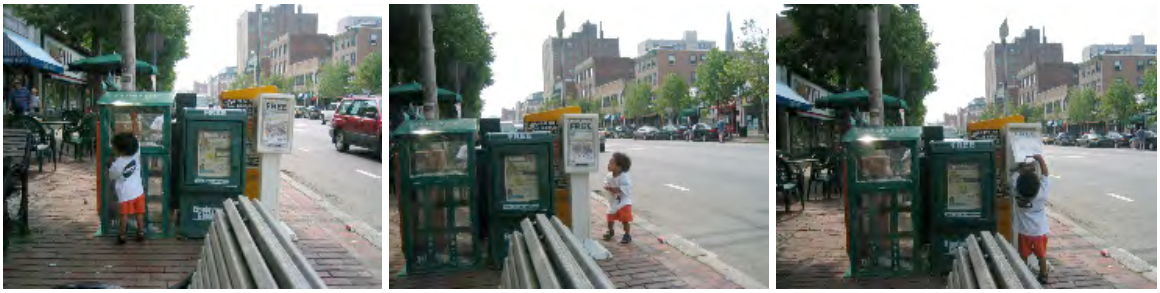

Figure 35. Children's Play – Newspaper- and magazine-dispensing boxes become objects of interest, discovery, and play.

Children's Play and Learning. Previous research on children's behavior has shown that children perceive streets differently from adults; find play opportunities in street furniture, mailboxes, fire-hydrants, parked vehicles, and so on, and prefer to use

streets as places for play even when other options are available (Barker and Wright, 1966; Francis, 1985; Eubanks-Ahrens, 1985; Brower, 1988; Moore, 1991, among others).

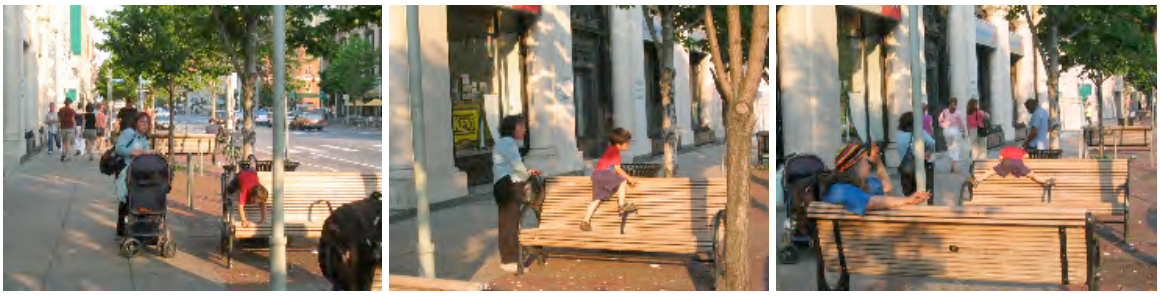

Figure 36. Children's Play – A bench was used climb, descend, and perform various kinds of gymnastics.

Numerous children's play activities were recorded on the street. Children repeatedly used newspaper and magazine dispensing boxes as equipment for play (see Figure 35). They opened and shut the various boxes to fetch papers or magazines for their parents. Children used the same boxes to run around and as props to play hide and seek. Benches were another popular prop with some children, and were used to climb, descend, jump on, perform other gymnastics, and play hopscotch and hide and seek (see Figure 36). As briefly discussed earlier, children also interacted with the building facade on the streets by walking close to it; touching different materials of the building surface, going in and out of the alcoves, niches, nooks and corners, driving toy vehicles on the surface of the buildings, using steps at entrances to sit and play with their toys, playing ball using the building surface, and so on.

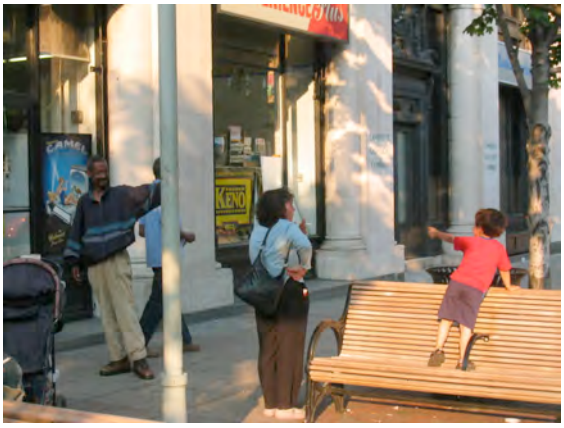


Figure 37. Children learned social skills and were exposed to new activities and objects.

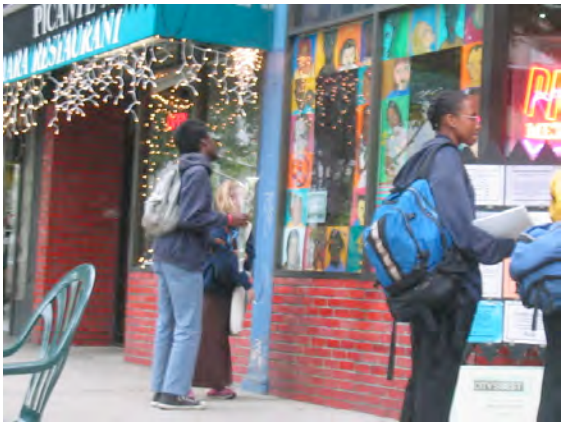


Figure 38. Permeable storefronts offered opportunities to learn from sensing activities, goods, and artifacts.

Opportunities for play were simultaneously opportunities for learning. The street environment provided an experience and exposed children to different objects, surfaces, colors, and the ability to see how they were used and operated. Seeing and meeting people on the street further educated children in the acquisition of social skills (see Figure 37).

Figure 39. The street provided a platform to bring special arts programs that brought opportunities to learn not only by seeing but also by actively engaging in the activities.

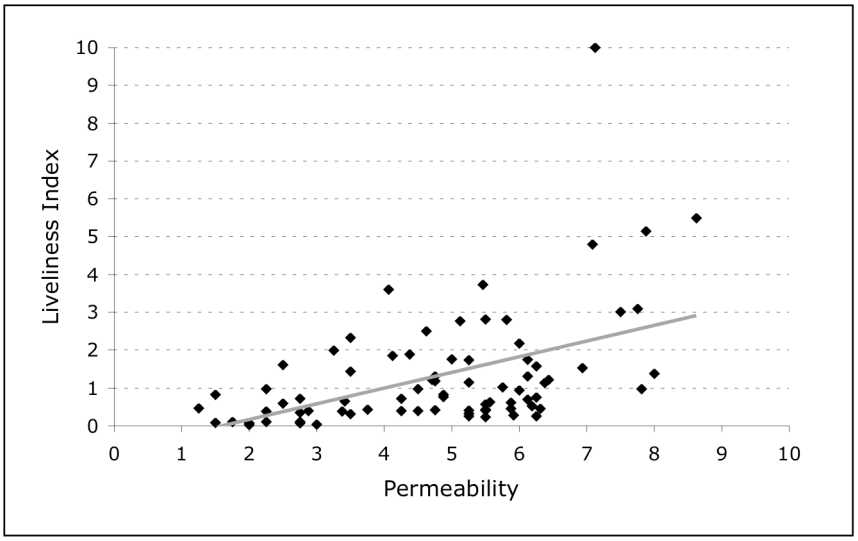

Figure 40. Relationship between permeability of the street wall façade and liveliness.
Data from 78 block-segments on 19 blocks in three study areas
(Pearson's Correlation r = 0.469 p=<0.001)

Storefronts that were permeable, such that the activities in the stores could be seen, heard, and smelled, offered children the opportunities to learn by sensing the activities and artifacts inside the stores (see Figure 38). Observations showed that permeability was an attraction not only for children but also for adults. Block-segments

with a higher degree of permeability were livelier (see Figure 40). Special programs arranged and managed by organized groups on the street brought additional opportunities for children to learn through firsthand experiences (see Figure 39).

Figure 41. People's postures, body language, and activities were an indication of relaxation on the street.

Relaxation. Carr et al. (1992) identified relaxation as one of the five primary needs of people in public space. Parks, plazas, squares, and other spaces of rest or gathering rather than the spaces of movement are usually associated with relaxation (Nager and Wentworth, 1976; Burden, 1977; Rapoport, 1990; Carr et al., 1992). However, Becker (1973), in his research of a Sacramento pedestrian mall, noted that people also seek relaxation in spaces that may usually be designed and suitable for

functions that are more active. Whyte (1980) observed that even when people in urban areas seek relaxation they do not want a complete retreat and separation from city life; rather, they look for some liveliness, activity, and some form of engagement. Observations from the present study indicate similar results. Postures and body language were an indication of relaxation on the street that is usually associated with movement (see Figure 41). Reading, eating and drinking, people-watching, watching other activities, and so on were the common and discernable signs of relaxation.

Figure 42. Pets often became the center of conversation and generated casual social interaction on the street.

Other Activities. Figure 34 shows that window-shopping, reading, smoking, walking pets, and performances were the other activities that were recorded relatively infrequently compared to talking or eating and drinking. Some window-shopping and smoking occurred as social activity. Pets frequently became the center of attraction and generated conversation and other social activity among the people on the street. People walking pets frequently interacted with other pet-walkers and with people with young children who were attracted to the pets (see Figure 42). Street musicians were seen to

perform at each of the three streets, usually locating themselves in alcoves created by articulated building facades that offered them space to set up. Musicians preferred to locate close to private or public seating (see Figure 43). Watching and listening to the musicians generated passive social interaction and valuable “low-level contacts” (Gehl, 1987) among the audience on the street.

Figure 43. Musicians occupied sheltered spaces near commercial or public seating to attract an audience.

Figure 44. Occasional activities such as decorating the storefront and campaigns added interest and social activity to the street.

Business activity such as regular maintenance, the occasional decoration of the storefront and entrance, and the movement the street furniture out to the street and back

in at closing time, added activity to the street. An increase in the number of stores and businesses per block-segment resulted not only in an increase in such activity but also a greater variety of materials and expression that added more visual interest to the street.

Occasional campaigns and fund raising events on the street made the street an arena for learning and the sharing of ideas, and contributed to the social life of the street (see Figure 44). Some panhandling activity and occasional vending on the street were also recorded.

A Sense of Comfort and Pleasure on the Street

It is reasonable to assume that most people who were observed engaged in stationary activity on the street were there by choice. The number of people and the duration of their stay was an indicator of how comfortable and pleasurable these locations were and how well they served basic human needs. A comfortable and pleasurable environment is one that provides physiological comfort, affords standing patterns of behavior, provides pleasing sensory experiences, and has positive symbolic associations for its users (Lang, 1987; Santayana, 1896 from Lang, 1987). The livelier places on the street were the ones that were better able to satisfy the range of physical, social, and psychological human needs on the street. Observations and user responses suggested that by providing a sense of safety, a sense of community and belonging, environmental comfort, convenience and physical comfort, a sense of control over the environment, sensory pleasure, and the opportunity for socializing, these settings supported the hierarchy of human needs that may be provided for in the public realm.

The surveys and interviews of users provided information on people's perceptions, attitudes, and feelings about these neighborhood commercial streets. This

aided the process of understanding the behaviors that were recorded through observations, and discussed in the previous section. While the macro-scale characteristics such as the proximity of the neighborhood commercial street to home or work, or the accessibility of the street, remain similar, results of the interviews clearly demonstrate that people chose to visit and spend more time at certain locations on the street. This is consistent with what was found through observations.

Purpose and Frequency of Use

Results of average pedestrian counts per hour on weekdays and weekends for all 19 blocks are presented in Figure 45. Since all three streets are near major transit stops, a significant amount of foot traffic on these blocks is generated from these transit stops. As expected, Figure 46 shows that there were more people walking by on blocks closer to major transit stops.

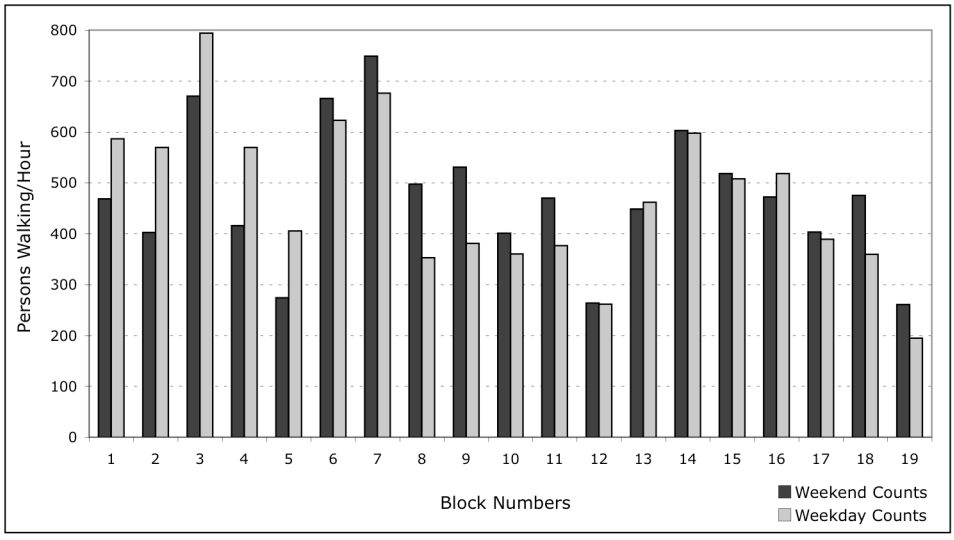

Figure 45. Daily average pedestrian counts per hour on weekdays and weekends on 19 blocks.

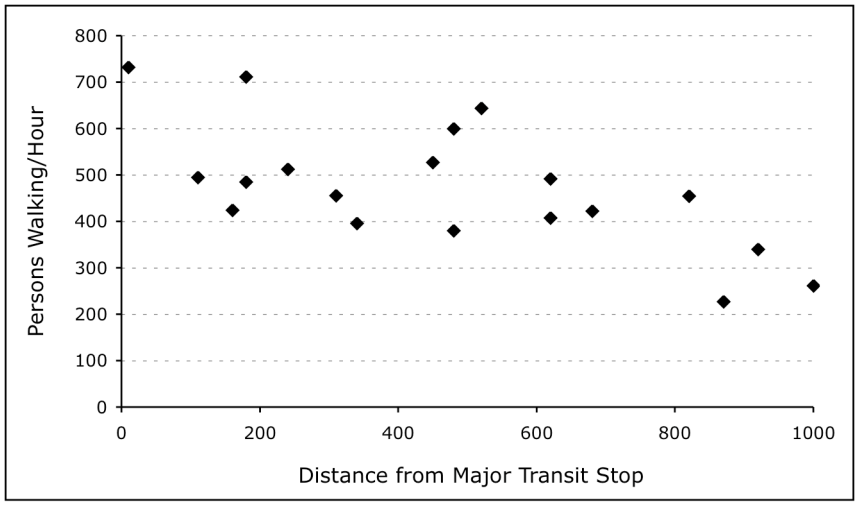

Figure 46. Relationship between distance of block from major transit stop and number of persons walking. Data from 19 blocks in three study areas. (Pearson's Correlation r = -0.66, p=<0.01)

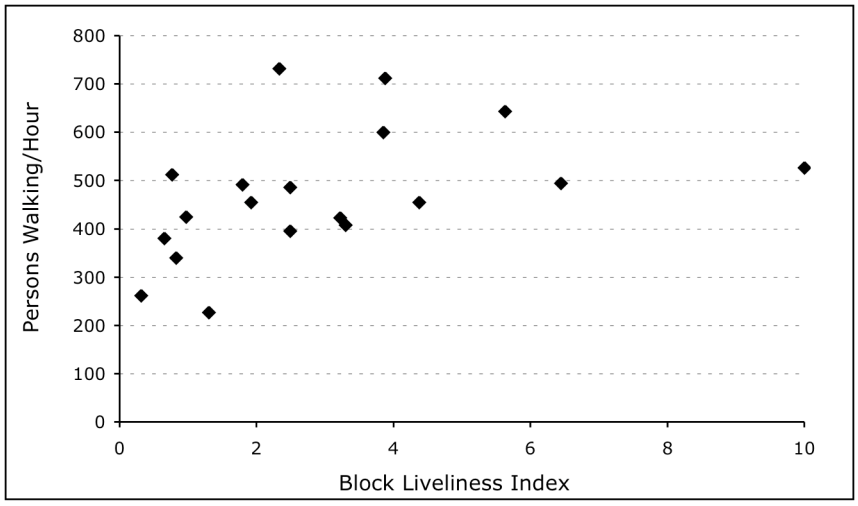

Figure 47. Relationship between liveliness of block and number of persons walking. Data from 19 blocks in three study areas. (Pearson's Correlation r = 0.44, p=<0.06)

Figure 47 suggests a relationship between number of persons walking and liveliness (people engaged in stationary and social activities), but raises the question whether the number of people walking affects liveliness or whether liveliness influences where people walk? In other words, did people stop on their way when they found something interesting or useful, and as a result, engage in stationary and social activity or

did the characteristics of certain blocks attract people to walk on those blocks? Common sense would suggest both. However, it is worth exploring if one of these was predominant. Observations showed that there were people who stopped by to window-shop or take a break in their walk. However, Liveliness Index for each block was calculated based on stationary and social activities that occurred for more than 15 seconds and many people who stopped for short durations of less than 15 seconds did not contribute to the Liveliness Index. Hence, blocks where people engaged in stationary activities for a longer duration were livelier. This suggests that Liveliness Index for a block was determined more by people who were there for longer durations and in groups than by the number of people present for shorter durations.

Most important, responses to open-ended questions confirmed that people preferred to be at the blocks that scored higher on Liveliness Index obtained through observations (see Figures 48 and 49), such as this woman who noted her preference for blocks with more people. “I go down this side more often. I walk on this side [of the street]. There are more people there. That makes me prefer to use that side.” Even when they did not intend to spend time in stationary activity, some people preferred to walk along the livelier blocks, suggesting that the lively character of the block itself was the attraction. One man’s comments summarized this well.

> I prefer to walk on the JP Licks side of the street. There are a variety of shops and displays to see. There’s flowers etcetera and seating at Zathmary’s. It is more interesting. There is much more foot traffic on that side. I see more people I know on that side of the street.

In most cases, people suggested that a combination of presence of people and visual interest affected their preference for walking on a particular block, such as this woman. “I prefer to walk on this side [of the street]. It has much more interesting visual

things. I look into the [shop] windows, people-watch. There are more people here."

Moreover, in some cases it was a matter of habit as noted by another user:

> I'm here at least once a week. I hang out at 1369 [Coffeehouse]. I'll get lunch at the Mexican place. Sometimes I come to read the paper here, get videos once in a while, go to the hardware store sometimes. Sometimes I just like to walk on this side of the street when I'm going somewhere.

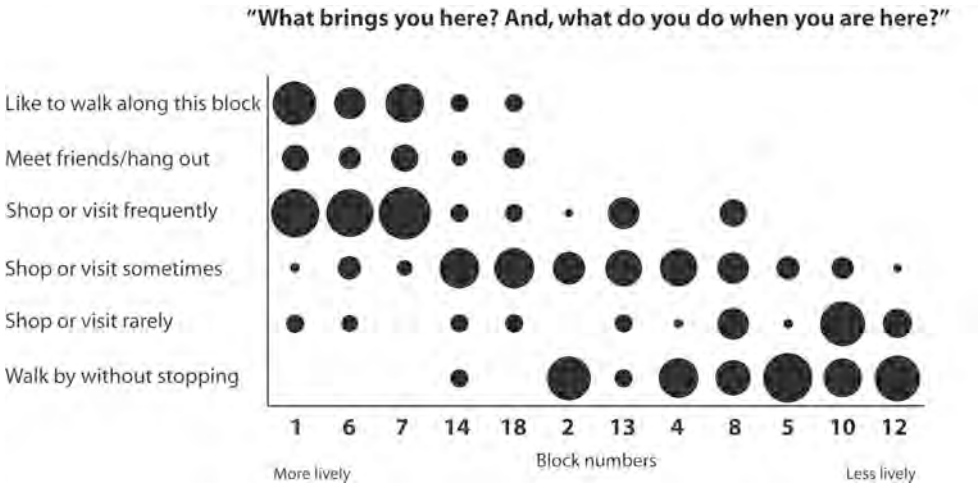

Figure 48. What users did on 12 blocks in three study areas. Response to open-ended question. Data from 51 interviews with each participant responding to four block. Dots proportionally represent frequency of use of block.

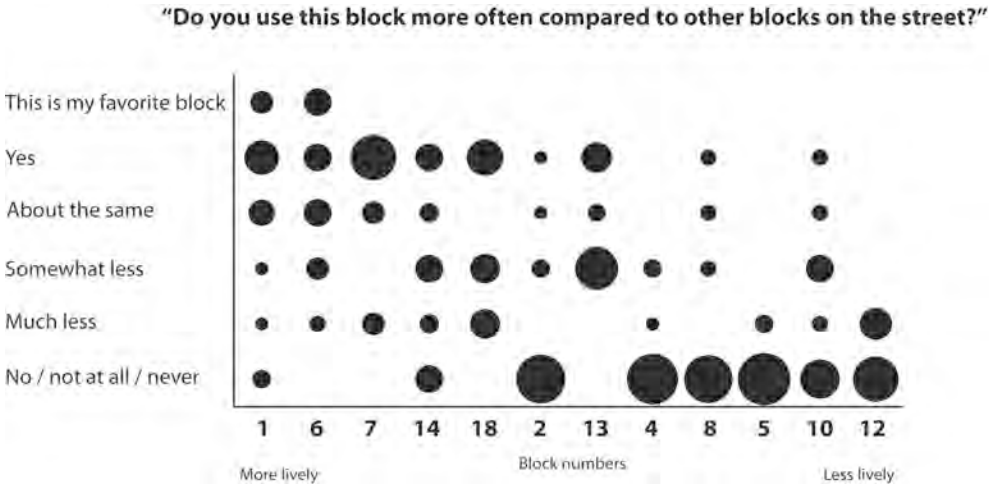

Figure 49. Level of use of 12 blocks in three study areas. Response to open-ended question. Data from 51 interviews with each participant responding to four blocks. Dots for each block add up to 100 percent.

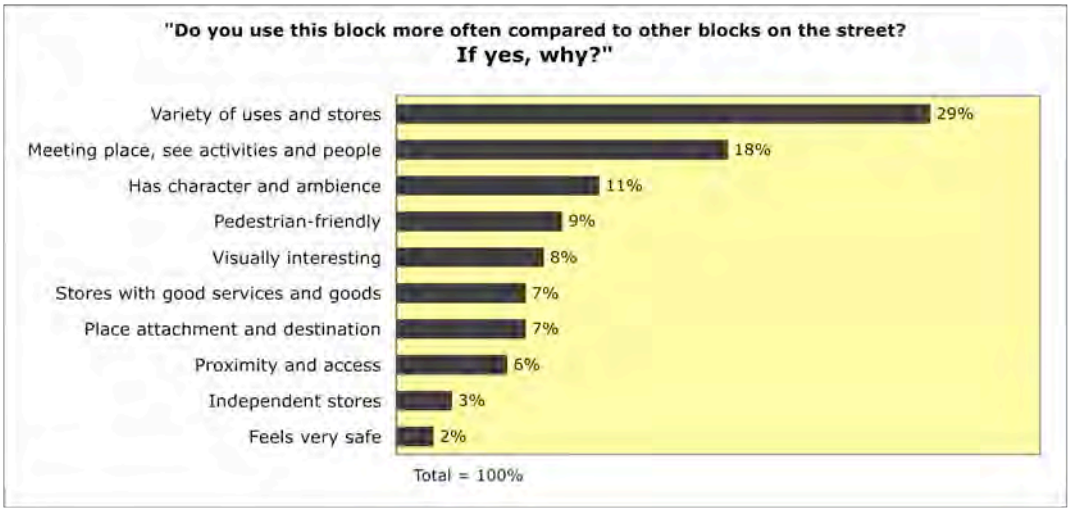

Figure 50. Why users preferred some blocks more than others on the same street. Response to open-ended question. Data from 51 interviews with each participant responding to four blocks

Opportunities to meet friends and see other people and activities were important criteria in people's decision to use a block (see Figures 50 and 51). Blocks that were livelier had more variety of uses and stores, were visually more interesting, had more community meeting places and destinations, were pedestrian-friendly, and so on. Undoubtedly, there are many other factors that may have contributed to walking behavior, and these have not been controlled for in this study; however, interviews and observations suggest that blocks that were lively attracted more people to walk there, indicating that liveliness influenced walking behavior more than the number of people walking affected liveliness. This is further supported by the fact that there was no significant correlation between distance from major transit stop and liveliness (see Figure 52).

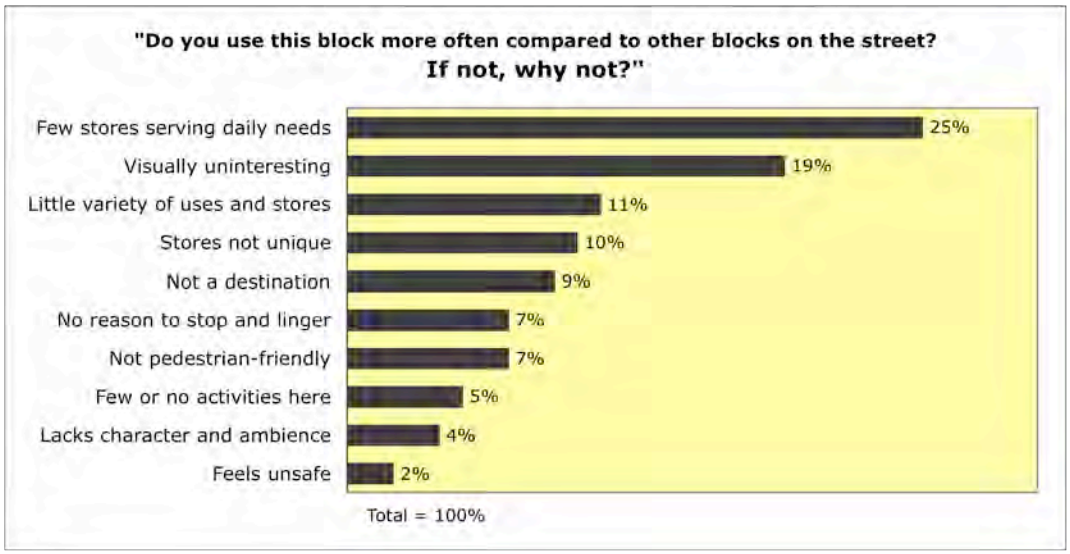

Figure 51. Why users preferred <u>not</u> to use some blocks on the same street. Response to open-ended question. Data from 51 interviews with each participant responding to four blocks

Figure 52. Relationship between distance from major transit stop and liveliness. Data from 78 block-segments on 19 blocks in three study areas. (Pearson's Correlation r not significant)

People had different perceptions of the street at different blocks. Responses to the open-ended questions revealed that <u>people preferred blocks that had a variety in the mix of uses and stores, particularly those that served daily needs; blocks that were visually</u>

interesting and had a distinctive/unique character and ambience; blocks that had destinations, which held special meaning for the community and were gathering places, where they could meet their friends and also be able to see other people and activities; blocks that were pedestrian-friendly such that they provided ample sidewalk space to accommodate walking as well as sitting areas, and provided shade and shelter; and blocks that had unique independently operated stores on them (see Figures 50 and 51).

Commonalities and Differences in Perception

The most common suggestion for all three streets was to retain the existing variety and diversity of uses and stores as well as the physical and visual characteristics that made the street more pedestrian-friendly, and to add to them (see Tables 11 and 12). However, the difference of emphasis is evident among the responses from users of the three streets. Overall, the four blocks on Massachusetts Avenue have less variety of uses and stores and fewer independently owned businesses compared to Harvard Street and Elm Street. Additionally, unlike Harvard Street and Elm Street, the variety of stores and the independently owned businesses are mostly concentrated on one of the five blocks studied on Massachusetts Avenue. However, at the same time, the sidewalks on Massachusetts Avenue are much wider, with more benches and other street furniture, mature trees, artwork on objects on the sidewalk, and other pedestrian-friendly amenities (see Figures 7 and 8). These differences were reflected in the responses from users of Massachusetts Avenue, who emphasized that the pedestrian-friendly amenities they have should be retained. Similarly, users of Harvard Street and Elm Street emphasized the variety of uses and stores, and independent businesses, which were perceived as paramount to the character of their neighborhood commercial street (see Table 11).

Table 11. "What are the three most important things about this block that you would <u>not</u> want to change?" Response to open-ended question. Data from 51 interviews with each participant responding to four blocks

	Mass. Ave.		**Harvard St.**		**Elm St.**		**TOTAL**	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Variety & diversity of uses and stores	27	11%	25	19%	44	30%	96	18.5%
Independent, small, unique stores and uses	17	7	21	16	23	16	61	12
Way businesses are operated/managed	2	1	0	0	1	1	3	0.5
Stores remain open late	1	0.5	1	1	0	0	2	0.5
Community places – not just a business	4	1.5	10	7.5	13	9	27	5
Stores that support street activities/people places	3	1	7	5	13	9	23	4.5
Mix of people on the block	8	3	2	2	0	0	10	2
Ambience/atmosphere/feel of the area	4	1.5	0	0	0	0	4	1
Pedestrian- & child-friendly street with wide sidewalks, seating, shade & shelter	78	33	10	7.5	15	10	103	20
Trees, landscape features, public art	41	17	17	13	13	9	71	14
Visual interest - displays, shop-windows, wares	5	2	6	4.5	4	3	15	3
Historic architectural quality, building features	31	13	15	11	12	8	58	11
Low impact of traffic, proximity to public transit	9	4	9	7	6	4	24	4.5
Bicycle-friendly block – bike lanes, bike stands	1	0.5	0	0	0	0	1	0
Keep street parking near stores	1	0.5	1	1	1	0.5	3	0.5
Maintenance of sidewalk and buildings	6	2.5	6	4.5	1	0.5	13	2.5
Safety on the block	2	1	1	1	0	0	3	0.5
TOTAL number of responses	240	100%	131	100%	146	100%	**517**	**100%**

This difference in perception is further supported in the data in Table 12. In providing suggestions for changes and additions to the blocks, responses from the users of Massachusetts Avenue showed less emphasis on the physical characteristics, which the blocks already possess, and more on adding variety of uses and stores and independently owned businesses. Similarly, responses from the users of Harvard Street and Elm Street showed a greater emphasis on changing and adding to the physical characteristics of the street to make it more pedestrian-friendly with wider sidewalks, seating, and other amenities – the characteristics that the blocks there do not already possess (see Table 12).

Table 12. "What are the three most important things that you would like to change or add on this block?" Response to open-ended question. Data from 51 interviews with each participant responding to four blocks

	Mass. Ave.		Harvard St.		Elm St.		TOTAL	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Variety & diversity of uses and stores	56	25%	33	20%	33	25%	122	24%
Independent, small, unique stores and uses	20	9	25	16	12	9	57	11
Way businesses are operated/managed	4	2	4	2	1	1	9	2
Stores remain open late	8	4	5	3	1	1	14	3
Stores that support street activities/people places	25	11	9	6	12	9	46	9
Pedestrian- & child-friendly street with wide sidewalks, seating, shade & shelter	21	10	32	20	31	24	84	16
Trees, landscape features, public art	21	10	12	7.5	9	7	42	8
Visual interest – displays, shop-windows, wares	13	6	9	6	17	13	39	7.5
Architectural quality, building features	18	8	13	8	3	2	34	6.5
Information about uses – signs	5	2	2	1	1	1	8	1.5
Low impact of traffic, proximity to public transit	7	3	3	2	0	0	10	2
Bicycle-friendly block – bike lanes, bike stands	3	1	1	0.5	3	2	7	1.5
Increase parking near stores	0	0	0	0	1	1	1	0
Maintenance of sidewalk and buildings	11	5	12	7.5	7	5	30	6
Safety on the block	9	4	1	0.5	0	0	10	2
TOTAL number of responses	221	100%	161	100%	131	100%	**513**	**100%**

The lack of an appropriate layout of the physical environment to support stationary and social activities on the street was further apparent in the results of the survey for the blocks on Elm Street. These are presented in the sections that follow. Some of the less lively blocks (block 18 and 13) were perceived to have more variety and more unique goods and services on the block. The stores on these two blocks were also perceived to change their signs and displays more often compared to block 14, which was the liveliest block on Elm Street (see Figures 58, 69, and 71). These differences may be explained as follows. Blocks 14, 18, and 13, all have a better behavioral environment

(uses that support street activities) than the physical environment required to support stationary and social activities on the street. Of the three, block 14 is the only one that has some supporting elements of the physical environment in the form of commercial seating, adequate sidewalk space to accommodate the seating, and so on. While the other two blocks have a suitable behavioral environment, the opportunities for stationary and social activities are stifled due to the lack of supporting elements of the physical environment. Hence, although block 14 is the liveliest of all blocks on Elm Street, the other two blocks are likely to be equally or more lively if the appropriate physical environment was provided in conjunction with the already existing behavioral environment. This is also reflected in the users' perception for change (see Tables 11 and 12).

Two other major differences in the responses need some elaboration. First, although there are already more independently owned businesses on Harvard Street compared to Massachusetts Avenue, users of Harvard Street in Coolidge Corner suggested adding more. This may be explained as follows. As a result of increasing property values and rents in the last few years, Coolidge Corner has been losing many independently owned businesses that have been replaced by chain stores. Users of the neighborhood businesses lamented this loss and reflected this in their suggestions for bringing back the small independently owned businesses. This long-time resident of the neighborhood noted:

> It's sad to see local smaller mom and pop stores go. They are being replaced by big chains. It changes the feel of the block. There's more loudness with younger people visiting. …… there are so many banks here. Banks are pretty boring. It doesn't add character to the neighborhood. When stores move out you expect an interesting business to move in. That's not happening.

Second, the suggestions from the users of Elm Street in Davis Square to the effect that the visual interest of the street should be enhanced, were considerably higher than those of Massachusetts Avenue and Harvard Street. Davis Square, like the other neighborhoods in the city of Somerville, has been a blue-collar neighborhood for most of the last century. Demographics have begun to change only in the last ten years or so, and Davis Square has now been "discovered" as an attractive neighborhood in the Boston Metropolitan area. However, most of the businesses in Davis Square have been around for many years, and they cater to the long-time blue-collar residents of the neighborhood. As a result, many of these businesses are old and appear grungy, and in need for upgrades. Users responded to this need and suggested adding to the visual interest of the street by upgrading the display of shop-windows, wares, and so on. This woman put it succinctly. "There are lot of relics here [at Davis Square]. They need to jazz them up a bit."

The commonalities and differences in the responses to the open-ended questions in the interview show that the users were concerned with both the social and physical dimensions of the street – what it offered as an amenity, how it was operated and managed, what physical comforts it provided, what activities and who they were able to see and meet, and how it looked.

Sense of Safety on the Street

Since the unit for the survey and interview for this study was a street block, sense of safety was studied not for each 50 to 60 foot long block-segment, but for each block (see Appendix 1). From the observations of three neighborhood commercial streets, it was evident that while many more people used and spent more time at some locations, all

the blocks studied at the three study areas were perceived to be generally safe. None of the properties was vacant. While the level of tidiness on the street varied from store to store, none of the buildings or sidewalks was in a state of disrepair. Even the frequency of street lighting fixtures and the illumination levels after dark were similar at all three study areas. There were no significant signs of anti-social activity or unruly behavior recorded by the author at any of these three locations. Panhandlers and homeless people were seen in some places but that did not seem to cause a major conflict with the use of the street by other people. Responses from surveys and interviews reinforced these observations. Sense of safety was the most minor factor indicated in determining whether to use a particular block on the street (see Figures 50 and 51). Even when suggesting changes, users placed much less emphasis on safety than other characteristics (see Tables 11 and 12).

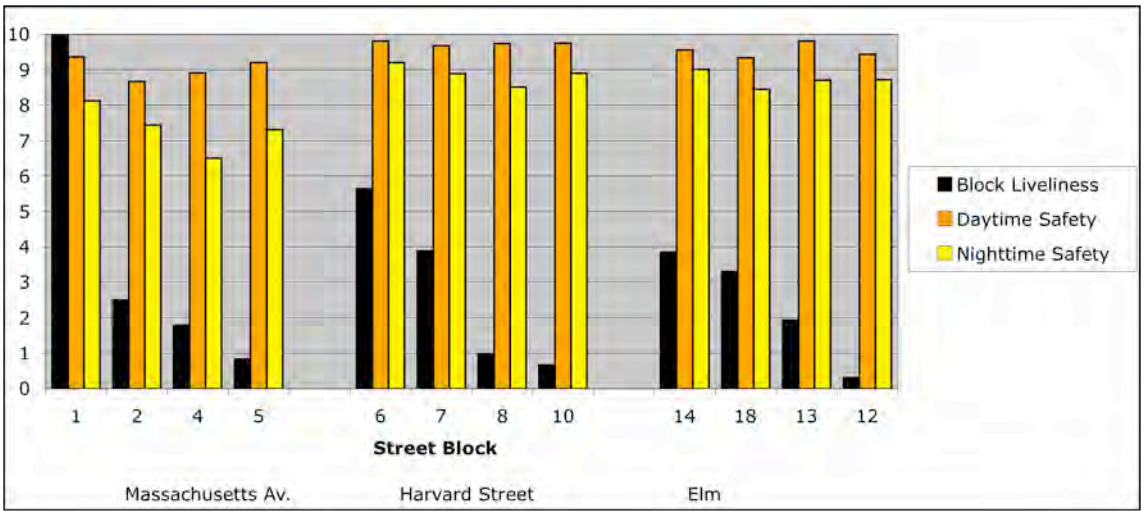

Figure 53. Relationship between users' perception of daytime and nighttime safety on the block and liveliness. User response to survey of four blocks each at the three study areas.
Daytime safety and Liveliness – Correlation not significant
Nighttime safety and Liveliness – Correlation not significant

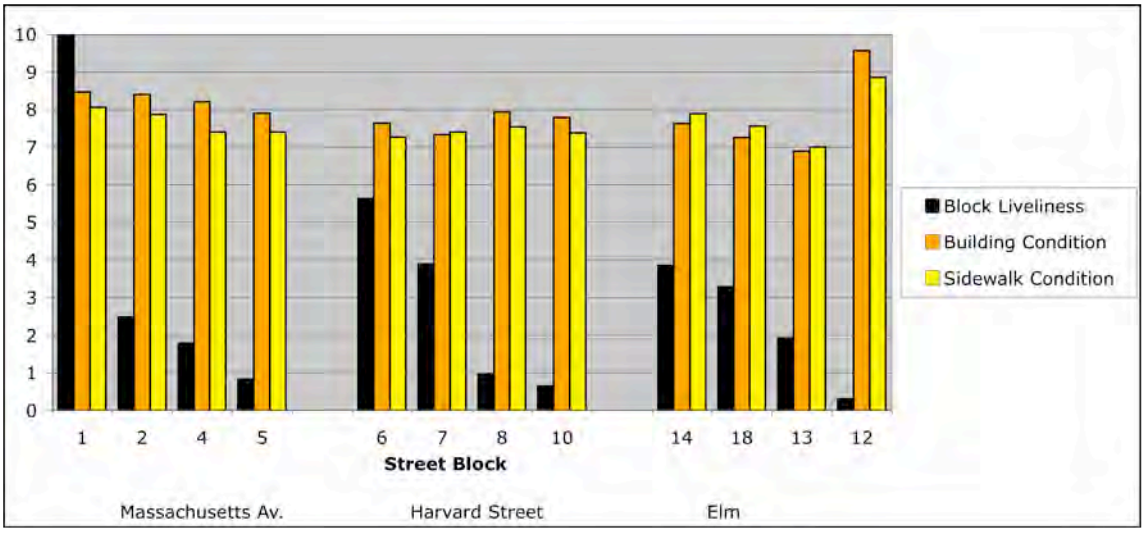

Figure 54. Relationship between users' perception of building and sidewalk condition of the block and liveliness. User response to survey of four blocks each at the three study areas.
Building condition and Liveliness – Correlation not significant
Sidewalk condition and Liveliness – Correlation not significant

Since the buildings and sidewalks on all blocks were generally perceived to be similar in physical condition and state of maintenance, the perception of safety was not affected by physical condition (see Figures 53 and 54). However, people perceived some of the blocks in each study area to be relatively less safe as this woman who noted that "I find [this block] less safe and interesting due to the parking lot, especially at night. [When] walking by, my preference would be for the other side." Many users commented that "nothing seemed to happen there," that those blocks were less interesting in appearance and less attractive, and had few or no stores that offered unique goods and services (see Figures 68 and 71). Others found it difficult to relate to the blank and monotonous facades of buildings, as this man who commented that "the building façade looks like an armor with big plates. It's not welcoming. They should change the façade slightly to make it welcoming." These were blocks that rated low on the no "dead space" scale. He suggested:

> They should get rid of the Sovereign Bank building. It's uninviting, ugly, [and] blank. It's almost like it tries not to have an identity. The buildings there have nothing to draw the eye. I do not like the bottom of those buildings. [However,] the sidewalk is well-defined for people to use."

Similarly, for another block a user noted:

> The huge Quest building is really designed to keep people out. Those dark windows – you just slide right by. It's like a transition block especially compared to the stuff across the street. There's nothing for me to stop for. No reason to stop. It is a blank zone in my mind."

Table 13. Distribution of mean Liveliness Index across block-segments with varying percentage of "no dead space." Data from 78 block-segments on 19 blocks in three study areas.

	No Dead space on the Block-segment		
	0 to 33%	34 to 67%	68 to 100%
Mean Liveliness Index	0.23	0.64	1.70
N (Block-segments)	7	18	53

Additionally, correlations showed that the block-segments with a higher percentage of "no dead space" were livelier (see Table 13). While the users of these three streets had a general impression of safety, these subtle differences in perception of safety were results of the appearance of each business – the way it looked and felt as noted by this woman:

> I have not been to The Burren but I feel it is a good place because of the way it presents itself on the outdoors. If it were not for The Burren pub there would be almost no sidewalk life.

People's perception of appearance of settings was addressed in the survey by using attractiveness and interesting appearance as measures that related to signs, plantings, openings at street level, lighting fixtures, and furniture on the sidewalk, and

also a variety in these elements. Users suggested that the lack of personalization and territorial control were the main reasons for these blocks to be perceived as less attractive and interesting, as this woman who suggested, "We need planters, awnings – things that give off that people are around. Something that makes the stores communicate with you. Window boxes for flowers would do a lot for me." This lack of personalization and territorial control made these blocks appear less safe compared to other blocks on the street.

Sense of Belonging: Community Places

People noted many businesses as their favorite community-gathering places. They valued these places as destinations to meet neighbors, friends, and sometimes strangers. Over time, these places had become neighborhood landmarks for the community. People designated a variety of businesses as community places including coffee shops, convenience stores, restaurants, bookshops, bars, and even a used goods store. Most people who lived or worked in the neighborhood had some place they could identify with as a community place. However, observations and interviews suggested that in some cases the choice of community place was based on class and attitudes that resulted in different community places for different groups in the neighborhood. New residents seldom mentioned an old bar that was a favorite community place for the long-time residents of this neighborhood as suggested by one man.

> Sligo [bar] is an institution of the community. It's a good place to hang out. It's a community place. It's a place you go to. People hang out there. It feels very comfortable for an average middle class person but there is a variety of people there. That's the old Davis Square. I know friends that use Sligo. I know people there for years.

However, users emphasized the ability of having people with different backgrounds as an important quality of a community place as suggested by this woman. "I like the big open space feeling at Goodwill. It is not pretentious. You can see people of all backgrounds. I like seeing the real community." Another participant pointed to the diversity of people in the neighborhood who used a coffeehouse as a gathering place.

> I like the fact that people can hang around here and socialize and not just be a customer. It is a meeting area, a destination. Everybody comes here. It attracts [people from] all walks of life, all races, working class, families, …….. it has it's own unique aura about it.

This woman compared the past to the present and noted some differences that were significant in her decision to use the business.

> There used to be a Greek local café where there is Diva [restaurant and bar]. It had hundred seats. People with all different backgrounds would go there. You could see the whole community there. Inside, it felt like a public restaurant. Now it is Diva, which is very private.

People attached special significance to community-gathering places that extended and engaged the outdoors, particularly by providing seating on the street. These two long-time residents noted:

> … Greater socialness is created when you are outdoors. People feel less private and have an ease of interaction. Sociability increases in outdoor seating. It just seems more comfortable and results in higher social interaction with all types of people.
>
> People in outdoor seating give the appearance of 'friendliness', sort of village model as contrasted with 'parking lot next to store'. It has a sense of connectedness.

Many others noted this outdoor quality for a coffeehouse that was frequently mentioned as a community-gathering place as this resident of the neighborhood. "1369

[Coffeehouse is my favorite]. It's affordable and I meet my friends there. It has a good in-out flow. The tables on the sidewalk and the benches are great. It is a magnet for street culture." However, not all these businesses had outdoor seating. The nature of some of these community-gathering spaces was not suitable to support outdoor seating. In a few instances, the business was suitable to support outdoor seating but the environment did not offer affordances to do so, such as inadequate width of sidewalk.

In some cases, the community-gathering places were so significant for people that they were part of their lives even when they no longer lived in the neighborhood as noted by this previous resident of the neighborhood.

> People have changed due to the rents. It used to be neighborhood people earlier [at the coffeehouse]. It has changed from neighborhood people to a destination with more new people. But people who lived here [in the neighborhood] still come back to this block. I used to live here …… Now I live in Davis Square. … I still come back here. 1369 [Coffeehouse] is a community-gathering point. I feel at home …… It has an ambience of community.

In contrast, interviews with the participants who were visitors to the neighborhood commercial street suggested that they distinguished very little between community places and other similar businesses. The visitors attached little or no value to such community places compared to the participants who lived or worked in the neighborhood.

Table 14. Distribution of mean Liveliness Index across block-segments with or without Community Places. Data from 78 block-segments on 19 blocks in three study areas.

	Community Place on the Block-segment	
	No	Yes
Mean Liveliness Index	1.01	3.24
N (Block-segments)	67	11

Table 14 shows that block-segments with a community place were livelier than block-segments with no community place (mean 3.24 on Liveliness Index compared to 1.01, t=-2.85, p<0.02).

Almost all the businesses identified by the users as community places were independently operated businesses where the business owners and workers too were an active part of the community.

Table 15. User Choice of Favorite Stores/Businesses

	Mass. Ave. No.	Percent	**Harvard St.** No.	Percent	**Elm St.** No.	Percent	**TOTAL** No.	Percent
Independently owned store/local chain	42	98	27	69	38	86	107	85
Chain store	1	2	12	31	6	14	19	15
TOTAL number of responses	43	100	39	100	44	100	**126**	**100%**

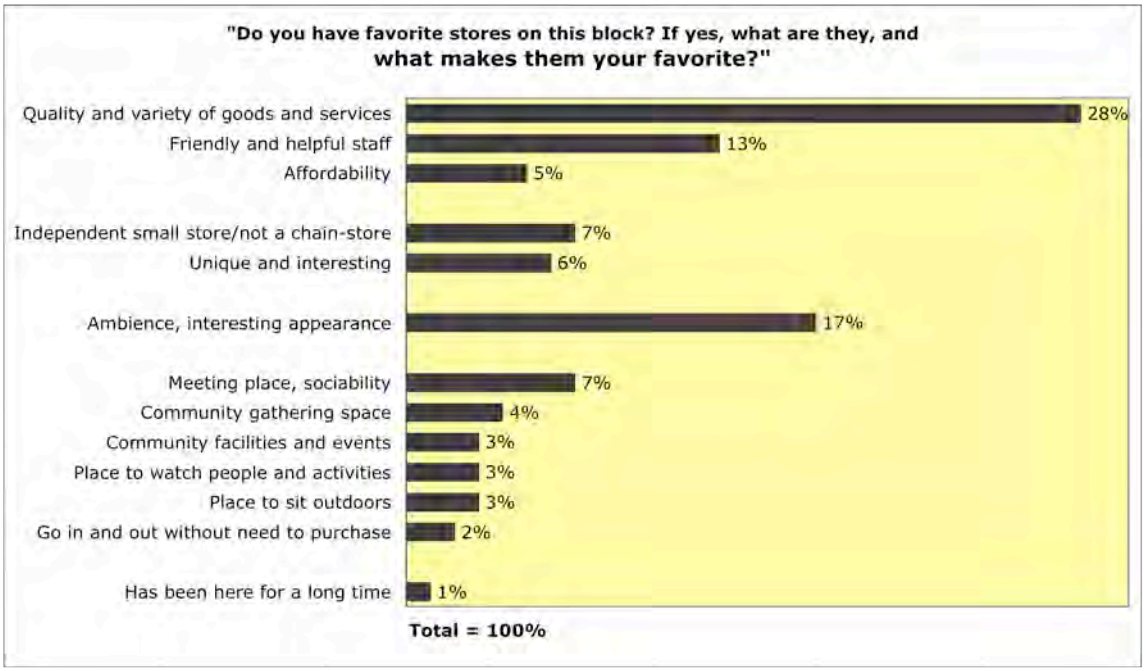

Figure 55. Why users preferred some stores and businesses to others on the same street. Response to open-ended question. Data from 51 interviews with each participant responding to four blocks.

Independently Owned Businesses. People preferred smaller independently owned and operated businesses not only for the quality and variety of goods and services and friendly staff but also for their uniqueness and character and the overall ambience they created. Most important, as discussed earlier, were the collective attachments to some of these stores that acted as community places. One resident noted, "Booksmith is the best bookstore around. I love it because it is independently owned. They have scheduled readings by decent authors……. The staff is knowledgeable. ……You can go in and hang out without buying anything……. They have a diverse selection." Some customers, as this woman, supported independent stores as a matter of principle. "Philosophically, I prefer smaller independent bookstores." Another woman concurred and further suggested that independent businesses were an important part of a neighborhood.

> Booksmith is my favorite because I strongly believe in supporting small businesses. The people at Booksmith make a great attempt at accommodating the customer. The employees are knowledgeable and helpful. They have marked down books. It is the center of cultural life. It's one of the reasons we chose to move here.

A large number of people found that the smaller businesses were friendlier and treated their premises, including the sidewalk and street outside, with more care and personal attention. This, they thought, made the streets more interesting and attractive and more conducive to lingering and meeting people (see Table 15 and Figure 55). This was consistent with the findings through observations (see Table 16). Block-segments with one or more independently owned stores were livelier than block-segments with no independently owned stores (mean 1.69 on Liveliness Index compared to 0.76, t=-3, p<0.01).

Table 16. Distribution of mean Liveliness Index across different numbers of independently owned stores. Data from 78 block-segments on 19 blocks in three study areas.

	Number of Independent Stores on Block-segment			
	0	1	2	3
Mean Liveliness Index	0.76	1.46	1.38	3.24
N (Block-segments)	31	20	20	7

Users of different ages, races, genders, professions, and income groups seemed to recognize their deliberate choice to live in a mixed-use area and were willing to support the smaller stores.

Environmental Comfort on the Street

Sunlight and Shade. As expected, people's preference for spaces in the sun or under shade on the street changed with changing seasons and weather. Most people were observed sitting in the sun during spring. However, during summer a combination of shade and filtered sunlight through tree-cover, canopies, awnings, and overhangs was most sought after. Sometimes people used retractable canopies provided by stores to create the desirable conditions. Direct sunlight was not desirable in summer. People who spend considerable time on the street particularly tended to use shaded or semi-shaded spaces under trees, in entrance alcoves, and in niches and nooks of buildings adjacent to the street (see Figure 56). The six liveliest block-segments had a combination of sunlight and shade with a mean of 63 percent street frontage under shade in summer compared to only 22 percent for the six least lively block-segments.

Figure 56. Trees, retractable canopies, awnings, overhangs, alcoves, and setbacks in the building façade provided shade.

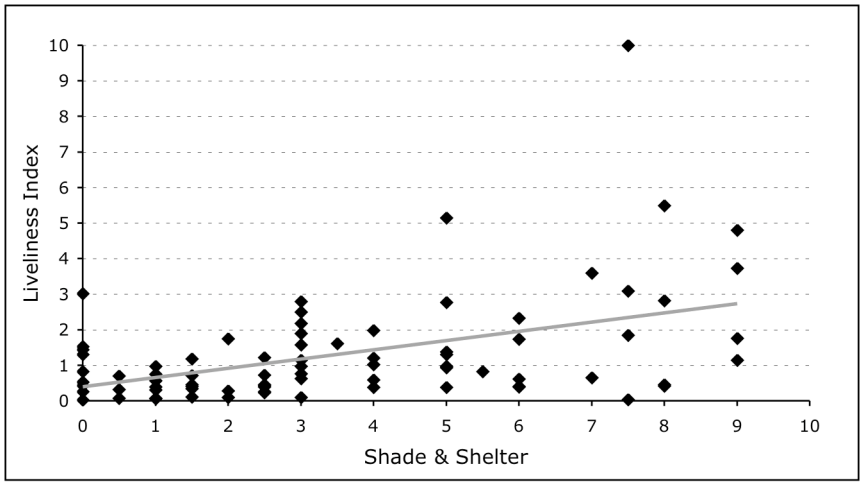

Figure 57. Relationship between shade and shelter through trees, canopies, awnings, and overhangs, and liveliness. Data from 78 block-segments on 19 blocks in three study areas. (Pearson's Correlation r = 0.454 p=<0.001)

User comments on retaining the physical characteristics as well as suggestions for change to make the street more pedestrian-friendly included the availability of shade and shelter from the sun and rain with the help of trees, canopies, awnings and overhangs on these blocks (see Tables 11 and 12). This was consistent with the findings of the

observations, which showed that block-segments that provided greater opportunities for shade and shelter were also livelier (see Figure 57).

Serving Needs - Physical Comfort and Convenience on the Street

In order to be perceived as a comfortable and pleasurable environment, the street needs to provide more than just a sense of safety, and protection from sun, wind, and rain. The street as a milieu must cater to the needs of people and provide support for various activities and standing patterns of behavior that may potentially occur on the street.

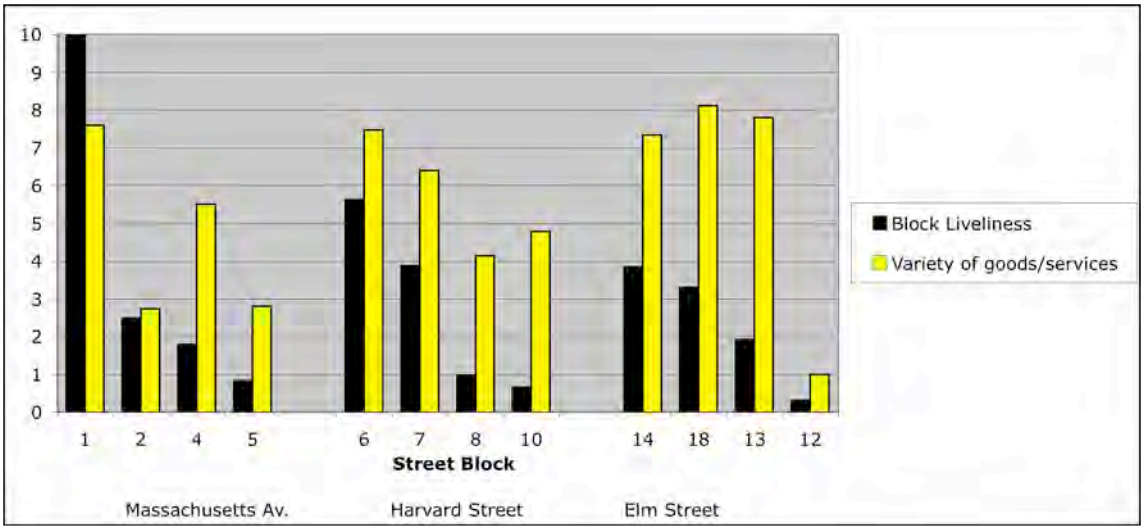

Figure 58. Relationship between users' perceived variety of goods and services available on the block and liveliness. User response to survey of four blocks each at the three study areas. (Pearson's Correlation r = 0.621, p=<0.03)

Variety of Goods and Services. The results of open-ended questions in the interview showed that the presence of a variety and diversity of stores offering different goods and services on a block, particularly of day-to-day use, was the most important factor in the users' selection and preference for that block (see Figures 50 and 51), such as to this resident.

> I use this block several times a day. I browse at the bookstore, go to CVS, rent movies, pick up dry cleaning. …….. I prefer it because everything is so close by and there are many types of uses. I don't use all but it is pleasant to see the variety. This block is more like a neighborhood center.

Even when they did not use all the businesses regularly, people were happy to have the variety as suggested by this man's comments. "This is my favorite block. It has got a little of everything, which I like – videos, food, Asmara has good food, [and] sort of, decent Mexican place. Even the places I do not visit, it's nice that they are there."

This preference for blocks with variety of goods and services was supported by the user survey (see Figure 58). The author's unstructured observations tracking some individuals further reinforced the conclusion that users of the neighborhood commercial streets combined chores and visited multiple stores during one visit.

Table 17. Distribution of mean Liveliness Index across difference in variety of stores on the block. Data from 78 block-segments on 19 blocks in three study areas. Numbers adjusted for Length of Block.

	Variety of Stores on the Block	
	0 to 2	More than 2
Mean Liveliness Index	0.80	1.64
N (Block-segments)	30	48

Additionally, the author also measured the variety of stores for each of the 78 block-segments on 19 blocks. Table 17 shows that the block-segments on blocks with a higher variety of stores were also livelier. Block-segments with more than two types of store on the block were livelier than block-segments with two or less than two types of stores on the block (mean 1.64 on Liveliness Index compared to 0.80, t=-2.63, p<0.011).

Pedestrian-friendliness. Since this study primarily addressed pedestrian behavior on the street, it was important to determine whether the users perceived the

street as a pedestrian-friendly environment or not. In the user survey a pedestrian-friendly street environment was broadly defined as a place that was good for walking, sitting, and other pedestrian oriented activities (see Appendix I). Hence, the level of pedestrian-friendliness of a block-segment on the street was an important factor in determining the level of physical comfort it provided to its users. Results of user surveys reported in Figure 59 show that the blocks on the streets that were perceived as being more pedestrian-friendly were also the ones that were livelier. Additionally, as discussed earlier, people emphasized pedestrian-friendliness as an important quality that they wanted to retain (see Table 11). In suggesting changes and additions, they prioritized it as a quality for the blocks that were not already pedestrian-friendly (see Table 12).

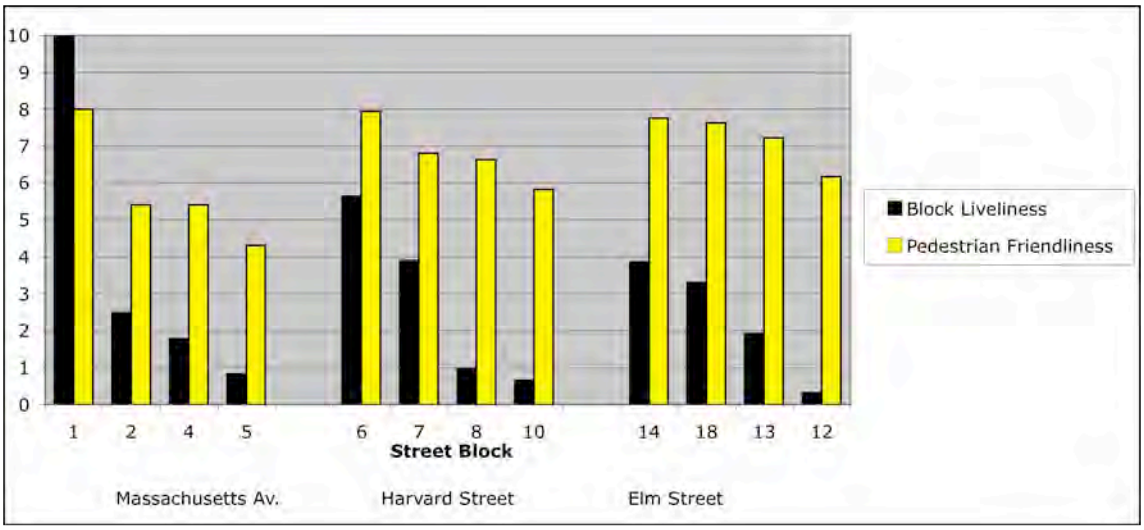

Figure 59. Relationship between users' perceived pedestrian-friendliness of the block and liveliness. User response to survey of four each at the three study areas.
(Pearson's Correlation r = 0.679, p=<0.02)

Seating. Sitting space has been identified as one of the most important characteristics in retaining people in public spaces and possibly supporting social behavior (Whyte, 1980; Linday, 1978). The findings in this study tend to validate

Whyte's findings. Block-segments with one or more public seats were livelier than those with no public seats (t=-2.88, p<0.01). However, not all block-segments with public seating were lively (see Table 18). Observations and behavioral maps show that public seating near businesses that support stationary activity was used much more than similar public seating located at block-segments without these businesses. The relationship between seating provided by stores (commercial seating) and liveliness was clearer: block-segments with more commercial seating were livelier (see Table 19). Block-segments with one or more commercial seats were livelier than those with no commercial seats (mean 3.99 on Liveliness Index compared to 0.97, t=-3.21, p<0.013).

Table 18. Distribution of mean Liveliness Index across different numbers of seating provided by public authorities. Data from 78 block-segments on 19 blocks in three study areas

	Number of Public Seats on the Block-segment		
	0	3	6
Mean Liveliness Index	0.75	1.66	0.81
N (Block-segments)	58	12	8

Table 19. Distribution of mean Liveliness Index across different numbers of seating provided by businesses. Data from 78 block-segments on 19 blocks in three study areas

	Number of Commercial Seats on the Block-segment		
	0	1 to 8	9 to 16
Mean Liveliness Index	0.97	2.10	6.36
N (Block-segments)	69	5	4

The location of seating, especially public seating, with respect to activity-supporting stores was found to be critical. All of the six liveliest block-segments had

either fixed benches provided by a public agency, or movable chairs provided by private stores. In addition, incidental integral surfaces on which people could sit, such as ledges, planters, steps, bollards and so on, contributed to retaining people in these locations. The use of fixed, movable, and integral seating increased dramatically when the seating was provided near stores that offered goods and services that could be immediately consumed outside the stores. In the liveliest setting (block-segment #2), fixed benches provided by a public agency (the City of Cambridge) combined with movable chairs and tables provided by the coffee shop allowed users to expand territories when needed and contract them when not (see Figure 60).

Figure 60. Chairs from the coffee house were moved to nearby locations by patrons to suit their needs.

Fixed wooden benches with backs seemed to be physically comfortable and retained people, especially singly or in pairs, for long periods. In contrast, fixed wooden benches without backs seemed less comfortable for long periods of time, although they

were able to accommodate a greater number of people in social activities, either sitting or standing nearby.

Benches, chairs, tables, and integral seating also acted as furniture that people used for purposes other than sitting. Often people used these horizontal surfaces as a place to put or reorganize their belongings, taking things out of a bag or putting them in, or just taking a rest on the walk.

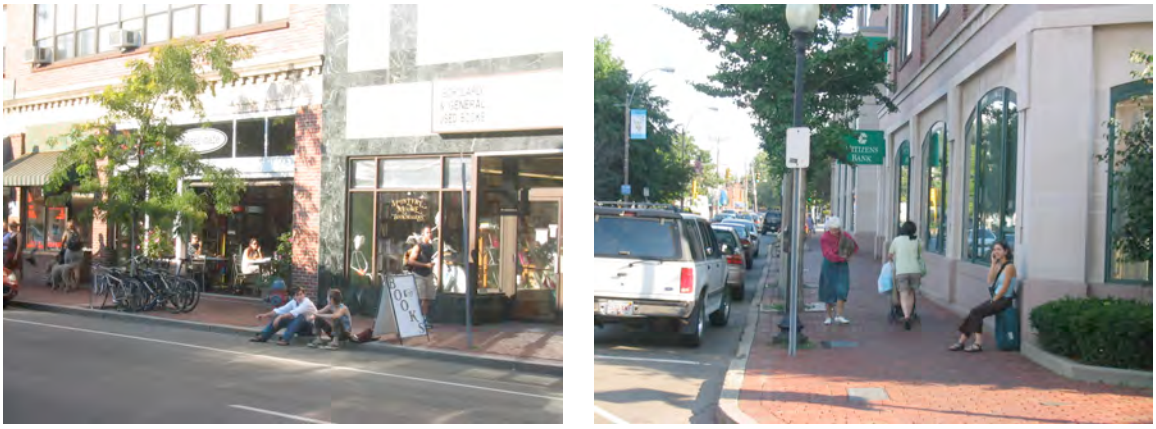

Figure 61. The lack of seating on these streets was evident.

Other Physical Artifacts on the Street. In the absence of seating or when they were not sitting by choice, people carried out most of their sustained or social activities near building walls, show-windows, steps, vehicles parked near the sidewalk, and other physical artifacts on or near the sidewalk. These included planters, bollards, advertising signs on the floor, magazine- and newspaper-dispensing boxes, bicycle stands, trashcans, light poles, sign posts, parking meters, tree trunks, railings, fire hydrants, electrical panel boxes, and so on. The users sat, leaned, or just stood next to on these objects. While physical artifacts were spread all along the sidewalk, the ones that were near the activity-supporting stores and businesses were used the most.

People used physical artifacts on the street for various purposes other than what may originally have been intended. Sitting was an example of the postures that occurred on the street. Armrests of benches, fire hydrants, bollards, electrical panel boxes, railings, window sills, edges of planters, and so on, were all used to sit on, sometimes even when a bench was available nearby. These artifacts provided different sitting heights and vantage points for viewing the street. In some cases, these artifacts may have been closer to the individual's destination, and hence more convenient. These physical artifacts also served as short-term seating alternatives to a bench.

Figure 62. Physical artifacts provide alternative seating options

Children used physical artifacts for play. They drew no distinction among benches, magazine- or newspaper-dispensing boxes, advertising signs on the floor, and so on. All of these objects presented children with opportunities for play and for exploration. Since adults accompanying the children were near activity-supporting uses, children used physical artifacts more if they, too, were near activity-supporting uses. This allowed children to play near the watchful eyes of adults, allowing the adults to remain on the

street longer, if they wished. Watching children play became yet another activity to engage people on the street.

Table 20. Distribution of mean Liveliness Index across different width of sidewalk at block-segment. Data from 78 block-segments on 19 blocks in three study areas

	Width of Sidewalk at Block-segment		
	upto 12 feet	13 to 24 feet	25 to 36 feet
Mean Liveliness Index	0.98	1.55	2.56
N (Block-segments)	47	22	9

Sidewalk width. Retaining the existing wide sidewalks and increasing the width of the narrow sidewalks were among the key recommendations from people for creating a pedestrian-friendly street environment (see Tables 11 and 12). The width of the sidewalk with ample space to walk (zone 2) is obviously an important criterion for accommodating the movement of pedestrians on the street. However, to support stationary activities it was even more critical to have a wider sidewalk area to accommodate street furniture and physical artifacts (zone 3) adjacent to the walking space. It is important to note that while this study found no significant correlation between the average sidewalk width of the block and liveliness, it did find a positive correlation between the width of the sidewalk at each block-segment and liveliness (see Table 20). This suggests that although the width of a sidewalk is an important physical characteristic to support stationary activities on neighborhood commercial streets, it is most critical to have wide sidewalks in conjunction with other physical and landuse characteristics that support stationary and social activities.

Territory, Personalization, and Control on the Street

The expression of territorial claim varied greatly at different locations on the street. Some businesses extended their territories on the street by personalizing their street interfaces with canopies, signs, planters, wares, and so on. Businesses offering items that could be consumed immediately outside the stores expanded their territories by placing tables and chairs for the use of their patrons, effectively extending the interior territory of the store to the exterior street space. Stores that extended their territories by putting tables, chairs, and other furniture on the street also transferred a certain level of control to their customers who could move and rearrange furniture according to their own needs. This allowed people to expand and contract their territories according to their needs. In this way, the otherwise public or *peripheral* territory was transformed into a semipublic or *supporting* territory.

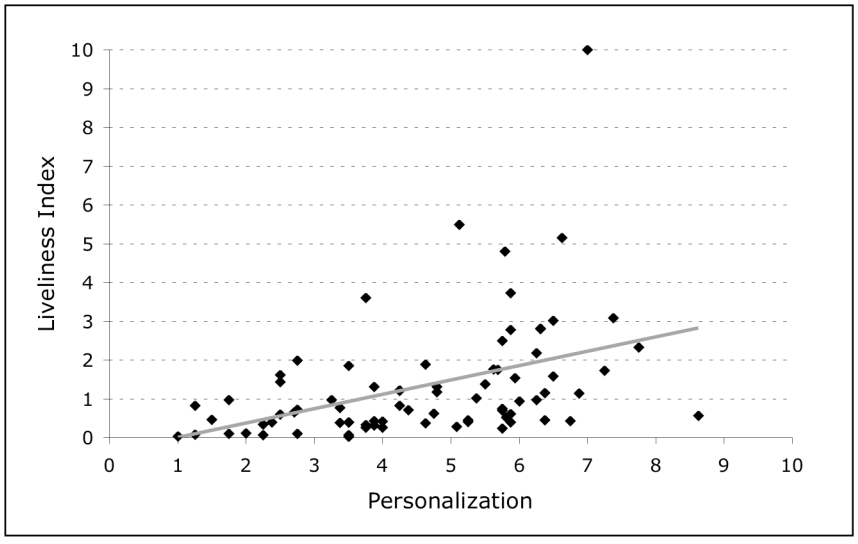

Figure 63. Relationship between personalization and liveliness. Data from 78 block-segments on 19 blocks in three study areas. (Pearson's Correlation r = 0.418, p=<0.001)

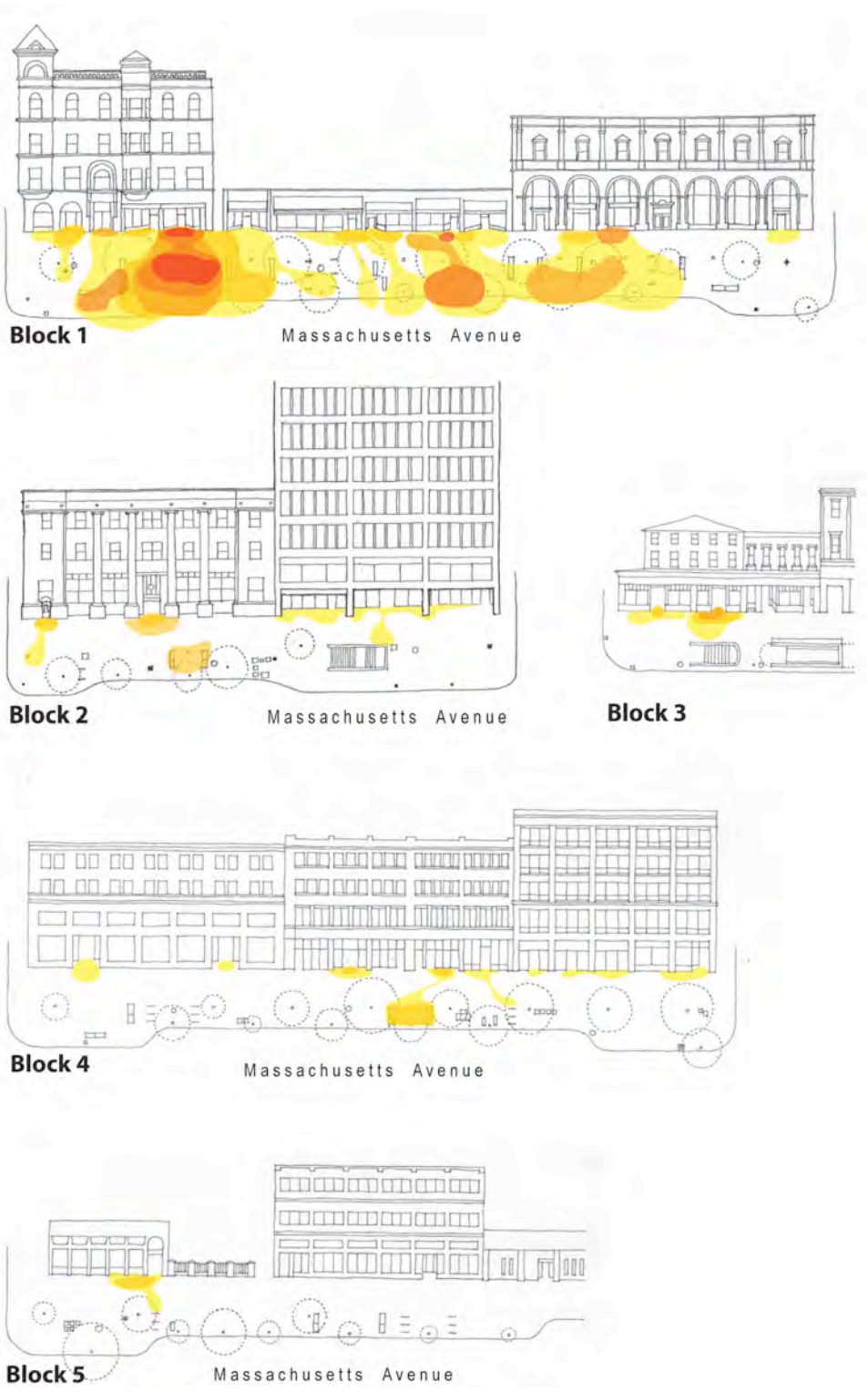

Figure 64. Territorial map based on observations and behavioral maps showing the range and intensity of the territories of stores. Five blocks on Massachusetts Av. at Central Square, Cambridge, MA. Intensity of color indicates the clarity of territorial claim.

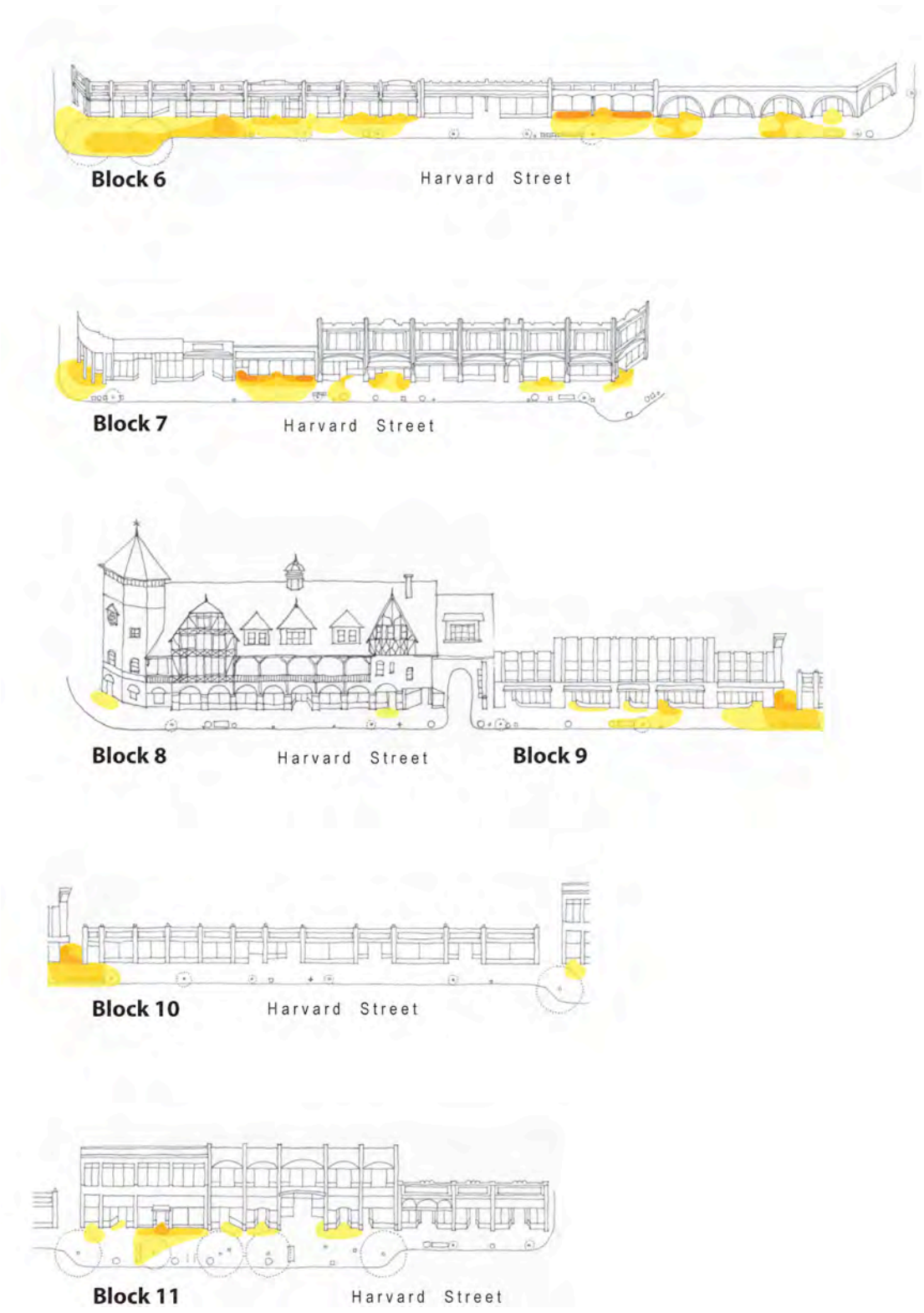

Figure 65. Territorial map based on observations and behavioral maps showing the range and intensity of the territories of stores. Six blocks on Harvard Street at Coolidge Corner, Brookline, MA. Intensity of color indicates the clarity of territorial claim.

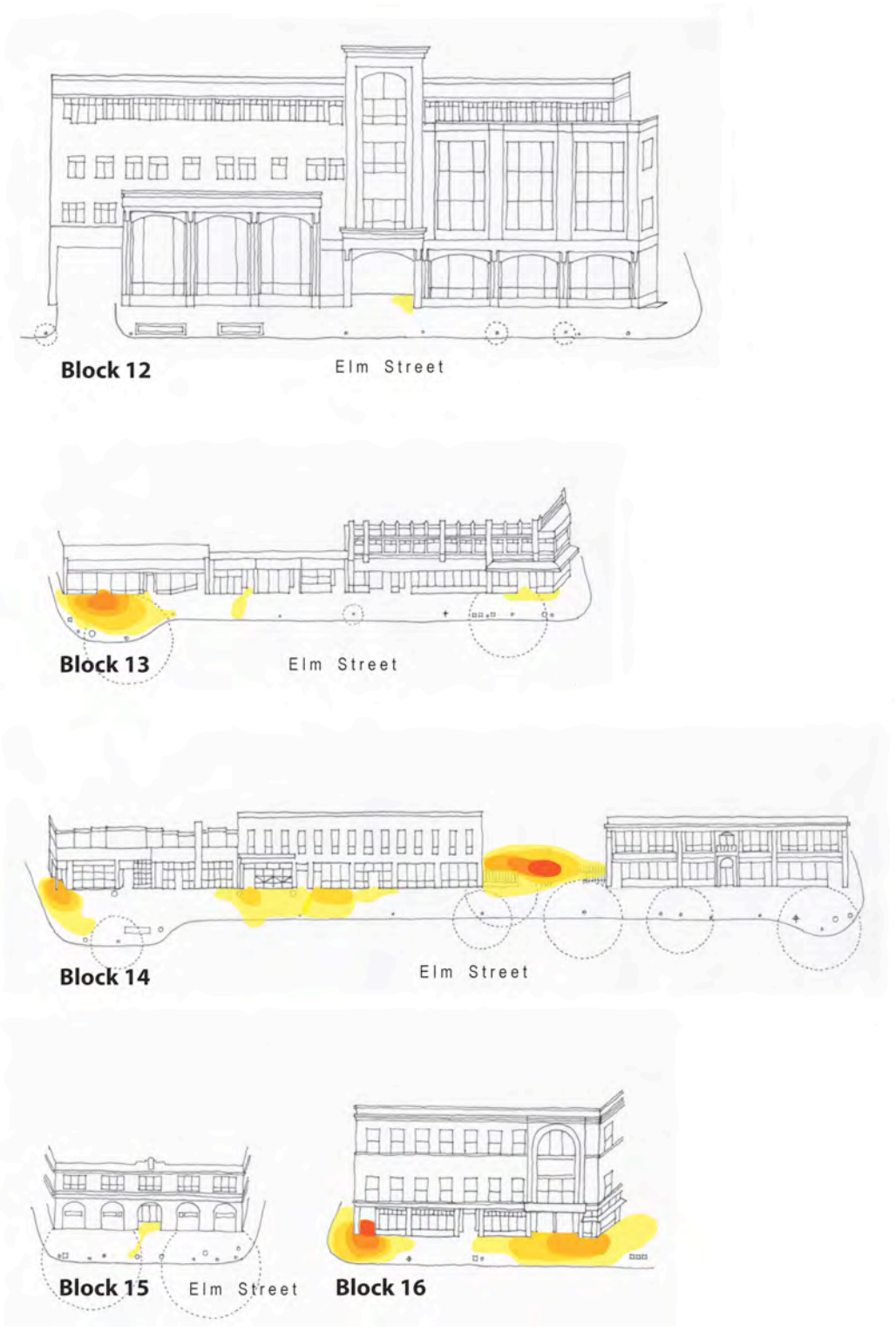

Figure 66. Territorial map based on observations and behavioral maps showing the range and intensity of the territories of stores. Eight blocks on Elm Street at Davis Square, Somerville, MA. Intensity of color indicates the clarity of territorial claim. (Continued in Fig. 67)

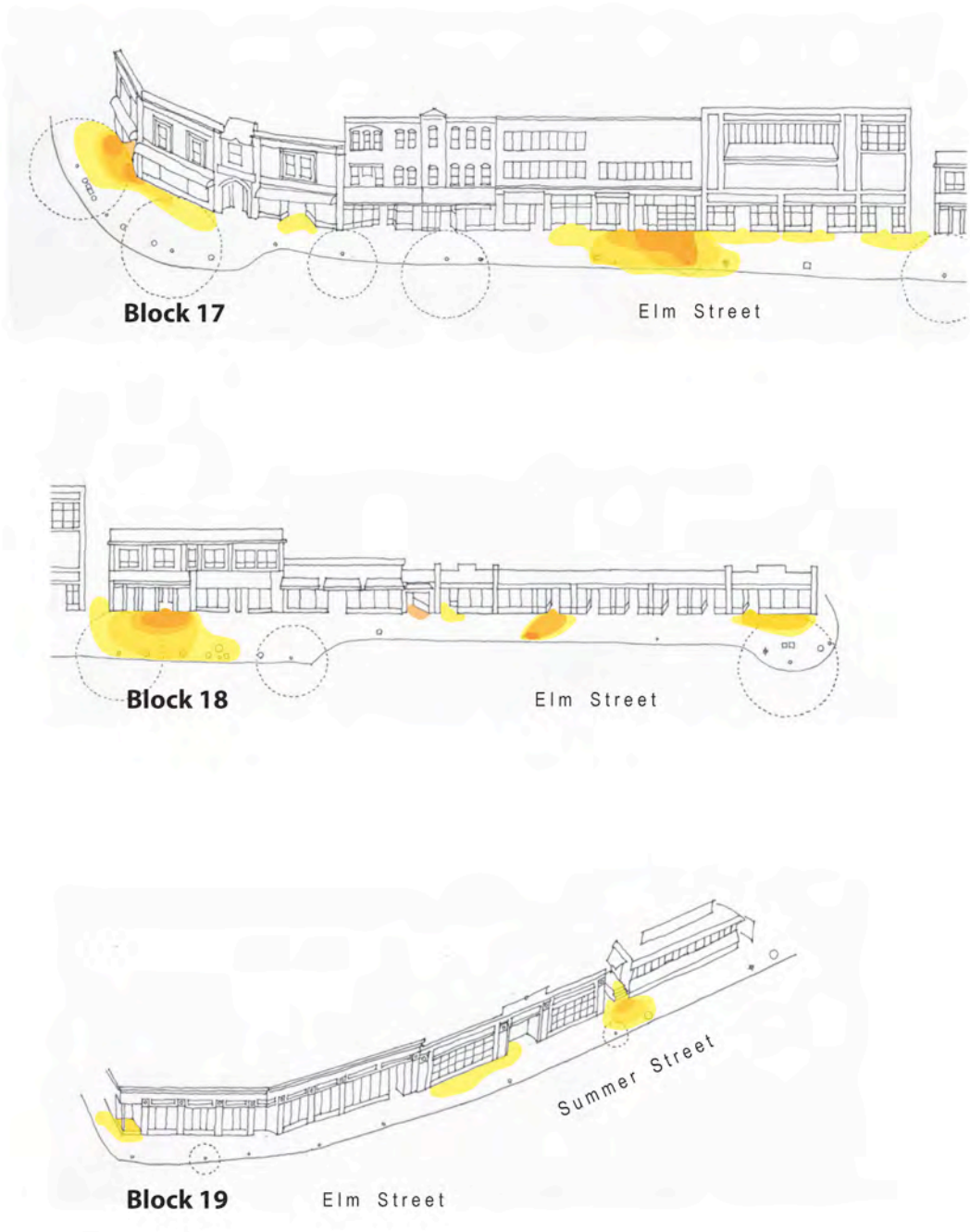

Figure 67. Territorial map based on observations and behavioral maps showing the range and intensity of the territories of stores. Eight blocks on Elm Street at Davis Square, Somerville, MA. Intensity of color indicates the clarity of territorial claim.
(Continued from Figure 66)

Figures 64, 65, 66, and 67 illustrate the varying extents of territorial claim and influence established by different businesses on the street. The illustrations depict the territorial claim as a result of a combination of locations on the street where the business owners personalized the street by bring their goods, wares, decorations, and furniture, as well as the extent of the street space that people used in association with that business. The intensity of the color is proportionate to the consistency and repetition of use of the street for personalization and territorial claim. Hence, the most intense color represents the area where the business most often brings out its goods and furniture, where workers or customers associated with the business are most often present. The most intense color also represents the area on the street that is claimed first. When there is more need for space due to more patrons, the range of the territorial claim expands as represented with decreasing intensities of color.

Block-segments on the street that were claimed as territories by the storeowners also appeared to be "occupied," "lived-in," and cared for. "The personalization of places thus serves many purposes: psychological security and symbolic aesthetic as well the adaptation of the environment to meet the needs of specific activity patterns. Above all, however, personalization marks territory" (Lang, 1987, p. 148). . The block-segments with a higher degree of personalization were able to afford an increased level of territorial behavior on the street and were thus livelier (see Figure 63).

The degree of territorial behavior and control on the street was not only dependent upon the types of businesses but also on the management of the businesses and the formal and spatial quality of the buildings and street space. The articulation of the building façade at the street level and at the entrance played an important role in creating

transitional space between the street and the interior that could be personalized and territorialized by the storeowners. The presence of this space to mediate between the street and the store's interior space helped in supporting physical expressions of a claim to territory on the street. The availability of adequate sidewalk space, which allowed for space to be designated for sitting or standing without directly interrupting the flow of pedestrians, was an important factor in enabling storeowners and users to exercise territorial control over the street space. Stores conducting the sort of business that enabled the use of street space, and which therefore personalized and territorialized that space, also shared in the maintenance of that public space.

In order to control territory people modify their environment to better fit their needs (Lang, 1987). In the case of the street, this need and ability to modify and control an otherwise public territory involved a certain degree of negotiation, compromise, and accommodation of the needs of other people present at the street. People were obliged to interact with other people to move furniture, ask for a chair, or ask to share the same table. All of this resulted in opportunities for social interaction, often with complete strangers.

Sensory Pleasure on the Street

Observations of people's behavior, their activities, their interactions with other people, and their postures, suggested that certain block-segments on the street provided a sense of pleasure to the users of the street environment. Their relative duration of stay on the street further reinforced this. Through observations of people's behavior the author was able to record expressed pleasure resulting from social encounters in the form of planned and unplanned interactions, and active and passive engagement in activities, such

as actively participating in playing a game or listening to musicians on the street. However, the pleasure or displeasure that users associated with various other sensory qualities of the environment, especially the physical characteristics of the street environment, were explored through user surveys and interviews.

Five measures were used in the survey to capture the degree of pleasure or displeasure that users derived through the sensory experience of the street: attractiveness, interesting appearance, change of signs and displays, occurrence of events, and uniqueness of goods and services (see Appendix I). Equally important were the responses from users to open-ended questions presented in Tables 11 and 12, and Figures 48, 49, 50, 51, and 55.

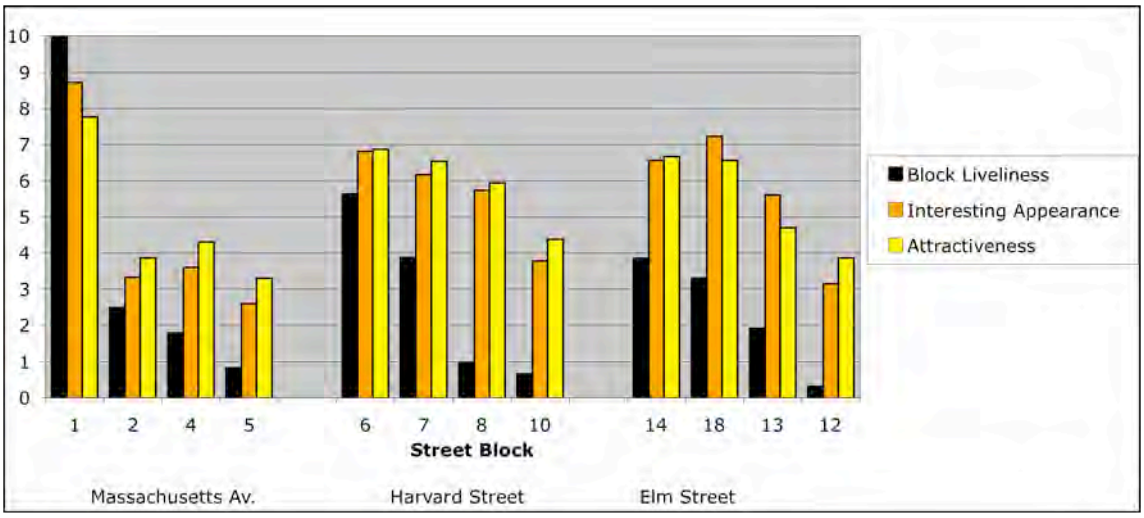

Figure 68. Relationship between users' perception of attractiveness and interesting appearance of the block and liveliness. User response to survey of four blocks each at the three study areas.
Interesting appearance and Liveliness – Pearson's Correlation r = 0.81, p=<0.01
Attractiveness and Liveliness – Pearson's Correlation r = 0.80, p=<0.01

Attractiveness and Interesting Appearance were measured on a visual rating scale, and related to stimuli from fixed, semi-fixed, and movable elements such as the

articulation of the building façade, the openings at street level, lighting fixtures, furniture on the sidewalk, signs, plantings, displays, and a variety in these elements. Hence, attractiveness and interesting appearance were set up as variables in an attempt to capture the sensory pleasure that the street environment as a setting was able to offer to its users. The results of the survey indicated that the blocks that seemed more attractive and interesting in appearance to their users were also the liveliest – the blocks that attracted the greater number of users, the blocks in which the users engaged in some form of social interaction, and the blocks in which the users spent the most amount of time (see Figure 68). While visual appearance and attractiveness are subjective qualities, people were generally able to agree that some blocks were more attractive and visually interesting than others. These were important factors in their selection and use of these blocks, especially when the environment lacked these factors (see Figures 50 and 51).

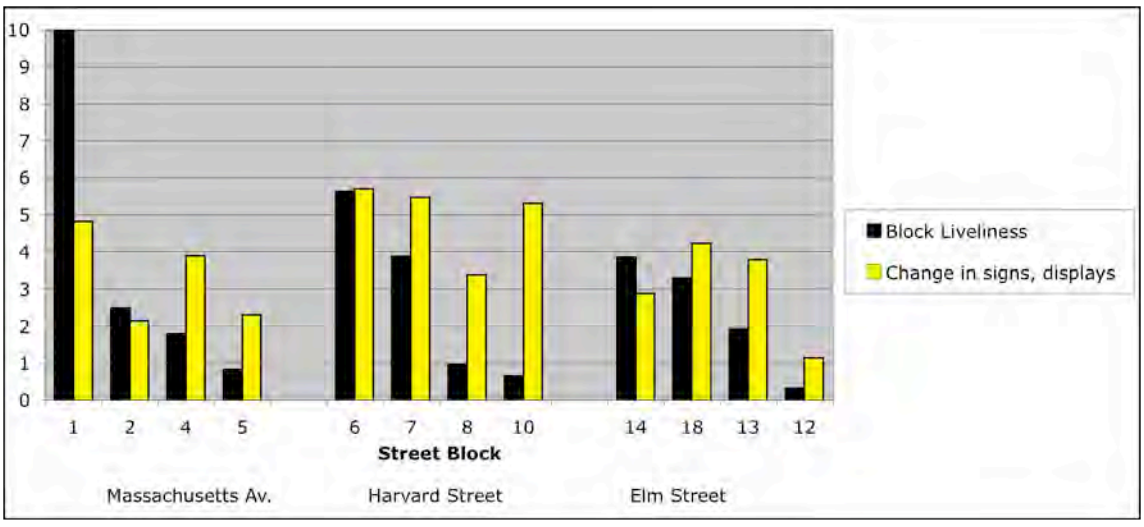

Figure 69. Relationship between users' perception of change in signs and displays on the block and liveliness. User response to survey of four blocks each at three study areas. Change in signs, displays and Liveliness – Pearson's Correlation r = 0.493, p=<0.10

Table 21. Distribution of mean Liveliness Index across different numbers of "rooted" signs. Data from 78 block-segments on 19 blocks in three study areas.

	Number of "Rooted" Signs on the Block-segment			
	0	1	2	3
Mean Liveliness Index	0.73	1.39	2.43	10.00
N (Block-segments)	34	35	8	1

Change of Signs and Displays in show-windows and entrances of stores attempted to capture the sensory pleasure that the street environment was able to offer to its users over time as a result of change. Results of the survey of all study areas indicated that users generally perceived a low level of change of signs and displays at the street. However, blocks that users perceived as having more changes in signs and displays were livelier (see Figure 69). Additionally, observations showed that window-shopping (used in a broad sense of looking at signs, displays, and so on) was a significant activity on the street, second only to eating and/or drinking. "Rooted" signs and displays were ones that were specific to the stores and block-segments where they were located. Social activity frequently occurred as people engaged in window-shopping. This was consistent with the findings through observations (see Table 21). Block-segments with one or more "rooted" signs were livelier than block-segments without them (mean 1.78 on Liveliness Index compared to 0.73, t=-3.4, p<0.01).

Occurrence of Events included outdoor sales, neighborhood campaigns, festivals, block parties, street musicians, and so on. Results of the survey of all study areas indicated that users generally perceived a low level of occurrence of events on the street. However, blocks that users perceived to have more events were livelier (see Figure 70).

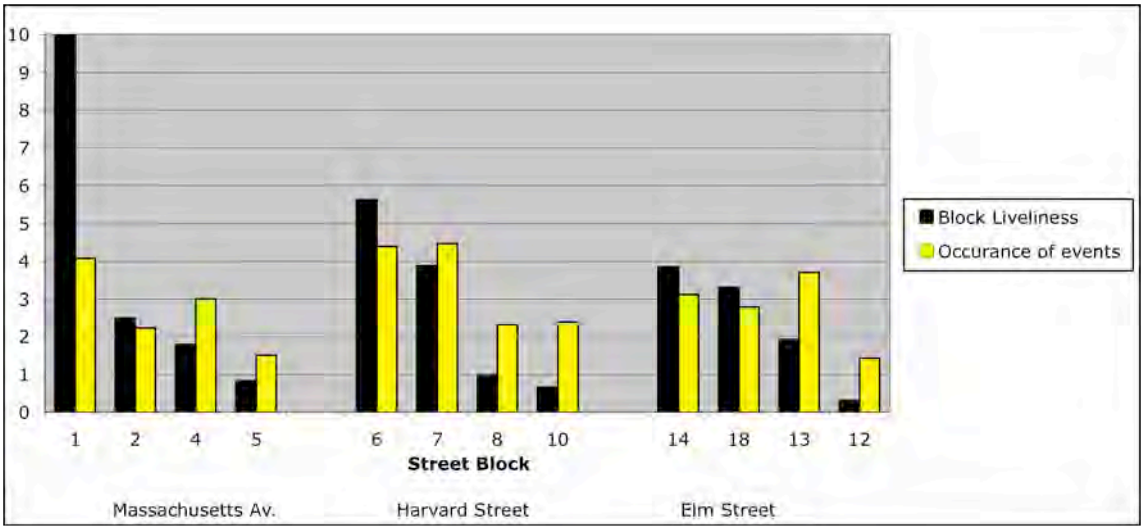

Figure 70. Relationship between users' perception of occurrence of events on the block and liveliness. User response to survey of four blocks each at three study areas. (Pearson's Correlation r = 0.717, p=<0.01)

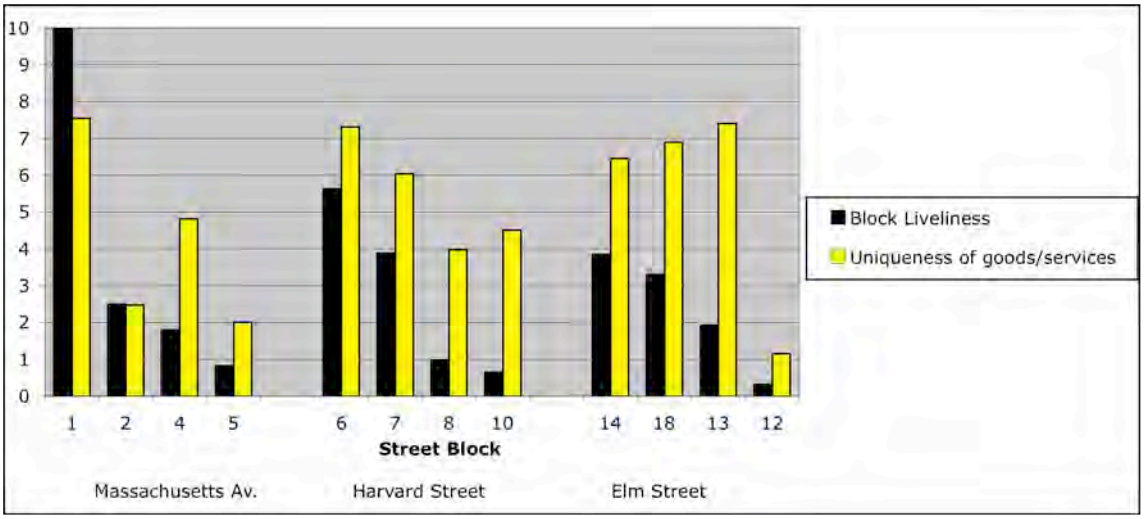

Figure 71. Relationship between users' perception of uniqueness of goods and services available on the block and liveliness. User response to survey of four blocks each at three study areas. (Pearson's Correlation r = 0.674, p=<0.02)

Uniqueness of Goods and Services. Results of open-ended interviews in Tables 11 and 12 also show that the uniqueness of goods and services on a block was an important factor in the users' preference for that block (see Figure 71).

> Yes [I prefer this block to other blocks] because of the variety and its uniqueness. There's a great sports bar, great ice cream place, a great niche supermarket, a nice florist.

As a response to questions about specific businesses, users indicated that the sensory pleasure they derived from the goods, services, and ambience in some stores was an important factor in their preference for that block (see Figures 50 and 51). Of the stores mentioned by users, all except one offered goods and services of day-to-day use. Users preferred stores that provided goods and services of day-to-day use in a manner and ambience that was unique. The user survey further supported this finding.

Important Characteristics of the Street and Liveliness

Eleven specific characteristics of the street environment were identified based on the literature review, interviews, and extensive observations made by the author. These were discussed in detail in the previous section. Table 22 shows the correlations between

Table 22. Relationship between characteristics of the street and liveliness.
Data from 78 block-segments on 19 blocks. * p<0.05, ** p<0.01, *** p<0.001

Street Characteristic	Pearson's r
Commercial seating	0.781***
Articulated street front	0.561***
Personalized storefront	0.507***
Community places	0.504***
Permeability of storefront	0.469***
Shade from trees and canopies	0.454***
Independent uses	0.377***
Public (non-commercial) seating	0.343**
Other furniture and physical artifacts	0.303**
Sidewalk width	0.294**
Variety of businesses on block	0.269*

these characteristics and liveliness of the neighborhood commercial street. A multivariate regression analysis with all the eleven characteristics showed that these variables together explained 85 percent of the variation in the Liveliness Index across all the 78 different block-segments on three neighborhood commercial streets (adjusted R^2=0.83, F=36.2, Sig. of F=0.000). The multivariate analysis showed that commercial seating (coef.=0.250, t=9.28, p<0.0001), public seating (coef.=0.206, t=4.59, p<0.0001), community gathering places (coef.=1.08, t=4.65, p<0.0001), personalization (coef.=0.244, t=3.02, p<0.005), and sidewalk width (coef.=0.03, t=2.09, p<0.04) were significant and had a positive impact on liveliness of a neighborhood commercial street. A comparison between the correlations and the multivariate analysis points to the important role that commercial and public seating, presence of community places, personalization of the storefront, and width of sidewalk play in supporting stationary, lingering, and social activities on the street. The articulation of the building façade had a high correlation with liveliness but it did not show significance in the regression. Similarly, many other characteristics that appeared to correlate with liveliness were not significant (see Table 22).

Table 23. Correlations between the eleven characteristics

	Commercial Seats	Public Seats	Sidewalk Width	Other Furniture	Shade	Articulation	Permeability	Block Variety	Independent Uses	Personalization	Community Places
Commercial Seats	1.00	.019	.198	.209	.316**	.372**	.441**	.091	.255*	.367**	.344**
Public Seats		1.00	.464**	.353**	.351**	.321**	-.131	.056	.037	-.036	-.053
Sidewalk Width			1.00	.536**	.441**	.201	-.186	-.293**	-.224*	-.238*	-.062
Other Furniture				1.00	.584**	.405**	.028	.119	-.001	.100	.080
Shade					1.00	.389**	.114	.097	.203	.200	.095
Articulation						1.00	.351**	.370**	.313**	.376**	.302**
Permeability							1.00	.526**	.461**	.749**	.311**
Block Variety								1.00	.494**	.541**	.256*
Independent Uses									1.00	.688**	.314**
Personalization										1.00	.305**
Community Places											1.00

** $p<0.01$, * $p<0.05$

However, Table 23 shows a high correlation between some of these eleven characteristics suggesting that many of the highly correlated characteristics may be explaining the same concept. A factor analysis can determine the variables that belong to the same concept, reduce them to a smaller set of constructs, and help make sense of social behavior by explaining it with a limited number of factors (Bryman and Cramer, 2001). A factor analysis was performed on all these characteristics using a principal component method to determine the key factors and concepts that explained the liveliness on the neighborhood commercial street[7]. Four components were selected using the Scree test[8].

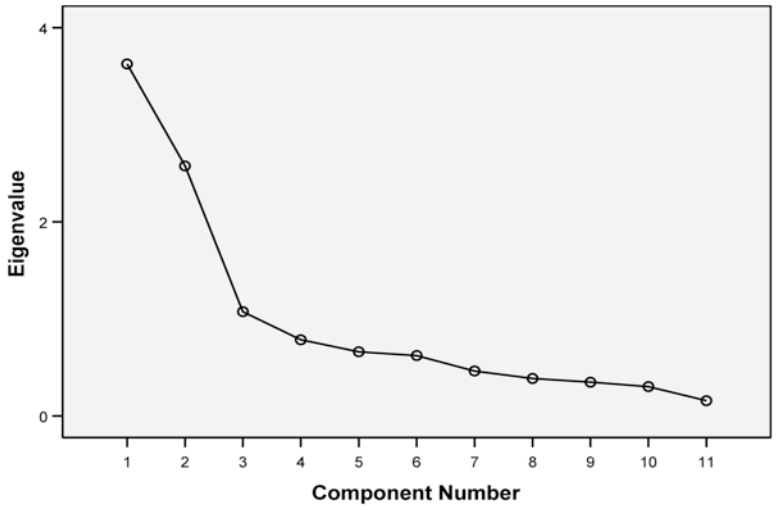

Figure 72. Scree Plot showing the Eigenvalues of the components.

[7] A KMO Measure of sampling adequacy recorded at 0.741 and the Barlett's Test of Sphericity being significant at p=0.000 showed that factor analysis was an appropriate method for the available data. Eleven factors explained 100% of the variance.

[8] The Kaiser criterion recommends using only those components that have Eigenvalues of more than one. However, a Scree test is sometimes more appropriate in determining the number of factors to be retained (Cattell, 1966). The components were extracted using an Eigenvalue of over 0.75. Four components were selected using the Scree test.

Table 24. Percentage Variance of Four Factors
Varimax rotation with Kaiser Normalization.

Rotation Sums of Squared Loadings			
Factor	**Total**	**% of Variance**	**Cumulative %**
1	**2.984**	**27.129**	**27.129**
2	**2.672**	**24.290**	**51.419**
3	**1.269**	**11.535**	**62.954**
4	**1.136**	**10.331**	**73.285**

Table 25. Details of Factor Analysis showing the weightings of each characteristic
Principal Component Analysis using Varimax rotation with Kaiser Normalization.

Street Characteristics	**Factors**			
	1	**2**	**3**	**4**
Commercial Seating provided by businesses			.780	
Seating provided by public authorities		.708		
Personalization and signs on street-front	.860			
Articulation of the building façade		.540		
Shade provided by trees, canopies, overhangs, etc.		.762		
Width of the sidewalk		.762		
Permeability at the street-front	.738			
Variety of businesses on the block	.811			
Other artifacts and furniture on the sidewalk		.802		
Number of independent stores	.778			
Number of community places				.912

The results of the factor analysis suggested that these four components or factors explained 73% of the variance (see Figure 72 and Table 24). Table 25 shows the details of the factor analysis with weightings of each characteristic.

A multivariate regression analysis with these four factors showed that together they explained 73.6% of the variation in the Liveliness Index across all 78 block-

segments on the three neighborhood commercial streets (adjusted R^2=0.721, F=50.75, Significance of F=0.000).

These four factors may be understood as the aspects of the street that help support stationary, lingering, and social activities on the street and make it lively. Factor 1 is a combination of characteristics of the street that are affected by businesses and land uses and explains 27% of variance (see Table 24). The four characteristics that load this factor suggest that the variety in the businesses on the street and the number of independently owned stores are important characteristics that determine one aspect of the street to support liveliness. The personalization of the street-fronts of the businesses by means of decoration, signs, plants, and so on, as well as the ability of a store to be permeable to the street are also important characteristics that make up this first aspect (see Table 25). These characteristics are largely the result of the initiative of the business owner but may depend on the design of the buildings and the policies in place. The result of the multivariate regression analysis confirmed that this factor had a positive impact on the liveliness of the street (coef.=.351, t=5.83, p=0.000).

Factor 2 is a combination of the physical aspects of the street and explains 24% of variance (see Table 24). Five characteristics load this factor (see Table 25). The width of the sidewalk, public seating, and other artifacts and street furniture may be noted as "street improvements" that are usually provided by public authorities. Shade on the sidewalk may be a result of trees provided by a public authority but also includes awnings, canopies, retractable umbrellas, and so on, provided by the businesses. The articulation of the building façade is a characteristic that is determined by the architecture

of the buildings. The result of the multivariate regression analysis confirmed that this factor had a positive impact on the liveliness of the street (coef.=.467, *t*=7.67, *p*=0.000).

Factor 3 is a function of the seating provided on the street by businesses and it explains 11.5% of variance (see Table 24 and 25). Although commercial seats are a physical characteristic of the street, it is interesting to find that this characteristic alone creates an independent factor to support liveliness on the street. This is probably so because it does not fall in the category of "street improvements" (factor 2) that are largely the responsibility of public agencies. Further, the correlation between the number of commercial seats and Liveliness Index was the most significant (0.78), indicating that it was a powerful characteristic for supporting liveliness. The result of the multivariate regression analysis confirmed that this factor had a positive impact on the liveliness of the street (coef.=.453, *t*=7.53, *p*=0.000).

Factor 4 represents the community places aspect within the neighborhood commercial street and explains 10% of variance (see Table 24 and 25). The collective attachment to places where people of the neighborhood come together stands apart from the landuse and physical characteristics. This suggests that businesses that people regarded as community places were independently an important factor in supporting liveliness. The result of the multivariate regression analysis confirmed that this factor had a positive impact on the liveliness of the street (coef.=.434, *t*=7.20, *p*=0.000).

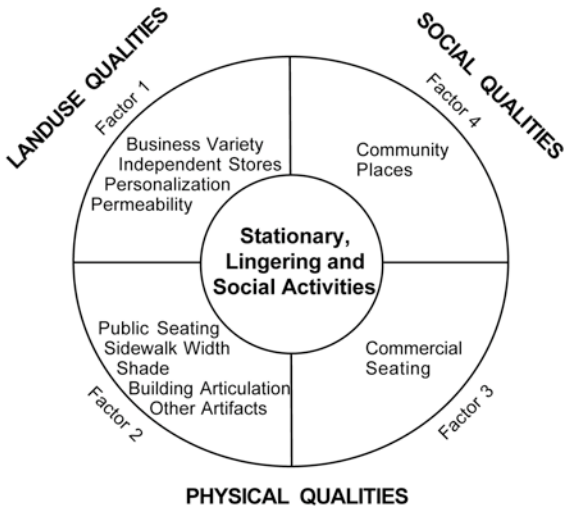

Figure 73. Important Characteristics of the Street.

Factor 1 represents landuse qualities of the street, factors 2 and 3 represent physical qualities of the street, and factor 4 represents social qualities of the street (see Figure 73).

Summary of Findings

Findings presented in the preceding pages clearly indicate that an engagement between the physical layout of the environment, the elements of behavioral environment (uses, activities, and management) and the places that have collective meanings for the community is essential for the social life on neighborhood commercial streets. A physically well-designed street for people, with generous sidewalks, ample seating and other street furniture, tree-cover and other landscape elements, articulated street facades of buildings built to sidewalk, and so on, becomes much more useful and meaningful for people when there are community-gathering places and a variety of activity-supporting stores and other land uses at the street, and vice versa. The following example helps to

illustrate this. Figure 74 shows two comparative examples of street configurations on corners of two blocks on Massachusetts Avenue. These two corner conditions drastically differ in their Liveliness Indices (6.1 and 0.54). Both blocks are approximately 300 feet long and are very similar in their physical characteristics. At these block corners, the sidewalks are wide and well-maintained by the city, there are a few benches and other street furniture, the buildings are historic with many large openings, and so on (see Figure 74). The businesses at these two corner locations, however, differ drastically, and as a result, so does the management of the street space. This difference in the businesses affects the perception and significance of the street for the users at these two locations and in ways that certain physical characteristics are manifest and utilized. A coffee shop at Block 1 is recognized as a community-gathering place for a variety of people in the neighborhood. This coffee shop provides commercial seating to use the sidewalk as a place to relax, interact, and socialize. The bank that occupies the whole building at the corner of Block 4 provides no such opportunities and as a result, the same area of sidewalk and the benches are seldom used at Block 4. There are large windows and doors at the street in both buildings. The three small businesses on Block 1 use the windows and doors in their own way, customizing and personalizing them with displays, signs, decorations, flowers, plants, lighting, and so on, to attract customers. In contrast,

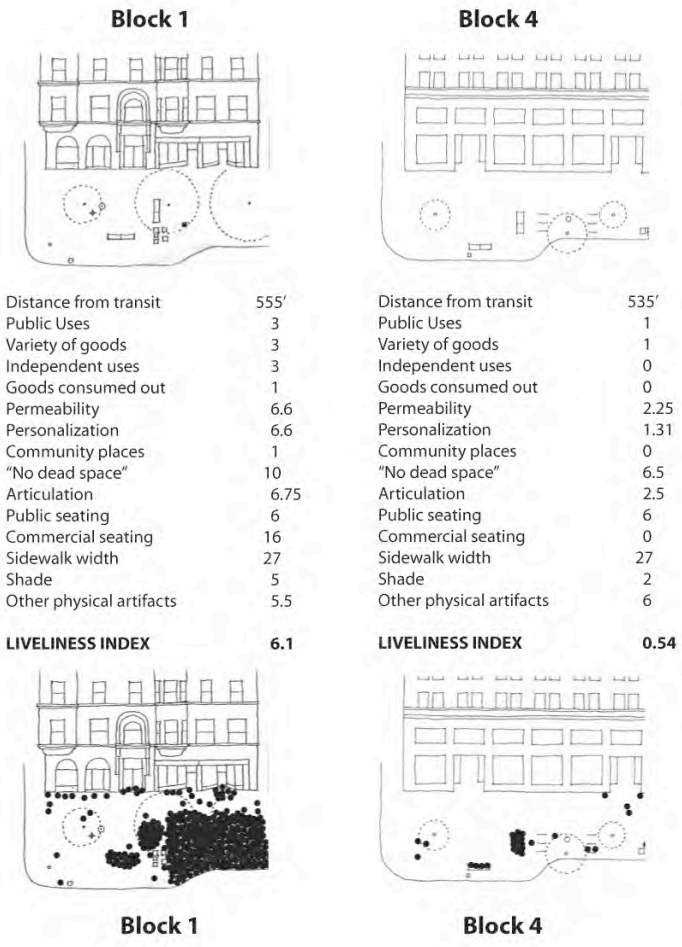

Figure 74. Varying liveliness on two similar physical street configurations.

the bank has little use for these fenestrations, and most of them remain covered with blinds making them appear like blank walls from outside. Additionally, the businesses on the corner of Block 1 remain open late, one of them from 7:00 AM until 11:00 PM, creating opportunities for activities to occur throughout the day. The differences in these two very similar physical conditions at the same neighborhood commercial street further illustrate how the engagement between the behavioral patterns and patterns of the physical environment is important to support stationary and social activities on the street.

The mixed-method strategy employed by this study used multiple qualitative and quantitative means of inquiry. Results suggest that the following characteristics are important to support liveliness on neighborhood commercial streets. However, the most important finding was that none of these characteristics alone was adequate for creating liveliness. Each of these characteristics depends on the presence of others, and it is their co-presence that is able to support various activity patterns leading to liveliness on the neighborhood commercial street.

Seating near activity-supporting stores and businesses

Seating on the street in the form of benches, chairs or other surfaces provided by a public agency or a private business, located near activity-supporting businesses, had a strong interrelationship with liveliness.

Seating provided by stores was usually near businesses that were public and where goods could be consumed outdoors. This meant that in most places where there was commercial seating there was a co-presence of other street characteristics that supported liveliness. The ability to consume goods or services outside the store allowed for an extension of the activity and hence the extension of the territory of the store space that would otherwise be limited within the store. This extension allowed people to engage in social activities on the street. Eating and drinking was an activity commonly associated with relaxation, with a break in the regular schedule, a pause. People frequently combined eating and drinking with socializing. This combination of food and social activity made people stay longer on the street, making it a very important characteristic in the generation of liveliness on the street. Additionally, this seating, in the form of chairs

that could be moved, provided a level of flexibility and control desirable to users. Hence, the relationship between commercial seating and liveliness was most evident.

Public seating in the form of benches not only provided a place for anyone to sit but also acted as physical artifacts for children to play on and for adults to stand next to, lean on, use as a table, and so on, and supported other postures and activities that encouraged social behavior.

Community places: stores that were places to meet neighbors, friends, and sometimes even strangers

All three neighborhood commercial streets had businesses that the residents and workers in the area identified as community places. These businesses had established themselves as destinations over time. People reported and were seen engaged in a variety of activities at these businesses. They treated these as places to spend time at to meet neighbors, friends and strangers, to chat, read, work, play games, listen to music, and so on. Users noted that these places meant more than just the act of conducting business and the business owners encouraged this notion by making the environment and policies conducive to letting people stay as long as they desired. These businesses supported a higher level of activity for longer durations compared to other businesses. In cases where the physical characteristics of the street, such as the ones identified in this study, were present these community places became anchors for liveliness. Most of community places identified by people were small independently owned businesses.

Stores that had personalized their street-frontage with signs, displays and decorations, and by bringing out their wares, goods and services to the street

Familiarity and change are particularly significant in neighborhood commercial streets since most of the users are people who live or work nearby, and who therefore

come back to visit the street and stores frequently. Many people expressed a preference for stores that had been present for a long time, because they were familiar with the goods and services, and owners and workers. This dealt with long-term familiarity and stability. However, in the short-term the liveliest settings were the ones that made frequent changes to their décor by personalizing them by, for example, updating or changing the goods they sold, the music they played, the signs, the plants and flowers, the displays, the decorations and artwork in show-windows, and so on. Personalization created change in an otherwise familiar setting that provided stimulation and interest, and created a reason to stop and window-shop (used in a broad sense), further generating conversation and other social interaction. Changing signs and displays also provided current information about schedules and events, and goods and services in the stores, right at the street.

Personalization of the storefront made each one appear and feel different, and that created variety on the street. This variety created interest and engaged people in various activities such as reading signs, window-shopping, touching and smelling objects, browsing through goods, trying things out and so on. All of these activities lead to more people spending more time on the street. Many of these activities further lead to social interaction with acquaintances and sometimes even with strangers.

Some stores within the liveliest settings limited the personalization to their street fronting show-windows, walls, doors, and windows. A few brought their wares, furniture, and furnishings out on to the sidewalk. They extended the store's territory into the sidewalk, thereby extending the types and levels of activity that occurred inside the store. People were seen going in an out of the store in a way that suggested the

interpenetrability between the street space and the space inside. In essence, the street space outside these stores became an extension of the store itself, making the street more lively. The stores with the highest level of personalization were mostly independently owned and operated or were small local chain stores.

Stores that offered goods and services for daily use in a manner and ambience that was unique

The liveliest settings on the street had a very high number of stores that were one-of-a-kind. Most were independently owned but a few were local small chain stores. It is important to note that the goods and services they sold were not necessarily specialty items. Instead, these were goods and services for daily use that were most commonly desired by people of various socio-economic groups, cultures, and ages. These goods and services were provided in ways and in a setting that were special to that particular store.

Since these stores offered goods, services, and an ambience that were not commonly available elsewhere in the same form, people could not easily substitute the experience by visiting another store. Hence, these stores became destinations in themselves.

Sidewalk width

Sidewalks provided a stage to house artifacts and gestures to support social activities. A certain minimum width of sidewalk was required to support the activities at the edges of buildings, the pedestrian flow of traffic, and space for street furniture and other artifacts. Sidewalks with width that could accommodate all the zones for these activities also enabled businesses to personalize the space at their threshold with the street and establish their territories, which was important to users of the neighborhood commercial street. The width of the sidewalk was critical as it was a prerequisite for

supporting other street characteristics, such as space for display of wares and signs, trees, street furniture, public and commercial seating that were crucial to support social activities.

Articulation: Building façade at street-level with nooks, corners, alcoves, small setbacks, steps, and ledges

The liveliest settings on the street had highly articulated building façades at the street-level with nooks, corners, alcoves, small setbacks, steps, and ledges. This articulation in the façade provided spaces for storeowners to personalize their interface with the street by, for example, the placement of signs, information boards, decorations, planters, flower boxes, and items for sale. This personalization provided an opportunity for people to see or do something on the street without entering the store, often encouraging passive or active social interaction. People used these spaces to seek shelter from the sun or rain, or to get out of the pedestrian traffic flow for a moment, or to stop and rearrange their belongings, or to use a cell phone, and so on. Spaces created by the articulation of the building facades were also the spaces of choice for the street musicians and performers. Articulated building facades with the small-scaled spaces and levels they created, were also attractive to children for active play with toys or to extend their passage along the street by playfully going in and out of the articulations.

Tree cover, canopies, awnings, and overhangs providing shade and shelter

It is often recommended by designers and planners that public spaces should generally be oriented to receive maximum sunlight. The observations of this study generally support this. However, it is equally important to provide shade at the street with trees, canopies, awnings, and overhangs as people’s preferences for spaces in the sun or under shade change with changing seasons and weather.

Other Street Furniture near activity-supporting stores and entrances

More than 90 percent of the more than 13,000 people observed carried out most of their stationary and social activities on or near some physical artifact, such as furniture on the sidewalk, building walls, show-windows, steps, vehicles parked near the sidewalk, trees, and so on. The users sat or leaned, or just stood next to these objects. While street furniture was often provided all along the sidewalk, the furniture that was near the activity-supporting stores and businesses was used the most.

People used street furniture for various purposes other than what may have been intended. Children used street furniture and other artifacts as objects for play and exploration. Since adults accompanying children were near activity-supporting uses, children used the street furniture that was near activity-supporting uses. This allowed children to play under the watchful eyes of adults, and this permitted the adults to linger on the street longer when desired. Watching children play became yet another activity to engage people on the street.

Permeability: Stores with street-fronts where goods, services and activities inside could be seen, heard, touched and/or smelled from outside

This finding refers to the permeability of a street front, which is more than mere transparency. The liveliest settings in the studied areas were the most permeable. People who were not simply passing through on their way to another destination, such as work, were generally curious about what went on in the buildings and spaces along their path. People did not linger and engage in any social activities where there was nothing to do or see in their surroundings. For the purpose of this study “dead spaces” at the street frontage are defined as blank surfaces of buildings that one cannot see through, such as blank walls or opaque or very dark glass, building walls set back more than ten feet with

vacant space, parking lots, and other spaces where the people on the street have no opportunity to engage and use the street frontage. Stores with none or limited “dead space” and that readily revealed interior activity attracted more attention. As a result, people spent more time lingering there. Window-shopping, including looking at goods in show-windows, looking at signs, or watching activities going on inside the stores, often encouraged conversation. However, this permeability in the liveliest settings was not limited to visual stimuli. Many stores left their doors or windows wide open, letting the people outside hear the activities inside and in some cases, smell the goods for sale. This permeability and information of the inside of stores attracted the curiosity of many, especially children, who were able to satisfy their curiosity by observing the objects and activities and also learn about these objects and activities that were visible from the street.

CHAPTER 5: CONCLUSIONS

This study was an empirical examination of behavioral responses, perceptions, and attitudes of people to the characteristics of neighborhood commercial streets. Many environmental psychologists, sociologists, landscape and urban designers, and cultural anthropologists emphasize an approach to design that incorporates the elements of the behavioral environment (its uses, activities, management), the elements of the milieu (its fixed, semi-fixed and movable objects), and the places that have special meanings for the community. This study was an attempt to integrate these approaches to arrive at an understanding of the nature of the neighborhood commercial street as a setting comprised of behavior patterns, the elements of the physical setting, and places that held community's collective meanings. Using this integrated approach, this study was an exploration of new ways to address the understanding, design, and management of this common neighborhood public space.

Limitations and Recommendations for Future Research

There are practical considerations of time and resources that limit all research. In this study, the inquiry was limited to neighborhood commercial streets in two cities and one town in the Boston metropolitan area in Massachusetts. All three locations are similar in many ways: they are in urban areas that have a high population density. All are perceived as being mostly safe. They are well served by major transit and are relatively better places for people to walk in the neighborhood, to shop, dine, and seek other entertainment. However, none of these neighborhoods is generally perceived as

representative of the sort of café society found in many European and South American cities. Although none of these neighborhoods is considered a downtown, the streets studied are among the major commercial streets in their respective neighborhoods. A mix of uses occurs at the block level such that most of the blocks have some variety of retail at the street level to serve daily needs, and some office space usually in buildings with upper floors. While there is very limited residential space on the upper floors of the buildings on these commercial streets, most of the adjoining streets are primarily residential. Hence, most people in the neighborhood need only walk a few minutes to reach the neighborhood's commercial street. This study is therefore most applicable to dense urban neighborhoods that have similar characteristics, or urban neighborhoods that may be planned to accommodate similar patterns of use.

Additionally, although the people observed on the neighborhood commercial streets represent a wide range of age, gender, and class, the majority of people interviewed were Caucasian. Culture, race, class, age, and gender play a significant role in molding attitudes and perceptions. There are likely to be cultural differences in preferences for location and day-to-day shopping and other commercial activities, especially in relation to local residential environments. Further, it is likely that in neighborhood commercial streets or similar environmental settings with a different ethnic and racial mix and different culture the use of these settings may be different. The social interaction on the street, as observed, and desired by people in this study may not represent a cultural behavioral pattern that is universally accepted. There is also a strong likelihood of many other variations. Different cultures have different thresholds for the tolerance and acceptance of perceptual stimuli and levels of social interaction, especially

among people of different gender, race, and class. Climatic/environmental variables alone may render certain locations hostile to social interaction outdoors. For these reasons, and to test, validate, and broaden the findings of this study, it would be useful to repeat the study on commercial streets in neighborhoods in other towns and cities, and in different cultures.

Three Aspects of Neighborhood Public Space

Urban neighborhoods and other inhabited places are often known to have their own cultures and norms. Certain behavior patterns in public spaces and the particular use of neighborhood commercial street may be peculiar to the residents of the town/cities studied. This study is not intended to suggest that the specific patterns of the behavioral environment, the elements of the physical setting and businesses that have special meanings for the community found on these three neighborhood commercial streets are representative of all possible behavioral and physical patterns. It is likely that neighborhood commercial streets or similar settings in other cultural contexts may have a different array of such patterns.

However, this study does suggest that the three aspects that emerged from the findings are critical in the understanding of neighborhood commercial streets (or other similar public and parochial spaces) and in achieving a quality of neighborhood public space that is conducive to stationary, lingering, and social activities. Further, the conceptual and theoretical framework and the mixed-methods used in this study, to understand the public environment as a combination of patterns of behavior and patterns of the physical environment, has demonstrated merit and should be useful for understanding, design, and management across varied environments and space types in

different cultures. This study suggests a three-part model to support stationary, lingering, and social activities on the neighborhood commercial street (see Figure 75).

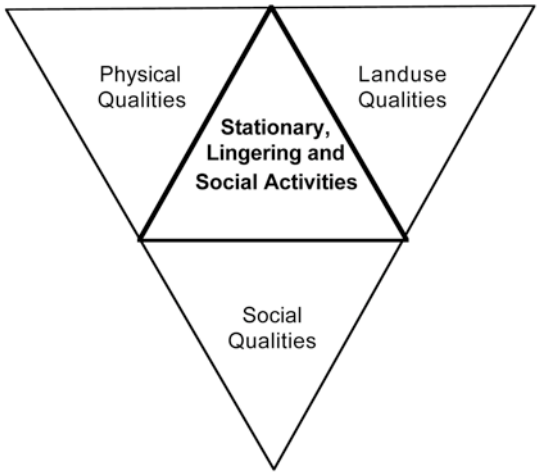

Figure 75. Three aspects support stationary, lingering, and social activities on the street.

The findings of this study suggest that it is the engagement between the places that have special meanings for the community, the elements of the behavioral environment (land uses and their management), and the elements of the physical setting (form and space characteristics) that creates a comfortable, pleasurable, meaningful and therefore desirable environment for people on neighborhood commercial streets. These findings have implications for urban design, community planning, and economic development policies. The findings show that people tend to choose settings that are meaningful to them as places of the community and that offer comfort and pleasure through various amenities and micro-scale physical features: elements that are extremely significant to the users of the environment.

Transportation planners generally characterize streets as dynamic spaces or paths that are channels for vehicular and pedestrian movement. However, the findings of this study challenge this view and contribute to the notion of the street as a social space as suggested by some social commentators, sociologists, and urban designers (see, for example, Jacobs, 1961; Appleyard, 1981; Gehl, 1987; Brower, 1988; Vernez-Moudon, 1991; Jacobs, 1993; Lofland, 1998; Loukaitou-Sederis and Banerjee, 1998; Hass-Klau et al., 1999). The findings show that when an appropriate combination of characteristics is present, the street can be a desirable place for stationary, lingering, and social activities. This is particularly important for North American and other modern cities, which, unlike most European and Asian medieval center-cities, have few or no squares or plazas designed specifically for casual stationary and social activities. Additionally, while modern urban societies no longer depend upon the square or the plaza for certain basic needs, like collecting water and gathering news, the neighborhood commercial street is a current and relevant behavior setting, especially in mixed-use neighborhoods because the amenities and activities on the contemporary neighborhood commercial street offer opportunities for informal social interaction as a part of the daily round.

Social Qualities - Community Places

In all three neighborhoods, the specific street studied is perceived to be the major neighborhood commercial street. This is where many people who live in the neighborhood do their daily or weekly shopping and come to eat and drink, to seek leisure and entertainment, to meet friends and watch people, and to see or participate in activities. These streets are the most lively, diverse, social, and public streets in their respective neighborhoods. However, the findings of this study suggest that there is a

hierarchy in the businesses that support this quality of liveliness, variety, diversity, and social contact on neighborhood commercial streets. In essence, certain businesses are able to generate and anchor this quality; others act as supports; and yet others contribute minimally or sometimes even detract from it.

People with different outlooks and backgrounds expressed an attachment to certain businesses that had evolved into community places: where they were able to see and meet friends, neighbors, or strangers, spend their leisure time and engage in various activities that reinforced their sense of community. When complimented with other physical characteristics, these businesses that were the community places of the neighborhood were the anchors for this quality of liveliness on the street. Almost all the businesses that had evolved into community places for people in the neighborhoods were small independent businesses. The most important and unparalleled benefits from these small independent businesses are that besides selling goods and services "they give out history, memory, a sense of place, local flavor, [and] community knowledge" (Solnit, 2000, cited in Johansen, 2005).

Landuse Qualities

Four characteristics of landuse were important in supporting liveliness on the street: independent stores, variety of stores, personalization of street-fronts, and permeability of street-fronts. There is clear evidence from the observational data, surveys, and interviews that users of different backgrounds and outlooks preferred small independently owned businesses. Smaller independently owned businesses were key to the liveliness on the street not only because people preferred them for their quality of goods and services but also because they incorporated other landuse characteristics those

were important to support liveliness. Physically, smaller businesses consumed much less street frontage, permitting more variety through increased numbers of businesses per unit length of the street. Smaller independently owned businesses had more personalized street-front with shop window and entrance decorations, plants, changing signs, and so on. Small businesses were also relatively more permeable to the street such that activities inside the store could be sensed on the street outside. Independent stores also provided important physical characteristics. Eighty-eight percent of seating on the street provided by stores was provided by small independent businesses. Hence, small businesses were important on multiple levels to support liveliness. Additionally, small businesses were more likely to offer a certain uniqueness of goods and services that cannot be replicated in larger chain stores. People preferred to deal with business owners who seldom change, as compared with the employees in larger chain stores, who are more likely to come and go.

Urban design and planning literature in the last two decades has suggested that mixed-use neighborhoods offer a desired pattern of physical development to achieve a more vital, vibrant, attractive, safe, viable and sustainable pattern of urban lifestyle. Previous studies have shown that one of the most important characteristics that people look for in mixed-use neighborhoods is the liveliness and diversity of the neighborhood commercial areas (Brower, 1996). A great deal of what is developed and built, however, falls far short of the promise of an interesting, lively, diverse, and stimulating environment, failing to capture the essence of a truly mixed-use neighborhood. Contemporary developments with distinct zones for living, working, shopping, and leisure, but lacking a mix of uses at the finer grain (Jacobs, 1961; Alexander et al., 1977;

Coupland, 1997; Montgomery, 1998, among others) are often classified as mixed-use neighborhoods. In these neighborhoods, however, there is little sharing of facilities and public open spaces and "the mixture is one of oil and water" (Montgomery, 1998, p. 105). As a result, there are few opportunities for seeing or meeting people.

The streets in this study possess a fine grain mix typical of older small North American towns. This study showed that variety of stores was an important landuse characteristic to support liveliness. The liveliest blocks in these streets had seven to eight businesses for every 200-foot segment of the block. On almost all of these lively blocks, there was a mix of places to eat/drink (coffee shop, restaurant, deli, pub/bar), to serve daily/weekly-shopping needs (convenience store, hardware, drycleaner), and to provide other services (bookshop, video shop, bank, florist, apparel, footwear, and so on). This variety provided most shopping needs on a stretch of just a few blocks. However, over the years, in some instances, small shops have been consolidated into larger businesses and, in a few cases, entire blocks have been razed and replaced by new monolithic structures with few uses. This has detracted from some of the fine grain quality of mix in some blocks. The findings clearly suggest that blocks that lacked the fine grain mix and variety were less lively and not preferred by people. More important, this has taken away small businesses many of which were community places for the people who live and work in the neighborhood.

It is unrealistic and even inappropriate to suggest that a neighborhood commercial street should consist only of cafes, coffee shops, restaurants, and the like, simply because these attract people and generate stationary, sustained, lingering and social activities. Any neighborhood is likely to support only a limited number of businesses of any particular

kind. As found in this study, people desire and value amenities and conveniences that satisfy day-to-day needs of shopping, entertainment, and social contact. It is not unreasonable, therefore, to suggest a variety of businesses and stores as well as physical characteristics on each block to provide for day-to-day shopping and leisure needs: some that generate and anchor stationary, sustained, lingering, and social activities, and others that support such activities. The fine grain mix of uses at each block mentioned earlier is important in containing the activity and the resulting liveliness on just a few blocks. Even within a single block, it is suggested that activity-supporting businesses be clustered together as much as possible.

Physical Qualities

According to this study six physical characteristics were most important in supporting liveliness on the street: commercial seating, public seating, width of sidewalk, shade on the sidewalk, other furniture and artifacts on the sidewalk, and articulation of the building facades. The relationship between commercial seating and liveliness was the most evident. Among other physical characteristics the width of the sidewalk, as a clear pedestrian domain on the street, was most important as it was required to accommodate most of the other physical characteristics, such as seating, trees for shade, and other furniture.

Additionally, certain characteristics of the environment and the elements of the physical setting, such as permeability, personalization, articulation of the building facades, street furniture, and signs, add to the perceptual diversity and complexity of the street. It was not the intent of this study to quantify an optimal perceptual diversity and complexity. Nevertheless, the findings do suggest that streets with higher levels of

perceptual diversity and complexity are generally preferable. While considerable work is currently being done in the area of visual preference, the findings of this study show that visual preference is only one factor affecting people's preference for an environment. It would be more appropriate to conduct further research regarding optimal levels of perceptual diversity and complexity by simultaneously studying the characteristics of use and the physical elements that engage all the senses.

However, "Who should be responsible for the overall design and operation of such public environments?" remains an open question. Presently, there is no profession in the social sciences, design, planning, management, or marketing fields that caters to understanding and providing for the needs of a cultural, behavioral, and physical environment. Should this be a realm of the urban designer, architect, community planner, economic planner, or the Main Street manager? Currently, the predominant paradigm in architecture and urban design lacks an engagement with the social sciences and scientific rigor. Should the holistic design of public environments be an area of education in the design and planning schools or should sociologists or environmental/ecological psychologists embrace it?

For now, urban designers, social scientists, community planners, and urban space managers need to incorporate empirically studied characteristics that combine meaning, use, management, and physical characteristics, like the ones in this study, which appear to be foremost in the people's choice of everyday use of neighborhood commercial streets. Community programs, and planning and economic development policies need to support and preserve small independent businesses, especially the ones that are perceived as community places, adopt building codes and laws, and management and design

strategies that serve pedestrians and help integrate social functions to make neighborhood commercial streets more useful and attractive to its users. Above all, rather than just a channel for movement of people and vehicles, the neighborhood commercial street should be conceived as a place for shopping, play, relaxation, and social interaction.

APPENDIX I

FINAL SURVEY and INTERVIEW INSTRUMENT

Introduction Letter, Questionnaire, and Visuals
(One block of Massachusetts Avenue, Central Square, Cambridge, MA example)

Introduction Letter

Hello. My name is Vikas Mehta. I am a doctoral student in the Urban and Regional Planning and Design program at the University of Maryland. As a part of my dissertation, I am studying people's ideas about some parts of Central Square in Cambridge, MA.

Anything you say will be treated as confidential. Your responses and inputs will not be directly associated with your name but will be combined with responses from other participants in this project to become a collective data-source. For example, the study will mention that so many people said so-and-so as a response to a question without mentioning any names.

As a part of the interview, I will ask you a few questions about some parts of Central Square. I will also show you some pictures of this area and ask you to respond to some questions about the pictures.

I am not testing you on your knowledge about Central Square. There are no right or wrong answers to these questions. **I am interested in your opinions.**

I appreciate your participation in this study. Please read and sign the Informed Consent Form on the back of this page.

Thank you.

Vikas Mehta
Ph.D. Candidate
Urban & Regional Planning & Design
University of Maryland
College Park, MD
vmehta@ursp.umd.edu
617-577-5701

Informed Consent Form

Project Title:	**Lively Streets: Exploring the relationship between the physical environment and social behavior**
Statement of age of subject:	You state that you are over 18 years of age and wish to participate in a program of research being conducted by Prof. Sidney Brower in the Department of Urban Studies and Planning at the University of Maryland, College Park.
Purpose:	The purpose of this research is to understand people's use and ideas regarding streets in cities.
Procedures:	The procedure involves answering a questionnaire.
Confidentiality:	All information collected in this study is confidential to the extent permitted by law. The information you provide will be grouped with information others provide for reporting and presentation and that your name will neither be recorded nor used on the questionnaire.
Risks:	There are no known risks posed to you by this study.
Benefits, Freedom & Ability to Withdraw, and Ask Questions:	Your participation in the study is completely voluntary. The study is not designed to help you personally, but to help the investigator learn more about people's use and ideas regarding streets in cities. You are free to ask questions or withdraw from participation at any time and without penalty.
Contact Information of Investigator	Professor Sidney Brower, 1230, School of Architecture, Planning and Preservation, University of Maryland, College Park Telephone: 301-405-6796
Contact Information of Institutional Review Board:	If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office, University of Maryland, College Park, Maryland 20742 Telephone: 301-405-0678 e-mail: irb@deans.umd.edu

Name of Subject:
Signature of Subject: _____
Date:

Questionnaire

Again, there are no right or wrong answers to these questions. I am interested in your opinions.

These are a few pictures of a block in this area.
[*Researcher shows one photograph with a general view of the block and two to three pictures (depending on the length of the block) taken at eye level while walking on the sidewalk on the block. These photographs attempt to capture and represent the different segments of the block. See Appendix 1a and 1b*].

1. How familiar are you with this block? Please circle one of the following.

1 2 3 4 5 6 7 8 9 10

Not familiar — Somewhat familiar — Very familiar

2. I am going to ask you to rate this block for the range of different goods and services that are available on the block. Think of a block where there are stores that sell a variety of goods, and almost every store and business offers something different as a #10 range, and a block where there is a very limited number of stores, and every store and business offers much the same thing as #1 range.
Now, using this scale of 1-10, tell me how you would rate this block for its range of different goods and services.

1 2 3 4 5 6 7 8 9 10

Very little range — High range

3. Next, I am going to ask you to rate this block for the degree to which the goods and services available on this block are not commonly available on other blocks.
Think of a block where almost every store and office offers goods and services that are only available on that block as a #10, and a block where every store and office offers goods and services that you can find almost anywhere as a #1.
Now, using this scale of 1-10, tell me how you would rate this block.

1 2 3 4 5 6 7 8 9 10

No special Stores and shops — All special Stores and shops

4. Now, I am going to ask you to rate this block for the frequency with which signs, show-window displays, and other decorations change on the buildings and on the street.
Think of a block where about half the stores and offices change signs, show window displays and other decorations once every month as a #10, and a block where no stores or offices change any signs, show window displays and other decorations for a year as a #1.
Now, using this scale of 1-10, tell me how you would rate this block.

1 2 3 4 5 6 7 8 9 10 Don't know

Little or no change — Once a month or more

5. The next question is about frequency of outdoor events such as block parties, outdoor sales, festival sales and other outdoor events.
Think of a block where at least one such event takes place once every month as a #10, and a block where such events almost never take place as a #1.
Now, using this scale of 1-10, tell me how you would rate this block for its occurrence of events.

1	2	3	4	5	6	7	8	9	10	
Few or no events									Daily events	Don't know

6. Kindly provide me any other information on what kinds of events take place here, when they take place, and who are the participants.

For the next series of questions, I will ask you to use a visual scale.

7. Here is the first scale.
[*Researcher shows the participant a visual scale. See Appendix 1c*].

These two sketches illustrate the two ends of a scale, which I will call the "interesting" scale.

The sketches differ in this respect: the one on the left shows a place where there are few signs, plantings, and openings at street level, and with little variety, and no lighting fixtures, or furniture; the one on the right shows a place that has all of these features and with a lot of variety. Which place do you find more interesting to look at?

Now, please tell me whether you think this block is closer to the picture on the left or to the one on the right. Please indicate where it falls on a scale of 1–10, where 1 is just like the picture on the left, and 10 is just like the picture on the right. You may write the number here

_____

8. Now, I will show you a different visual scale.
[*Researcher shows the participant a visual scale. See Appendix 1d*].

These two pictures illustrate the two ends of a scale, which I will call the "pedestrian-friendly" scale.

The picture on the left represents a place that is not good for walking, sitting, and other pedestrian activities, and the picture on the right represents a very good place for walking, sitting, and other pedestrian activities.

Now, please tell me whether you think this block is closer to the picture on the left or to the one on the right. Please indicate where it falls on a scale of 1–10, where 1 is just like the picture on the left, and 10 is just like the picture on the right. You may write the number here

_____

9. Here is the next visual scale.

[*Researcher shows the participant a visual scale. See Appendix 1e*].

These two sketches illustrate the two ends of another scale, which I will call the "attractiveness" scale.

The sketches differ in this respect: the one on the left shows a place where there are few openings at street level, and no planting, lighting fixtures, signs, or furniture; the one on the right shows a place that has all of these features. Which place do you find more attractive to look at?

Now, please tell me whether you think this block is closer to the picture on the left or to the one on the right. Please indicate where it falls on a scale of 1–10, where 1 is just like the picture on the left, and 10 is just like the picture on the right. You may write the number here

_____

10. How safe do you feel walking around this block during <u>daytime</u>?
I would like you to rate this on a ten-point scale, where #1 means you do not feel safe here at all, #5 or #6 means you feel somewhat safe and #10 means you feel very safe here during daytime.

1 2 3 4 5 6 7 8 9 10

Not safe at all — Very safe

11. How safe do you feel walking around this block <u>after dark</u>?
I would like you to rate this on a ten-point scale, where #1 means you do not feel safe here at all, #5 or #6 means you feel somewhat safe and #10 means you feel very safe here after dark.

1 2 3 4 5 6 7 8 9 10

Not safe at all — Very safe

12. How would you rate the overall physical condition of the <u>buildings</u> on this block in terms of cleanliness and need for repair?

1 2 3 4 5 6 7 8 9 10

Very poor — Poor — Fair — Good — Excellent

13. How would you rate the overall physical condition of the <u>sidewalk</u> on this block in terms of cleanliness and need for repair?

1 2 3 4 5 6 7 8 9 10

Very poor — Poor — Fair — Good — Excellent

I have a few more general questions.

[*Researcher took the questionnaire back from the participants and filled out their responses to the next ten questions*].

14. Do you live in this area/neighborhood?
If yes, please answer the following questions. If not, skip questions 15, 16 and 17, and proceed to question 18.

15. How long have you lived in the area/neighborhood?

16. What has changed in the area/neighborhood in the last few month or years?

17. Can you tell me what changes, if any, have happened in this block during that period?

18. How frequently do you visit this block?

19. What brings you here? And, what do you do when you are here?

20. Do you use this block more often compared to other blocks on this street? If yes, why? If not, why not?

21. Do you have favorite stores and shops on this block? If yes, what are they, and what makes them your favorite?

22. What are the three most important things about this block that you would <u>not</u> want to change?

23. What are the three most important things that you would like to change or add on this block?

APPENDIX Ia

(One block of Massachusetts Avenue, Central Square, Cambridge, MA example)

APPENDIX Ib

(One block of Massachusetts Avenue, Central Square, Cambridge, MA example)

APPENDIX Ic

Interesting Scale

1 2 3 4 5 6 7 8 9 10

Not Interesting Interesting

APPENDIX Id

Pedestrian-friendly Scale

1 2 3 4 5 6 7 8 9 10

Not Pedestrian-friendly

Pedestrian-friendly

APPENDIX Ie

Attractiveness Scale

1 2 3 4 5 6 7 8 9 10

Not Attractive to look at

Attractive to look at

APPENDIX II

Flyer advertising the study
(Massachusetts Avenue, Central Square, Cambridge, MA example)

RESEARCH on PUBLIC SPACES

WANTED!
YOUR OPINIONS & IDEAS

I am a doctoral student in the Urban & Regional Planning & Design program at the University of Maryland. As a part of my dissertation I am studying people's ideas about some parts of Central Square in Cambridge, MA

As a part of the interview I will ask you a few questions about some parts of Central Square. I will also show you some pictures of this area and ask you to respond to some questions about the pictures

The interview takes 25 to 30 minutes depending on your time availability

Anything you say will be treated as confidential
There are no right or wrong answers to these questions
I AM INTERESTED IN YOUR OPINIONS

I would like to conduct the interview at your convenience at some place on Massachusetts Avenue near Central Square

Your participation in this study is appreciated
THANK YOU

CONTACT: Vikas Mehta
617-577-5701
vmehta@ursp.umd.edu

APPENDIX IIa

Flyer advertising the study
(Massachusetts Avenue, Central Square, Cambridge, MA example)

STUDY on STREET LIFE

WANTED! YOUR OPINIONS & IDEAS

I am a doctoral student in the Urban & Regional Planning & Design program at the University of Maryland. As a part of my dissertation, I am studying people's ideas about some parts of Central Square in Cambridge, MA

In a brief interview, I'll ask you few questions about some parts of Central Square. The interview takes 25 to 30 minutes depending on your time availability

Anything you say will be treated as confidential. There are no right or wrong answers to these questions. **I AM INTERESTED IN YOUR OPINIONS**

I'd like to conduct the interview at your convenience at any place near Central Square
Your participation in this study is appreciated

THANK YOU CONTACT: Vikas Mehta 617-577-5701 vmehta@ursp.umd.edu

APPENDIX III

Characteristics of Survey-Interview Participants

		Mass. Ave.		Harvard St.		Elm St.		TOTAL	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Age									
	18 to 29	7	33%	4	24%	2	16%	13	26%
	30 to 44	8	38	6	35	5	38	19	37
	45 to 59	4	19	6	35	5	38	15	29
	60 and over	2	10	1	6	1	8	4	8
Gender									
	Male	14	67%	9	53%	4	31%	27	53%
	Female	7	33	8	47	9	69	24	47
Race									
	White-American	15	71%	14	82%	13	100%	42	82%
	African-American	1	5	1	6	0	0	2	4
	Hispanic-American	0	0	0	0	0	0	0	0
	Asian-American	3	14	2	12	0	0	5	10
	Hispanic	1	5	0	0	0	0	1	2
	Asian	1	5	0	0	0	0	1	2
Marital Status									
	Married	9	43%	9	53%	6	46%	24	47%
	Single	11	52	7	41	7	54	25	49
	No response	1	5	1	6	0	0	2	4
Occupation									
	Artist/Musician/Writer Photographer/Play Director	4	19%	2	11.5%	1	7.7%	7	13.5%
	School Principal/ School Teacher/Teacher	1	5	2	11.5	0	0	3	6
	Sociologist	0	0	0	0	1	7.7	1	2
	Researcher (Psychology)	1	5	1	6	0	0	2	4
	Marketing/Advertising/ Communications/Fundraising	1	5	2	11.5	1	7.7	4	7.5
	Publishing/Editor	1	5	1	6	1	7.7	3	6
	Computer Eng/Sys. Admn Programmer/Software Eng.	2	9.5	1	6	1	7.7	4	7.5
	Sound Engineer	0	0	1	6	0	0	1	2
	Business owner	0	0	2	11.5	1	7.7	3	6
	Business Manager	2	9.5	0	0	0	0	2	4
	Administrator	1	5	1	6	0	0	2	4
	Disaster Mngmnt. Planner	0	0	1	6	0	0	1	2
	Attorney	0	0	0	0	1	7.7	1	2
	Architect	1	5	0	0	0	0	1	2
	Web Designer	0	0	0	0	1	7.7	1	2
	Employee in Hardware Store/Picture-framing store	0	0	1	6	0	0	1	2
	Realtor	0	0	0	0	1	7.7	1	2
	Employee w/ non-profit	1	5	0	0	0	0	1	2
	Nurse	1	5	0	0	0	0	1	2

	Mass. Ave.		Harvard St.		Elm St.		TOTAL	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Occupation (contd.)								
Police Officer	0	0%	0	0%	1	7.7%	1	2%
Student	2	9.5	1	6	1	7.7	4	7.5
Retiree	1	5	1	6	1	7.7	3	6
Looking for Job	0	0	0	0	1	7.7	1	2
No Response	2	9.5	0	0	0	0	2	4
TOTAL	21	100%	17	100%	13	100%	**51**	**100%**

APPENDIX IV

Description of Measures for each Characteristic

The author or architects/urban designers calculated scores by visiting each neighborhood commercial street

1. Variety of goods and services on the block

Variety was based on the type of businesses and other public uses at the street level, which were open during normal business hours on the block. Only public uses, as described above, were included in determining variety. A block that had two banks, a restaurant, a coffee shop, a fast food restaurant, a hair salon, and a video store would result in a score of six for that block. The two banks would only count as contributing one to the score of variety. This score for the block was then used as a score of variety for each block-segment on that block.

Calculated by: author
Unit of measurement: number

2. Number of independent businesses at the block-segment

All independently owned or small local chain stores at the street level on the block-segment were included. Again, only public uses, as described above, were included in determining the score for independent businesses.

Calculated by: author
Unit of measurement: number

3. Degree of permeability of street-front at the block-segment

All businesses and uses (public or private) at the street level were individually rated. The degree of permeability was determined by rating how well the activities inside the buildings were visible or could be sensed by sound or smell from the street. Each architect/urban designer rated the permeability for each business or use (see Appendix IVa). The scores for all businesses or uses within a block-segment were aggregated and a mean calculated. Finally, a mean was calculated for all four raters' scores to determine the final permeability score for a block-segment.

Calculated by: Four architects/urban designers including the author
Unit of measurement: Likert-type scale rating ranging from 1 to 10

4. Degree of personalization of storefront at the block-segment

All businesses and uses (public or private) at the street level were individually rated. The degree of personalization was determined by rating how the interface of the business with the street (building façade, entrances, show-windows) was embellished with personal touches such as displays, decorations, signs, banners, planters, flowerboxes, and other wares. Each architect/urban designer rated the personalization for each business or use (see Appendix IVb). The scores for all businesses or uses within a block-segment were aggregated and a mean calculated. Finally, a

mean was calculated for all four raters' scores to determine the final personalization score for a block-segment.

Calculated by: Four architects/urban designers including the author
Unit of measurement: Likert-type scale rating ranging from 1 to 10

5. Number of Community Places at the block-segment

As a response to an interview question, people mentioned certain businesses that were places where they would come to meet neighbors, friends, and strangers. They identified these businesses as places that reinforced their sense of community.

Calculated by: author (based on the places people mentioned in the interviews)
Unit of measurement: number

6. Percent articulation of street-front at the block-segment

Articulation of building façade measured how much of it was articulated and punctuated with nooks, corners, alcoves, small setbacks, steps, and ledges at the street level. It was calculated as a percentage for each block-segment and the percentage was converted to a score.

Calculated by: author
Unit of measurement: percent converted to a score (for example, 68% = 6.8)

7. Number of public (non-commercial) seating at the block-segment

Public or non-commercial seating included benches and chairs that were provided by a public agency where people could sit at the sidewalk or street without having to pay for any goods or services. It was calculated as number of seats for each block-segment.

Calculated by: author
Unit of measurement: number

8. Number of commercial seating at the block-segment

Commercial seats were outdoor seating opportunities provided by private businesses usually in the form chairs. Usually, only patrons of these businesses were permitted to use these seats. It was calculated as number of seats for each block-segment.

Calculated by: author
Unit of measurement: number

9. Average sidewalk width at the block-segment

Calculated by: author
Unit of measurement: number in feet

10. Percent shade and shelter from trees and canopies at the block-segment

Shade and shelter at the street was provided by tree canopies, awnings, overhangs, canopies, and other shading devices. It was measured as a percent of area on the sidewalk that was under shade at each block-segment. The percentage was converted to a score.

Calculated by: author
Unit of measurement: percent converted to a score (for example, 68% = 6.8)

11. Number of other street furniture and physical artifacts at the block-segment

All objects (other than chairs, tables, benches and other seating) that users of the street could sit or lean on such as tree trunks, poles, parking meters, bicycle racks, newspaper-dispensing boxes, integral seating as ledges, railings, and so on, were counted at each block-segment.

Calculated by: author
Unit of measurement: number

APPENDIX IVa

Rating form for Permeability for each business
(Part of Massachusetts Avenue, Central Square, Cambridge, MA example)

Kindly rate each of the following stores or businesses for the degree to which goods, services and activities inside the store can be seen, heard, touched and/or smelled from outside.

Think of a store with the highest permeability and in-out connectivity as a #10 and a store that offers very little or no connection to the outside as a #1.

Store or Business Rating (1 to 10)

Hollywood Video _____

Hair Collage _____

1369 Coffeehouse _____

Omni Hair _____

Pills Hardware _____

Asmara Restaurant _____

Picante Restaurant _____

Seven Stars Books _____

Kaplan's _____

Convenience Store _____

Bank of America _____

Citizen's Bank _____

T-Mobile _____

Office _____

Leader Bank _____

Starbucks _____

Central Square Florist _____

Wainwright Bank _____

Cheapo Records _____

APPENDIX IVb

Rating form for Personalization for each business
(Part of Massachusetts Avenue, Central Square, Cambridge, MA example)

Kindly rate each of the following stores or businesses for the degree to which they have personalized their street front with signs, displays, decorations, plants, flowers and so on and by bringing out their wares, goods and services to the street.

Think of a store with a street front that is full of personal touches as a #10 and a store with very little or no personal expression on the street front as a #1.

Store or Business Rating (1 to 10)

Hollywood Video _____

Hair Collage _____

1369 Coffeehouse _____

Omni Hair _____

Pills Hardware _____

Asmara Restaurant _____

Picante Restaurant _____

Seven Stars Books _____

Kaplan's _____

Convenience Store _____

Bank of America _____

Citizen's Bank _____

T-Mobile _____

Office _____

Leader Bank _____

Starbucks _____

Central Square Florist _____

Wainwright Bank _____

Cheapo Records _____

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