Sidewalks, human behavior, and social engagement:
An observational study of downtown sidewalks in Manhattan, Kansas and Lawrence, Kansas

by

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Abstract

Social interactions provide human beings with a sense of fulfillment and joy. Interpersonal interactions, encounters, exchange of ideas and information are essential for the growth, innovation, and advancement of a society. One role of public places is to facilitate these social encounters and interactions. In this regard, streets are the most ubiquitous public spaces used by urbanites in their daily activities. Scholars have illustrated the importance of considering the street as a social public space rather than just a medium of transportation, since the design and characteristics of a street sidewalk environment can heavily impact people's behavior and activity. It is important, therefore, to understand and study the factors and characteristics of street sidewalks that influence 'sociability'—the quality of a space that facilitates casual and informal social interactions among users.

This thesis investigates commercial streets of two cities in Kansas, to find out how physical features and aspects of the street sidewalks facilitate sociability. Empirical observations are carried out to study user activities and behavioral patterns in downtown commercial blocks in Lawrence, Kansas, and Manhattan, Kansas. Four blocks from each downtown are observed and people's activities on these sidewalks are recorded using behavior mapping techniques, systematic observations, field notes, and photographs. Observations are carried out to record: (1) the locations of users; (2) types of activity; and (3) pedestrian movement. Along with the behavioral patterns, corresponding physical features—for example, fixed, semi-fixed, moveable objects, perceptual elements, land use patterns, and environmental characteristics of these sidewalks—are recorded and studied. By analyzing these observations and findings, this research identifies correlations between people's behavioral patterns and physical characteristics of the street environment to understand how design and management of street sidewalks influence people's activities and the sociability. Ultimately, this research aims to answer the question, 'How can we design more sociable and livelier urban sidewalks?'

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Chapter 1: Social Life, Public Space, and Street Sidewalks

Humans are by nature social beings and people seek interactions with other people. Studies have shown that meeting and communication with other people is crucial for emotional, psycho-physical, and social well-being. Thus, public places play an important role in facilitating these social encounters. Public places provide the opportunity for users to come out of their private realm and experience the outside world. Public places work as a stage for people to see and be seen by other people. These places allow people to experience, see, hear, feel, and learn about the world around them. Successful public spaces can even inspire people to become more social and compassionate. These spaces can promote social bonding and community feeling. Successful public spaces can also contribute to the social, cultural, and economic growth of a society. Conversely, poorly designed public spaces can damage a community. Rather than bringing people together, they create segregation and isolation. They fragment the overall social experience of the outside world. They are under-used and economically unproductive.

Modern urban societies no longer depend upon traditional piazzas or town squares to exchange news or for trading goods. Public space as a marketplace has transformed from open shops to enclosed shopping malls. Pedestrian streets have been transformed into vehicular traffic-way. Scholars and researchers have however, always emphasized the importance of these public spaces and how they are an integral factor for creating a lively city (e.g., Jacobs 1963; Whyte 1983; Gehl 1987; Lofland 1998; Carmona et al. 2003; Mehta 2013). In recent times, many urban planners and designers have employed strategies to create more pedestrian-oriented and traditional types of public spaces, as it is evident that such places are crucial for the social, cultural, and economic advancement of a society.

In this regard, streets are the most ubiquitous public space that people encounter in their daily activities. Streets are one of the most important part of a city and its public realm. Today, streets and sidewalks play a significant role in people's social lives. Street sidewalks hold the potential of becoming

successful social spaces for urban cities. The design and planning of sidewalks, however, is often neglected, and many neighborhood streets fail to work as spaces of social engagement. The design and characteristics of street sidewalks can heavily influence people's behavior and how they interact.

This thesis investigates several different aspects of street sidewalks and corresponding behavioral responses, to identify how the design and planning of sidewalks can affect overall 'sociability' — the quality of a space that facilitates social interactions among people. Directed observations are conducted in downtown streets of Lawrence, Kansas, and Manhattan, Kansas to record people's behavioral patterns and corresponding physical features of those streets. Observations are carried out to record: (1) the locations of users, (2) types of activity, and (3) pedestrian movement. Along with behavioral patterns, corresponding physical features—for example, fixed, semi-fixed, moveable objects, perceptual elements, land use patterns, and environmental characteristics of these sidewalks and streets—are also recorded and studied.

In terms of analyzing the sidewalk environment and the physical characteristics of the study areas, this thesis investigates some of the small-scale features and aspects of the two streets, which can be perceived and analyzed through direct observations, such as: (1) sidewalk design; (2) availability of sitting spaces; (3) sidewalk elements and artifacts; (4) shading elements; and (5) variety of uses. Finally, by analyzing the observations and findings, this thesis identifies several correlations between people's behavioral patterns and physical features of the street environment to understand how design and management of sidewalks influence people's activities and the overall sociability. Ultimately, the thesis attempts to find out ways of designing more sociable, successful, and lively streets.

Background

From the beginning of human history, human beings have responded to and interacted with nature or natural forces for survival and existence. In doing so, people have built structures and spaces that

facilitate human needs and activities. Broadly, these human-made spaces and elements can be termed as the 'built environment'. In social science, the term 'built environment' refers to the human-made surroundings that provide the setting for human activity, ranging in scale from buildings to parks. Throughout history, people have changed, modified and shaped the built environment according to their needs and desires. In modern urban environments, we live, work, play, interact, relax and conduct our day to day activities within the built environment. And as we live and interact within our built environment, it plays a significant role in shaping our life as well. Change in the components of the built environment can deeply influence a person's activities and behavior. In this regard, British Prime Minister Winston Churchill famously mentioned, "We shape our buildings and thereafter they shape us". Various scholars and researchers have illustrated how the design of the built-environment can impact and guide our activities and behavior (e.g., Jacobs 1961; Whyte 1981; Bentley et al. 1985).

In primordial times, humans created structures or built forms to protect themselves from animals and natural calamities. Then with time, built environments became a symbol of wealth, strength and power. We have seen in historical examples of kings and emperors and how they have used the built environments to express their supremacy and power. Leon Battista Alberti, the Italian Renaissance-era architect claimed in the 1400s that monumental classical forms would compel invaders to put down their arms and become civilians (Fitch 1990). Similarly, architect Frank Lloyd Wright suggested how appropriate architecture would prevent corruption and turn people back to wholesome endeavors (Golembiewski 2014). Various architects, planners and designers believe in the power of architecture and design, and how well-designed environments can impact people positively. Conversely, environments can have severe negative impact on people and society too. Saint Louis' infamous Pruitt-Igoe housing project illustrates how designing the built environment without consideration of human needs and context, can create a perilous situation and negative environment for people and the society (Bristol 1991). Streets, plazas and town

squares can also play an important role in social and political movements or protests. In recent events we have seen how public spaces like Tahrir Square in Cairo, Egypt; Shahbag Square in Dhaka, Bangladesh; Zucotti Park in Wall Street, New York were used to start social movements and protests.

It is evident that the built-environment influence us in various ways and has a wide-ranging effect on different realms of our daily lives. The research in this thesis mainly focuses on the street environment and investigates how the different components and characteristics of the sidewalks influence people's activities and behavioral responses and thus affect the overall social engagement of a neighborhood or community.

Significance of the Research

Today, technology has given rise to various virtual realms where people can interact virtually through social-media platforms, without meeting with each other physically. Digital devices and gadgets have taken over people's urge to go out and socialize. Children have become captivated by their video games, smart-phones and social-media profiles. Scholars have illustrated the various negative effects of becoming addicted to the virtual world (Sidani et al. 2016), and why physical places and place experiences are important for us (Seamon 2018). Excessive use and dependency on digital devices and technology can have severe negative impact on people and isolate people socially by making them self-centered. In the long run, it sometime leads to depression, anxiety, and other disorders among people (O'Keeffe et al. 2011).

Lack of public places and social spaces can increase this social isolation even further. This is where streets can play a significant role by functioning as an easily available social space. Streets as social spaces can create opportunities for social contact, interaction, awareness, learning, and overall social cohesion (Mehta 2007). Besides being a medium for movement, people use streets for social and leisure

activities (Jacobs 1961). Streets are used for meeting, shopping, selling goods, playing, relaxation, and so on. Streets facilitating these activities essentially function as a social space and they are positively associated with economic growth (Florida 2002) and physical health (Frank, Engelke, and Schmid 2003). In mixed-use neighborhoods, public and social life occurs in different portions of the neighborhood commercial streets. More than any other space, the street represents the social life of a city. Streets hold the capacity to incorporate various activities, and a street can become one of the most diversified spaces in a city. Well-designed street sidewalks enable the casual interactions between neighbors in their daily activities and these short-term interactions can play a major role in building the trust between community members and create a sense of belonging. Children playing in lively streets can learn from their surrounding world and real-life situations (Jacobs 1961).

Since streets are the most ubiquitous public spaces, they have the potential of becoming lively social spaces. However, not every street is lively and sociable. The sociability and liveliness of a street environment is centrally dependent on how they are planned, designed, and managed. In today's socio-cultural context, it has become ever so important to put the focus on design, use, and management of streets, so that they can facilitate various social activities, interactions, and contribute towards the overall betterment of the social and public life of a community. And in order to do so, it is crucial to understand the dynamics and interrelationships of the different features and characteristics of a street sidewalk that make it more conducive to social activities and engagement. Broadly, this thesis aims at finding the aspects and elements that make a street successful, sociable, and lively.

Specifically, this thesis studies people's behaviors and activities in two downtown streets of Manhattan, Kansas and Lawrence, Kansas, in order to find out how different design elements of these street sidewalks impact user participation and social interactions. Before this research is presented, however, I provide a review of research literature related to streets, sociability, and urban design.

Chapter 2: Literature Review: Streets, Sociability, and Urban Design

To understand various aspects and dimensions of the street environment and how they impact people, several books and research-papers have been reviewed for this thesis. A literature review is done, firstly, to understand the various perceptual and non-perceptual components of public places and how they function as a whole; secondly, to learn how behavioral patterns of people can be observed and studied to find correlations between human behavior and environmental characteristics. Major books that are reviewed for this research are: Jane Jacob's *Life and Death of Great American Cities* (1961); William Whyte's *Social Life of Small Urban Spaces* (1981); and Vikas Mehta's *The Street* (2013). *Life and Death of Great American Cities* illustrates the qualities and importance of public spaces, streets, and sidewalks. It gives us an overall idea about the different aspects of the public spaces and how they impact our lives and lifestyles. *Social Life of Small Urban Spaces* introduce the methods of observing, studying, and learning about the public spaces and the drama that unfolds there. Finally, Vikas Mehta's *The Street* is considered as the main reference point, which provides a key research framework for this thesis.

Jane Jacobs' Death and Life of Great American Cities

The Death and Life of Great American Cities (Jacobs 1961) discusses about the deleterious effects of the modern, orthodox city planning, and urban renewal. In this book, urbanist Jane Jacobs criticizes the principles and aims of modern urban planning theories and theorists. She points out the mistakes and misconceptions of city planning that destroys potentially diversified and lively cities. The book illustrates how assumptions and theories about city planning doesn't work in practical scenarios and why many planning strategies fail because of not studying the city properly. It suggests that, the only way to truly learn about cities is to observe how cities work in real life; to notice what promotes social and economic vitality. Jane Jacobs encourages the readers to observe and look closely at the behavior of cities and its people to understand how a city actually functions in our everyday lives.

The first part of the book looks at ordinary scenes and events of the urban environment to understand how different components of a city are interrelated with one another and what makes them work successfully. The author observes how people use various parts of the city to find out whether any underlying pattern of principle emerge among them. She points out different problems and complexities that are related to the city environment. She provides examples of various city environments and use her own experience to explain and analyze the reasons behind their success and failure. The second part of the book provides different probable solutions of the problems that are discussed in the first part. It illustrates different strategies and approaches of making a city more lively, sociable, and successful both socially and economically.

Jacobs discusses the uses of streets and sidewalks and the roles they play in making the city more sociable and safer. Streets and sidewalks are the main public places of the city and its most vital organ. A successful street is not merely a path for transportation, it works as a social space for people to meet informally in their day-to-day activities. Streets and sidewalks play a vital role in various aspects of our social life. Jacobs discusses different key issues regarding the use of sidewalks, such as: safety, contact, and assimilating children. Here, I highlight topics most relevant to the research focus of my thesis.

a) Safety

One of the major factors for a street to become successful, sociable and lively is to make its sidewalks safe for people. And this is only possible when there is unconscious, casual surveillance by the people themselves. If there are enough people watching over the streets throughout the day, security is automatically ensured. The author argues that, modern planners used safety as an excuse to create gated, guarded, introverted communities which are devoid of the vitality of city-life. It is indeed true that seclusion cannot be a good solution for safety. So, alternatively a sense of security can be achieved when there are

people on the streets and sidewalks, during the different hours of the day. But people will only come to the streets when they have a purpose and interest to come. So, urban planners and designers should take this into account and include various activities for people to use the streets throughout the day rather than secluding and isolating them in the name of safety. However, in today's time, this task of bringing people into street has become even more difficult because of the widespread popularity of online shopping and marketing. But, innately and instinctively, most people seek to meet with other people and socialize. We are inherently social beings. So, when there is proper opportunity, scope, and environment for socialization, people usually do come out. In that respect, Jane Jacobs rightly points out the incompetence of urban planners to create more sociable and safe streets for people to come together.

b) Contact

Sidewalks also works as a casual meeting place for neighbors. This is where people exchange casual pleasantries and nods between them while going out for walking the dog or for groceries. This is how a sense of trust grows between the community members. This casual contact & trust between people is essential for a lively city street; and this cultivation of trust cannot be institutionalized. This is why planned gathering spaces might not work as effectively as the sidewalks. However, this casual contact and social exchange is possible only when the concrete, tangible facilities like the grocery store, bars, and restaurants are available nearby. The streets and sidewalks become dull and lifeless when these amenities are poorly placed or distributed.

c) Assimilating Children

Another important aspect of the sidewalks is its usefulness as a playing space for the children. The author argues that playing in the street is more enjoyable and safer for children when they have constant casual supervision from the adults nearby. More bullying incidents are reported in secluded playing areas, but in

the streets or sidewalks, there is casual surveillance. The author points out that children need variety of places to play and learn. They need an outdoor base from which they can play, hang around and form their notion of the world. Sidewalks often fulfill this role for them, and children essentially learn from the adult life that goes on around them. Modern planning often secludes children's play area from the streets and as a result separate them from the practical social life around them. However, it can be argued that not all streets have this quality of informal surveillance and are unsafe for children to play. When there are no public amenities or activities around, the street can become quiet, secluded and unsafe for children. Also, unmonitored or unsupervised vehicular movement can pose a big threat for children playing on the streets. In this regard, proper planning and design can improve the situation and surveillance for children to play safely.

d) Use of Neighborhood Parks

Neighborhood parks are often considered as the lungs of the city. However, Jane Jacobs disagrees with this notion and points out that not all parks are successful and effective. Unpopular parks are harmful because of their negative effects. They have the same problem as the streets without eyes. Unused or underused parks become places of vandalism. The author argues that, contrary to popular belief, not all parks can uplift the quality of the neighborhood or improve people's behavior. Physical arrangement of surrounding neighborhood and its amenities heavily affect the usefulness and success of a park. A park becomes successful when it caters a mixture of users and activities throughout the day. And that is only possible when there is a genuine content of diversity in the surrounding areas. The park can work affectively when there are a variety of users using the park at different times of the day. Otherwise it can become dead or inactive after a certain period of time. It can also be added that the visual appearance and permeability of the park is also essential for its success. If the park is not permeable enough visually or physically, it can fail. It should look inviting for the people to use it.

Jacobs also discusses the importance of physical, economic, and social diversity and the different conditions that are necessary for creating diversity and thus creating a lively city life. The author suggests that if a city has enough opportunity for economic diversity, it can eventually create other diversities too. The author illustrates four specific conditions that are essential for creating diversity: *primary mixed uses, small blocks, aged buildings,* and *concentration of people*. She points out that all of the four physical conditions are needed together to create diversity in a city. They are the main generators of diversity and, as we shall see, have relevance to my two study sites.

a) Need for Primary Mixed Uses

Places of primary uses are like anchorage points, to which people come on a regular basis to conduct their necessary daily activities, for example, places of work and places of study. These are the places which generate assemblage of people and also other secondary uses. Jane Jacobs suggests that a mixture primary uses are essential for diversity. If there is only one primary use in a place, there will only be activity in a certain period of time by a certain group of people. But if there is a mixture of primary uses, it creates the variation that enables the place to be used at different times by different people. Any primary use is ineffectual by itself; other uses must be combined to generate diversity. This mixture of primary uses can also create a mutual economic support between different enterprises. Civic centers and cultural centers often fail in creating diversity because they isolate the different uses and users.

b) Need for Small Blocks

Large blocks inherently create self-isolating streets. Shops, stores, bars are usually placed at corners or intersections of streets. So shorter blocks create better distribution of these facilities, where people can use them by travelling much shorter distances. Shorter blocks also create more choices and alternative routes for people. This adds to the fabric of intricate cross use. However, it is important to note that shorter blocks

create more streets and thus more traffic stops, so the pedestrian and vehicular flow must be managed strategically to avoid traffic congestion or a conflict between them.

c) Need for Old Buildings

The author also elaborates on the need of old buildings and how they contribute in economic progress. She criticizes the tendency of planners to create new buildings by destroying old ones unwisely. It is easily understood why old buildings are needed for small enterprises like bookstores, pawn shops, local bars and restaurants to survive, which adds significantly to the diversity of the city.

d) Need for Concentration

Concentration of people is crucial for diversity. Without proper concentration of people there can be little diversity. If various primary uses take up physical space and only involve a few people, they will not be able to create diversity or liveliness. Orthodox planning and housing theories oppose high dwelling densities, it sees high density as a problem and difficulty. But the author suggests that a proper concentration and distribution of people is essential for diversity. No matter how diverse the primary uses are, if there are not enough people to use and utilize them, the neighborhood would become lifeless and dull. But it is important to remember that the relationship between density and diversity is not simple and straight-forward. No concentration of residents, however high it may be, is "sufficient" if diversity is suppressed or thwarted by other insufficiencies (Jacobs 1961). So, a good balance of all the factors is necessary for the generation of diversity.

Overall, Jane Jacobs demonstrates how different planning theories and policies often fail and can even jeopardize the diversity and liveliness of a city. Jane Jacobs strongly recommends the use of careful observation and analysis to know about the real-life situations and how cities actually work. Jacobs uses different examples of personal experience and observation to explain her points.

Similarly, this thesis draws upon the concept of observing the public life and public activities of streets to understand the relationship of different elements of the study sites. For this, I point out and count the primary uses of the study sites and see how they impact activities of people and also how they contribute in creating secondary uses. I compare the number of different primary and secondary uses of both the study sites to analyze if there is a good mixture of uses to create diversity and sociability on the streets. As per Jacobs' suggestion, I also look at the relative density of people within and around the study sites and the number of users on the streets. I analyze the size of the blocks to see if small blocks impact the activity and movement pattern of people. Overall, Jacobs provides some key factors to look at as a starting point for this thesis.

William Whyte's The Social Life of Small Urban Spaces

In *The Social Life of Small Urban Spaces,* urbanist William Whyte (1980) discusses the various factors that make public plazas lively, active, and sociable. Whyte, along with his research group conducted observational studies on several public plazas in New York city to find out why some plazas are well-used and why others are not. The basic framework of the research was to simply observe the activities on the plazas and the corresponding attributes to see how they impact the use and sociability.

Whyte used time-lapse photography to capture the activities of people on eighteen New York city plazas throughout the day. Observers were also appointed to take note of the different uses of the plaza and people's behavioral differences. This way, it was possible to compare the number of users, their activities, and the corresponding physical characteristics of the plaza. Through these observations and analysis, Whyte pointed out some key design elements that contribute to the sociability. Whyte found out that one of the major design factors that influences plaza-use is 'seating space'. People would frequently

use and search for wide steps, planter boxes, low walls, ledges to sit and relax. The use of plazas increased concomitantly with the availability of seating spaces. Whyte suggests that there should be wide variety of seating spaces to choose from in a plaza and these should be both physically and socially comfortable.

Permeability and accessibility of the plazas was another important factor that Whyte found out. Pedestrians are more likely to use a plaza when it is easily accessible from the street. In this regard, the street-plaza relationship is crucial. Whyte suggests that the relationship between the street and plaza should be such that it generates 'impulse use' — the quality of a space that draw people into it without conscious attention. Plaza that had poor permeability and visibility were comparatively less used. In addition to seating spaces, several other factors have correlations with plaza use, such as: sun, water, trees, food, and triangulation. Whyte also found out that 'beckoning devices' such as sculptures, fountains, street performers, exhibits were essential in attracting people to use a plaza. The most important factor that Whyte identified was the relative location of the plaza. Plazas that are located in areas with heavy pedestrian flows had more chance of being used, and sequentially an active, lively plaza would attract more people.

Overall, *The Social Life of Small Urban Spaces* illustrates how a simple observational study can reveal and identify insightful information about design and use. William Whyte's work is one of the main inspirations behind this thesis. In this thesis, I draw upon Whyte's observational method and use it in the context of streets and sidewalks to see if it provides us with insights that might help us to design better, successful, and sociable streets.

Vikas Mehta's The Street: A Quintessential Social Public Space.

The Street by urban designer Vikas Mehta (Mehta 2013), discusses the importance of the street not only as a medium of transportation but as a place of social, cultural, political, and economic activities. The book also ventures into the dynamics of the relationship between the streets and its users. The author reminds us how the streets have played an influential role in shaping the society throughout history. He also points out that the streets can create meaningful associations for us as social beings. There can be different kinds of streets in a city but for this book the author has focused on the 'local retail streets' that serve the commercial, leisure and social needs of the people of the neighborhood and the city. The author suggests that these streets work as places for social activities and facilitate social encounters and interactions. He uses empirical research, observations, interviews, and analysis to understand the different patterns of social behaviors on the street and finally, based on the findings of the research, he provides us with a set of design, planning, and management guidelines for creating more sociable streets. Similarly, for this thesis, I study and observe two downtown commercial streets to understand how they are used and how their design influence sociability.

Mehta discusses the characteristics of sociability and sociable streets. He focuses on the streets that are sociable throughout the day and week, not the one that are sociable only on special events. He defines *sociable street* as a street that is open to public, where people are engaged in a variety of active or passive social activities that are stationary and sustained in nature. A sociable street is one where people use the street for myriad purposes of socializing, everyday shopping, dining, lingering, promenading, celebration, protest, and survival (ibid. p.25). Sociable streets are essential for vibrant, exciting and lively cities.

Researchers who study environment-behavior relationships use different research methods to test their theories and claims. These methods include study of real-life situations, activity and behavior of the

users, in order to understand human needs and preferences through empirical observation (Joardar 1977). Mehta suggests that an effective way to understand and evaluate neighborhood commercial streets would be to study how the streets fulfill everyday needs and provide aesthetic and interactional pleasures. He argues that this can be done by empirically studying the interrelationships between the characteristics of the streets, including its uses, physical elements, management of the street spaces, and the behavior of the users. Overall, he proposes the environment-behavior approach to study the interrelations between the characteristics of the street and the behavioral patterns of the users. He suggests that this approach can be used to examine and design more sociable streets which provide both affordances and aesthetic pleasures to support a wide range of social interactions and encounters. Similarly, for this thesis, I use the environment-behavior approach and study social behaviors in two downtown streets to understand how the designed environment impacts sociability and social engagement.

Mehta presents us with three case studies of streets in Boston: Massachusetts Avenue, Harvard Street, and Elm Street. He describes his research methodologies to capture the stationary, lingering, and social activity on the streets. He studied the three streets using structured walk-bys and timed observations. He also used his own experience as a user of those streets. He took photographs and made short videos to observe the behavioral patterns of the people and their surrounding environment. He interviewed fifty-one people who actively used the streets. Further, he illustrates the main findings of the research, such as the nature of gatherings, kinds of behavior, duration of stay, and how people perceived the streets. He points out that the studied streets were renovated within the previous eight years to promote more social interactions, however, only a few block segments worked successfully. Many block segments lacked a proper layout of the environment to afford social behaviors, but certain stores on the street created behavior setting that supported social activities and behaviors. He suggests that patterns of organization and configuration of buildings, landscape, street furniture and artifacts provided the affordances for social

activities and behaviors on the street. For this thesis, I study some of these features, elements, and characteristics of the street environment to see how they impact the use, activity, and social behavior.

Mehta interprets the findings of the research to point out the different characteristics and features of the streets that support sociability. He discusses the different factors that influence the sociability of streets, such as – the sense of comfort, sense of safety, environmental conditions, aesthetic appearance, permeability, sense of belonging, and so on. The author also discusses about the street as a place, and the characteristics that can create a sense of place. He discusses the concepts of continuity, adaptability, and personalization as means of transforming a street space into a place. Overall, he discusses different social, psychological, and physical needs for sociability and how different characteristics of a street may support, enhance or limit social behavior.

Finally, Mehta discusses the dynamic, evolving, and ever-changing street culture and behavior. He suggests that there are many lessons to be learnt from different sociable streets such as the neighborhood commercial street in Delhi, where the street transforms into a sociable place and provides many sensory stimulations. He compares the streets of the East with that of the West to point out the differences and similarities between them. Ultimately, Mehta provides us with a set of design, planning, and management guidelines to create and sustain sociable streets for all. The guidelines include improving access, reducing traffic, accommodating seating, providing shelters, increasing safety and so on. He suggests supporting the existing vibrant places and creating new one by promoting diversity of uses along the streets.

In *The Street*, author Vikas Mehta illustrates how the environment-behavior approach can be used to study street life and gain insights about the different characteristics of the street that govern social behavior. For this thesis, I use *The Street* as a main reference point for the methodology of my research. Firstly, I follow some of the techniques and procedures that Mehta uses to study street life and street

environment. Secondly, I draw upon Mehta's concept of *human behavior as a basis of design* to understand how behavioral patterns and activities can be analyzed and interpreted to evaluate the impact of street-design on sociability.

In terms of this thesis, all these studies reviwed provide a broad knowledge regarding different uses and impacts of the street environment. They stress on the fact how streets have the potential to become sociable public places. If designed properly, streets can provide people with the appropriate settings for social engagement and interaction. Firstly, Jane Jacobs' *Life and Death of Great American Cities* demonstrates the importance of streets and sidewalks, and the role they play in influencing the mechanism of city-life. It shows why the design and management of streets and sidewalks is important for the liveliness and sociability of a city. Secondly, William Whyte's *Social Life of Small Urban Spaces* introduces us with the observational method of research. Whyte demonstrates how simple observations of people's activity can give us important insights into the use and design of public places. Finally, *The Street* provides the basic research framework for this thesis. Overall, different parts of these literatures are used as reference points to study, observe, and understand several aspects of the characteristics and uses of the study sites of this thesis research.

Chapter 3: Research Methodology - Behavior Mapping and Structured Observations

The methodology of this thesis research is based upon the works of urbanists William Whyte and Vikas Mehta, which has been discussed in the literature review section. In the 1980s, William Whyte (1980) and his team conducted a research on the behaviors and activities of plaza users in New Yok City to identify factors that influence plaza-use. He conducted empirical observations to find out how people use plazas and why some plazas are more successful than others. Similarly, Vikas Mehta (2013) used observational method to study behavioral patterns and activities of people in three neighborhood commercial streets of Boston, MA. He conducted several empirical observations to understand how these streets are used by people, and how the design and management of these streets impacts social behavior and sociability. This thesis takes a similar approach to observe people's activities in study blocks of Massachusetts Street and Poyntz Avenue to identify design factors that can influence usability and liveliness of these streets.

For this thesis, observations have been conducted in three phases. Firstly, people's stationary behavior and activities on the sidewalks have been observed and mapped to identify places that are frequently used and occupied, and conversely, to identify spaces that are seldom used. For this, behavior mapping techniques have been used to observe people's activities and behaviors at different time periods for five consecutive days; secondly, people's movement pattern and movement frequency have been observed and recorded to understand how many people use these downtown streets for pedestrian-use; and thirdly, some small-scale aspects, amenities, and features of the study blocks have been observed and studied to understand the design characteristics of the street environment.

In terms of stationary activities, directed observations have been carried out to map people's behavioral patterns and activities using base maps, field notes, and photographs. Systematic observations have been carried out to identify the places that people frequently occupy and use, and to understand how people interact with the physical features of the street environment.

Figure 3.1: Combined base map with sidewalk plan and elevation.

To record stationary activities, a base map has been used for each of the study blocks. The base map was created by combining the plan of the sidewalk and corresponding elevations of the block facades (Figure 3.1). For ease of observation and analysis, each block was divided into smaller block segments. Corresponding names of the shops and restaurants were added to the base map, so that it was easier to identify the physical features of the street environment in relation with the user activities. The base map also had spaces for recording the date, time, temperature, weather, and other relevant information regarding each observation period.

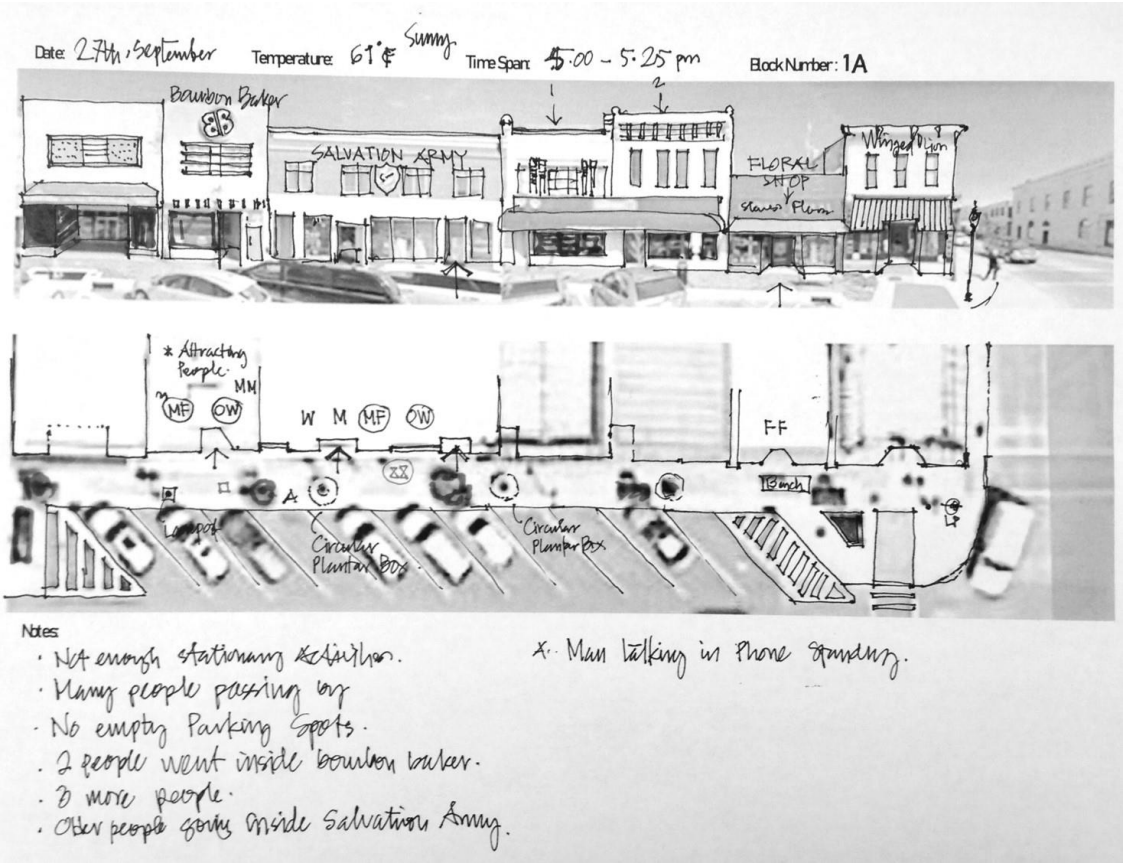


Figure 3.2: Base map used for the pilot study.

A pilot study was conducted to establish the behavior mapping process. During pilot observations, it became evident that walk-by observations are the most effective way to map stationary activities of people on the sidewalks. I spent fifteen minutes in each of the four study blocks to conduct the walk-by observations for each session. I started walking from one end of a block to the other and recorded every stationary activity into the base map. It was found out that in fifteen minutes I could make three rounds in a single block from end to end. In this way, I could also note down any change of activities within block segments during the fifteen minutes of observation. The pilot study proved helpful in establishing the actual process of behavior mapping for final observations. The base map used for the pilot study (Figure 3.2) was refined and redeveloped for the final observations.

Mapping Procedure of Stationary Activities

To map the location and activities of people, every stationary user on the sidewalks was marked with a dot and corresponding activities were noted accordingly on the base map (Figure 3.3). Mapping the locations of users was essential in identifying spaces that are mostly active and most used during observation periods. People in groups of two or more were marked with a circle to identify if certain spaces are used by groups of people rather than individuals. This can also identify if certain spaces are mostly used by individuals who want to be alone among the crowd. People's activities were categorized into five basic types: sitting, standing, eating, using electronic devices while standing, and using electronic devices while sitting. This categorization of activities is helpful in understanding if specific spaces facilitate specific activities. Any additional information related with user activities were also noted on the base map (Figure 3.3) and photographs of different activities and corresponding spaces were captured accordingly.

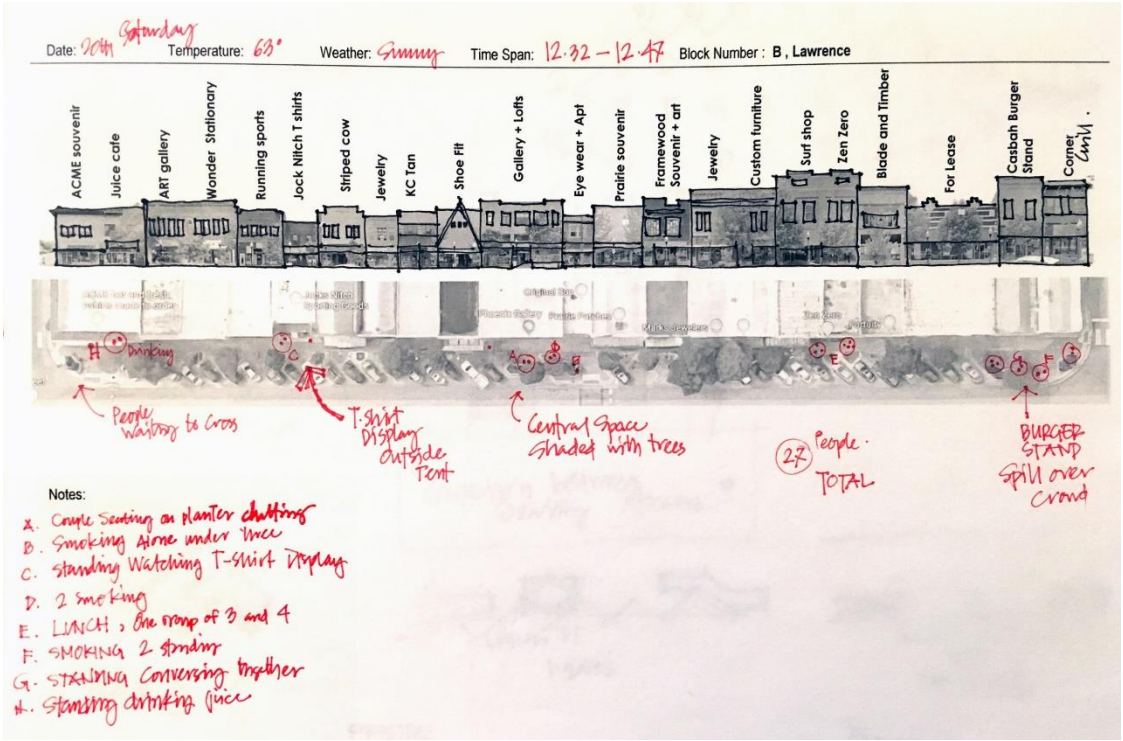


Figure 3.3: Mapping of stationary activities in block B.

Mapping Procedure of Pedestrian Flows

Directed observations were carried out on each block to record pedestrian flows and movement patterns. This was done mainly to understand how many potential users visit the downtown streets and how they move about the study blocks. To record pedestrian flows, each study block was observed for ten minutes in each observation period. To get an overall idea of the number of users in motion, both ends of a block was observed for five minutes. On the base map, each end of a block was marked with an 'end line' (Figure 3.4) and users crossing the end lines were counted to get the total number of users. The direction of the pedestrian flow was also recorded to identify if there is any pattern of flow.

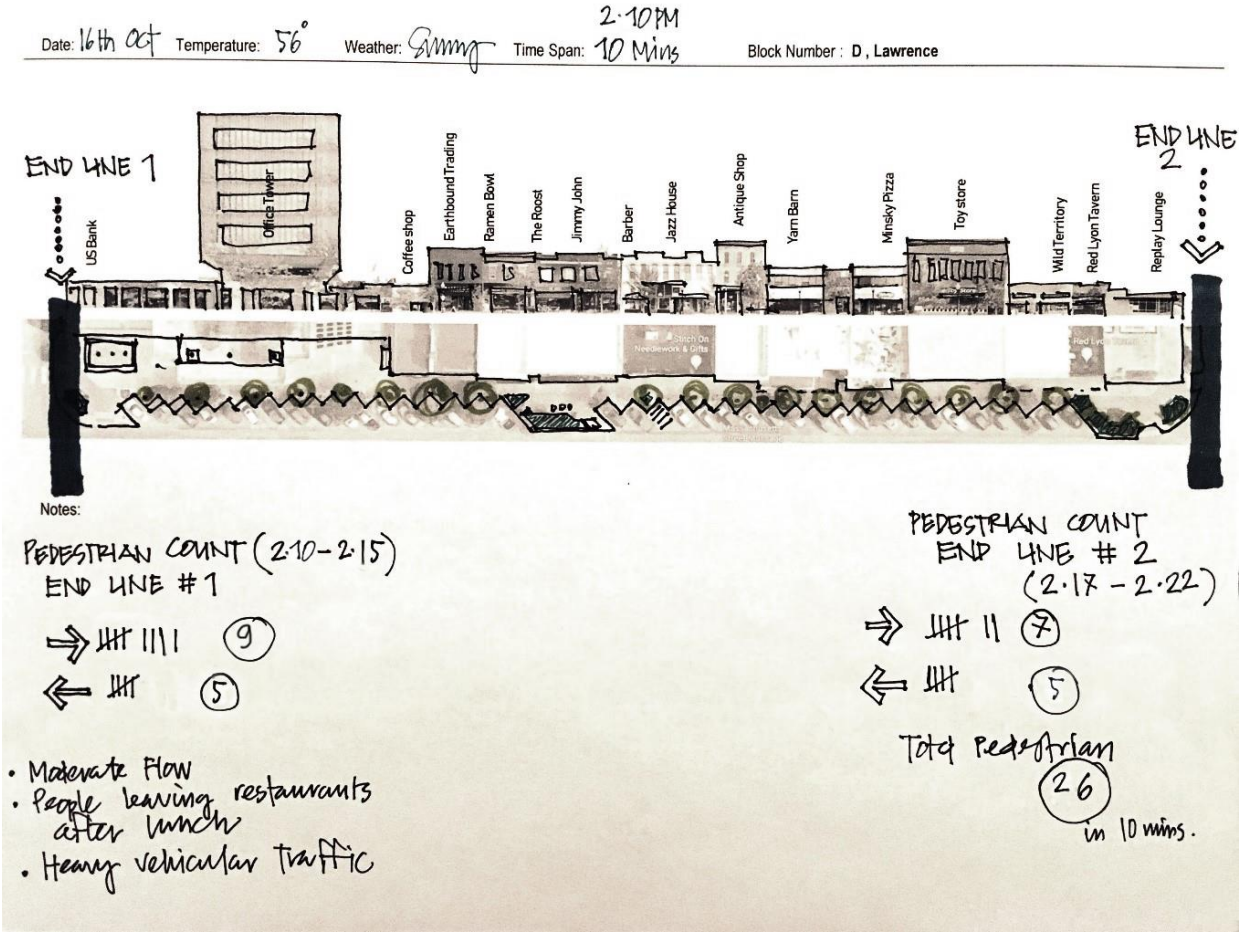


Figure 3.4: Mapping of pedestrian flow.

Observation of Street Environments

Several studies suggest that there are various factors and characteristics that influence the quality and use of the built environment. Architect and author Amos Rapoport (1990) suggested that large-scale characteristics like technology, safety, climate, weather, topography, availability of services, physical and perceptual characteristics affect the pedestrian use of streets. Similarly, urbanist Vikas Mehta (2013) points out several small-scale factors which play an important role in people's selection of environments. Overall, it can be said that there are various large- and small-scale characteristics that affect people's preference and decision to use an environment (pp. 167). For this research, I investigate some of the small-scale features and aspects of the street environment which can be perceived and analyzed through direct observations, since one of the primary objectives of this research is to gain insights about the built environment through simple structured observations.

A review of relevant literatures proved helpful in identifying several aspects and physical characteristics which can influence people's preference in using the street environment—for example, availability of sitting spaces (both commercial and public), width and design of sidewalks, shading elements, sidewalk elements and artifacts, and variety of goods and services. Overall, these various characteristics and aspects of the designed environment were observed and studied through visual surveys, photographs, and sketches. This research analyzes these characteristics in relation to user activity to identify if there is a correlation between the two. Observations and analysis regarding these aspects are discussed in detail in Chapter 9; but before that, in the next chapter, I discuss and describe the two study sites in detail.

Chapter 4: Study Blocks of Massachusetts Street, Lawrence, KS

For the research in this thesis, two contrasting downtown streets have been chosen. The first research site is Massachusetts Street in Lawrence, Kansas; and the second research site is Poyntz Avenue in Manhattan, Kansas. Both Lawrence and Manhattan are considered as 'university towns' in that the University of Kansas and Kansas State University are located in the two cities, respectively. Major social and cultural activities revolve around these universities, and the downtown areas incorporate considerable student activity, particularly in Lawrence. Massachusetts Street runs along a north-south axis, whereas Poyntz Avenue runs east to west, and both streets pass through the core area of the two downtowns. For this thesis, I have conducted structured observations in four blocks from each of the downtown sites in Lawrence and Manhattan. The study sites are discussed in detail below.

Massachusetts Street is located in the northeastern sector of Lawrence. It is commonly known as 'Mass Street' and it is one of the most popular spots in Lawrence. It is a hub for various businesses including cafes, restaurants, art galleries, theaters, antique shops, and many offices. At the north end of the street, a bridge runs over the Kansas River and connects the downtown area with North Lawrence. The core downtown area starts right after the South Park and the Lawrence city administrative office. There is also the District Court and the Watkins Museum of History on the south side of the street. The University of Kansas is located nearby towards the west. The city's public library is located on the northwest side of Mass Street (Figure 4.1).

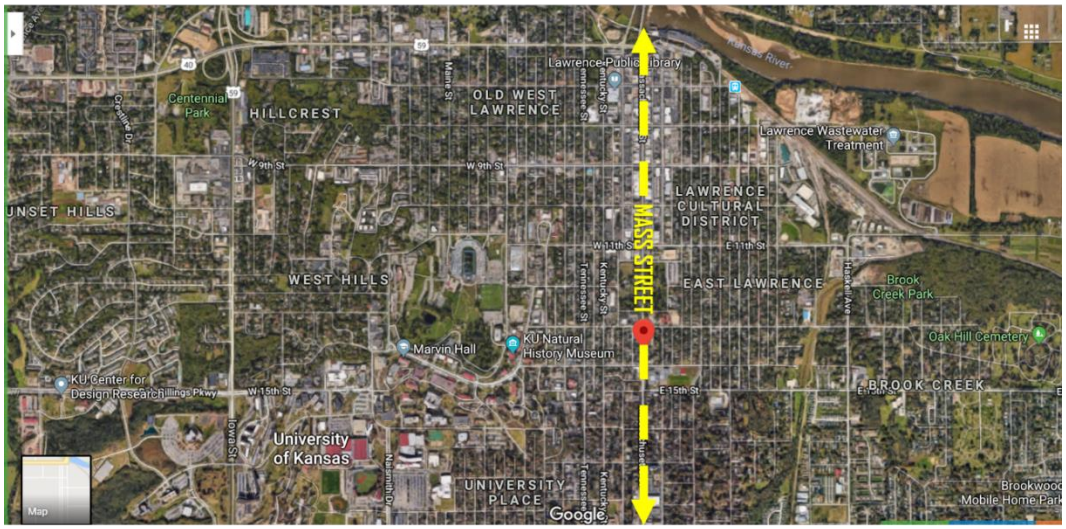


Figure 4.1: Location of Mass Street.

For this thesis, I have chosen four blocks within the core of Lawrence's downtown. I have chosen these four blocks because, during preliminary observations, I noticed that these blocks have a diverse range of uses like shops, restaurants, and stores, and a good number of people come to use these sections for different indoor and outdoor activities. For ease of identification and analysis, these four blocks have been labeled as A,B,C, and D (Figure 4.2).

Figure 4.2: Study blocks of Mass Street, Lawrence, KS.

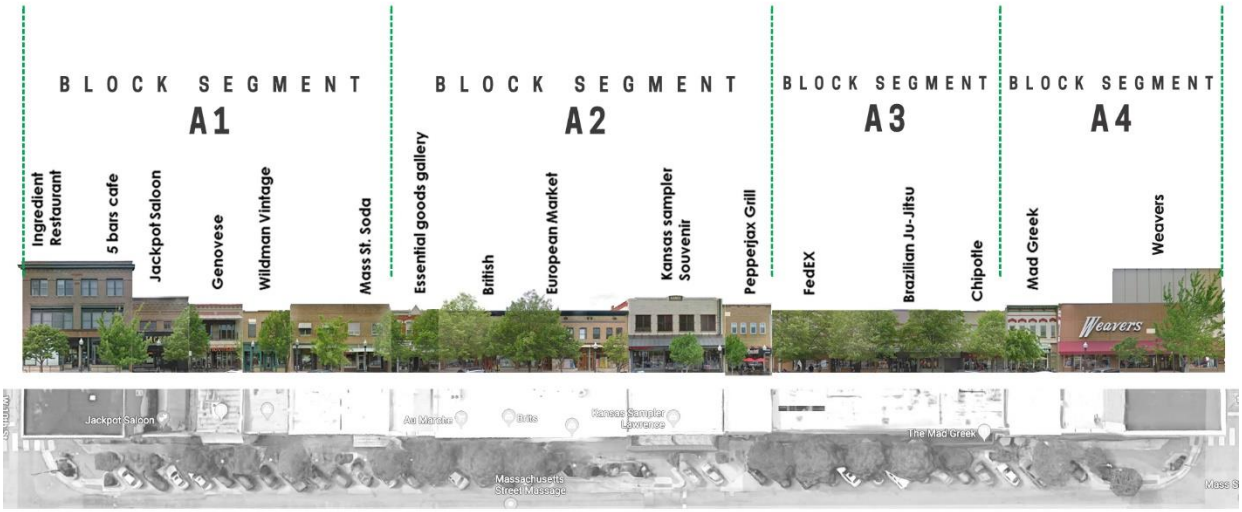


Figure 4.3: Block segments of Block A in Mass St.

To observe and study the blocks in depth, I have divided each block into four smaller block segments (Figure 4.3). This has been done mainly for the ease of analysis and comparison between different block segments. Each block segment has been studied in terms of building uses, street-façade articulation, street artifacts, and sidewalk design. The blocks and block segments are described in detail below.

Block A

In this description, I present the blocks sequentially, starting from block A, which is southwest of Mass Street and runs between 10th Street and 9th Street towards the north (Figure 4.2). Block segment A1 contains a total of five buildings, four of which are two-storied and one building is three-storied. In terms of uses, block segment A1 contains two restaurants, one café, one bar, one local soda shop, and one vintage resale shop (Figure 4.4).

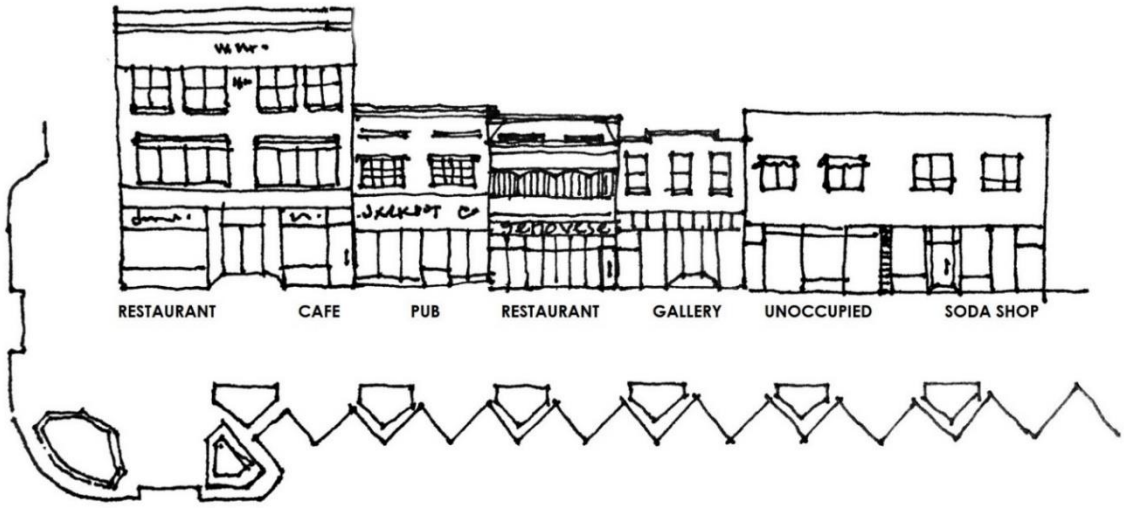


Figure 4.4: Building-uses in block segment A1.

The two restaurants, the bar, and the café have outdoor seating area with moveable chairs and tables. These outdoor seating areas are semi-enclosed with minimal fencing (Figure 4.5). One of the restaurants has large umbrellas to provide shade in the outdoor area. Four buildings in this block segment have lofts on the upper floor; only one building has office spaces.

Figure 4.5: Views of block segment A1.

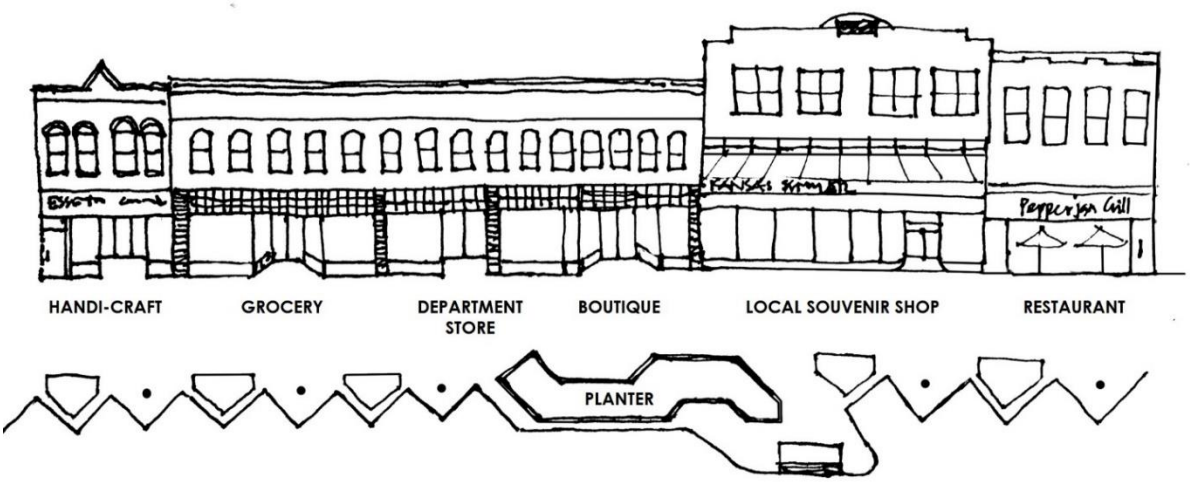


Figure 4.6: Building-uses in block segment A2.

Block segment A2 (Figure 4.6) begins with a gallery of handcrafted goods. It has an outdoor display area with glass boxes and a recessed entry. The next building houses a series of small European stores; it includes a small French grocery store named 'Au-Marche' and another department store named 'Brits' for British goods. There are also two boutique clothing stores in this building. This is the widest building of this block segment (Figure 4.6). The next building is a local souvenir shop named 'Kansas Sampler'; with a huge front overhang which shades a large portion of the sidewalk. Next to it is a small restaurant with an outdoor seating area that incorporates two small tables and chairs shaded with large umbrellas. All of the buildings in this block segment have lofts on the upper floor.

Figure 4.7: Views of block segment A2

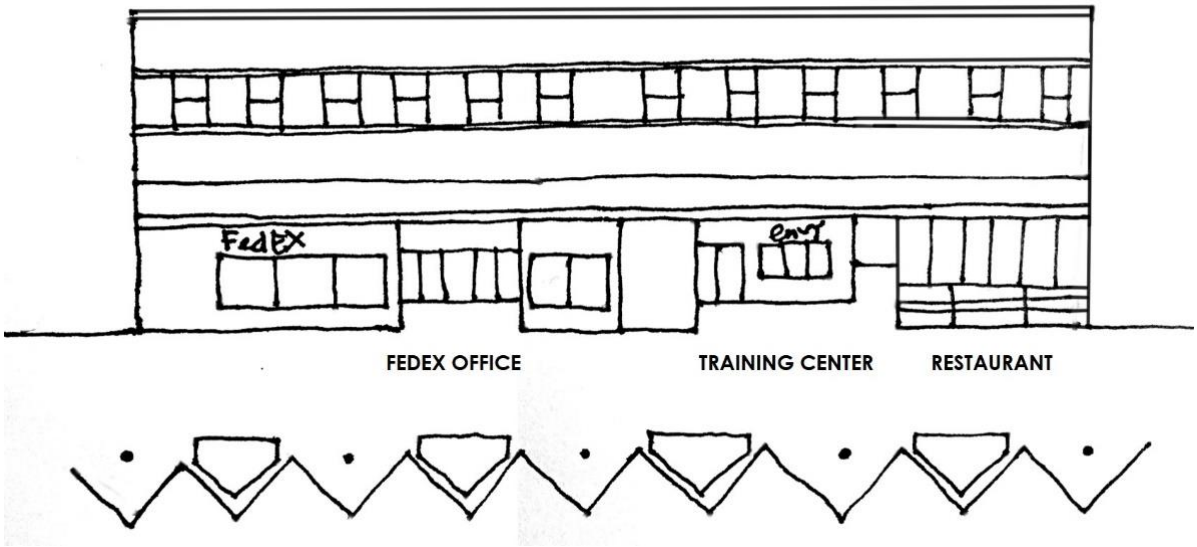


Figure 4.8: Building-uses in block segment A3.

Block segment A3 contains only one wide building which has a FedEx office, a Jiu-Jitsu training center, and a Mexican restaurant (Figure 4.8). The FedEx office has a wide façade and glass windows covered with opaque stickers and the interiors are not visible from outside. There is a wide overhang above the entry space. Beside the FedEx office, there is an unoccupied store; next to it there is a Mexican restaurant with a large outdoor seating area which contains six tables and moveable chairs. This building has a recessed entry which works like a lobby-space for going to the upper floor lofts.

Figure 4.9: Views of block segment A3.

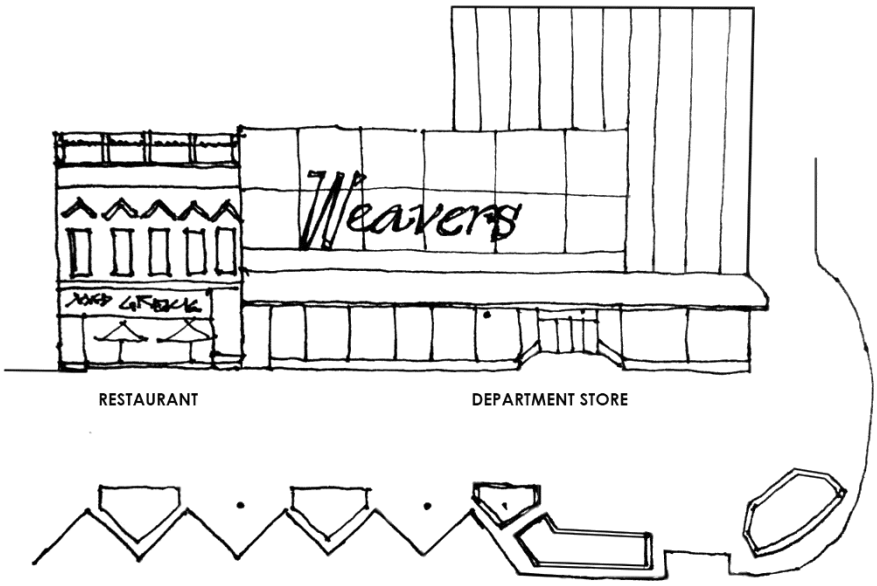


Figure 4.10: Building-uses in block segment A4.

Block segment A4 (Figure 4.10) consists a Greek restaurant with outdoor seating shaded with umbrellas. This building visually stands out from the rest because of its contrasting white color. It incorporates a separate entry door for the upper floor loft. The last building in the block segment houses a large department store named 'Weavers'. It includes large display windows and an overhang which spans through the whole front façade (Figure 4.11).

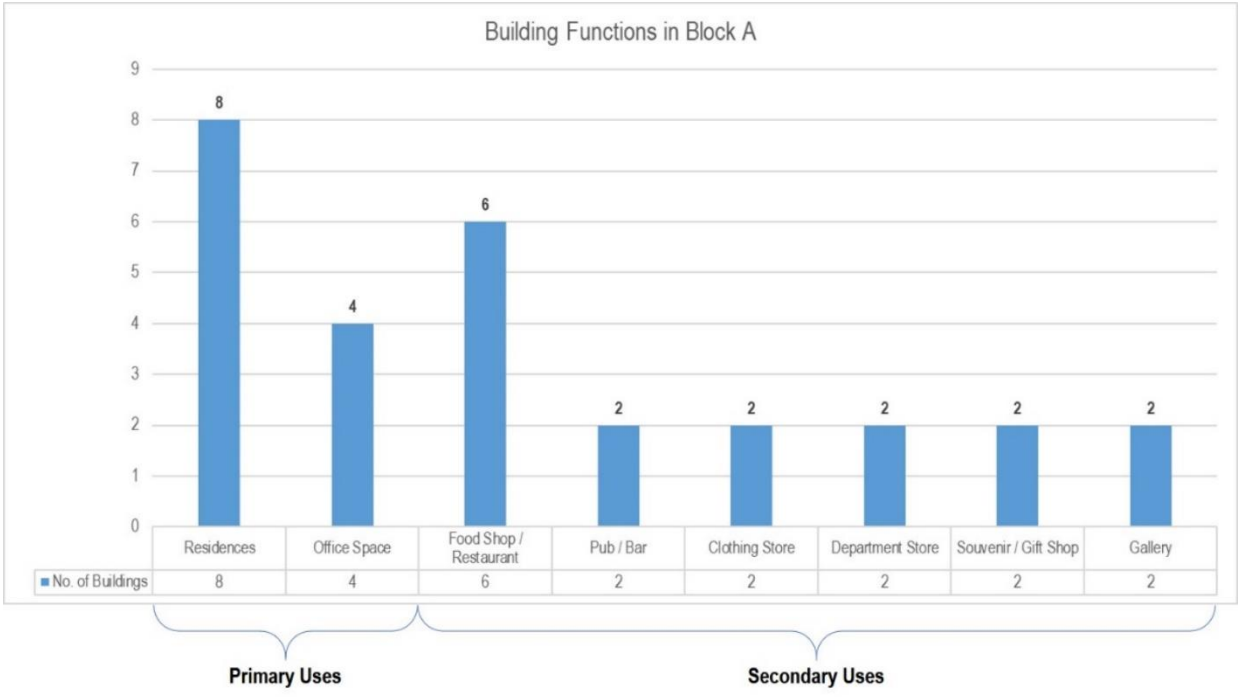
Figure 4.11: Views of Block segment A4.

As summarized in Table 4-1 and Graph 4-1, in total, there are twelve separate buildings in block A and some of these buildings house multiple functions together. In terms of primary uses, there are eight buildings which have lofts or studio apartments on the upper floors; four buildings have office spaces. In terms of secondary uses, there are six restaurants or food shops, two pubs, two clothing stores, two souvenir shops, two department stores, and two galleries. The following table and graphs illustrate the total number of functions in block A.

Table 4-1: Table showing number of building functions in block A.

	Building Uses	No. of Buildings
Primary Uses	Residences	8
	Office Space	4
Secondary Uses	Food Shop / Restaurant	6
	Pub / Bar	2
	Clothing Store	2
	Department Store	2
	Souvenir / Gift Shop	2
	Gallery	2

Graph 4-1: Graph showing building functions in block A.



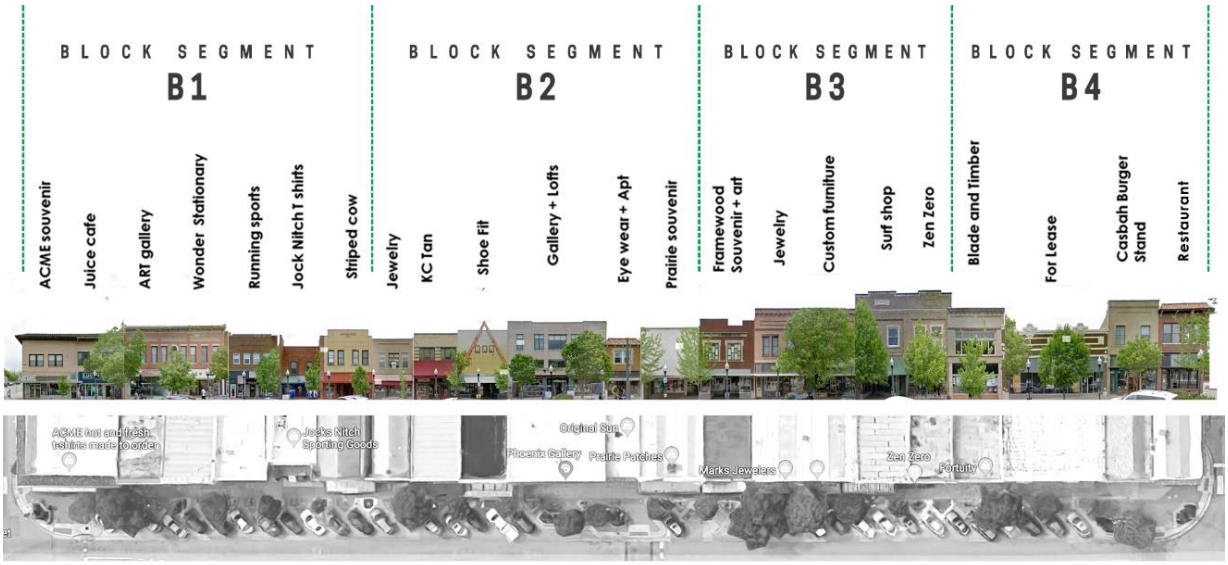


Figure 4.12: Various building functions in Block B.

Block B

We next move on to block B, which is on the west side of Mass Street and north of 9th Street (Figure 4.2). As I did in block A, I have divided Block B into four smaller block segments and labeled them as B1, B2, B3, and B4 (Figure 4.12). The first building in block segment B1 (Figure 4.15) has a souvenir shop and a juice cafe. The souvenir shop includes a large overhang with an angular entryway and to its right, the café provides outdoor seating with a few moveable tools. There are two lofts on the upper floor. The next building houses an art gallery and an art supply store; both stores have large glass-box façade to display products and artworks.

Figure 4.13: Views of block segment B1.

Figure 4.15: Building-uses in block segment B1.

The next three buildings in block segment B1 house a sports utility shop, a t-shirt shop, and a souvenir shop (Figure 4.15). All these shops have a similar kind of recessed entry in the middle with display windows on both sides. All these shops also use a portion of the sidewalk to put different advertisements and displays on the front (Figure 4.14). The t-shirt shop utilizes the sidewalk area by putting up a small outdoor tent to display their products. All the buildings in block segment B1 have brick-cladded exterior and lofts on the upper floors.

Figure 4.14: Outdoor displays and advertisements in Block segment B1.

Figure 4.16: Building-uses in block segment B2.

Block segment B2 (Figure 4.16) begins with a building that has a jewelry shop on the ground floor and an office space on the upper floor. This building has comparatively smaller display windows with limited interior visibility. The next building houses a travelling agency and a tanning salon with a large canopy over the entryway. Next, there is a shoe store with a triangular shaped steel exterior, which is visually dissimilar from other buildings in the block. Then there is an art gallery and a boutique store with large display windows and visually permeable entrances. It also has four lofts on the upper floor. The next building is the narrowest in the block. It houses an eyewear shop with a small loft on the upper floor. There are large glass box displays on the outside.

Figure 4.17: Views of block segment B2.

Figure 4.18: Building-uses in segment B3.

Block segment B3 (Figure 4.18) has a picture frame shop housed in a brick cladded building with visually striking windows on the upper floor. The next building houses a jewelry shop and a custom furniture shop on the ground floor; both have recessed entryways and similar front overhangs. The last building in this segment has a surf shop and a Japanese restaurant. Like several other restaurants on Mass Street, it provides outdoor seating with umbrellas and large dense trees which keeps the space well shaded. All the three buildings in block segment B3 have lofts on upper floors.

Figure 4.19: Views of block segment B3.

Figure 4.20: Building-uses in block segment B4.

Block segment B4 (Figure 4.20) begins with a sports facility, housed in a narrow two-storied building with loft on the upper floor. Next to it is a one-storied building which was unoccupied at the time of the survey. This building has wide spanning glass façade. This is the only one-storied building on the block. At the end of the block there are two buildings, one housing a popular burger shop and the other housing a bistro. Both buildings have lofts on the upper floor and separate front entry-stairways.

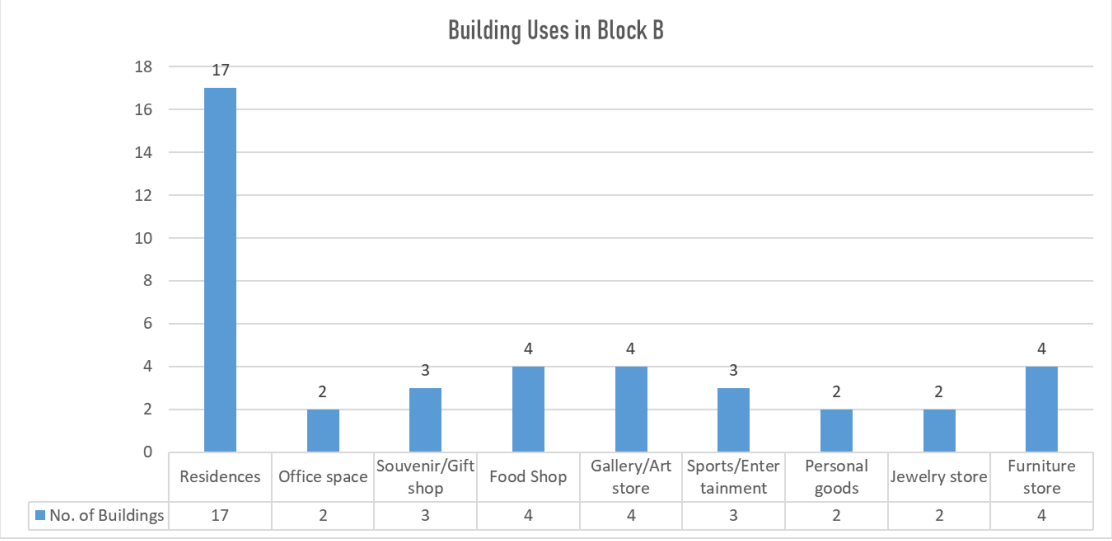
Figure 4.21: Views of block segment B4.

As summarized in Table 4-2 and Graph 4-2: Graph showing number of buildings with different functions in block B., Block B has eighteen separate buildings and in terms of primary uses, seventeen buildings have lofts or residences on the upper floor and two of the buildings have office spaces. In terms of secondary uses, there are four restaurants, three souvenir/gift shop, four galleries/art stores, four sports/entertainment shops, three clothing/personal goods store, two jewelry stores, and one furniture store. The following table and graph show the number of various building functions in block B.

Table 4-2: Table showing number of buildings with different functions in block B.

	Building Uses	No. of Buildings
Primary Uses	Residences	17
	Office space	2
Secondary Uses	Souvenir/Gift shop	3
	Food Shop	4
	Gallery/Art store	4
	Sports/Entertainment	3
	Personal goods	2
	Jewelry store	2
	Furniture store	4

Graph 4-2: Graph showing number of buildings with different functions in block B.



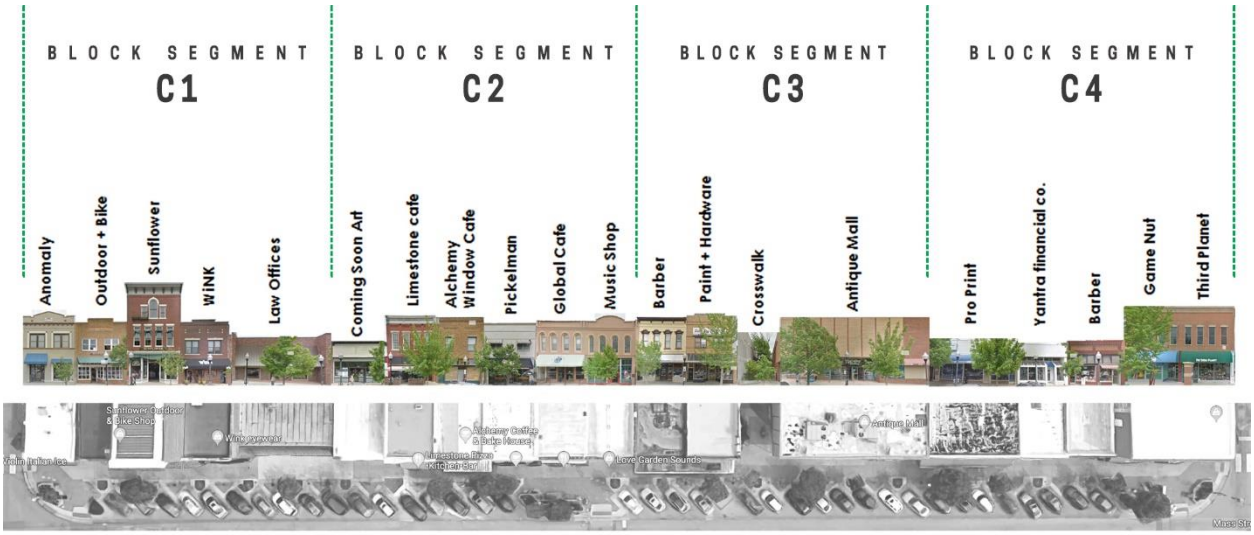


Figure 4.22: Various building uses and block segments in Block C.

Block C

From block B, I now move to the opposite side of Mass Street to block C, which is east of Massachusetts Street and spans between 8th Street and 9th Street (Figure 4.2). Starting from the north, one notes that block segment C1 (Figure 4.22) begins with a 1915 building housing a gift shop on the ground floor and lofts on the upper floor. The front façade of the building has a canopy over the entry and a large display window. The next building includes a sports shop on the ground floor and loft on the upper floor. This is a brick-cladded building with french windows and a canopy.

Figure 4.23: Views of block C.

Figure 4.24: Building uses in block segment C1.

The next building in block segment C1 (Figure 4.24) is three-storied with a bicycle shop on the first two floors and a loft on the third floor. The bicycle shop has tall display windows and a canopy similar to the one in the previous building. The next building has an eyewear shop with an articulated brick façade and a recessed entry. This building has a separate entryway for the lofts on the upper floor. Next, there is a wide one-storied building with a law office. This building incorporates a recessed setback for the entryway with an overhang.

Figure 4.25: Views of block segment C1.

Figure 4.26: Building uses in block segment C2.

Block segment C2 (Figure 4.26) begins with a one-storied building unoccupied at the time of the survey. Next to it there is a pizza shop with an outdoor seating area shaded by a canopy. This shop has Street facing window seats, and the interiors can be seen from the sidewalk. The next building houses a coffee shop with transparent glass windows and a clearly visible interior. The next building houses another sandwich shop with outdoor seating well shaded with a large canopy. Next to it, there is a breakfast café and a music store with a colored glass façade. All of the buildings in block segment C2 have lofts on the upper floor.

Figure 4.27: Views of block segment C2.

Figure 4.28: Building functions in block segment C3.

Block segment C3 (Figure 4.28) begins with an older building incorporating decorative windows and a ledge on top. This building houses a small barber shop on the ground floor and lofts on the upper floor. The next building houses a paint and hardware shop. Next, there is a space in-between two buildings which creates a passageway towards the parking lot at the back of the block. This space contains some planter boxes and wall-paintings on both sides (Figure 4.29). Next to the passageway there is a large two-storied antique mall with a recessed entry that creates a shaded setback space. The building includes two display glass boxes on the ground floor and the façade on the upper floor is opaque with brick cladding.

Figure 4.29: View of block segment C3.

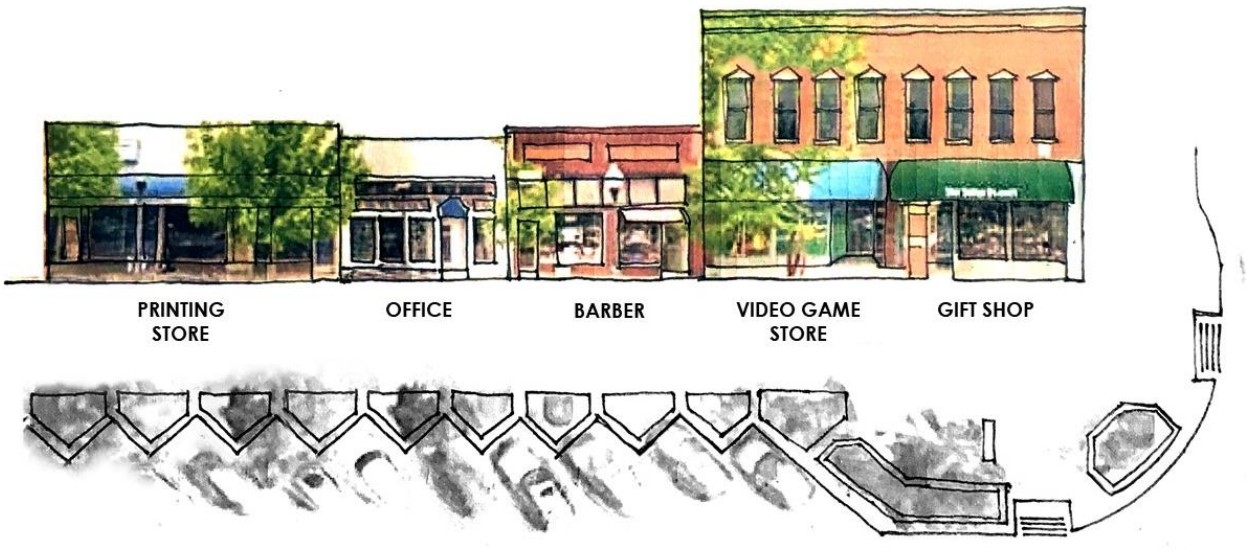


Figure 4.30: Building-uses in block segment C4.

Block segment C4 (Figure 4.30) starts with a one-storied printing shop with a wide canopy and glass windows that are covered with blinds and the interiors are not visible from outside. Next, there is a one-storied building which was under construction during the time of the survey. Beside it, there is another one-storied barber shop with colorful display windows. The last building in this block is a two-storied building with a game store and a gift shop. The game store incorporates a wide display glass box with a canopy on top. The souvenir shop also provides large display windows with various display items. This building consists lofts and studio apartments on the upper floor.

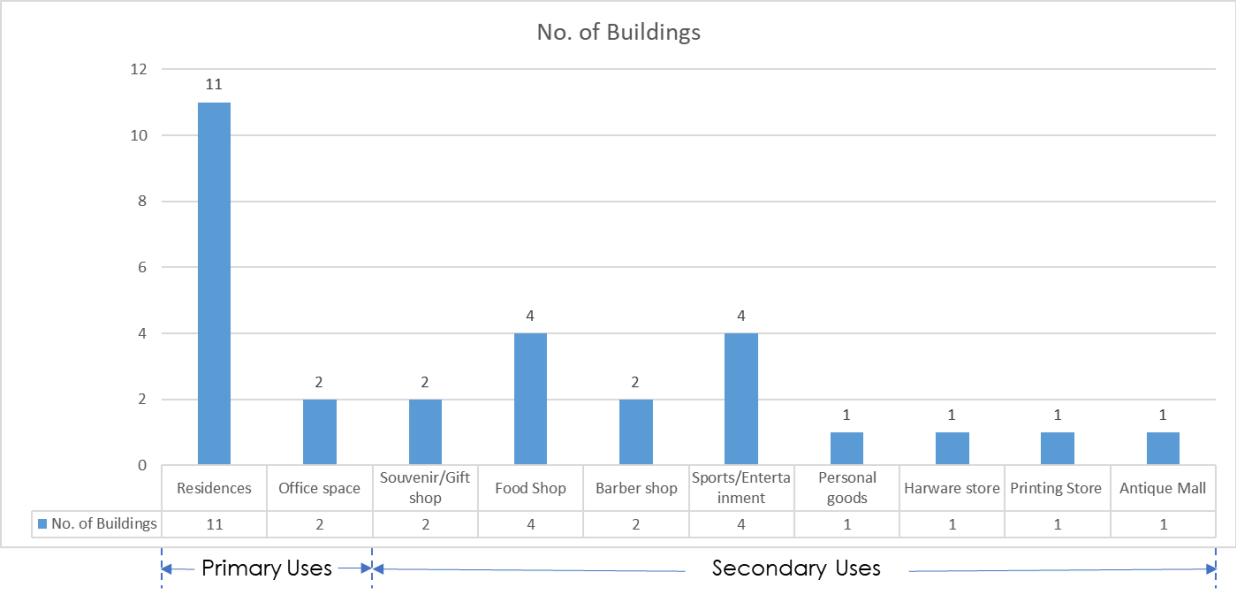
Figure 4.31: Views of block segment C4.

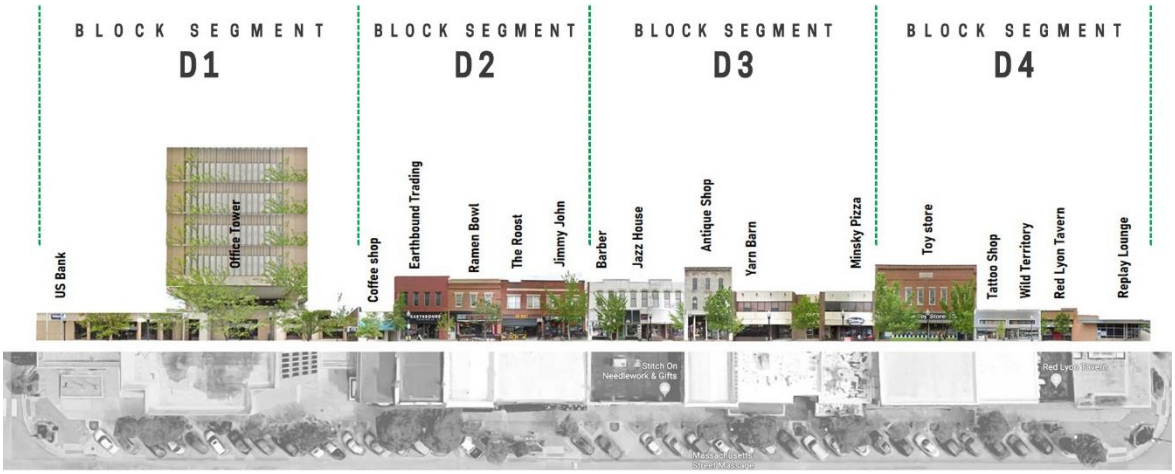
As indicated in Table 4-3 and Graph 4-3, Block C has seventeen separate buildings and in terms of primary uses, eleven buildings have lofts on the upper floor. It is notable that five of buildings in block C are one-storied and two of the buildings have offices. In terms of secondary uses, there are two gift shops, four sports/entertainment shops, one eyewear store, four food shops, two barber shops, one hardware store, one antique mall, and one printing store. The following table and graph illustrate the range of different building function in block C.

Table 4-3: Table showing number of buildings with different functions in block C.

	Building Uses	No. of Buildings
Primary Uses	Residences	11
	Office space	2
Secondary Uses	Souvenir/Gift shop	2
	Food Shop	4
	Barber shop	2
	Sports/Entertainment	4
	Personal goods	1
	Harware store	1
	Printing Store	1
	Antique Mall	1

Graph 4-3: Graph showing number of buildings with different functions in block C.





BLOCK D
Massachusets Street, Lawrence Kansas.

Figure 4.32: Building uses and block segments in block D.

Block D

Block D is located on the east side of Massachusetts Street and runs between the 9th Street and 10th Street towards the south (Figure 4.2). As with other blocks, I have divided block D into four smaller block segments, labeled as D1, D2, D3, and D4 (Figure 4.32). Block D begins with a six-storied office tower and a one-storied bank. The bank contains dark-tinted glass facades with colonnaded columns. In the middle of the ground floor there is a double-heighted entry space for the office tower. Block segment D1 ends with a small ATM booth at the far right of the bank building (Figure 4.33).

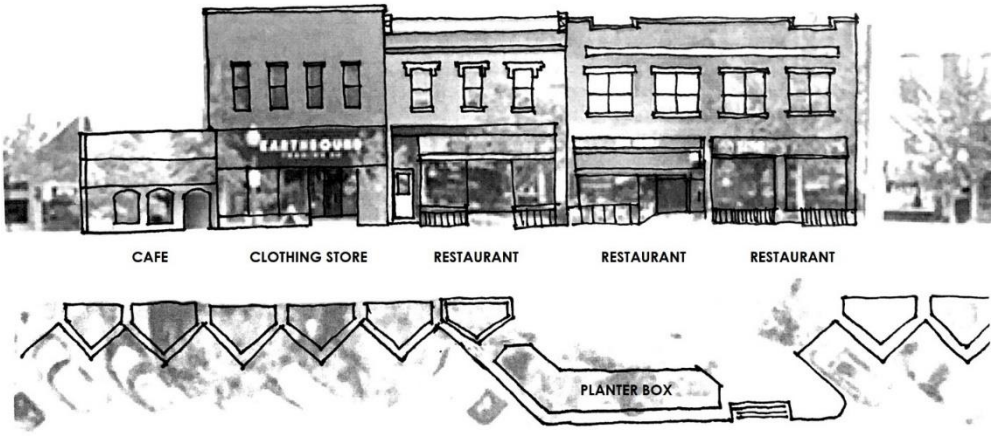


Figure 4.33: Building uses and block segment D1.

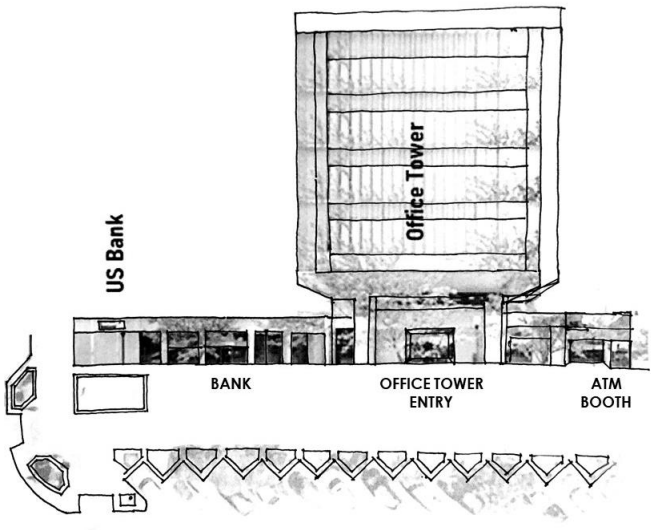


Figure 4.35: Building functions in block segment D2.

Block segment D2 (Figure 4.35) begins with a small one-storied coffee shop, which incorporates a white façade with glass windows. The next building is two-storied with a clothing store on the ground floor and lofts on the upper floor; the building is stone-cladded and includes display windows. Next, there is a series of three restaurants in two consecutive buildings. These restaurants are similar in design and they incorporate large glass windows with lightly-fenced outdoor seating. Both buildings are brick-cladded and house lofts on the upper floor.

Figure 4.34: Views of block segment D2.

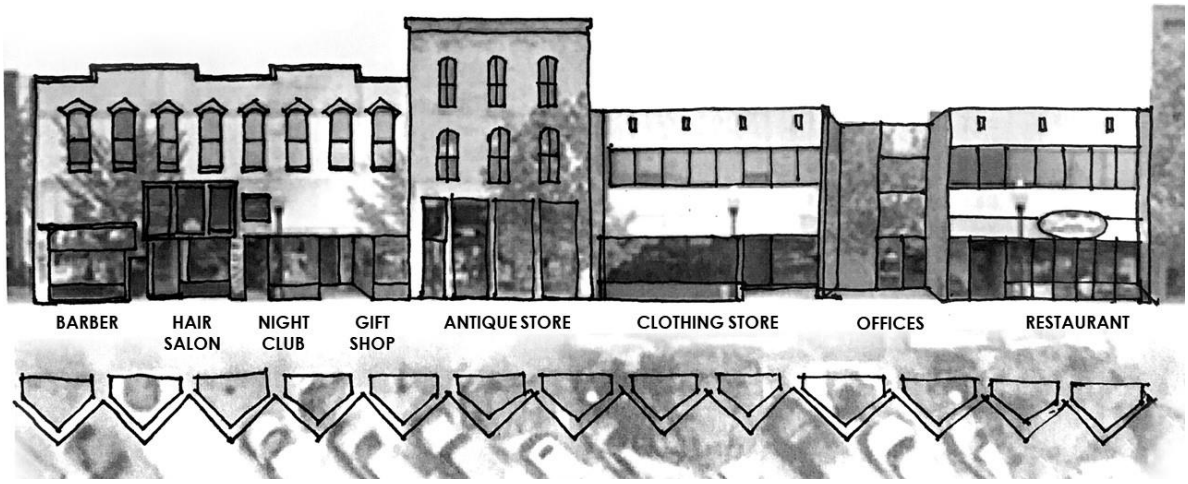


Figure 4.37: Building functions in block segment D3.

Block segment D3 (Figure 4.37) begins with a two-storied building incorporating four different functions: a barber shop, a hair salon, a gift shop, and a night-club on the upper floor. This building is white brick-cladded with several windows on the upper floor. Each of the functions in this building has separate entry spaces on the front. Next, there is a three-storied building with an antique store on the ground floor and comprises a white brick-cladded exterior and thin decorative column on the entry space. The next building houses a clothing store, a pizza-shop, and several offices on the upper floor. In terms of architectural style, this building has a modern design and is different in appearance from other buildings on the block.

Figure 4.36: Views of block segment D3.

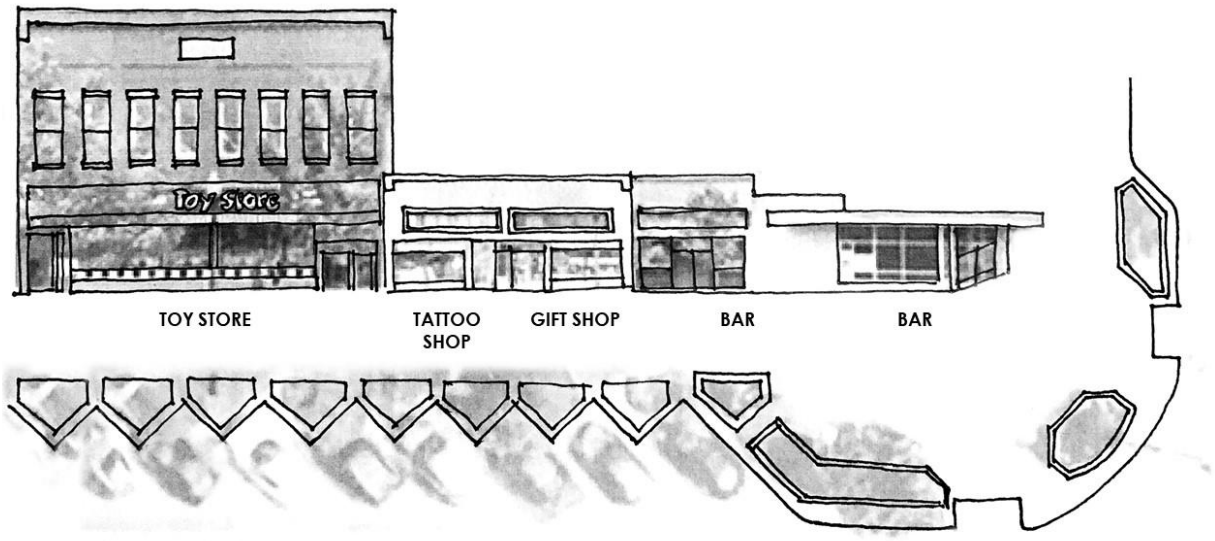


Figure 4.38: Building uses in block segment D4.

The first building in block segment D4 (Figure 4.38) is a large toy-store with wide-spanning colorful display windows. This building incorporates a large canopy which shades the front façade and houses lofts on the upper floor. The next two buildings in this block segment are both one-storied; the first building houses a tattoo shop and a 'science and nature' gift shop. Both of the stores have tall display windows and a central entryway. The second building houses two bars with a partially opaque exterior façade, the interior of this building is not visible from the outside. This building includes a front-overhang and also an ATM booth.

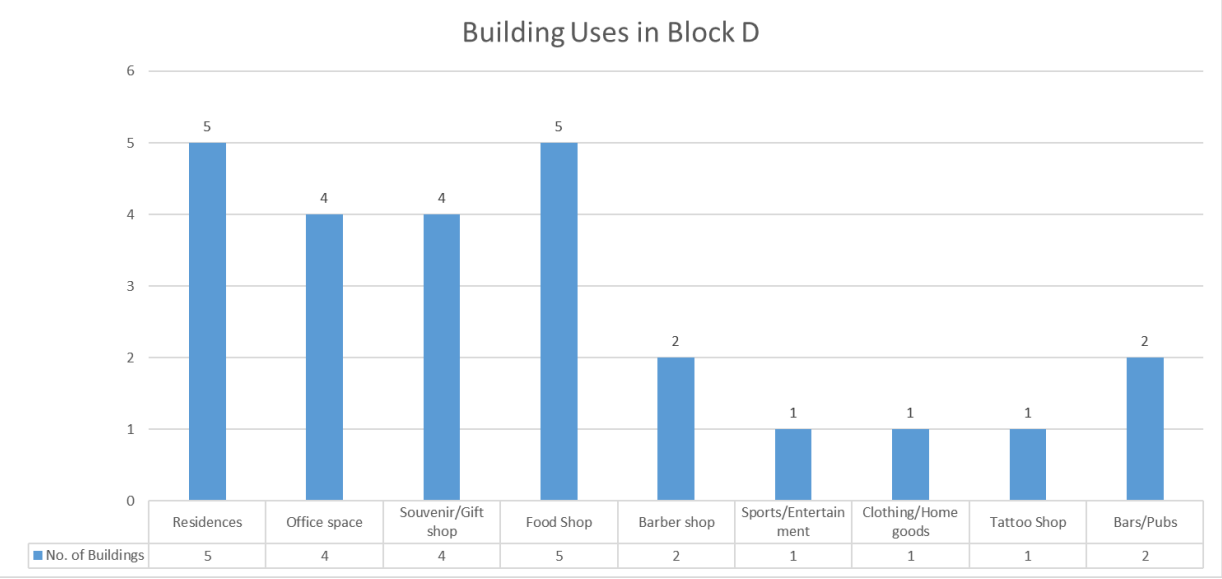
Figure 4.39: Views of block segment D4.

As summarized in Table 4-4 and Graph 4-4, block D has ten separate buildings. In terms of primary use, five buildings have residences on upper floors and four buildings have office spaces. In terms of secondary uses there are four gift shops, five food shops, one barber shop, one night- club, one clothing store, one tattoo shop, and two bars. Overall, there are nine different type of functions in block D. The following table and graph show the total number of various building functions in block D.

Table 4-4: Number of building functions in block D.

	Building Uses	No. of Buildings
Primary Uses	Residences	5
	Office space	4
Secondary Uses	Souvenir/Gift shop	4
	Food Shop	5
	Barber shop	2
	Sports/Entertainment	1
	Clothing/Home goods	1
	Tattoo Shop	1
	Bars/Pubs	2

Graph 4-4: Number of functions in block D.

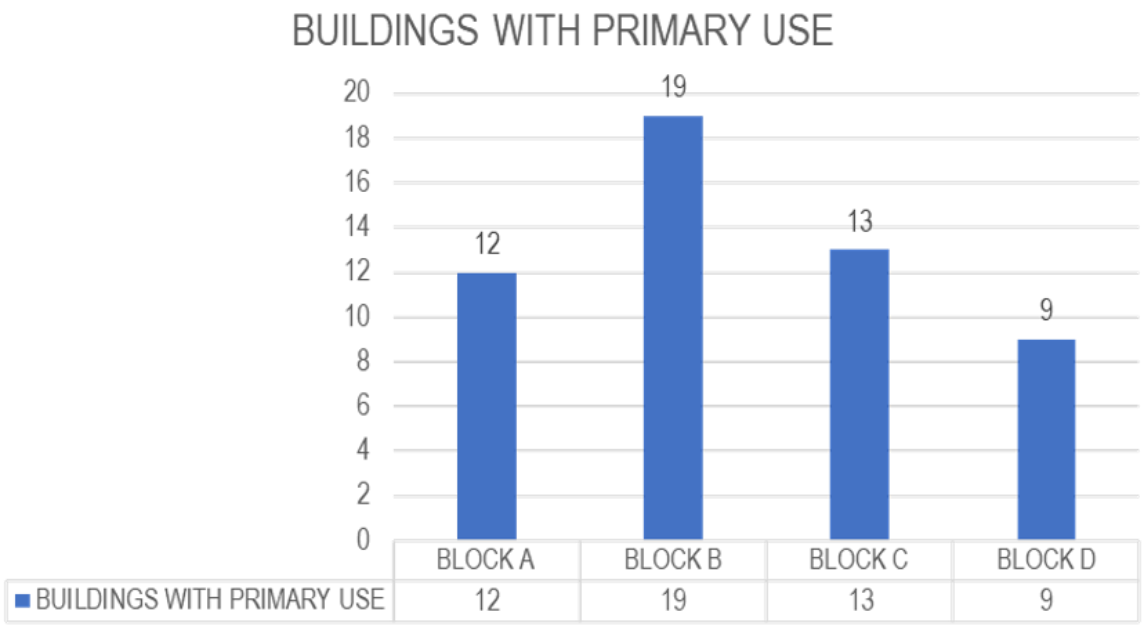


Overall, the four study blocks in Massachusetts Street have a total of forty-one buildings with residential use and a total of twelve buildings with office space. In terms of buildings with residential use, there are eight buildings in block A, seventeen buildings in block B, eleven buildings in block C, and five buildings in block D. In terms of buildings with office spaces, there are four buildings in block A, two buildings in block B, two buildings in block C, and four buildings in block D. The following table and graph illustrate the number of buildings with primary uses in the four study blocks.

Table 4-5: Number of buildings with primary use.

PRIMARY USE	BLOCK A	BLOCK B	BLOCK C	BLOCK D	TOTAL
RESIDENCES	8	17	11	5	**41**
OFFICE	4	2	2	4	**12**

Graph 4-5: Number of buildings having primary use.

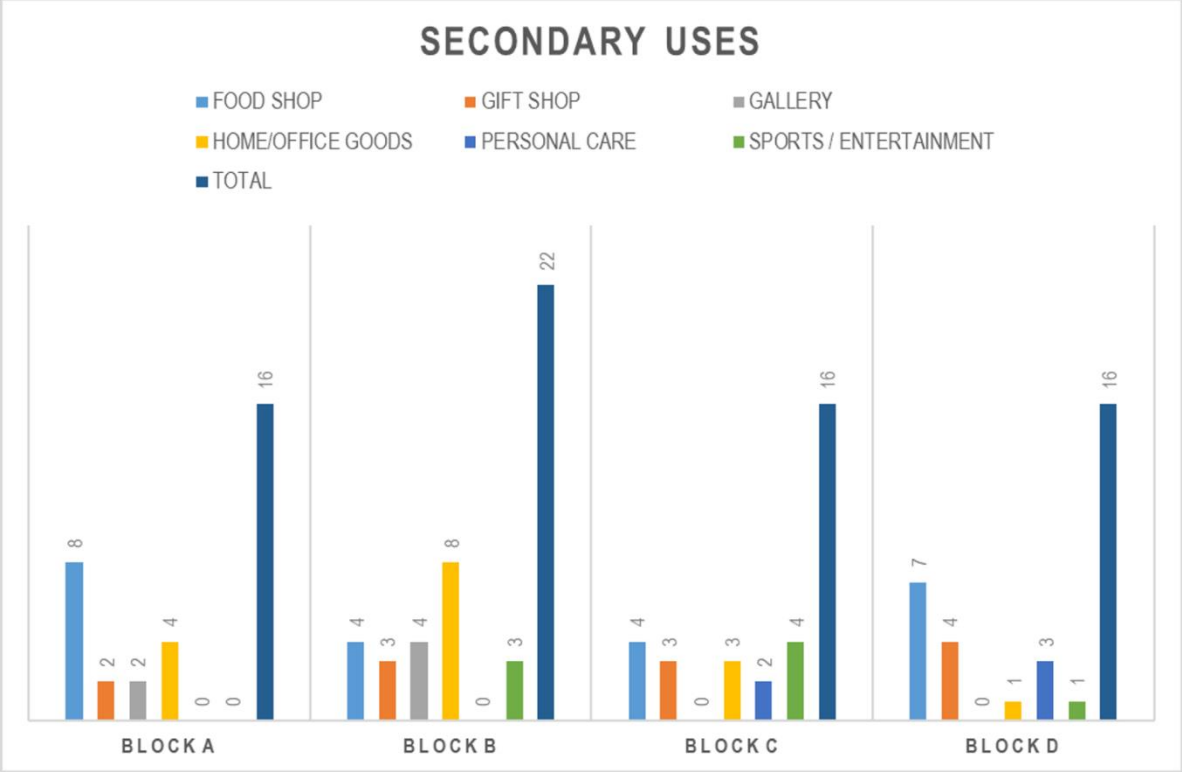


In terms of buildings with secondary use, there are sixteen building in block A, twenty-two buildings in block B, sixteen buildings in block C, and sixteen buildings in block D. The following table and graph illustrate the number of buildings with secondary uses in all the four study blocks in Massachusetts Street in Lawrence.

Table 4-6: Number of buildings with secondary use in each block.

SECONDARY USE	BLOCK A	BLOCK B	BLOCK C	BLOCK D
FOOD SHOP	8	4	4	7
GIFT SHOP	2	3	3	4
GALLERY	2	4	0	0
HOME/OFFICE GOODS	4	8	3	1
PERSONAL CARE	0	0	2	3
SPORTS / ENTERTAINMENT	0	3	4	1
	16	**22**	**16**	**16**

Graph 4-6: Number of buildings with secondary use in each block.



Chapter 5: Study Blocks of Poyntz Avenue, Manhattan, Kansas

The section of Poyntz Avenue studied in this thesis research is considered as the downtown of Manhattan, Kansas. This section of Poyntz Ave. is located in the southeastern part of the city and runs straight from the Town Center shopping mall on the east, towards Sunset Avenue on the west. The shopping mall and its parking lots cover the whole of the east end of Poyntz Ave (Figure 5.1). Apart from the shopping mall and the movie theatre, there are a good number of businesses and offices on each side of Poyntz. The core of the downtown area is about a five-minutes' drive from the main campus of Kansas State University. Manhattan public library and the district courthouse is also nearby. City blocks in this area are mostly square in shape, measuring about 400 ft by 400 ft.

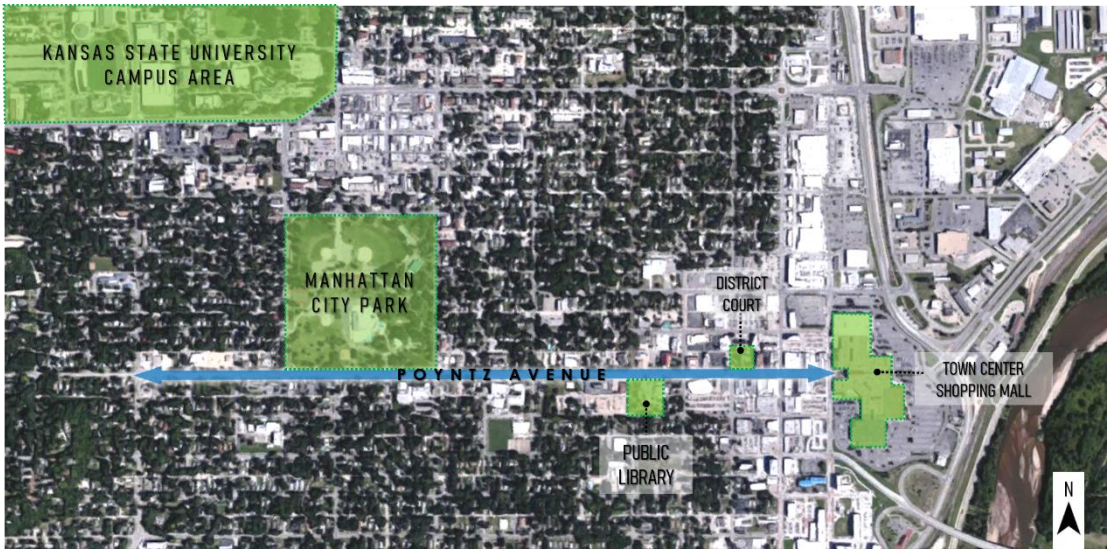


Figure 5.1: Location of Poyntz Avenue in relation with the city.

I conducted preliminary walk-by observations in Poyntz Avenue and selected four blocks for my research. These four blocks are chosen because they are similar to the downtown blocks of Lawrence, with a varied range of shops, cafés, and restaurants. The blocks have been labeled as E, F, G, and H for the ease of identification and analysis (Figure 5.2).

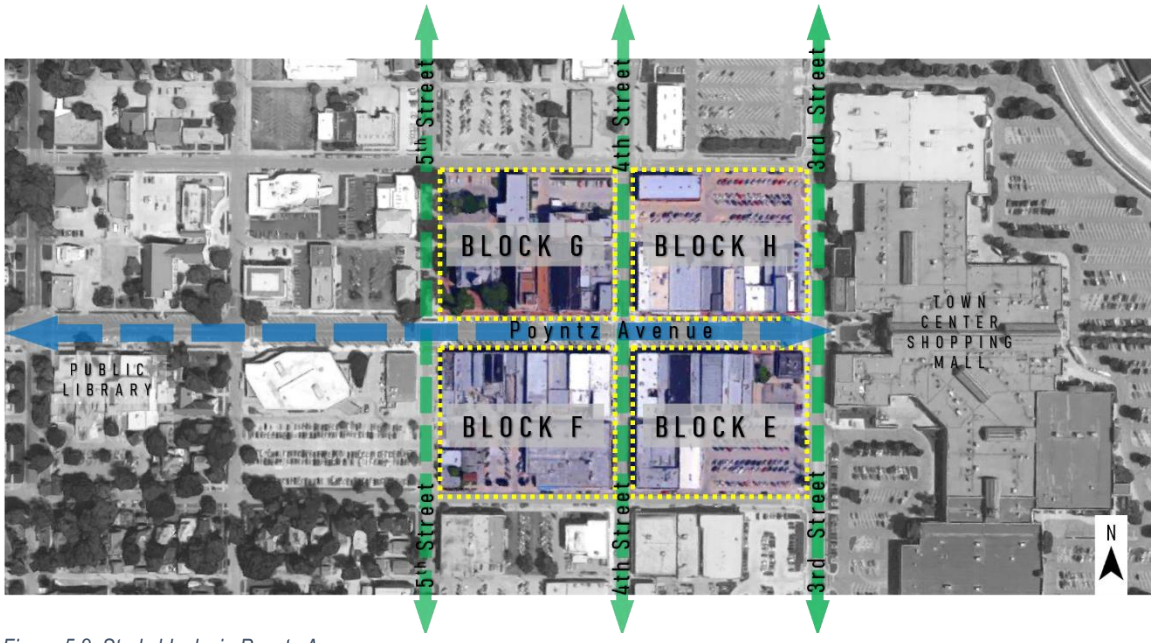


Figure 5.2: Study blocks in Poyntz Avenue.

To observe the blocks in Poyntz Avenue, I have followed the same procedure that I used for Massachusetts Street in Lawrence. Since the study blocks of Poyntz Avenue are comparatively smaller that the blocks in Massachusetts Street, I have divided each block into three smaller block segments instead of four (Figure 5.3). Each block segment has been studied in terms of building uses, street-façade articulation, street artifacts, and sidewalk design. The blocks and block segments are described in detail below.

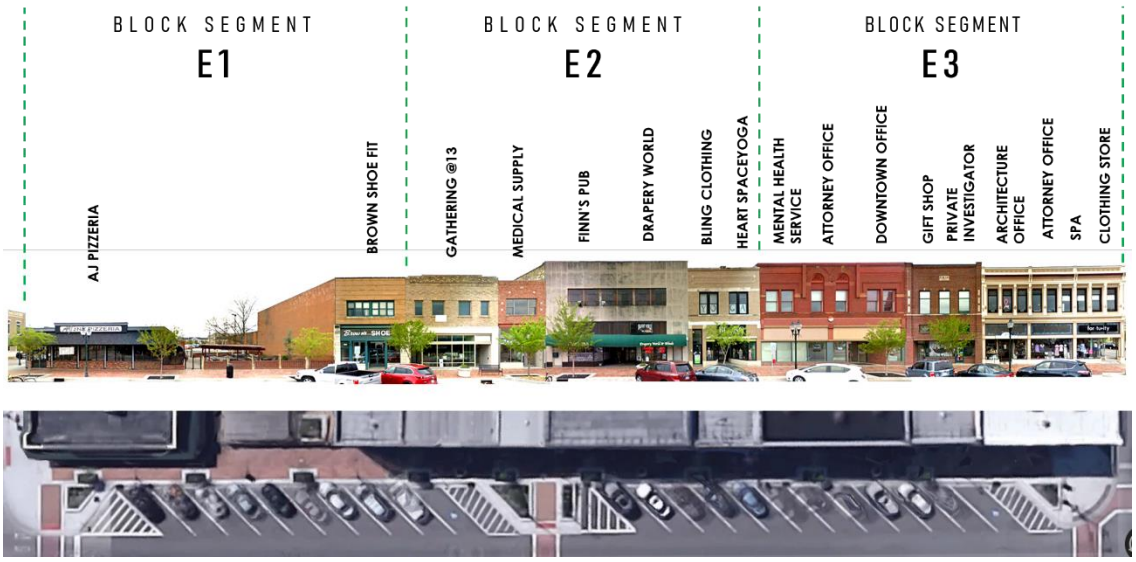


Figure 5.3: Block segments of block E.

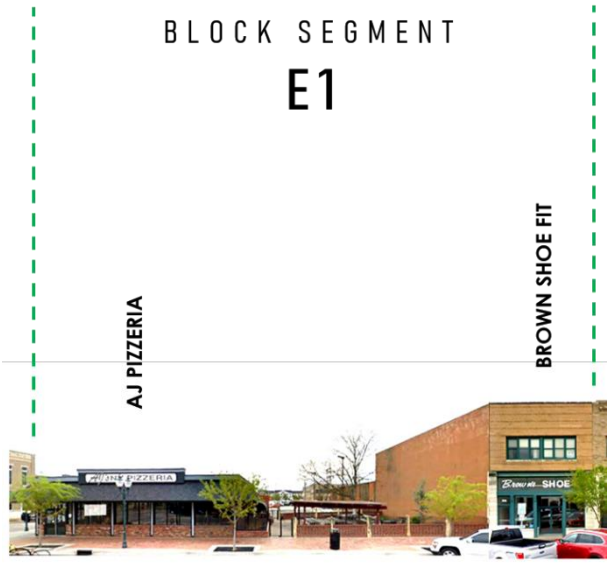


Figure 5.4: Block segment E1.

Block E

Block E is on the southeast side of Poyntz Avenue and runs from 3rd Street to 4th Street (Figure 5.4). Starting from the east, block segment E1 contains a pizza shop and a shoe store. The pizza shop is housed in a one-storied building with wide-spanning glass windows and an overhang. This shop also incorporates a semi-shaded outdoor seating area. Although this area is fully visible from the sidewalk, it is partially fenced and has a gated entry. The next building houses a shoe store on the ground floor and lofts on the upper floor (Figure 5.5).

Figure 5.5: Views of block segment E1.

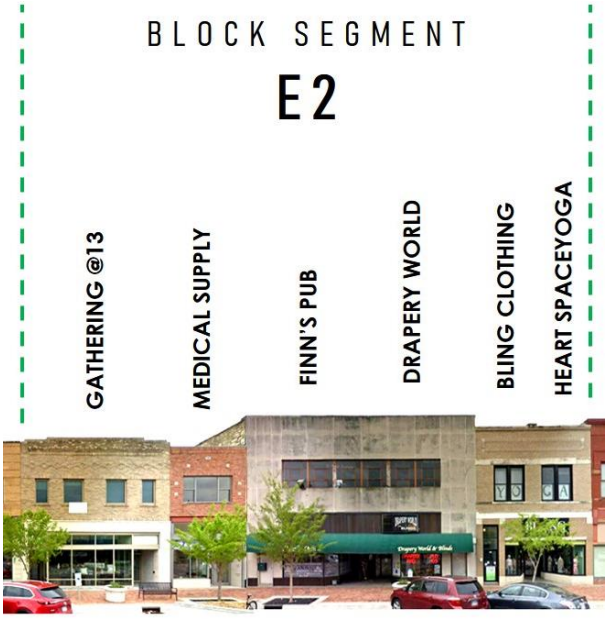


Figure 5.6: Block segment E2.

Block segment E2 (Figure 5.6) begins with a two-storied building which houses a gift shop on the ground floor. This building has full-height display windows. Next, there is a narrow two-storied building with a medical supply store on the ground floor and a loft on the upper floor. The next building houses a pub and a drapery store with a wide-spanning awning on the front-façade. The entry of the building has a recessed space with glass doors. The next building houses a clothing store on the ground floor and Yoga center on the upper floor. This building has a brick exterior with tall display windows and a recessed entry (Figure 5.7).

Figure 5.7: Views of block segment E2.

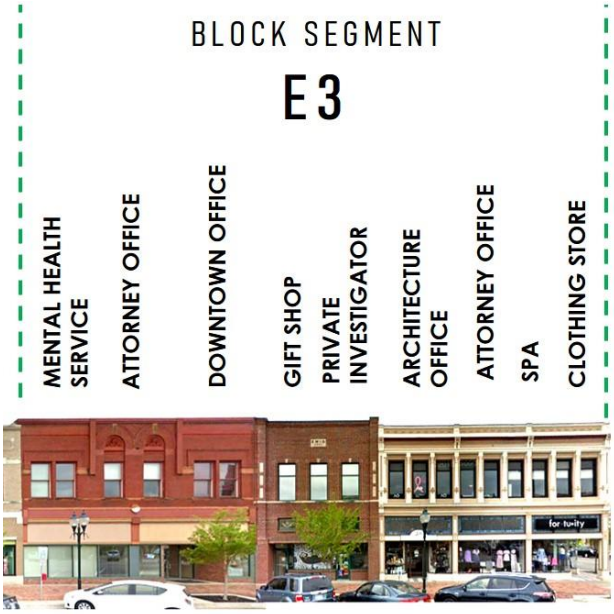


Figure 5.9: Block segment E3.

The first building in block segment E3 (Figure 5.9) is two-storied with a brick-cladded exterior. This building houses the downtown real estate office on the ground floor. There are several offices on the upper floor including a mental-health service center. Next, there is another two-storied brick-cladded building with a gift shop on the ground floor. This building also houses a software company, a credit-counseling office, and a private investigator office on the upper floor. The last building houses a large clothing store and a gift shop on the ground floor with tall display windows. On the upper floor, there is an architecture office, an attorney office, and a spa (Figure 5.8).

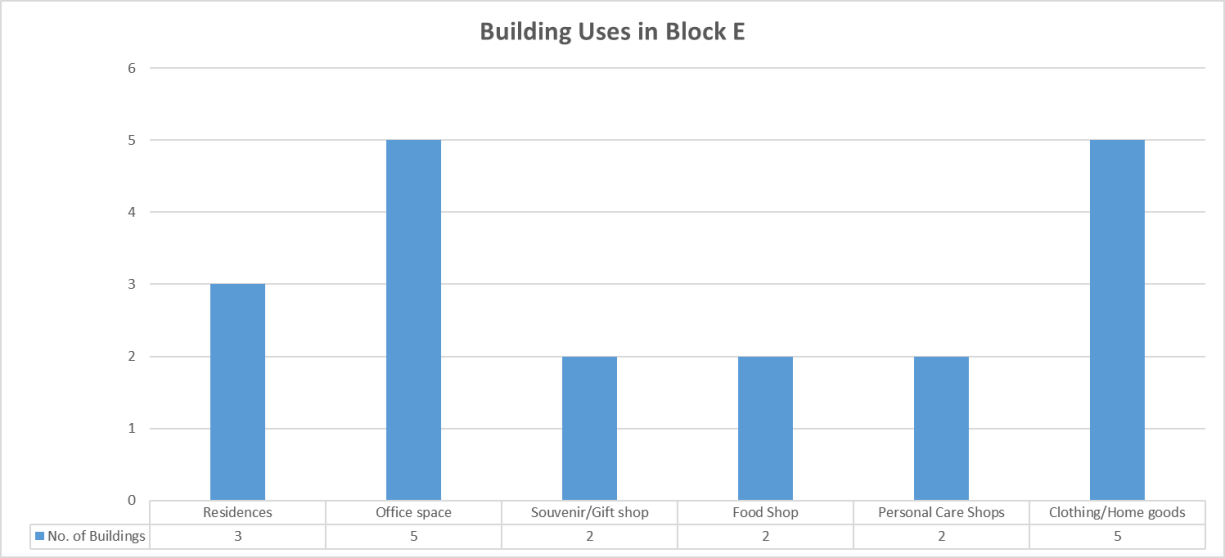
Figure 5.8: Block segment E3.

As indicated by Table 5-1 and Graph 5-1, block E has nine separate buildings, three of which have residences. Five buildings have offices, which makes a total of eight spaces with primary uses. In terms of secondary uses, there are two food shops, two gift shops, five home/office goods store, and two personal care shops. Overall, there are eight buildings with primary uses and eleven buildings with secondary uses in block E.

Table 5-1: Number of functions in block E.

	Building Uses	No. of Buildings
Primary Uses	Residences	3
	Office space	5
Secondary Uses	Souvenir/Gift shop	2
	Food Shop	2
	Personal Care Shops	2
	Clothing/Home goods	5

Graph 5-1: Number of functions in block E.



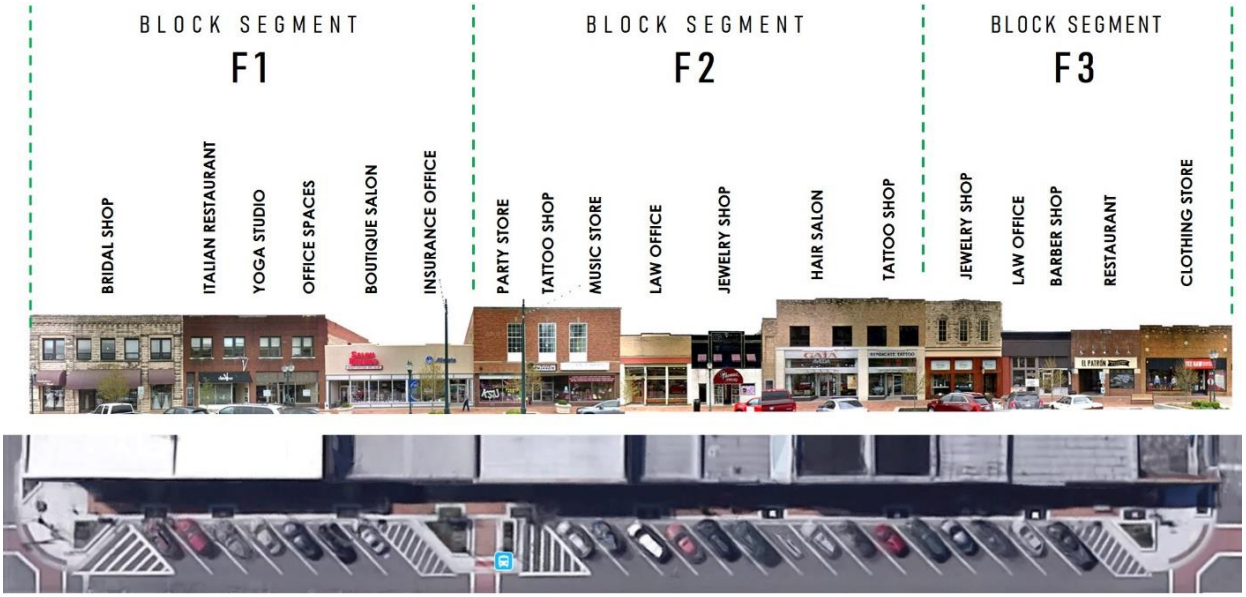


Figure 5.10: Different functions and block segments of block F.

Block F

Block F is located on the south side of Poyntz Avenue and runs between 4th Street and 5th Street (Figure 5.2). Block segments F1 (Figure 5.10) begins with a stone-cladded building consisting of a bridal shop on the ground floor and lofts on the upper floor. The bridal shop incorporates tall display windows with awnings. The next building houses an Italian restaurant and a rentable working space on the ground floor. On the upper floor there is a yoga studio and several offices. Next, there is a one-storied building with a boutique salon and an insurance company office. This building incorporates long-spanning display windows (Figure 5.11).

Figure 5.11: Views of block segment F1.

Figure 5.12: Block segment F2.

Block segment F2 (Figure 5.12) begins with a brick-cladded building consisting of a party store, a tattoo shop, and a music store. There is also a law office on the upper floor. The next building is one-storied with another law office on the ground floor. The law office has a tall glass façade. Next, there is another one-storied building with a jewelry store. This is a brick-cladded building with an overhang on the central entry space. The last building of this block segment houses a hair salon and another tattoo shop. This building also includes lofts on the upper floor.

Figure 5.13: Views of block segment F2.

Figure 5.14: Block segment F3.

The first building in block segment F3 (Figure 5.14) houses a jewelry store on the ground floor. This is a stone-cladded building with lofts on the upper floor. Next, there is a one-storied building with a law office and a barber shop. This building is visually different from the other buildings, with a painted façade and tinted glass windows. The next building is also a one-storied building housing a Mexican restaurant. This building has brick-cladded exterior and a recessed entry space. The last building on the block houses a clothing store with large display windows (Figure 5.15).

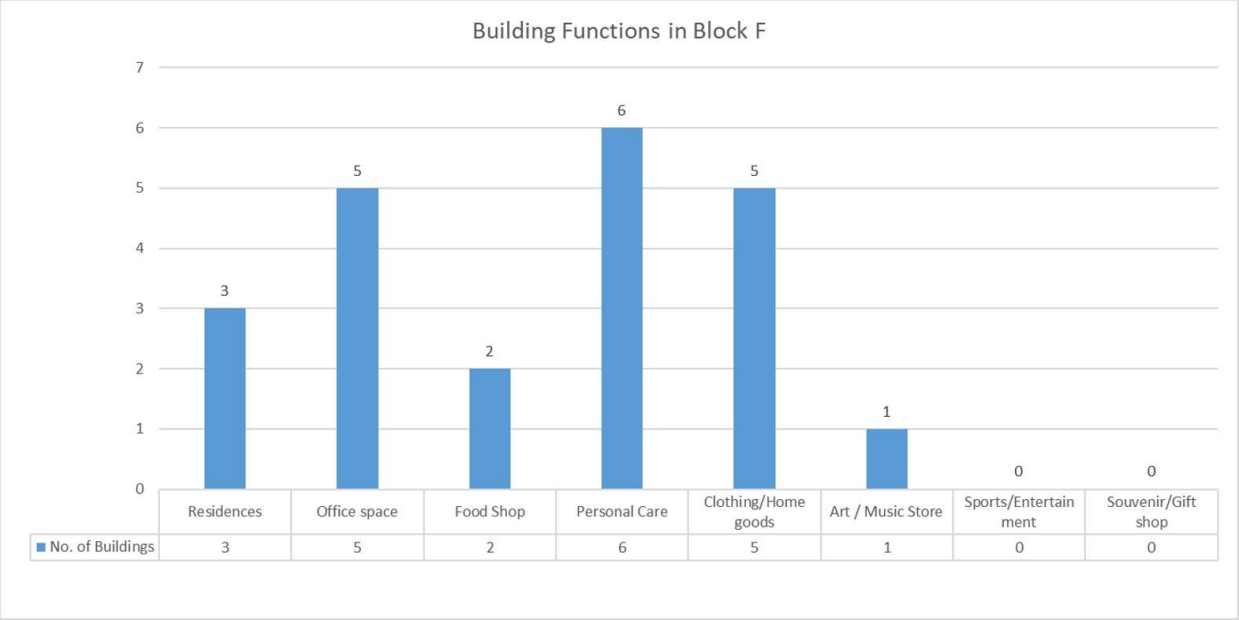
Figure 5.15: Views of block segment F3.

As indicated by Table 5-2 and Graph 5-2, block F has eleven separate buildings. In terms of primary uses, three buildings have residences on upper floors and five buildings have office spaces. In terms of secondary uses, there are two food shops, one music store, two salon, two tattoo shops, two jewelry store, and five home/office goods stores for a total of fourteen secondary uses.

Table 5-2: Number of different functions in block F.

BLOCK F	Building Uses	No. of Buildings
Primary Uses	Residences	3
	Office space	5
Secondary Uses	Food Shop	2
	Personal Care	6
	Clothing/Home goods	5
	Art / Music Store	1
	Sports/Entertainment	0
	Souvenir/Gift shop	0

Graph 5-2: Number of functions in block F.



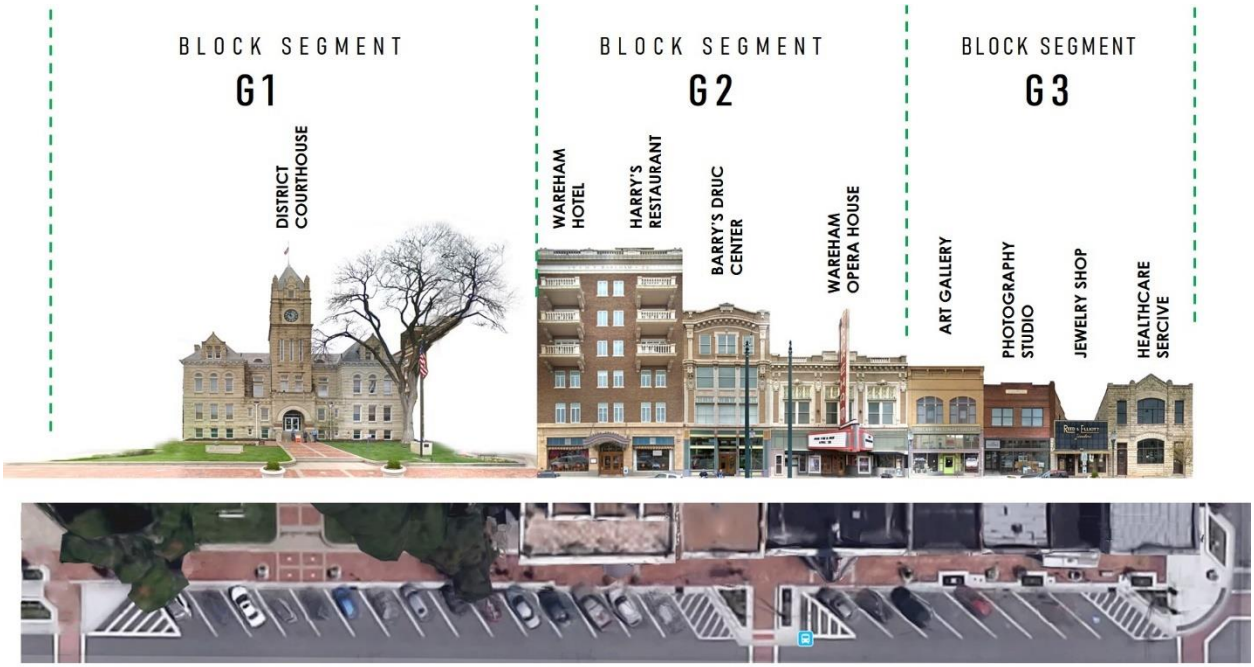


Figure 5.16: Different uses and block segments of block G.

Block G

Block G is on the north side of Poyntz Avenue and runs from 4th Street on the east to 5th Street on the west (Figure 5.2). Block segment G1 (Figure 5.16) begins with the district courthouse. The courthouse building is four-storied with a tall clock-tower, this building occupies a large portion of block G with open green spaces. There is an outdoor seating area in the front with fixed benches and planter boxes. The placement of the courthouse building is different from other buildings on the block as it is placed at a considerable distance from the sidewalk (Figure 5.17).

Figure 5.17: Views of block segment G1.

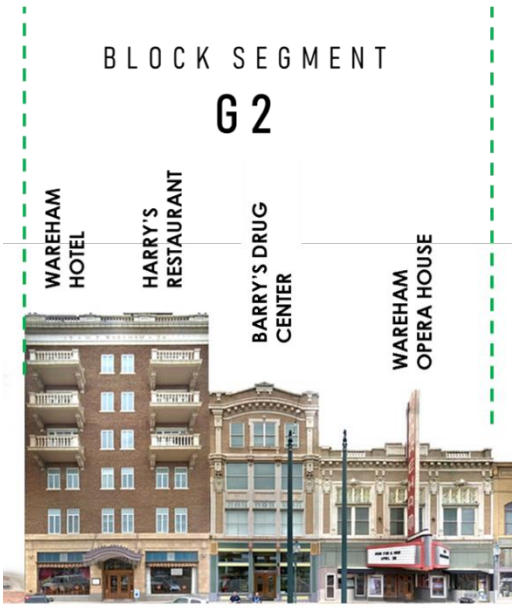


Figure 5.18: Block segment G2.

Block segment G2 (Figure 5.18) begins with the Wareham Hotel, which is a six-storied brick-cladded building. The top three floors have balconies and there is a dining restaurant on the ground floor which has large glass windows and a recessed entry space with an awning. The next building houses a drug store on the ground floor with a tall glass façade, and there are lofts on the upper floor. Next, there is a historic three-storied opera house with a tall marquee, this building is often used as a wedding venue. The front façade of the building has small windows and a recessed entry (Figure 5.19).

Figure 5.19: Views of block segment G2.

Figure 5.20: Block segment G3.

The first building in block segment G3 (Figure 5.20) is two-storied with an art gallery on the ground floor incorporating display windows and a colorful entry door. The next building is a two-storied brick-cladded building with a photography studio. This building has tall glass façade on the ground floor with displays and a loft on the upper floor. Next, there is a small one-storied building with a jewelry shop, this building has display-windows and a large signage with an overhang. The last building on the block houses a healthcare service center on the ground floor and an office space on the upper floor.

Figure 5.21: Views of block segment G3.

As indicated by Table 5-3 and Graph 5-3, block G has eight separate buildings. In terms of primary uses, five buildings have residences, and two of the buildings have office spaces. In terms of secondary uses, there is a restaurant, a drug store, an art gallery, an opera house, a photography studio, a jewelry shop, and a healthcare service center. Overall, there are seven buildings with primary uses and six buildings with secondary uses in block G.

Table 5-3: Number of functions in block G.

	Building Uses	No. of Buildings
Primary Uses	Residences	5
	Office space	2
Secondary Uses	Food Shop	1
	Health Care	1
	Pharmacy	1
	Art Gallery	1
	Entertainment	1
	Jewelry Shop	1

Graph 5-3: Number of functions in block G.

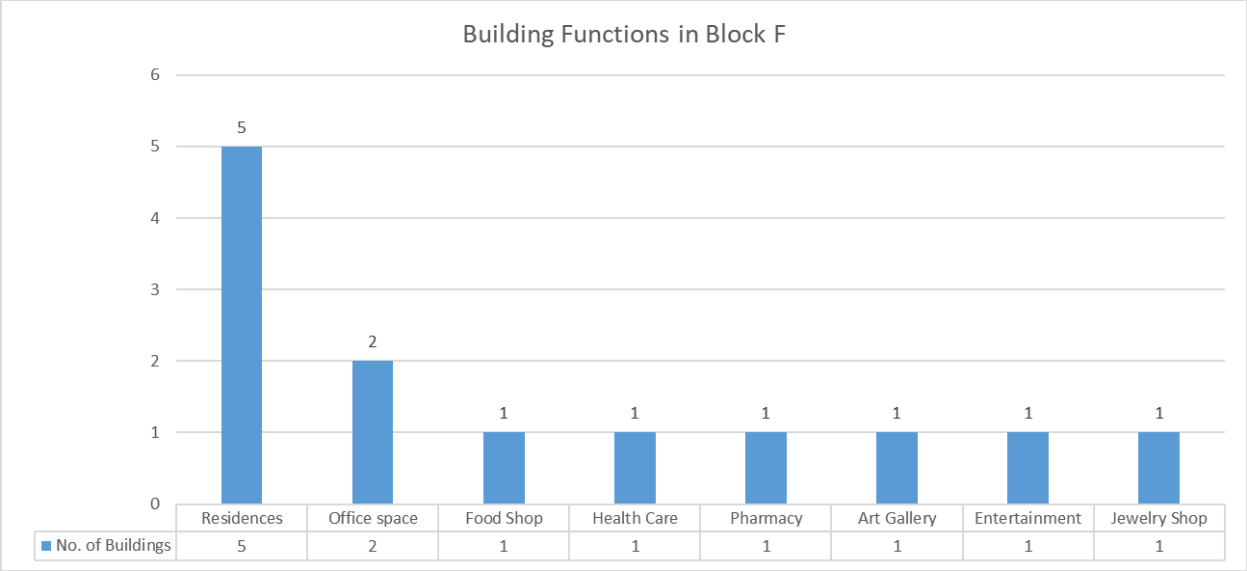


Figure 5.22: Building-uses in block H.

Block H

Block H is located on the north side of Poyntz Avenue and runs between 3rd Street and 4th Street (Figure 5.2). Block segment H1 begins with a two-storied stone-cladded building housing two functions on the ground floor. On one side there is a wealth-management office and on the other side, a fellowship church named 'House of Prayer'. The upper floor of the building has several rentable office spaces. The next building houses a bar and a bedding store. The bar provides an outdoor seating area on the roof of this one-storied building. The building facade includes an overhang with glass windows on the ground floor (Figure 5.23).

Figure 5.23: Views of block segment H1.

Figure 5.24: Building-uses in block segment H2.

Block segment H2 begins with a boutique clothing store incorporating large display windows and an awning. The next building is two-storied and was unoccupied at the time of the survey. Next, there is another two-storied building with a boutique bridal shop. This shop incorporates a recessed entry which creates a foyer-like space with display windows. The last building in block segment H2 houses a popular bar with a recessed entry and glass windows. There are lofts on the upper floor (Figure 5.25).

Figure 5.25: Views of block segment H2.

Figure 5.26: Building-uses in block segment H3.

The first building in block segment H3 is a thrift store with large display windows and two recessed entry spaces. It is a brick-cladded building with lofts on the upper floor. Next there are two buildings which have been converted into an outdoor sports shop with display windows and a large canopy. Both of the buildings have lofts on the upper floor. The next building is a small one-storied floral shop with an awning in the front. Next there is a two-storied building with a home goods store on the ground floor and lofts on the upper floor, this building incorporates a recessed entry space with an awning on top (Figure 5.27).

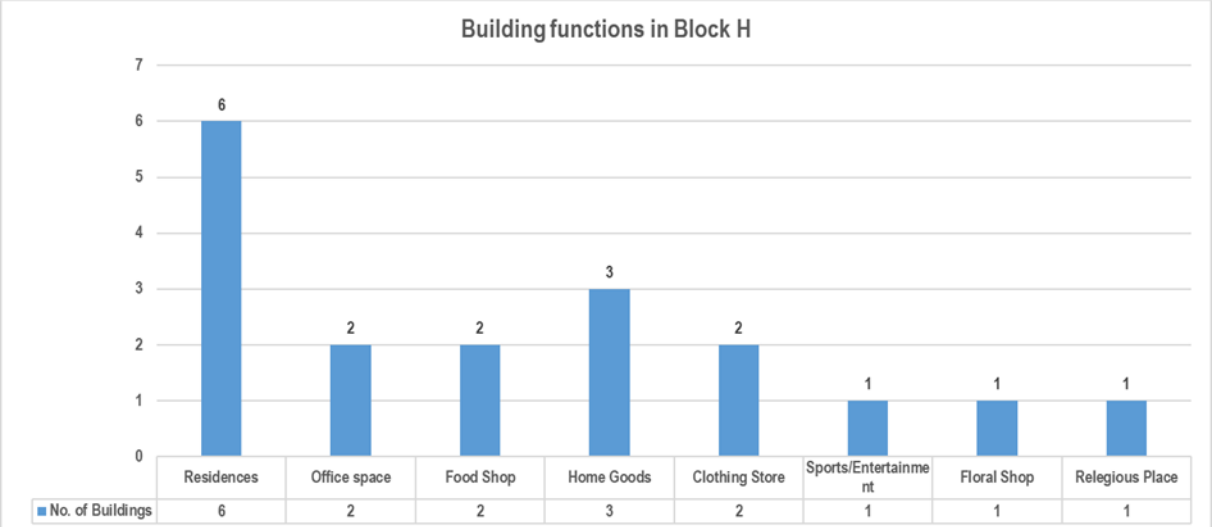
Figure 5.27: Views of block segment H3.

As indicated by Table 5-4 and Graph 5-4, block H has eleven separate buildings. In terms of primary uses, six buildings have residences and two of the buildings have office spaces. In terms of secondary uses, there are three home goods store, two boutique clothing store, one sports shop, one floral shop, and one religious' space. Overall, there are eight buildings with primary uses and ten buildings with secondary uses.

Table 5-4: Number of functions in block H.

	Building Uses	No. of Buildings
Primary Uses	Residences	6
	Office space	2
Secondary Uses	Food Shop	2
	Home Goods	3
	Clothing Store	2
	Sports/Entertainment	1
	Floral Shop	1
	Relegious Place	1

Graph 5-4: Number of functions in block H.

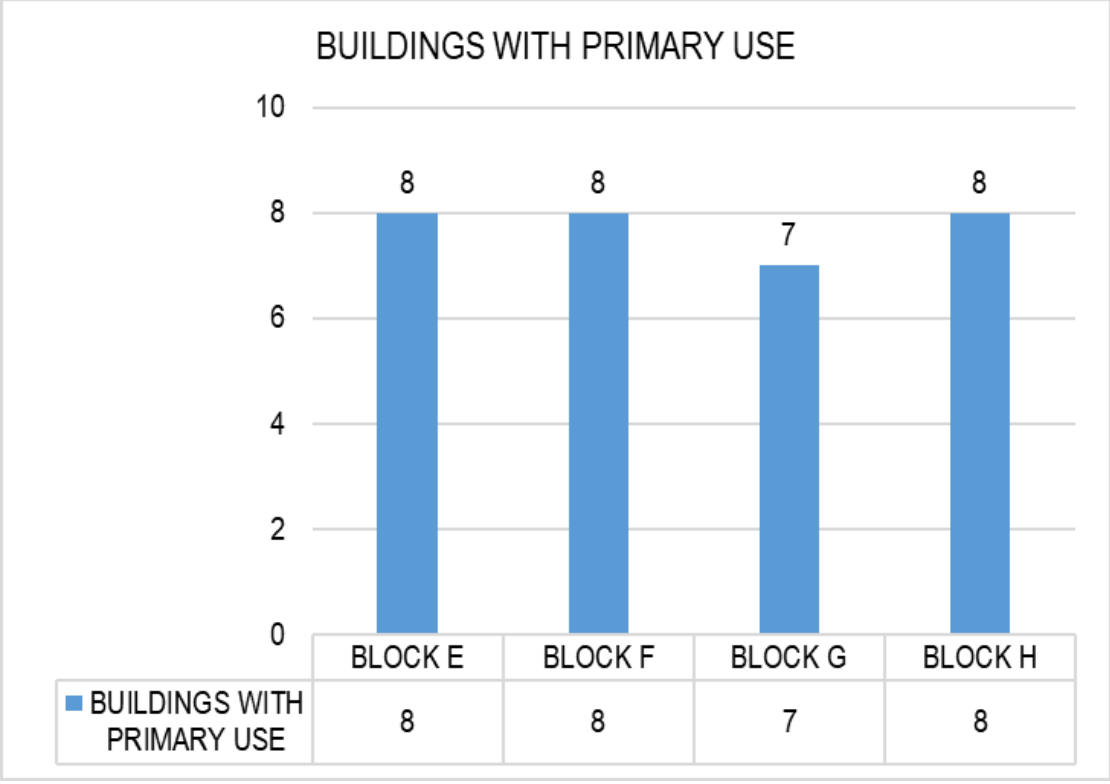


Overall, the four study blocks in Poyntz Avenue have a total of seventeen buildings with residential use and a total of fourteen buildings with offices. In terms of residences, block E has three buildings, block F has three buildings, block G has five buildings, and block H has six buildings. In terms of buildings with offices and workspaces, block E has five buildings, block F has five buildings, block G has two buildings, and block H has two buildings. The following table and graph illustrate the number of buildings with primary uses in the four study blocks.

Table 5-5: Number of buildings with primary uses in the four study blocks of Poyntz Avenue.

PRIMARY USES	BLOCK E	BLOCK F	BLOCK G	BLOCK H	TOTAL
RESIDENCES	3	3	5	6	**17**
OFFICE	5	5	2	2	**14**

Graph 5-5: Number of buildings with primary use in study blocks of Poyntz Avenue.

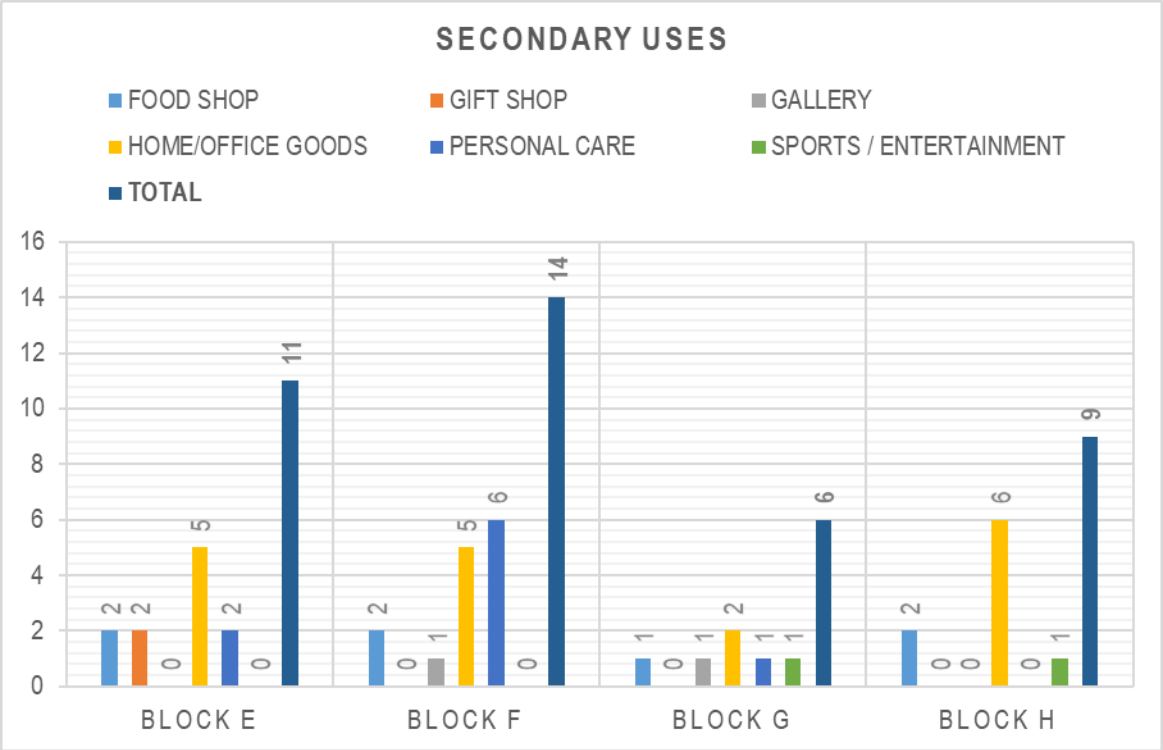


In terms of secondary uses, some of the buildings contain multiple functions, each having their own separate space within the building. With regard to spaces with secondary uses, block E has eleven buildings, block F has fourteen buildings, block G has six buildings, and block H has nine buildings. The following table and graph illustrate the number of secondary uses in the four study blocks at Poyntz Avenue.

Table 5-6: Secondary uses in each study block at Poyntz Avenue.

SECONDARY USE	BLOCK E	BLOCK F	BLOCK G	BLOCK H
FOOD SHOP	2	2	1	2
GIFT SHOP	2	0	0	0
GALLERY	0	1	1	0
HOME/OFFICE GOODS	5	5	2	6
PERSONAL CARE	2	6	1	0
SPORTS / ENTERTAINMENT	0	0	1	1
TOTAL	11	14	6	9

Graph 5-6: Secondary uses in each study block at Poyntz Avenue.



Chapter 6: Sidewalk Design and Sitting Spaces

In the previous chapter I discussed the range of primary and secondary uses on the blocks of the two study sites. In this chapter, I elaborate on the design and the physical features of the sidewalks. During observations in both study sites, I noted that the design and layout of sidewalks in Mass Street differ from the design and layout those of Poyntz Avenue. In the following sections, I discuss various aspects of sidewalk design and physical characteristics of the sidewalk zones.

Massachusetts Street's Sidewalk Design

The sidewalks of Massachusetts Street are similar in design in the four blocks studied in this research. In terms of designed zones, the total length of the sidewalk of a block can be divided into five zones (Figure 6.1).

Figure 6.1: Mass Street's sidewalk zones in terms of length.

The staring zone has an accentuated curb-design with two large planter boxes often used for sitting. The planter boxes are designed in such a way that they create a pathway for the crosswalks. People usually stand between or sit on these planter boxes while waiting to cross the street. The accentuated sidewalk design highlights the crosswalk area so that motorists can be cautious about pedestrians crossing the street.

Figure 6.2: Intermediate zone of sidewalk with diagonal parking and landscaping areas.

Next to the starting zone, the intermediate zone consists of a series of trees, parking meters, and light poles. This zone includes zigzag patterned landscaping areas, created through diagonally placed road-side parking spaces (Figure 6.2). Trees are placed in this zone at regular intervals in pentagon-shaped planting areas between parking spaces. There are two modes of tree planting; in one mode, the ground for planting trees is left exposed so that rainwater can be absorbed; alternatively, the ground is covered with a tree-grill. These two planting modes contribute to the visual variety of the sidewalk design. Light poles with parking meters are also placed between the trees at consecutive intervals (Figure 6.3).

Figure 6.3: Figure showing tree planting approaches and landscaping areas.

Figure 6.4: View of central zone of sidewalk.

The next portion of the sidewalk area is the central zone which has large planter boxes and public seating (Figure 6.4). This zone takes space from parking spots and creates a directional segue-way towards the central crosswalk. These planter boxes are designed to create a sense of enclosure within the sidewalk segment. Material for the ground cover is also different in this space. Many street performers use this space, and people passing by often stop and sit on the planter boxes to watch the performances. This space contains several street artifacts such as water fountain, bike rack, letterbox, newspaper-dispensing box and so on (Figure 6.5).

Figure 6.5: Central zone of sidewalk with planter boxes and street artifacts.

Figure 6.6: End zone of sidewalk area.

The end zone of the sidewalk area has design features similar to those of the central zone (Figure 6.6). This zone contains two large planter boxes and other street artifacts. This space is often used to display public art and sculptures. Street performers frequently occupy this space as it provides public seating and large trees. Occasionally, street vendors use this space to place their food carts (Figure 6.7). This space is also used for various street signs and a place directory. The sidewalk in this area has an extended curb designed to highlight the crosswalks for pedestrian movement.

Figure 6.7: End zone of the sidewalk used for different activities.

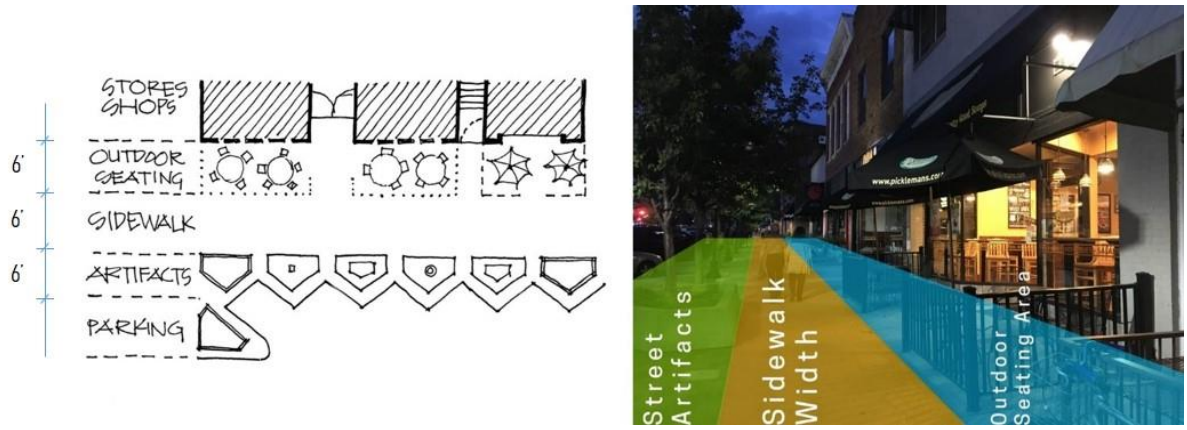


Figure 6.8: Figure showing various zones of sidewalk width.

As illustrated in Figure 6.8, the total width of Mass Street's sidewalks is eighteen feet and in terms of width, can be divided into three zones. The first zone along shops and restaurants is used for outdoor seating and outdoor displays. Some of the stores, however, do not utilize this zone for any kind of use. Most of the restaurants use this zone for outdoor seating, and some stores use this zone for outdoor displays and advertisements (Figure 6.9).

Figure 6.9: Use of sidewalk area for various functions.

As shown in Figure 6.8, the second sidewalk zone is for unobstructed walking and to facilitate smooth pedestrian flow. This zone is marked by a grout in the ground-material, which creates a subtle distinction between the different zones of sidewalk (Figure 6.10). A third sidewalk zone contains various landscaping elements and street artifacts like benches, planter boxes, light poles, signposts, drinking fountains, newspaper boxes, letter boxes, sculptures, trash cans, parking meters and so on. This zone includes the diagonal street-parking spaces.

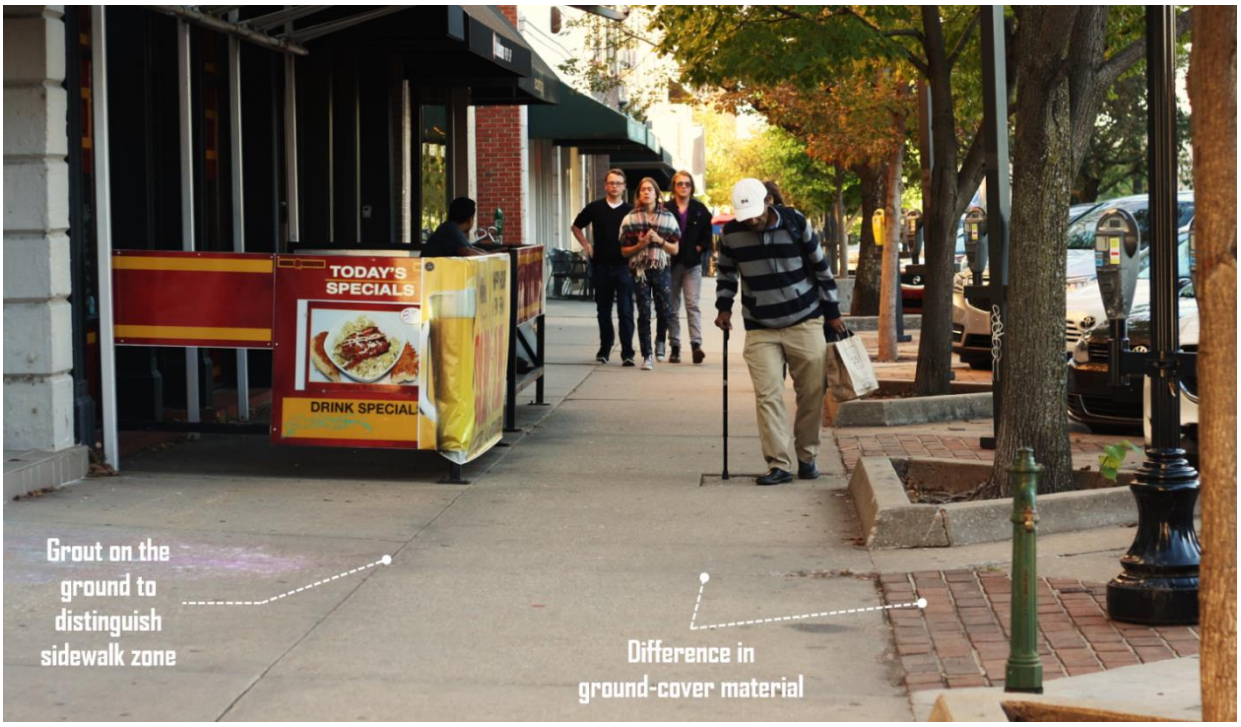


Figure 6.10: Distinction between different zones of sidewalk width.

Poyntz Avenue's Sidewalk Design

In terms of width, Poyntz Avenue's sidewalks are comparatively narrower than Mass Street's sidewalks. In the four study blocks of Poyntz Avenue, design of the sidewalks is similar, and they have similar layouts and design elements. In terms of length, the sidewalks can be divided into five zones: starting zone, intermediate zone, central zone, second intermediate zone, and an end zone (Figure 6.11).

Figure 6.11: Poyntz Avenue's sidewalk zones in terms of length.

The starting zone of the sidewalk incorporates an accentuated curb design to highlight the crosswalks. This zone contains one circular-shaped planter box and two triangular-shaped planter boxes. Unlike Mass Street's planter boxes, however, these are low in height, measuring about six inches from the ground. This zone also contains a fire hydrant and the pole for traffic lights (Figure 6.12).

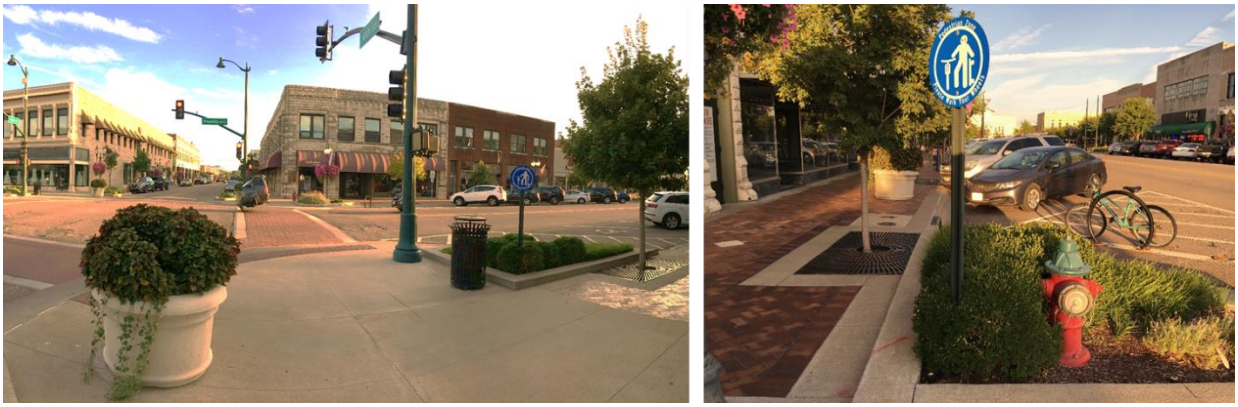


Figure 6.12: Views of the starting zone.

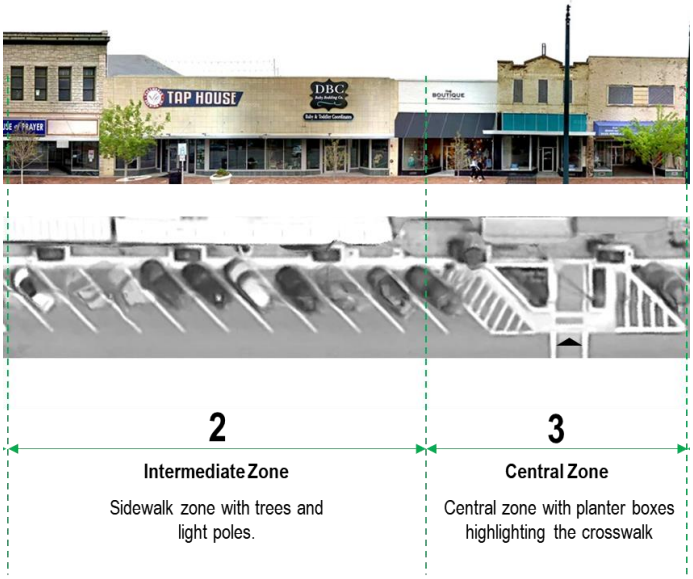


Figure 6.13: Intermediate zone and central zone

Next, the intermediate zone (Figure 6.13) contains a series of trees and light poles. The trees are planted in regular intervals and the ground is covered with tree grills. Between the trees there are light poles with flower basket and flags (Figure 6.14). At random intervals, there is a different kind of circular planter and a few public benches for seating. This zone contains several diagonal parking spaces on the street side. Unlike Mass Street, the parking spaces are not integrated within the sidewalk area (Figure 6.14).

Figure 6.14: Views of sidewalk zones.

Figure 6.15: End zone of sidewalk.

Next to the intermediate zone, the central zone (Figure 6.13) includes an extended sidewalk area to accentuate the center crosswalk. There are two low-height planter boxes which create a directional segue way for the crosswalk. Two tall light poles along the planter boxes enhance the crosswalk visibility and contribute in cautioning drivers. A string of lights connects the light poles on each side of the street (Figure 6.14). The end zone of the sidewalk is similar to the starting zone with triangular-shaped planter boxes highlighting the crosswalk. This zone contains a few street artifacts like the street signage, traffic lights, trash cans, and a public seating bench (Figure 6.16).

Figure 6.16: Views of the end zone of sidewalk.

Figure 6.17: Zones of sidewalk width.

In terms of width, Poyntz Avenue's sidewalks are narrower than Mass Street's sidewalks. In Poyntz Avenue, the total width of the sidewalk is thirteen-and-a-half feet. As illustrated in Figure 6.17, a portion of the sidewalk used for planting trees is five feet, four inches wide. This portion has trees, planter boxes, and light poles placed at regular intervals with only a few benches. The next portion of the sidewalk is for unobstructed walking which facilitates smooth pedestrian flow. This portion is six feet, eight inches wide (Figure 6.17). Next, there is another small sidewalk portion, one and a half feet wide. This portion is used by some of the stores for placing advertisements and menu boards. It is noticeable that none of stores and restaurants in Poyntz Avenue have an outdoor seating area.

Types of Sitting Spaces

One of the most important factors to retain people in public spaces is the availability of sitting spaces. People need spaces to sit and relax and sitting space is one of the pre-requisites for people to socialize in public spaces (Lindsay 1987). In his research on plazas, William Whyte (1980) explained that, "People tend to sit where there are places to sit." People generally need sitting spaces to remain in a public space. Whyte suggested that there should be one linear foot sitting space for every thirty square feet of area. Choice of seating can also affect people's decision to stay in a place. People tend to search for places to sit which are socially and culturally comfortable. Thus, a wide range of choice for sitting spaces can facilitate more interaction and participation in public spaces. The location of sitting spaces is also important in this regard. Seating tend to be used more frequently when it is located near or combined with a place of activity.

For this research, I observed the number of sitting spaces on each block segment, their types, location, and how they were being used by people. This included commercial seating such as chairs in outdoor seating areas of restaurants, and public seating such as benches. In terms of public seating, the four study blocks in Mass street have only one bench; however, there are several planter boxes in each block, which are frequently used as sitting spaces by many people (Figure 6.19); these planter boxes are twenty inch in height and are of various shapes (Figure 6.18). Block A and block C both have nine of these planter boxes, and block B and block D have eight planter boxes. In each block, planter boxes are located in the starting zone, the central zone, and the end zone (Figure 6.1).

Figure 6.18: Types of planter boxes suitable for sitting in study blocks of Mass Street.

Figure 6.19: Use of planter boxes as sitting spaces.

In terms of commercial seating, Mass street has several restaurants with outdoor seating areas. It has been observed during the stationary observations that some of these outdoor seating areas are frequently used and enable users to remain in the sidewalks for longer period of time. Most of the restaurants provide moveable tables and chairs to facilitate outdoor seating. In terms of restaurants with outdoor seating, block A has six restaurants, block B has two restaurants, block C has three restaurants, and block D has four restaurants.

Figure 6.20: Outdoor seating areas in Mass Street.

During observations, I measured the planter boxes and the outdoor seating areas to calculate the total amount (linear feet) of sitting spaces in each block. The results showed that block A has 503.8 feet of sitting space, block B has 361.4 feet of sitting space, block C has 427.4 feet of sitting space, and block D has 488.4 feet of sitting space including planter boxes and commercial seating. The following graph and table illustrate the amount of sitting space in each block segment of Mass Street.

Graph 6-1: Amount of sitting spaces in each block segment.

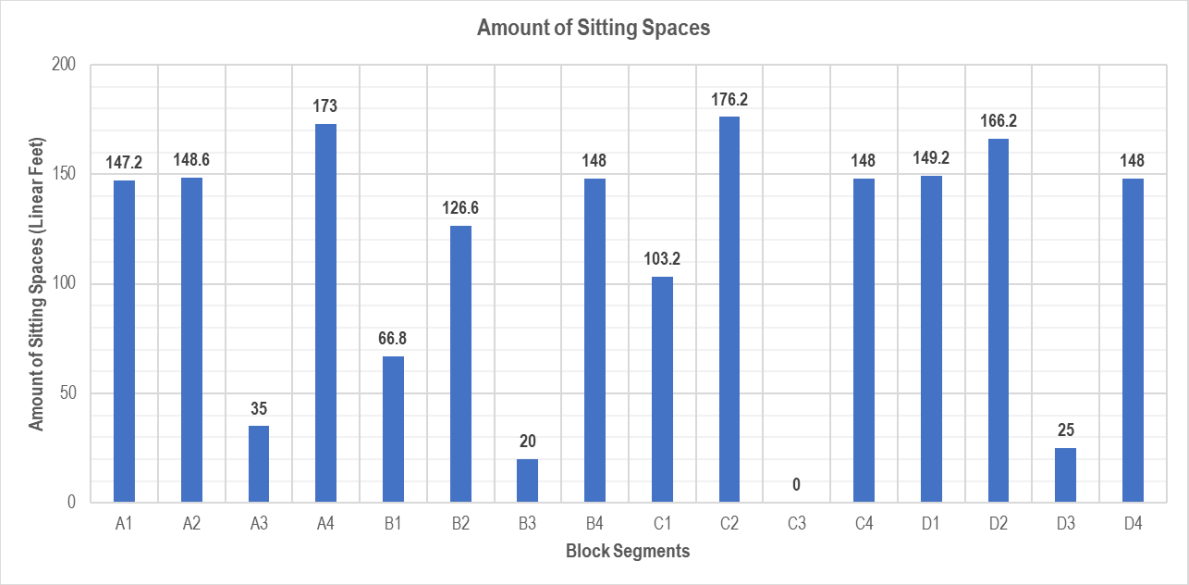


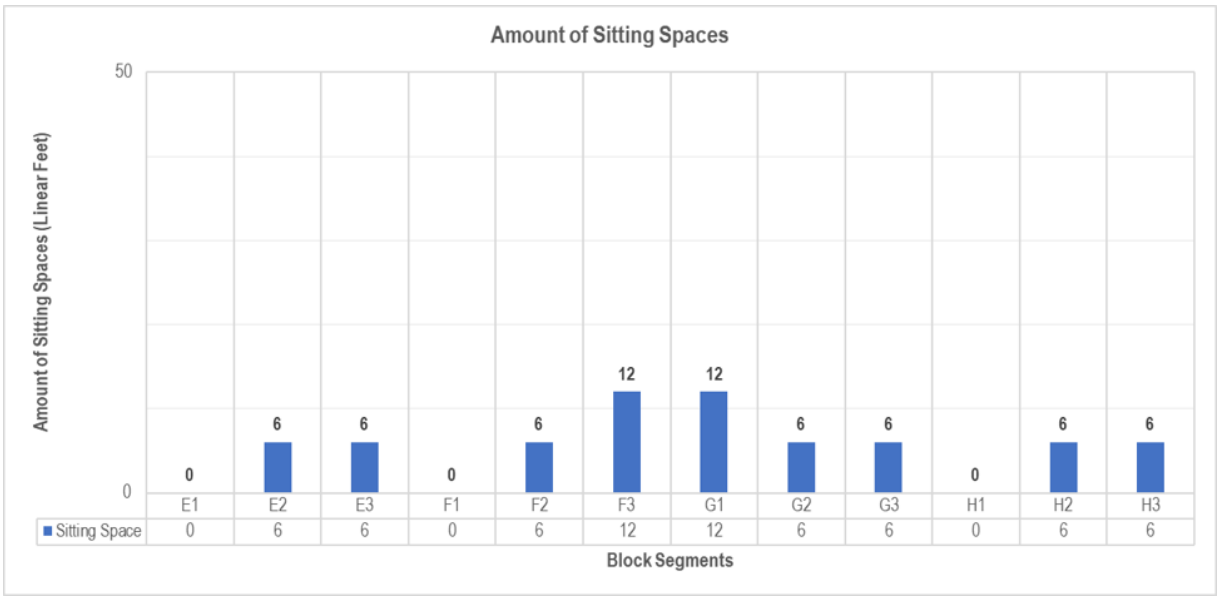
Table 6-1: Amount of sitting space in each block segment.

Block Segment	Sitting Space	
A1	147.2	503.8
A2	148.6	
A3	35	
A4	173	
B1	66.8	361.4
B2	126.6	
B3	20	
B4	148	
C1	103.2	427.4
C2	176.2	
C3	0	
C4	148	
D1	149.2	488.4
D2	166.2	
D3	25	
D4	148	

Figure 6.21: Benches and planters in study blocks of Poyntz Avenue.

In contrast to Mass Street, Poyntz Avenue has a very low amount of sitting space in all four study blocks. Other than a few benches, Poyntz Avenue blocks don't have any other options of seating. Unlike Mass street, planter boxes in Poyntz Avenue are not suitable for sitting as some are circular in shape and too high, and some are too low for anyone to sit on (Figure 6.21). Even though Poyntz Avenue have a few restaurants and bars but none of them have outdoor seating areas on the sidewalk. Graph 6.2 illustrates the total amount of sitting spaces in each block segment of Poyntz Avenue.

Graph 6-2: Amount of sitting space in each block segment of Poyntz Avenue.



So far, in chapters 4, 5, and 6, I have described and discussed different uses, sidewalk designs, and types of sitting spaces; these chapters provide an overall understanding of the functions and physical setting of the street environment. In the next chapter, I discuss stationary observations and stationary sidewalk activities of both study sites.

Chapter 7: Mapping Stationary Activities

Behavioral observations for this research were conducted in two consecutive weeks of October 2018. Observations in Massachusetts Street were conducted for five days from Tuesday, 16th October, to Saturday, 20th October; and observations in Poyntz Avenue were conducted for another five days from Tuesday, 23rd October, to Saturday, 27th October. These specific weeks for observations were selected by looking into the weather forecast so that weather conditions would be similar for both locations. Each day, time periods for observations were same on both locations and observations were conducted in two phases—firstly, stationary user activities were recorded; and secondly, pedestrian flows and frequency were recorded

Observation Periods of Stationary Activities

To record and map stationary activities for the two study sites, observations were conducted in four different time periods: (1) in the morning from 10.00 a.m. to 11.08 a.m.; (2) in the afternoon from 12.15 p.m. to 1.25 p.m.; (3) in the evening from 5.15 p.m. to 6.25 p.m.; and (4) at night from 7.30 p.m. to 8.38 p.m. These four time periods were selected to get an overall understanding of how sidewalks were being used at different times of the day.

Table 7-1: Observation periods in Mass Street.

Observation Period	Time Span
Morning	10.00 am - 11.08 am
Afternoon	12.15 pm - 1.25 pm
Evening	05.15 pm - 06.25 pm
Night	07.30 pm - 08.38 pm

Stationary Activities in Mass Street

Formal observations of Mass Street began on Tuesday, 16th October. The base map for each block was placed on a clipboard for the ease of recording. Observations were carried out by walking from one end of a block to the other while recording different user activities on the base map. User's stationary activities were recorded in six categories: sitting, standing, eating, smoking, using digital devices while standing, and using digital devices while sitting. Each user engaged in any of these sidewalk activities was marked with a dot on the base map and users in groups were marked with a circle. Additional information regarding their behavior and activity was noted in the lower portion of the observation sheet as was the date, time period, temperature, and weather condition (Figure 7.1).

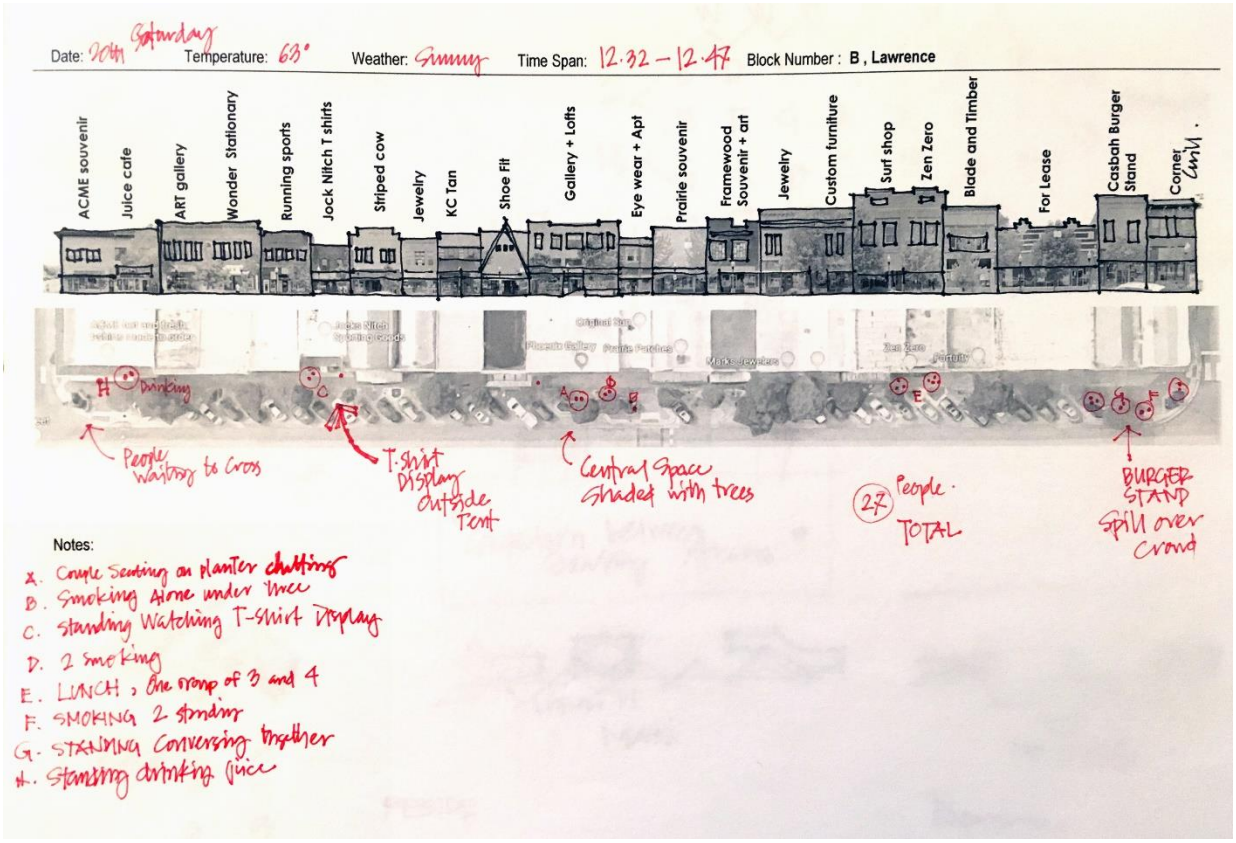


Figure 7.1: Behavior mapping sheet of one of the blocks in Mass Street.

Stationary Activities in Block A

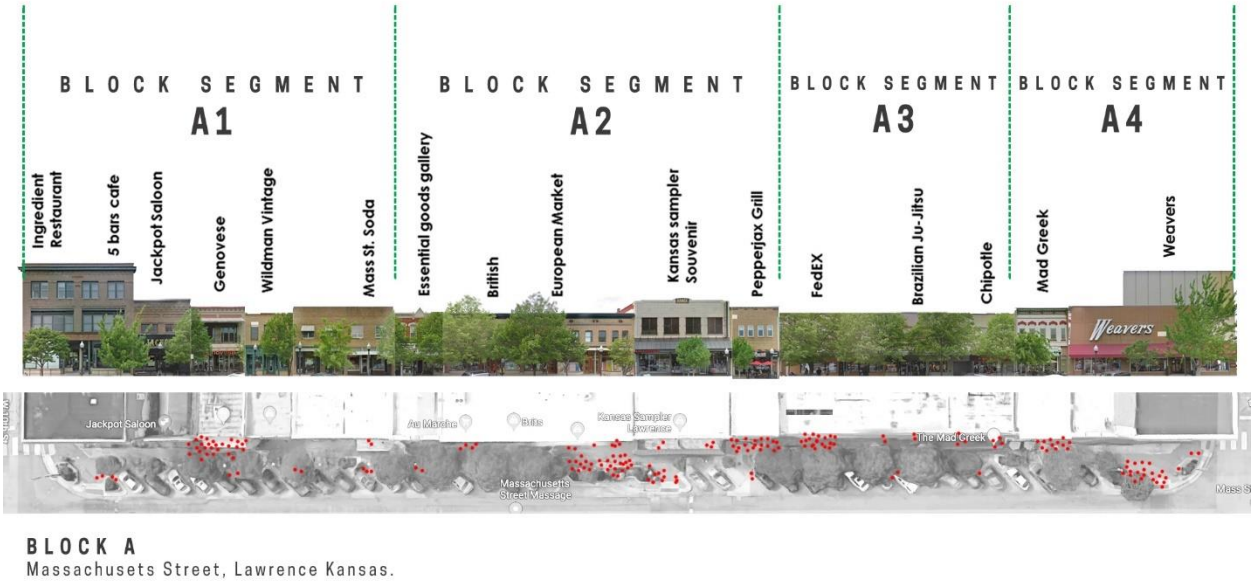


Figure 7.2: Stationary activities in block A.

After the completion of all observations, acquired behavioral data was compiled into a single base map for each block. This aggregate map is useful in identifying the active segments in a block where a good number of stationary activities occurred. In these aggregate maps, every stationary sidewalk activity is marked with a red dot. Figure 7.2 shows an aggregate map of all recorded stationary activities in different segments of block A.

In block segment A1 (Figure 7.3), a total of 40 users were recorded to be involved in stationary activities. 29 (72.5 %) of all 40 users were recorded on the outdoor seating area provided by the restaurant. The outdoor seating area was almost always full during the afternoon and evening hours. A majority of the users were in groups. A few users were recorded sitting on the planter box at the beginning of the block segment, four were smoking under trees, and few others were recorded chatting in groups in front of the soda shop.

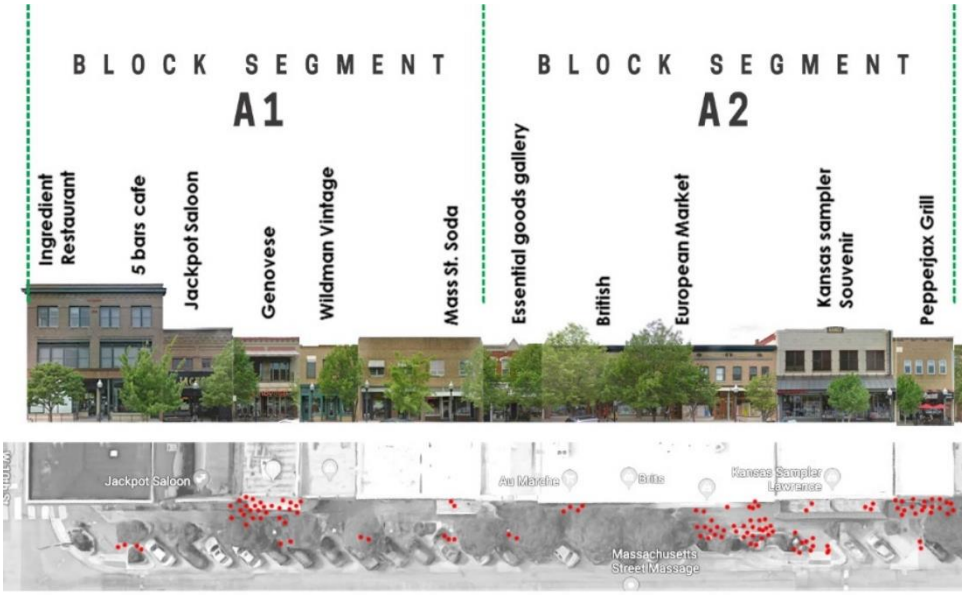


Figure 7.3: Stationary activities in block segment A1 and A2.

Next, in block segment A2 (Figure 7.3), there was a total of 83 users. 50 (62.2 %) out of the 83 users were occupying the central recessed area with planter boxes in front of the European market and the souvenir shop; a guitar player used one of the planter boxes to sit and play in the afternoons (Figure 7.4). Many users stopped by and listened to the guitar player for a few minutes; some users sat beside the guitar player and chatted with him. 22 (26.5 %) users were recorded in the shaded outdoor seating area of the restaurant having their lunch or snacks. There were many users who were using their electronic devices, mainly mobile phones while sitting on planter boxes and a few users were reading books. Block segment A2 had significantly more users than the other segments.

Figure 7.4: Stationary activities in block A.

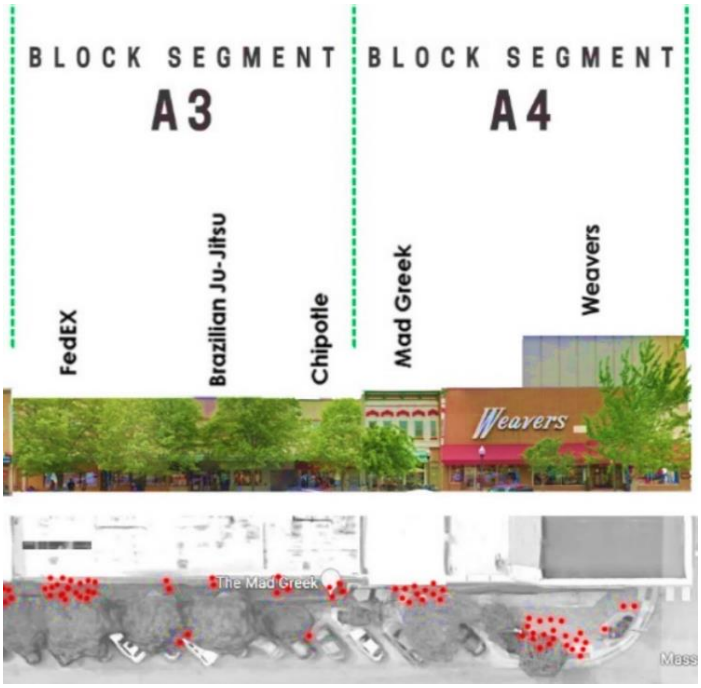


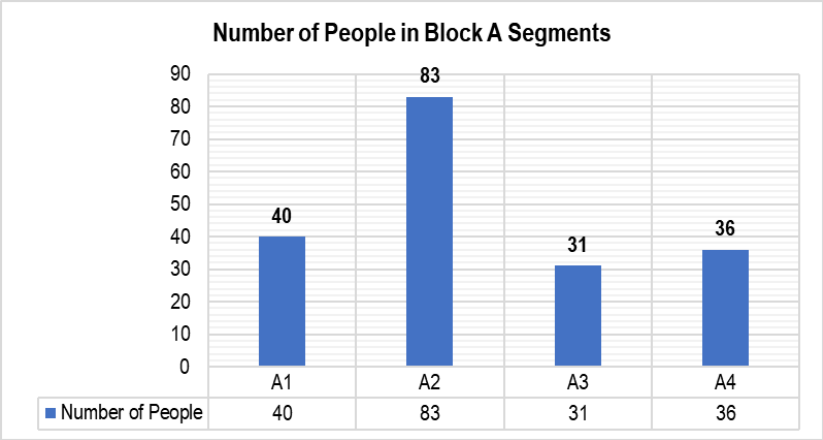
Figure 7.5: Stationary activity data in block segment A3 and A4.

Block segment A3 comprises a large FedEx office, a clothing store, a Ju-Jitsu training center, and a restaurant. A total of 31 users was recorded in this segment. There was a homeless couple, who regularly occupied a space in front of the FedEx office and some users stopped by to talk with them briefly. This was the least used segment of block A. Next, block segment A4 includes a small restaurant and a department store. This segment contains four planter boxes at the end of the sidewalk. Most users were recorded using these seating spaces for different stationary activities. In total, 36 users were recorded in this segment.

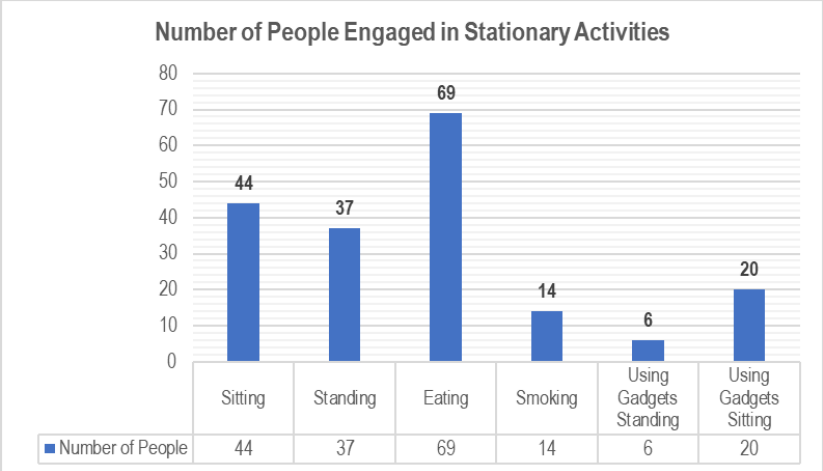
Figure 7.6: Views of activities in block A.

Overall, in five days of observations, a total of 190 users were involved in some kind of stationary activity in Block A. In terms of block segments, block segment A1 had 40 users, block segment A2 had 83 users, block segment A3 had 31 users, and block segment A4 had 36 users. There were various kinds of stationary activities, but the highest number of users were either eating or conversing. Out of 190 users, 69 (36.3 %) were eating and 44 (23.2 %) were sitting and conversing, and 20 users were using digital devices while sitting. There was a large number of users standing and talking under the trees and canopies of shops. The following graphs show the total number of users recorded in each block segment and the number of different stationary activities in block A.

Graph 7-1: Number of people in block segments of block A.



Graph 7-2: Number of various types of stationary activities.



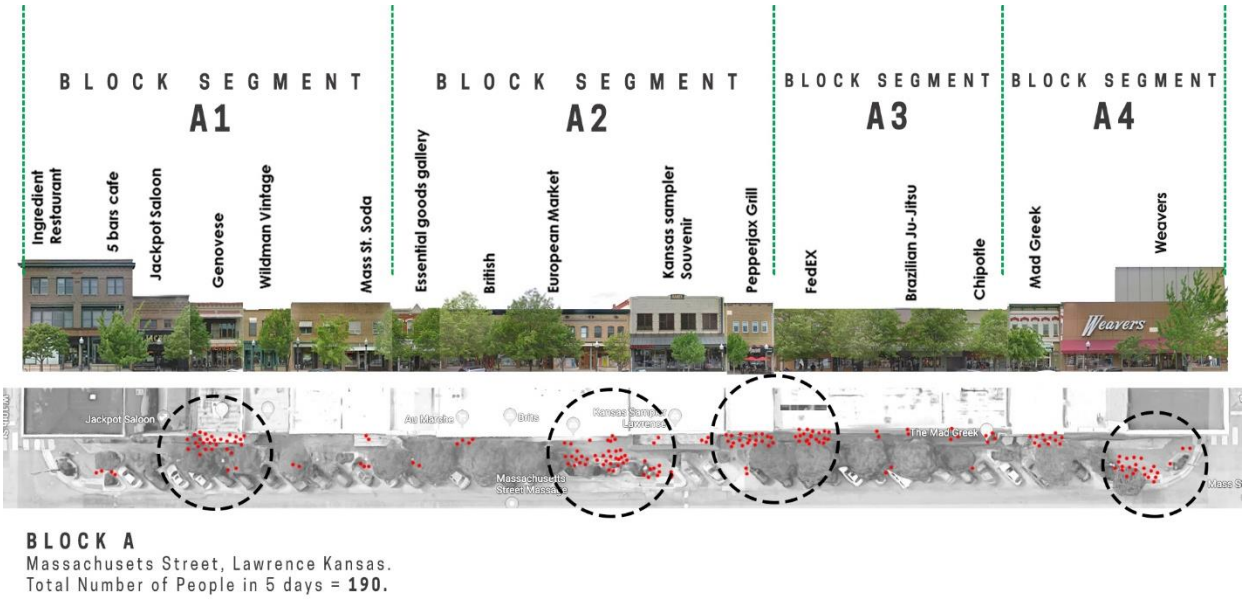


Figure 7.7: Activity zones in block A.

Compilation of all the activity data for block A reveals four distinct zones of activities in block A, that include the outdoor seating areas of restaurants, the recessed seating space in the central zone, and the designed planter boxes.

Stationary Activities in Block B

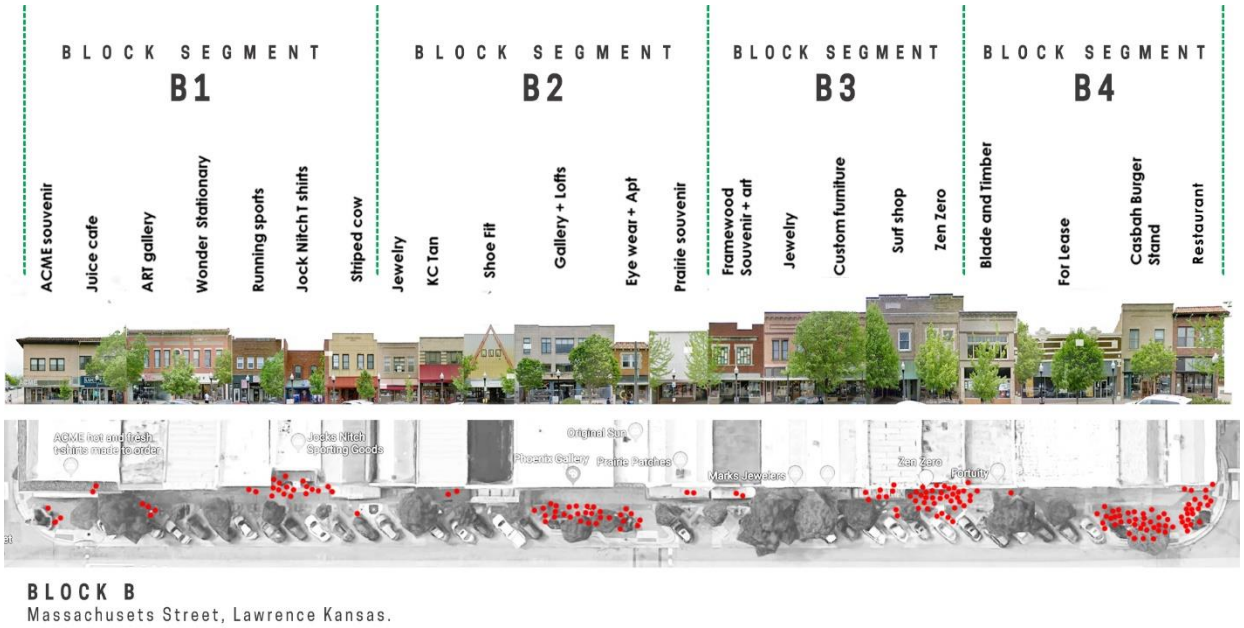


Figure 7.8: Mapping of stationary activities in block B.

As illustrated in figure 6.8, a total of 178 users were recorded in different segments of block B. In block segment B1, a total of 29 users were recorded as engaged in stationary sidewalk activities. Among all users, 19 (65.5 %) were present in front of a clothing store with an outdoor display tent (Figure 7.9). This display tent attracted many who stopped to take a look at display wares; this ten is a good example of what William Whyte calls 'triangulation'—some external stimulus prompting strangers to talk to each other as though they were not (Whyte 1981, p.94). A few other users were recorded sitting on the planter box at the south end of the block.

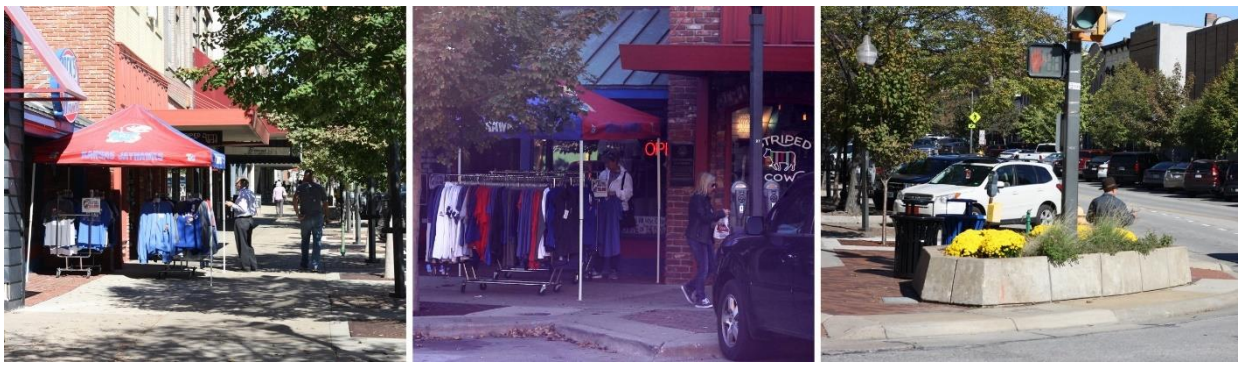


Figure 7.9: Views of block segment B1.

Figure 7.11: Stationary activities in block segment B2 and B3.

In block segment B2, there was a total of 34 users engaged in stationary activities; almost all of these users were observed to be in the central recessed area in front of the gallery (Figure 7.10). This area contains several street artifacts such as a water fountain, a newspaper dispenser, and a post box. Most of the users were sitting, conversing, and relaxing on ledges of the large planter box; there was a good balance between sun and shade. A few users were observed to be using digital devices while sitting in the shade. In block segment B3, there was a total of 49 users and among them 36 (73.4 %) were recorded in the outdoor seating area of the restaurant (Figure 7.11). Some users were observed conversing and standing under the canopy and the recessed entry space of the surf shop.

Figure 7.10: Activities in block segment B2.

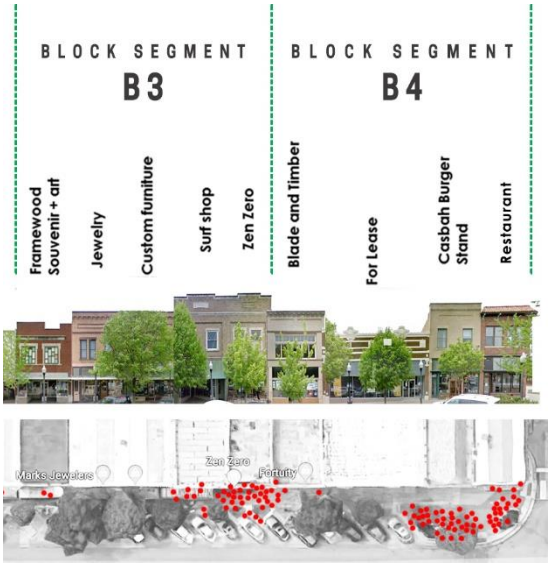


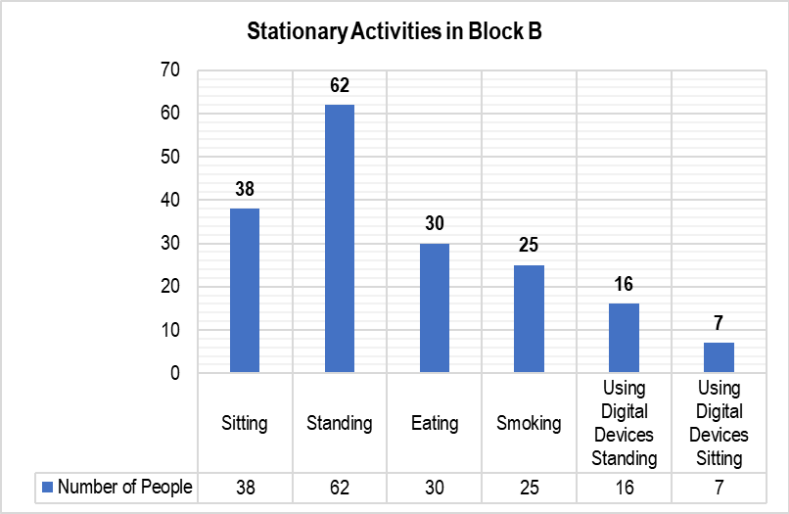
Figure 7.13: Stationary activities in block segment B3 and B4.

Block segment B4 includes a sports shop and two popular restaurants. In total there were 66 users recorded in this segment (Figure 7.13). Even though there was no outdoor seating area, a good number of users lingered in front of the two restaurants. Spillover users from the two restaurants occupied the extended sidewalk area and planter boxes. Users were generally in groups of three or four and there was a mixture of both standing and sitting activity. Some users were recorded eating their food while sitting on the planter box and putting beverage cups on the ledge; the height of the planter boxes was comfortable enough for users to use it for eating and drinking (Figure 7.12). Overall, block segment B4 was the most used segment of block B.

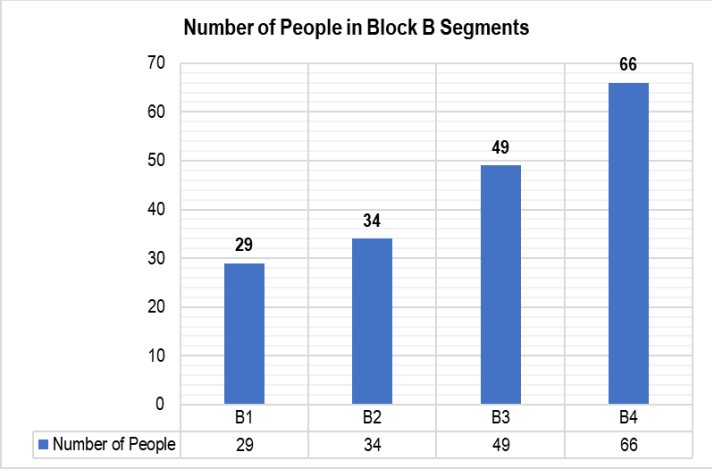
Figure 7.12: Stationary activities in block segment B4.

Overall, in block B, a total of 178 users were recorded to be engaged in different kinds of stationary activities during the five days of observation. In terms of segments, block segment B1 had 29 (16.3 %) users, block segment B2 had 34 (19.1%) users, block segment B3 had 49 (27.5 %) users, and block segment B4 had 66 (37.1 %) users. In terms of activity types, the highest number of users were involved in standing activities. Out of the 178 users, 62 (34.8%) were standing or conversing with others, 38 (21.3%) were sitting or relaxing, and 30 (16.9%) were eating or drinking. There was a good number of users (25, 14%) recorded who were smoking alone or in a group. The following graphs illustrate the total number of users in each segment and the number of various types of activities in block B.

Graph 7-3: Types of activities in block B.



Graph 7-4: Number of users in block segments of block B.



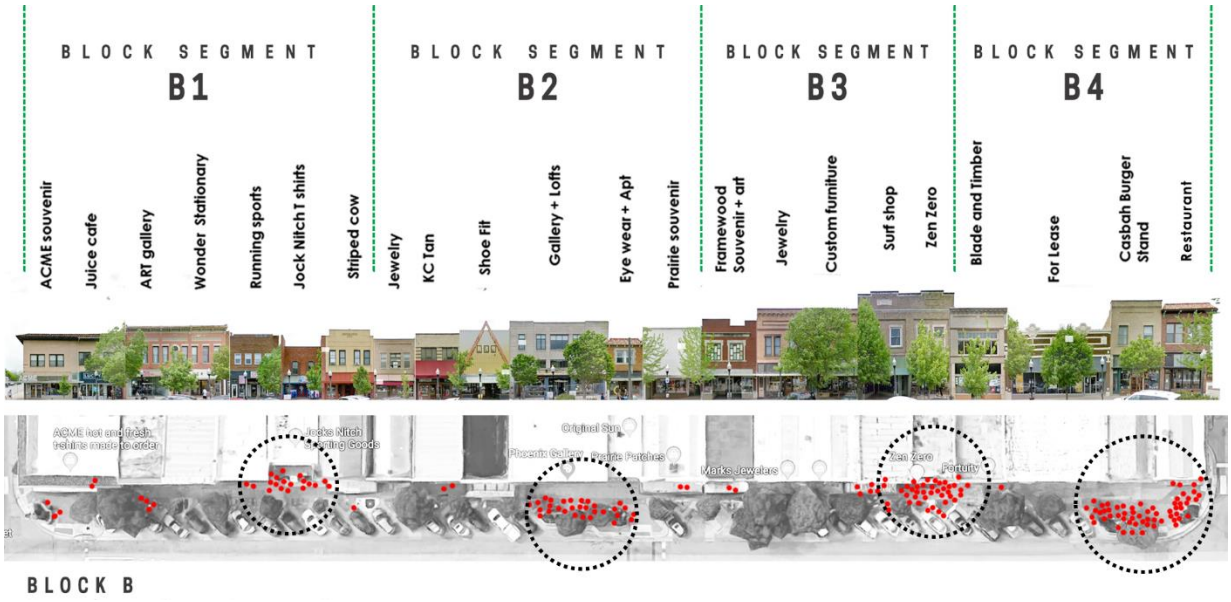


Figure 7.14: Activity zones in block B.

A compilation of all the observation data is presented in the aggregate map of block B in figure 6.14. In this figure one notes four distinct zones of activity that include the area of the outdoor display tent, the central recessed space, the outdoor seating area of the Japanese restaurant, and the extended sidewalk area at the end of the block (Figure 7.14).

Stationary Activities in Block C

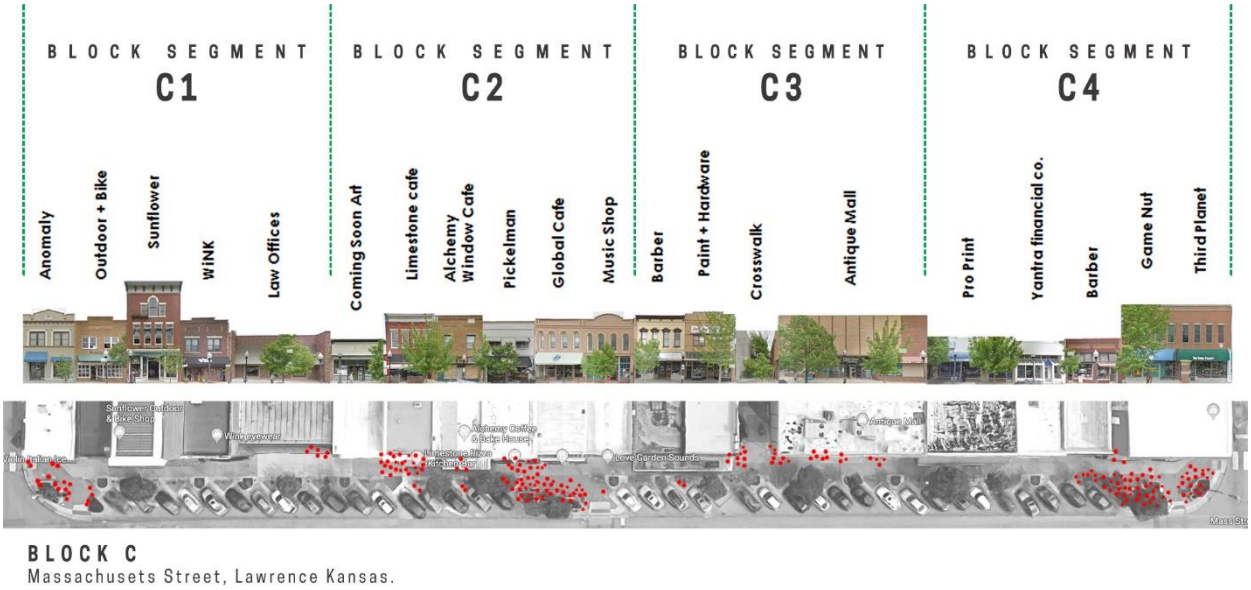


Figure 7.15: Stationary sidewalk activities in block C.

As illustrated in Figure 7.15, a total of 213 users were recorded in different segments of block C. In block segment C1, 24 users were observed to be involved in stationary sidewalk activities. Most of the users (18, 75%) in block segment C1 were either sitting or standing near the two planter boxes at the starting zone of the sidewalk. A few users were observed having their lunch while sitting on the planter box and a few were smoking outside the law office. A group of three people were distributing leaflets, and this made some pedestrian users stop and talk with them.

Figure 7.16: Views of block segment C1.

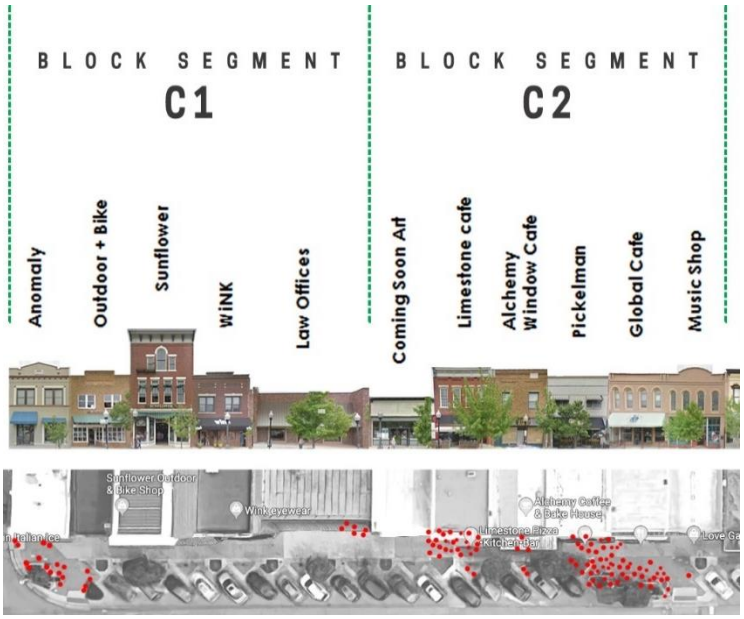


Figure 7.17: Stationary sidewalk activities in C2 and C3.

Block segment C2 was the most active segment of block C. Among its 213 users, 90 (42.2%) users were observed in block segment C2 (Figure 7.17). There are three restaurants, one coffee shop, and one music shop in block segment C2 and all three restaurants had outdoor seating area with canopies. A total of 49 (54.4%) users were observed in these outdoor seating areas eating or conversing after a meal. It is noticeable that even though the restaurants had outdoor seating area, a large number of users (40, 44.4%) was occupying the central recessed area with planter boxes. Many users were recorded to having their food or beverages in these planter boxes.

Figure 7.18: Views of block segment C2.

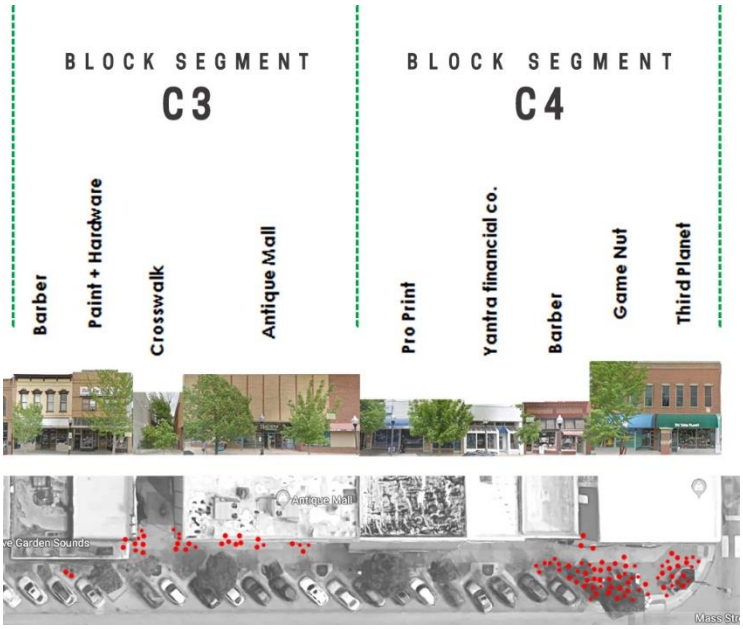


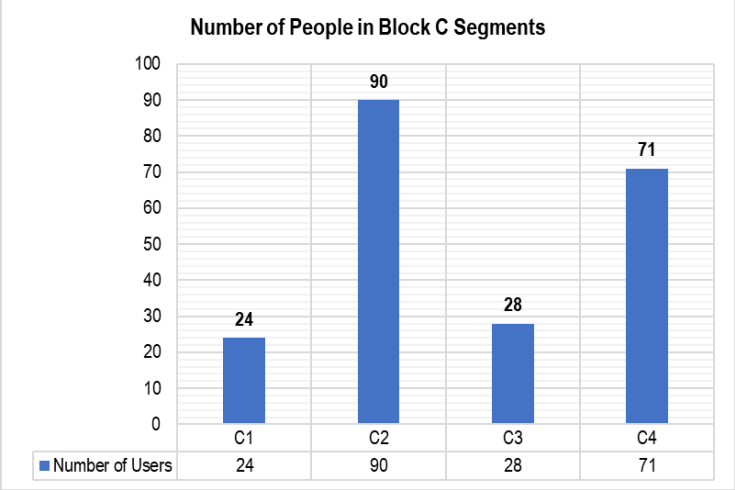
Figure 7.19: Stationary activities in block segment C3 and C4.

In block segment C3, there was a total of 28 users. This segment includes a narrow passageway leading towards the backside parking lot and was often occupied by smokers. A few other users were recorded in front of the antique mall. Next, in block segment C4, a total of 71 (33.3%) users were recorded and most of the users in this segment were occupying the extended sidewalk area with planter boxes (Figure 7.19). It was noticeable during multiple observation periods that several street performers selected this segment to perform and this attracted a lot of users who stopped by. Users frequently occupied different ledges of the planter boxes to sit and relax while listening to the performance (Figure 7.20).

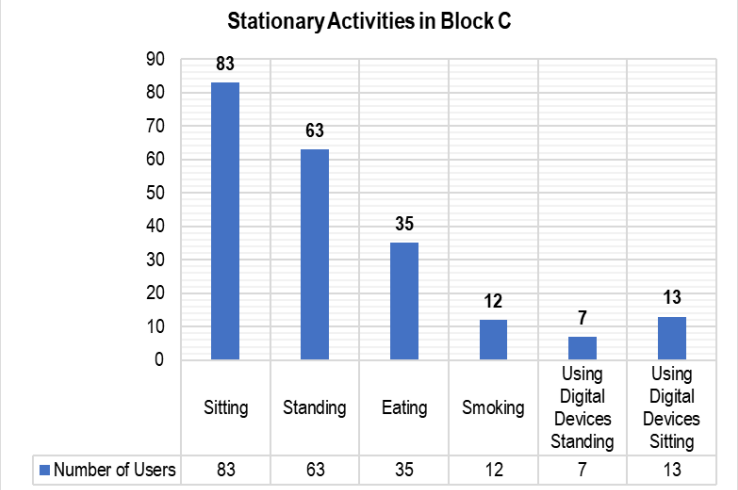
Figure 7.20: Activities in block segment C4.

Overall, in block C, a total of 213 users were recorded to be involved in stationary sidewalk activities during the observation periods. In terms of segments, block segment C1 had 24 (11.3%) users, block segment C2 had 90 (42.3%) users, block segment C3 had 28 (13.1%) users, and block segment C4 had 71 (33.3%) users. In terms of activity types, highest number of users were recorded to be sitting. Out of 213 users, 83 (39%) users were sitting, 63 (29.6%) users were standing, and 35 (16.4%) users were eating; a few other users were either smoking or using digital devices. The following graphs illustrate the total number of users in each segment and the number of various activity types in block C.

Graph 7-5: Number of people in block segments.



Graph 7-6: Type of activities.



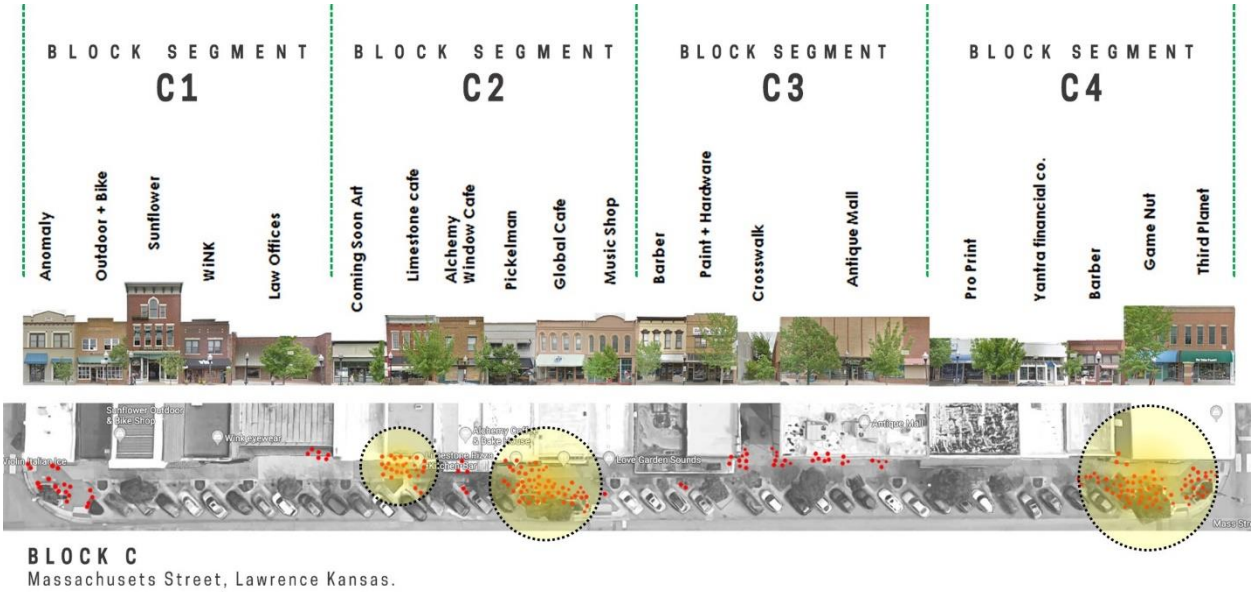


Figure 7.21: Activity zones in block C.

As illustrated in Figure 6.21, a compilation of all the observation data in an aggregate map for block C reveals four distinct zones of activity that include outdoor seating areas of restaurants, the central recessed space, and the extended sidewalk area at the end of the block (Figure 7.21).

Stationary Activities in Block D

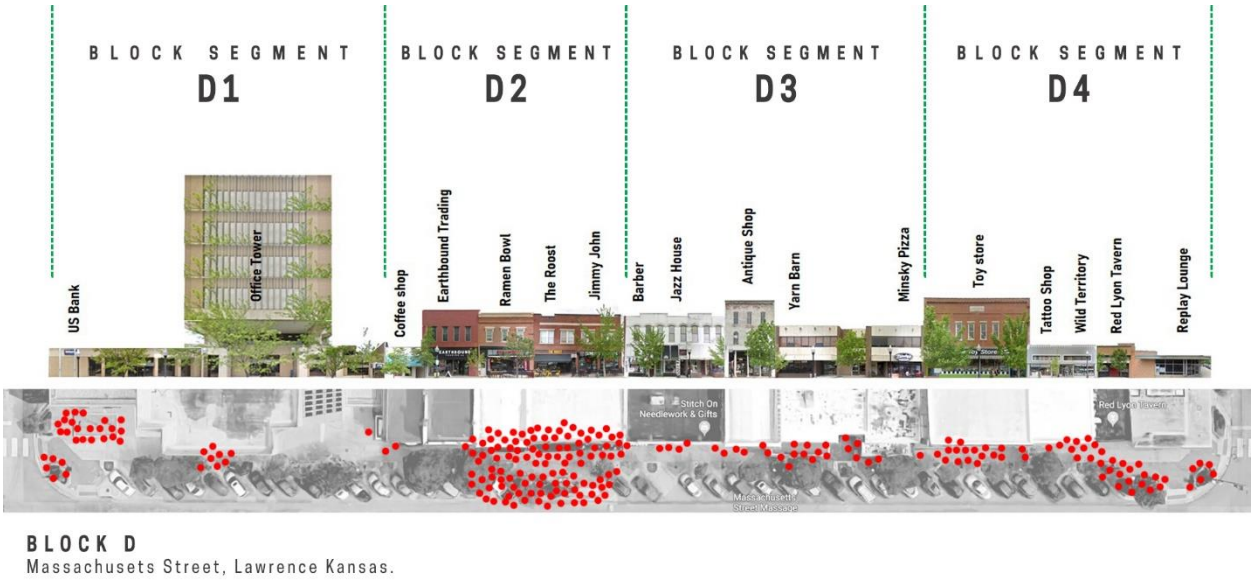


Figure 7.22: Mapping of stationary activities in block D.

As illustrated in figure 6.22, a total of 230 users were observed in different segments of block D. In block segment D1, a total of 36 (15.7%) users were engaged in stationary sidewalk activities. Most of the users in block segment D1 were sitting on the low-height platform for flag poles in front of the bank building (Figure 7.22). Users were also occupying ledges of the planter boxes for various use; some users were relaxing, using digital devices, having lunch, and some were just sitting and watching pedestrians walk by. It is noticeable that even though this segment had planter boxes, users generally preferred to sit on the wider low-heighted platform.

Figure 7.23: Views of block segment D1.

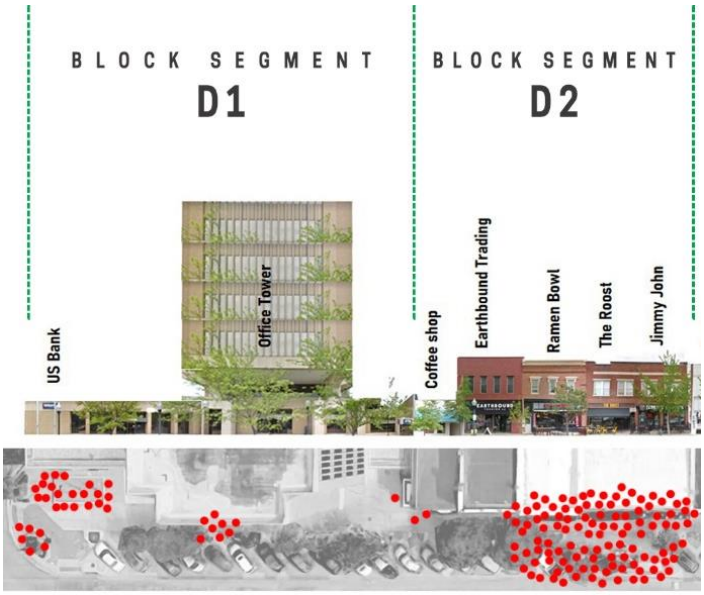


Figure 7.25: Mapping of stationary activities in block segment D1 and D2.

Among all block segments, the highest number of users were observed in block segment D2 (Figure 7.25) having a total of 114 (49.6%) users engaged in stationary sidewalk activities. This segment has three restaurants and a coffee shop. A good number of users from these restaurants were occupying the planter box in the front. It is noticeable that all three restaurants have a visually permeable front façade, which enables a visual connection between the users inside and the users occupying the outside planter box. As William Whyte suggests, activity of people attracts more people, and this visual connection creates a lively atmosphere and thus, a large number of users were observed in this segment (Figure 7.24).

Figure 7.24: Views of block segment D2.

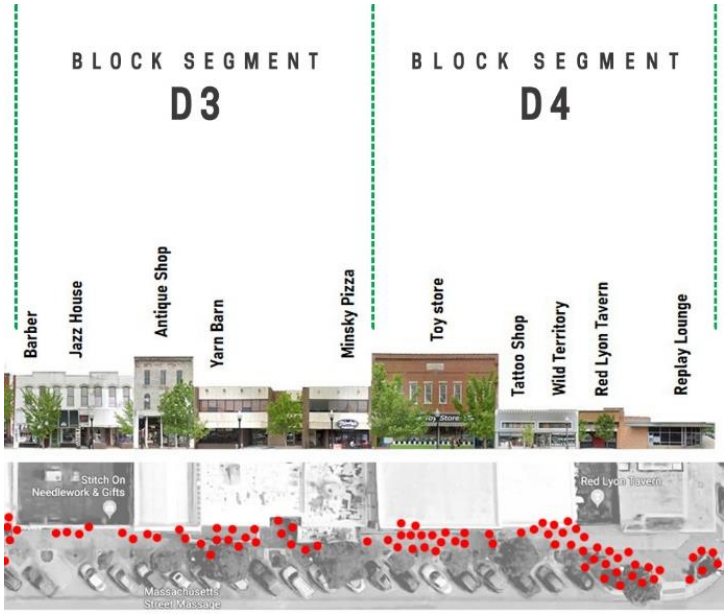


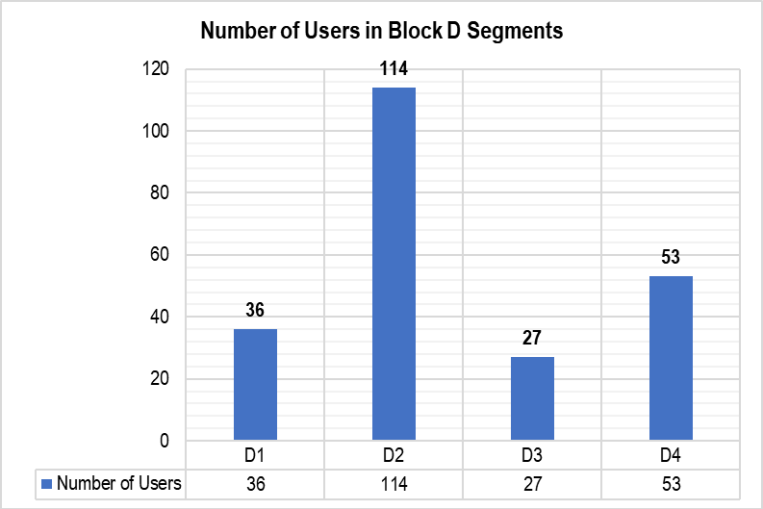
Figure 7.26: Mapping of stationary activities in block segment D3 and D4.

In block segment D3, there was a total of 27 (11.7%) users (Figure 7.26). Most of the users in this segment were observed standing or looking at display windows, and some users were smoking in the recessed space in front of the office building. Women in groups of two and three were observed in front of the yarn store (Figure 7.27). In block segment D4, a total of 53 (23%) users were recorded. A number of families with children were observed in this segment as it includes a large toy store and a science shop, and there were chance encounters between families in front of the store. The majority of users in this segment were sitting on planter boxes and the public bench in front of the bar and the tavern.

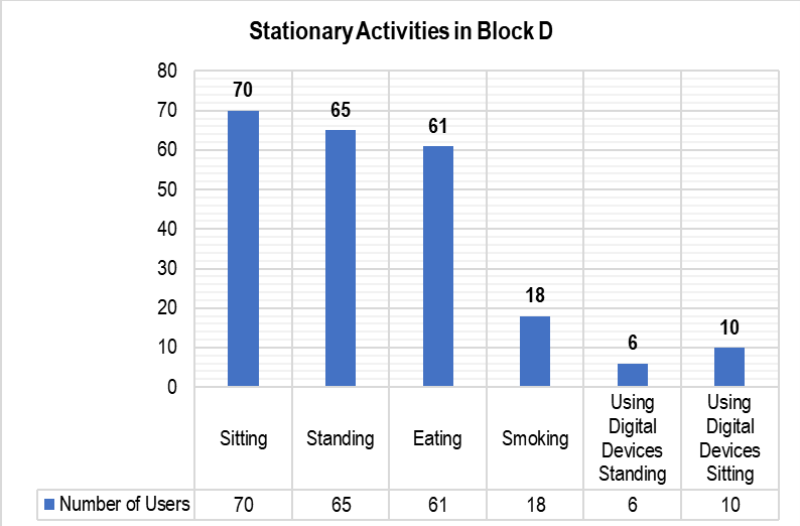
Figure 7.27: Views of block segment D3 and D4.

Overall, the highest number of users were observed in block D, and a total of 230 users were engaged in stationary sidewalk activities. In terms of segments, block segment D1 had 36 (15.7%) users, block segment D2 had 114 (49.6%) users, block segment D3 had 27 (11.7%) users, and block segment D4 had 53 (23%) users. In terms of activity types, the highest number of users were sitting. Out of the 230 users, 70 (30.4%) were sitting, 65 (28.3%) were standing, and 61 (26.5%) were eating or drinking. A few users were smoking and using digital devices. The following graphs illustrate the total number of users in each segment and the number of various types of activities in block D.

Graph 7-7: Number of users in segments of block D.



Graph 7-8: Stationary activities in block D.



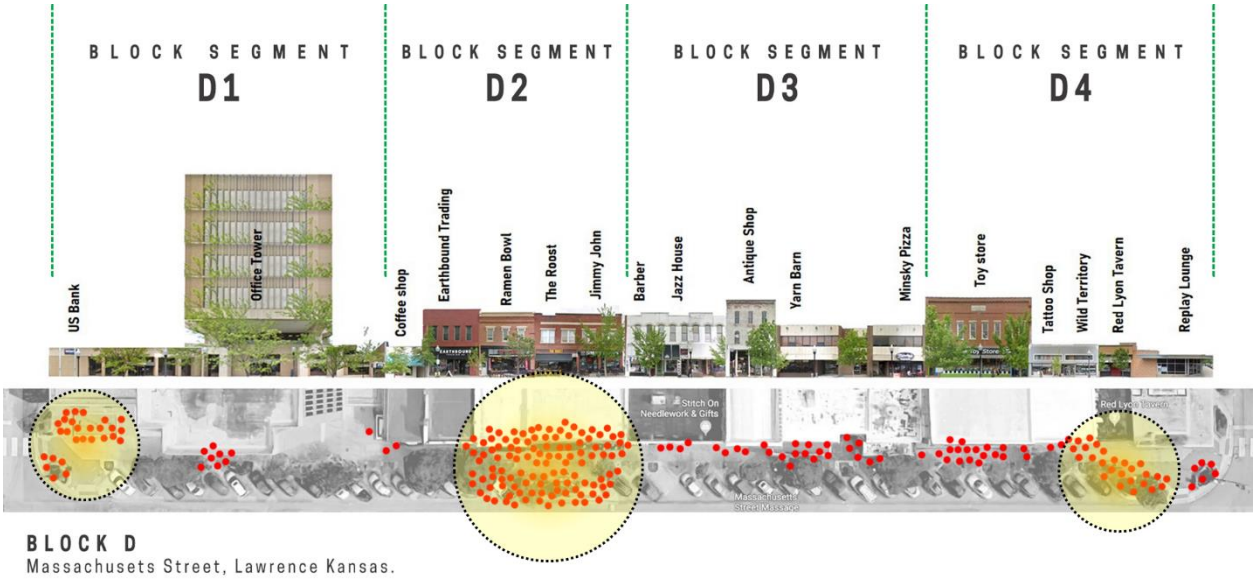
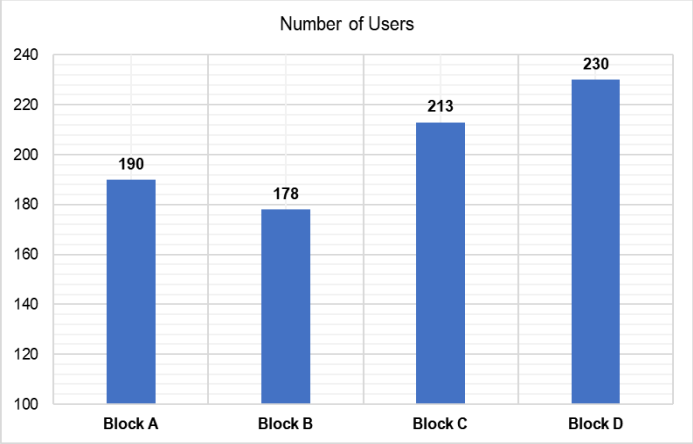


Figure 7.28: Activity zones in block D.

As illustrated in Figure 6.28, a compilation of all the observation data in an aggregate map for block D reveals three distinct zones of activity that include the wide ledge in front of the bank, the central recessed area with outdoor seating spaces of restaurants, and the extended sidewalk area at the end of the block.

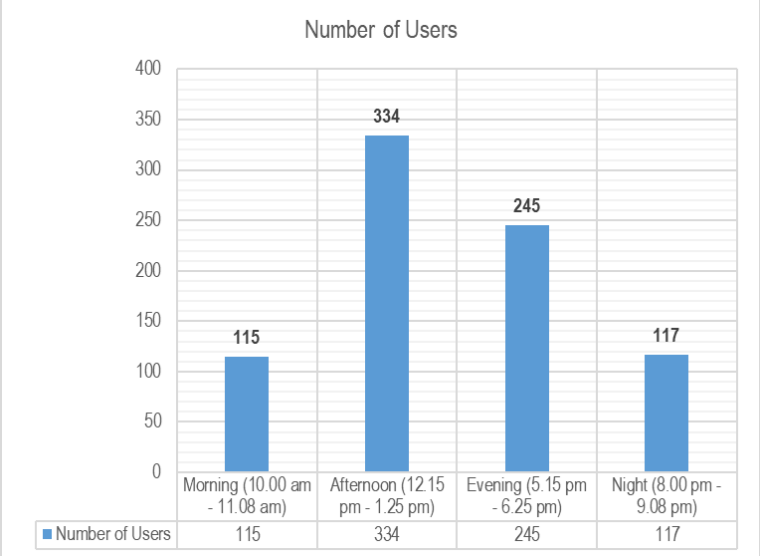
Overall, during the five days of observation, a total of 811 users were recorded in the four blocks of Mass Street. Among all the blocks, the highest number of users (230) were observed in block D, followed by block C with 213 users, block A with 190 users, and block B with 178 users. The following graph illustrates the total number of users on each block at Mass Street.

Graph 7-9: Total number of users on each block at Mass Street.

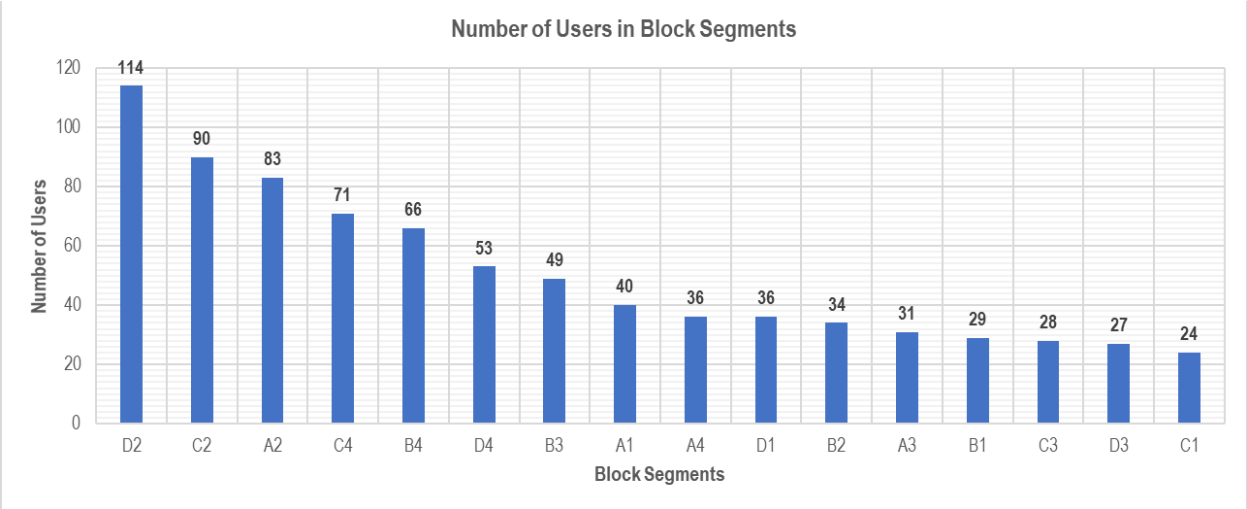


In terms of observation periods, number of users increased significantly during the afternoon and evening observation periods. As illustrated in graph 6-10, a total of 334 (41.2%) users were observed during afternoon observations, and a total of 245 (30.2%) users were observed during evening observations in the four study blocks.

Graph 7-10: Number of users in different observation periods.



Graph 7-11: Number of users in block segments.



In terms of block segments, it is noticeable that out of the sixteen block segments, some segments had significantly more users than other segments. As illustrated in graph 6-11, block segment D2, C2, A2, C4, B4, and D4 had a greater number of users engaged in stationary sidewalk activities and thus, these block segments were more active and livelier. Out of 811 users, 526 (64.9%) were observed in these seven segments. The following figure shows the most active zones in the four study blocks.

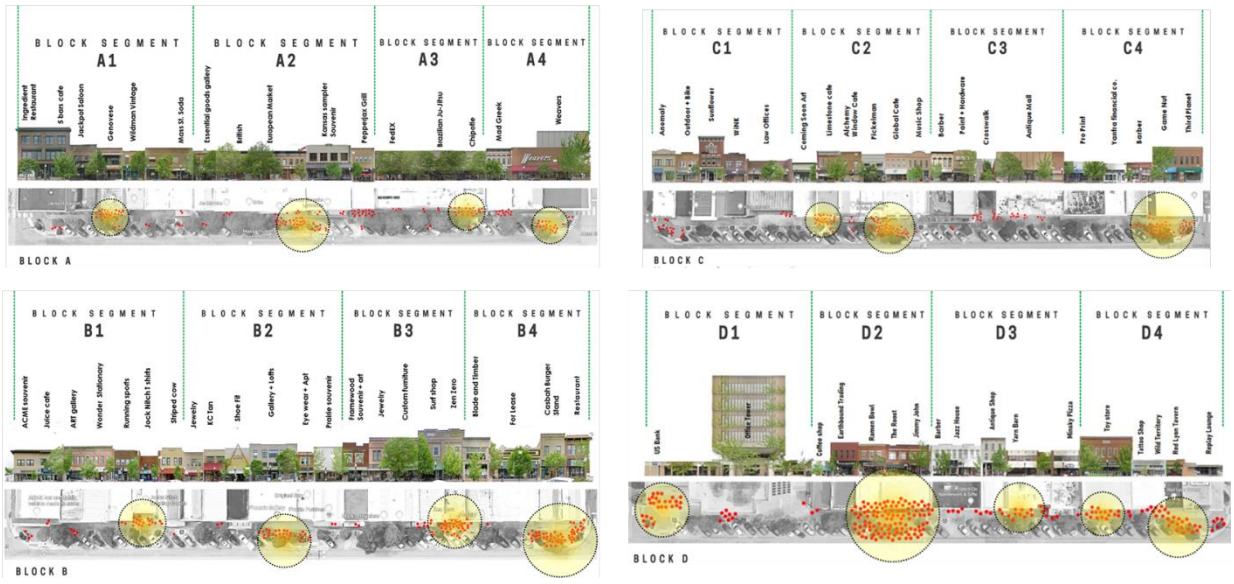


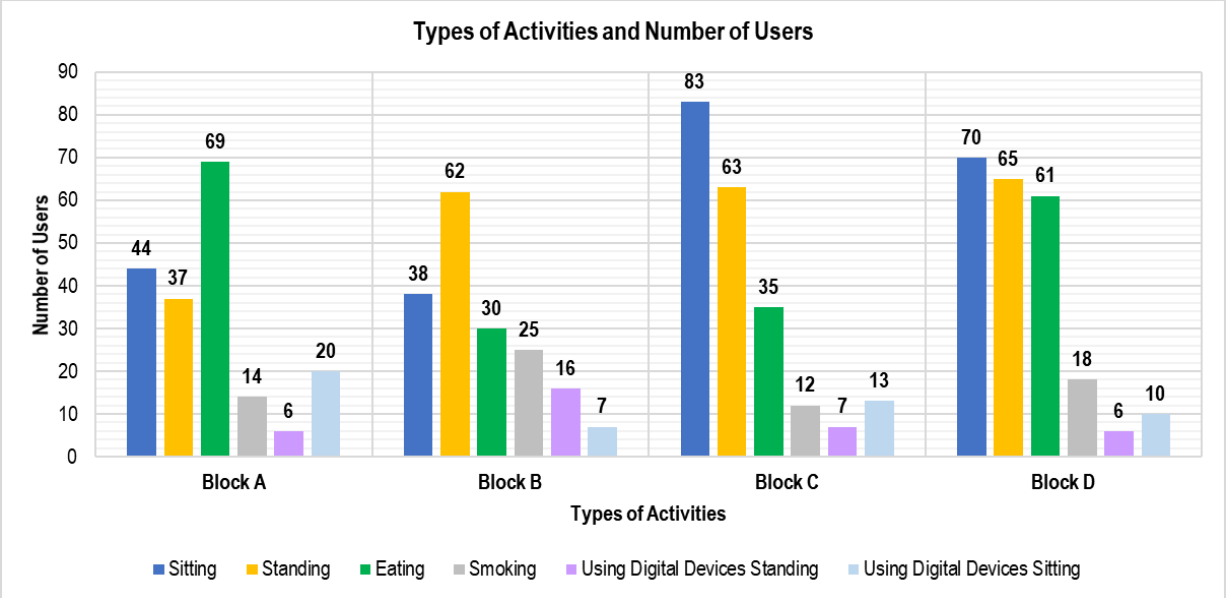
Figure 7.29: Active zones in four study blocks at Mass Street.

As illustrated in Table 7-2 and Graph 7-12, the highest number of users (235, 29%) were engaged in sitting activities. These users were conversing, reading, listening to street performers, watching other people or just relaxing. Among all blocks, block C (83) and block D (70) had a greater number of users who were involved in sitting activities. In terms of standing activity, all the blocks had significant number of users except block A. In total, 227 (28%) users were engaged in standing activities. Block A and block D had a good number of users who were eating; overall, in four blocks, a total of 195 (24%) users were eating. There were some other users who were either smoking or using digital devices.

Table 7-2: Types of activities in four study blocks.

Type of Activity	Block A	Block B	Block C	Block D	Total
Sitting	44	38	83	70	**235**
Standing	37	62	63	65	**227**
Eating	69	30	35	61	**195**
Smoking	14	25	12	18	**69**
Using Digital Devices Standing	6	16	7	6	**35**
Using Digital Devices Sitting	20	7	13	10	**50**

Graph 7-12: Number of users engaged in various sidewalk activities in four study blocks.



Above discussion and graphical analysis provides us with an overall picture of various stationary activities and number of users in the four study blocks of Mass Street. One notes that, out of the sixteen block segments, only some block segments are highly used. In chapter 9, I discuss in detail some of the factors that contribute to the liveliness of these segments; before that analysis, however, I first examine stationary sidewalk activities on Manhattan's Poyntz Avenue.

Stationary Activities in Poyntz Avenue

Formal observations in Poyntz Avenue were conducted from Tuesday, 23rd October to Saturday, 27th October, 2018. Directed observations were conducted at four different time periods each day (Table 7-3); the duration of observations in Poyntz Avenue was the same as the duration of observations in Mass Street. Stationary activities of users were recorded on the base map while walking from one end of a block to the other. In the following section, I discuss the stationary sidewalk activities on each of the four blocks in Poyntz Avenue.

Table 7-3: Observation schedule of Poyntz Avenue.

Observation Period	Time Span
Morning	10.00 am - 11.08 am
Afternoon	12.15 pm - 1.25 pm
Evening	05.15 pm - 06.25 pm
Night	07.30 pm - 08.38 pm

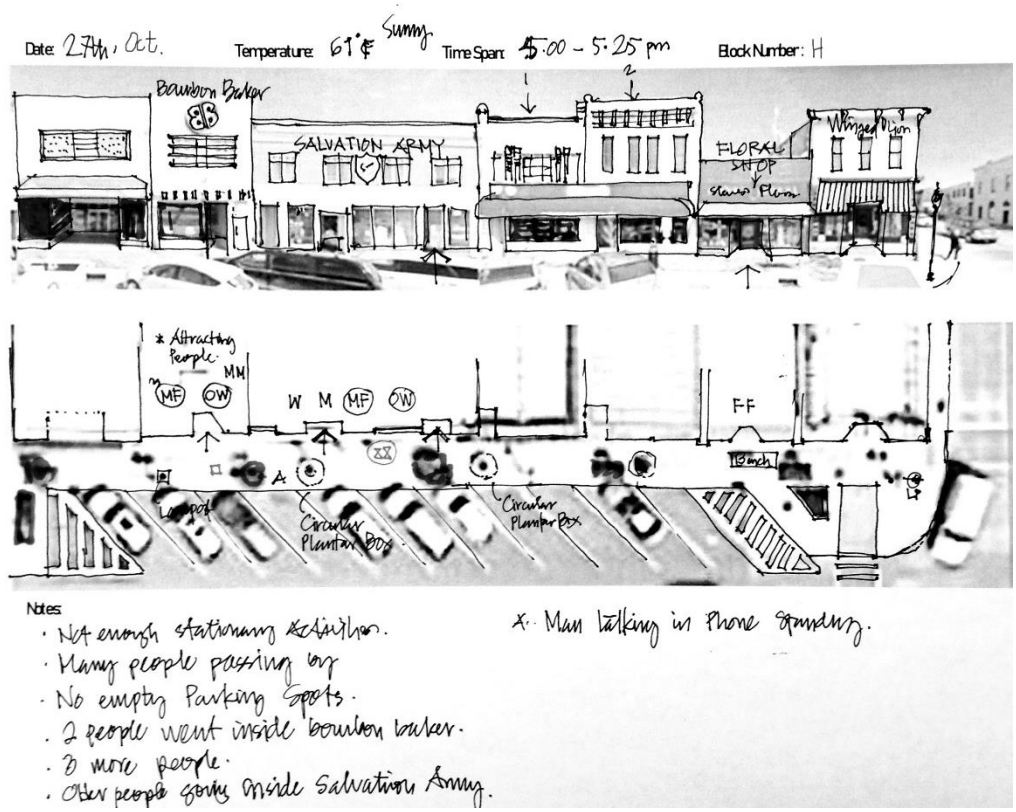


Figure 7.30: Behavior mapping sheet of Poyntz Avenue.

Stationary Activities in Block E

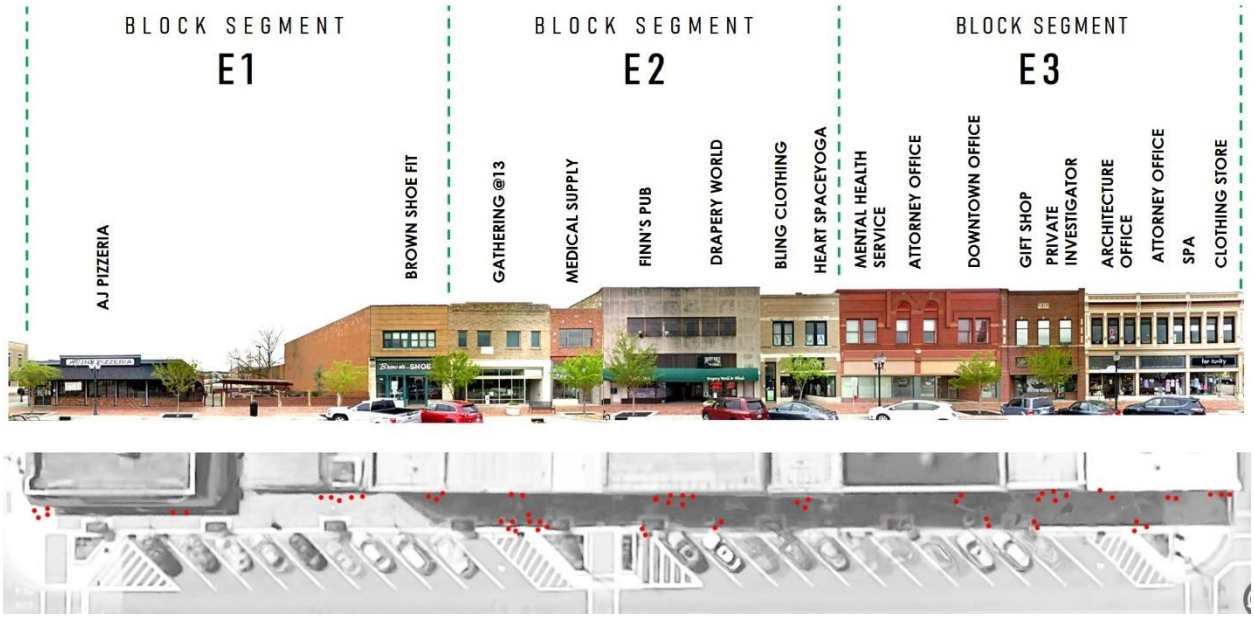


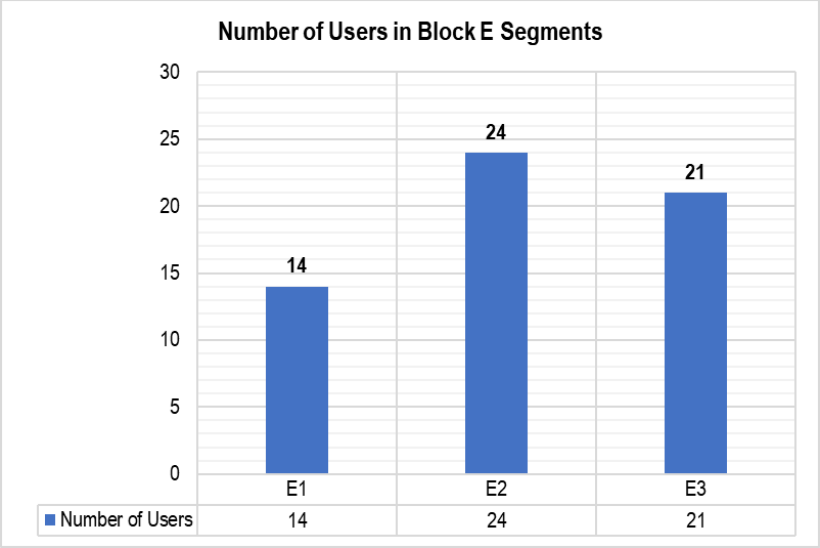
Figure 7.31: Stationary activities in block E.

As illustrated in figure 6.31, a total of 59 users were observed in the three different segments of block E. Block segment E1 had 14 (23.7%) users, block segment E2 had 24 (40.7%) users, and block segment E3 had 21 (35.6%) users. In block segment E1, users were standing and conversing beside the outdoor seating area of the pizza shop. In block segment E2, a few users were observed sitting on a bench in front of the gift shop, and a few others were leaning on a circular planter box. In block segment E3, some users were observed looking at display windows and a few users were sitting on another bench.

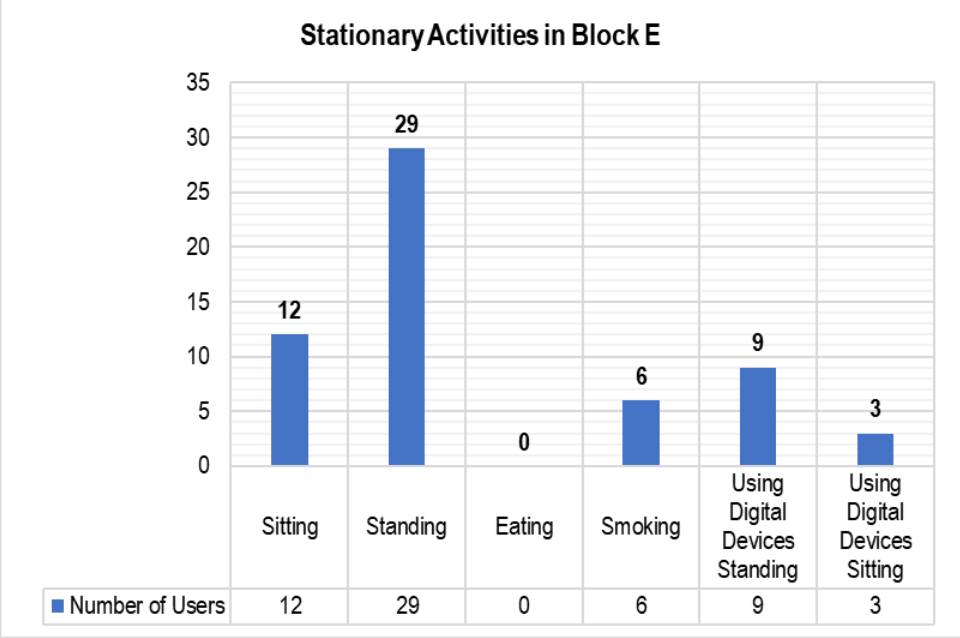
Figure 7.32: Views of block E.

Overall, a total of 59 users were engaged in stationary sidewalk activities in block E. Out of 59 users, 29 (49.2%) were standing and 12 (20.3%) were sitting on benches. A few users were observed smoking and using digital devices. It is significant that there were no distinct zones of activity, and even though there were two public benches, most of the users were observed at random locations on the sidewalk. The following graphs illustrate the total number of users and activities in block E.

Graph 7-13: Number of users in block E segments.



Graph 7-14: Stationary activities in block E.



Stationary Activities in Block F

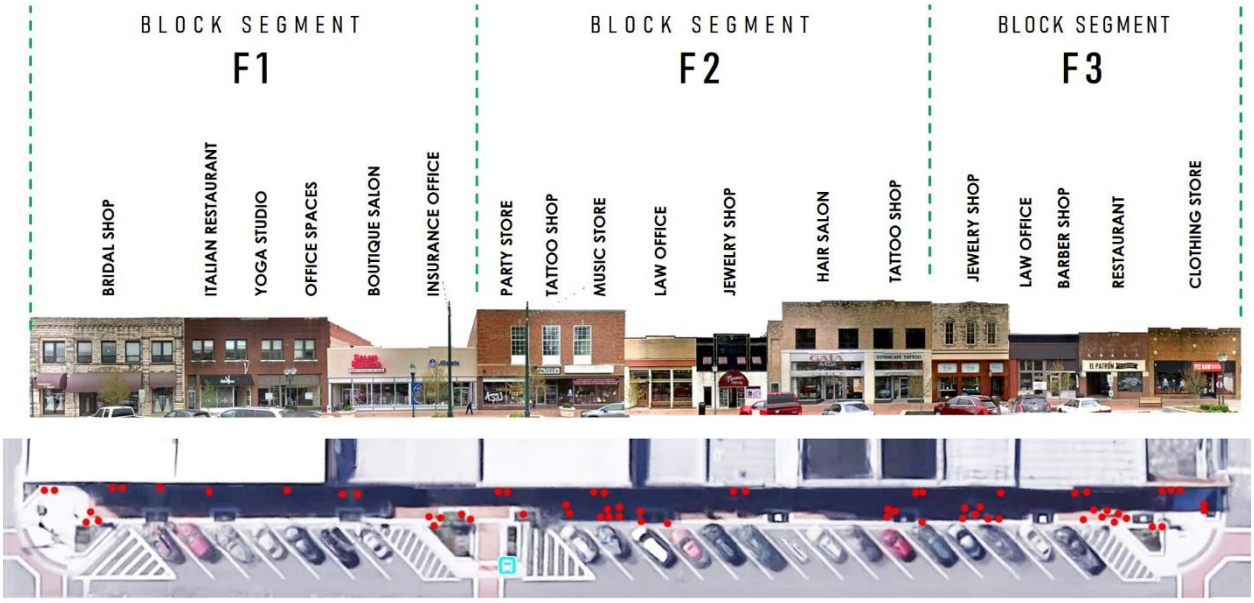


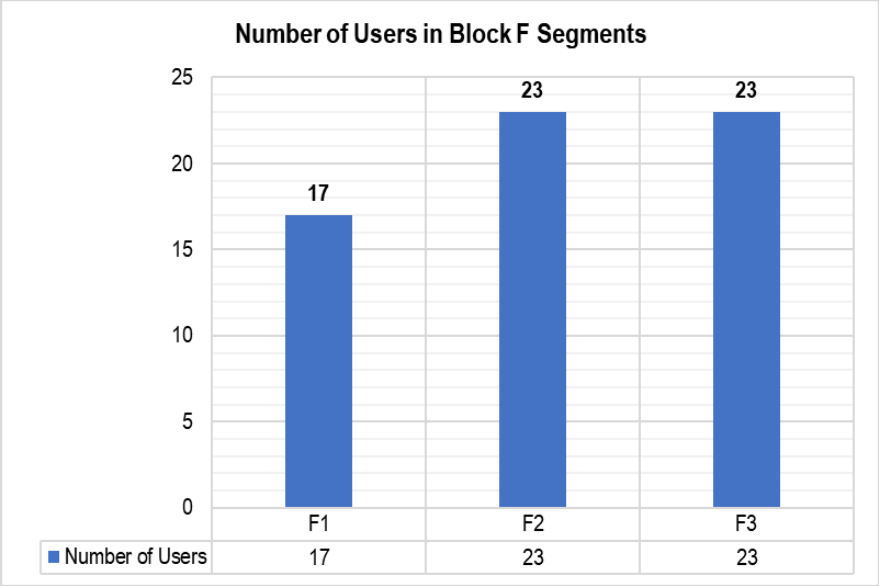
Figure 7.33: Stationary activities in block F.

There was a total of 63 users in different segments of block F. Block segment F1 had 17 (27.0%) users, block segment F2 had 23 (36.5%) users, and block segment F3 also had 23 (36.5%) users during the five days of observations. In block segment F1, most of the users were observed looking at display windows and a few users were smoking. In block segment F2, a few users were sitting on the bench in front of the tattoo shop and a few others were smoking. In block segment F3, most of the users were observed in front of the Mexican restaurant which has a bench, and a few users were observed eating snacks while sitting on the bench.

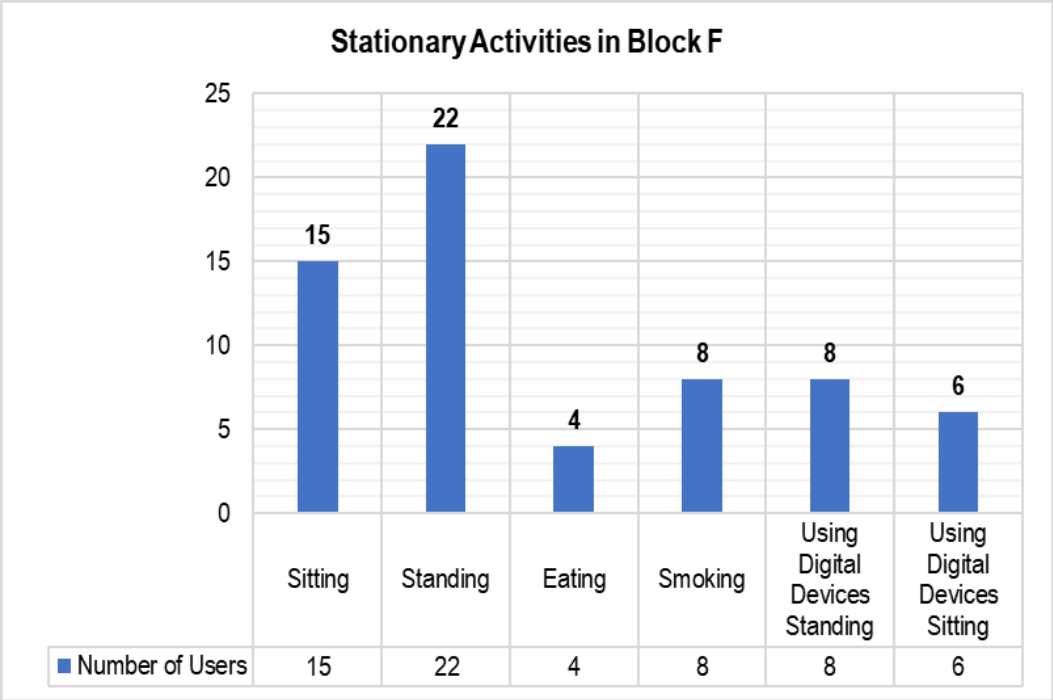
Figure 7.34: Views of block F.

Overall, out of 63 users, 22 (34.9%) were standing, 15 (23.8%) were sitting, 8 (12.7%) were smoking, 4 (6.3%) were eating, and a few other users were using digital devices while sitting or standing. The following graphs illustrate the number of users in each block segment and the activity types in block F.

Graph 7-15: Number of users in block F segments.



Graph 7-16: Stationary activities in block F.



Stationary Activities in Block G

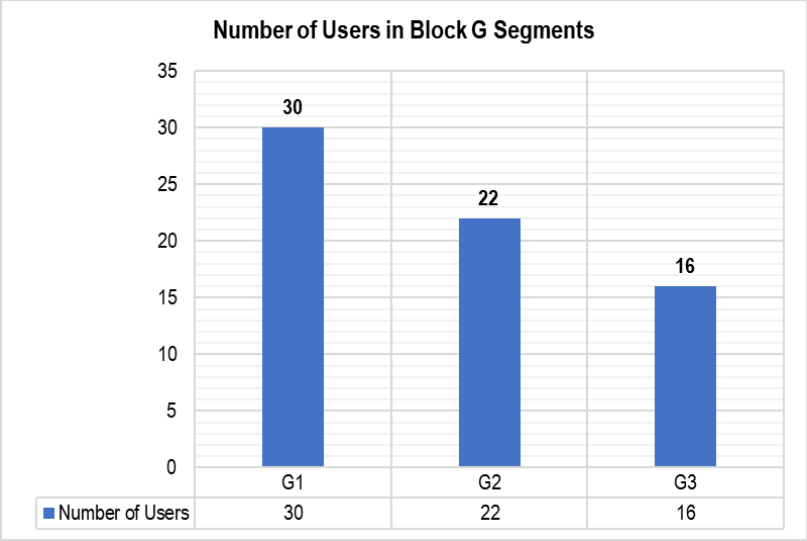
Figure 7.35: Stationary activities in block G.

As illustrated in figure 6.35, a total of 68 users were observed in different segments of block G. Block segment G1 had 30 (44.1%) users, block segment G2 had 22 (32.4%) users, and block segment G3 had 16 (23.5%) users. Block segment G1 includes the district courthouse having an outdoor seating area; a good number of users were observed sitting in this zone and some users were observed near the two ledges in front of the courthouse lawn. In block segment G2, a few users were standing and conversing underneath the awning of the opera house, and a few others were sitting on the public bench. In block segment G3, most of the users were observed sitting on a bench, and a few users were smoking.

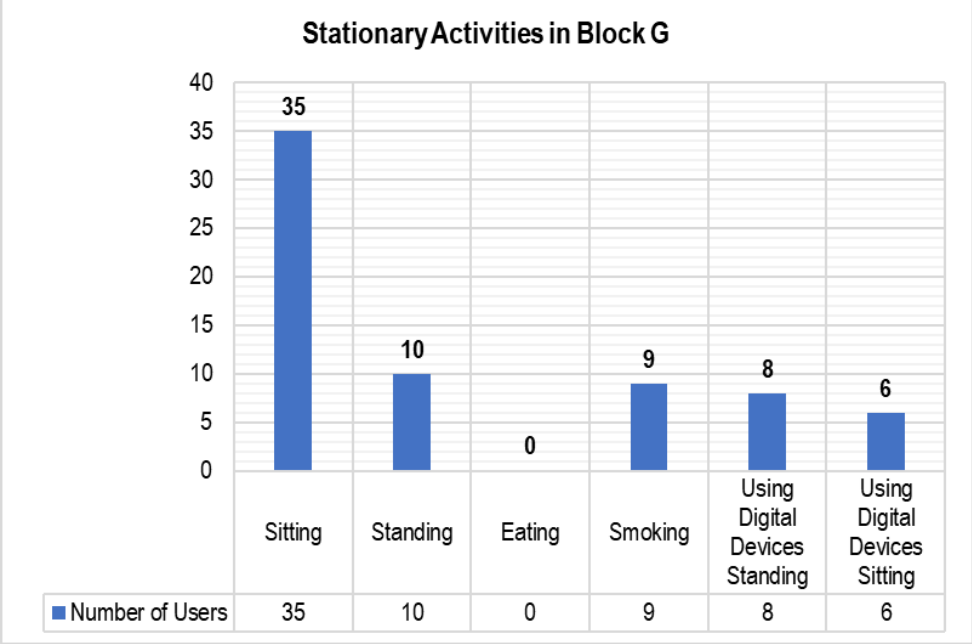
Figure 7.36: Views of block G.

Overall, a total of 68 users were engaged in stationary sidewalk activities in different segments of block G. In terms of activities, 35 (51.5%) users were sitting, 10 (14.7%) users were standing, 9 (13.2%) were smoking, and 14 (19.6%) were using digital devices. As illustrated in graph 6-18, it is notable that a good number of users were sitting in block G, partly because of the planter box ledges in front of the courthouse and the two benches were also frequently used.

Graph 7-17: Number of users in block G segments.



Graph 7-18: Stationary activities in block G.



Stationary Activities in Block H

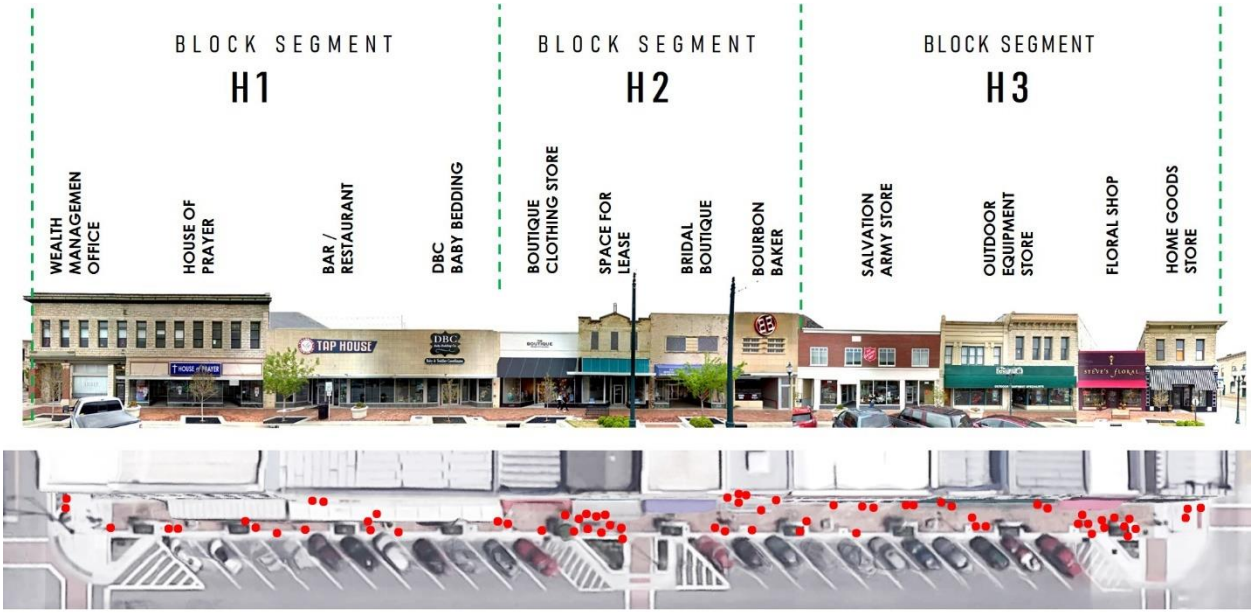


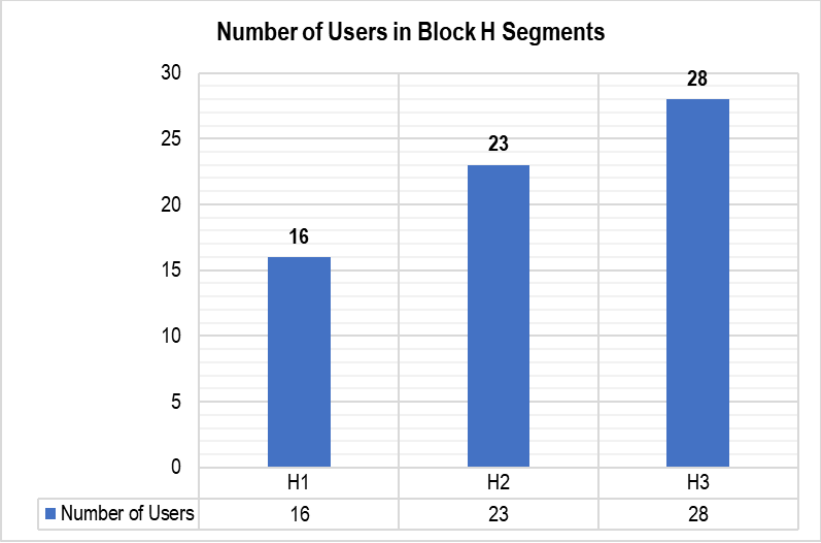
Figure 7.37: Mapping of stationary activities in block H.

As illustrated in Figure 7.37, a total of 67 users were engaged in stationary sidewalk activities in different segments of block H. Block segment H1 had 16 (23.9%) users, block segment H2 had 23 (34.3%) users, and block segment H3 had 28 (41.8%) users. Block segment H1 was the least active of the three segments; most of the users in this segment were standing, conversing, or smoking. In block segment H2, most of the users were sitting on the public bench and a few users were standing and conversing. Block segment H3 also contains a public bench and it was occupied by several users.

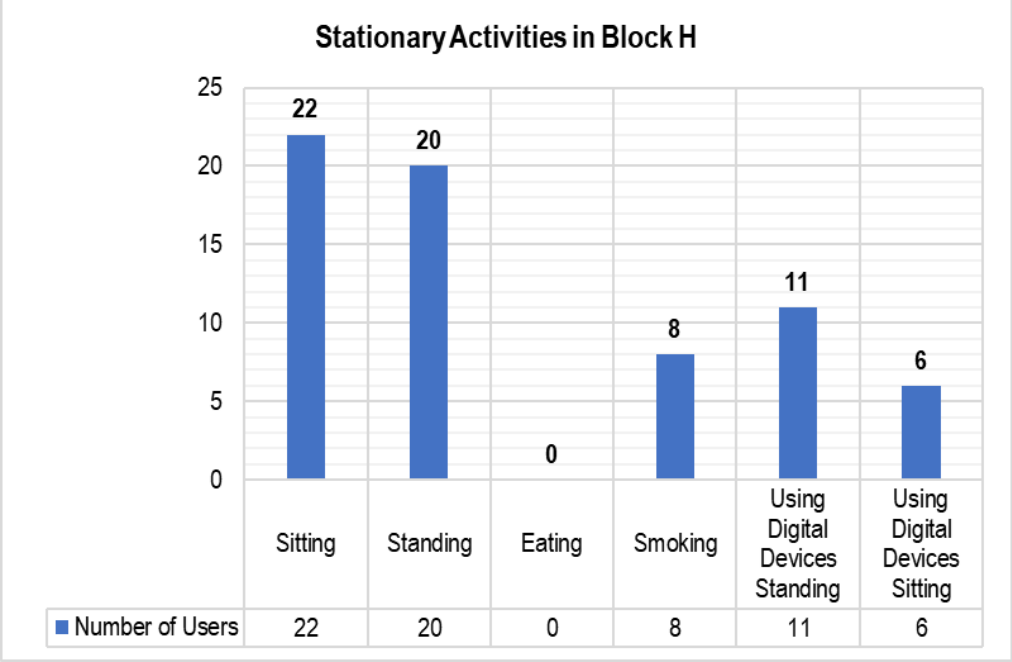
Figure 7.38: Views of block H.

Overall, a total of 67 users were engaged in stationary activities and among all the users, 22 (32.8%) were sitting, 20 (29.9%) were standing, 8 (11.9%) were smoking, and 17 (25.4%) were using digital devices. As illustrated in Figure 7.37, apart from the two benches in block segment H2 and H3, there were no other distinct zones of activity in block H. The following graphs illustrate the total number users in each block segment and the number of different stationary activities in block H.

Graph 7-19: Number of users in block H segments.

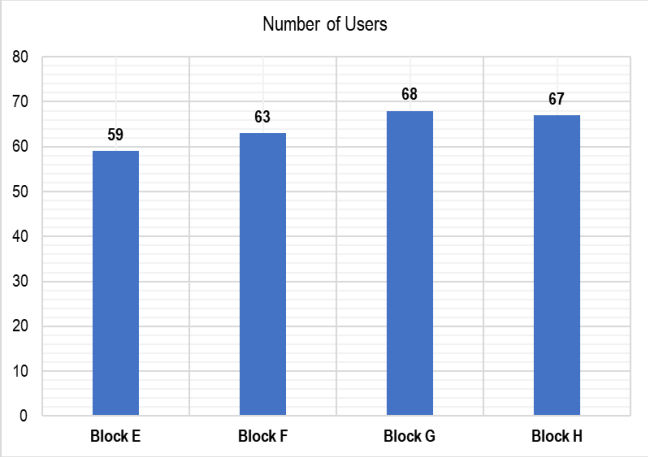


Graph 7-20: Stationary activities in block H.



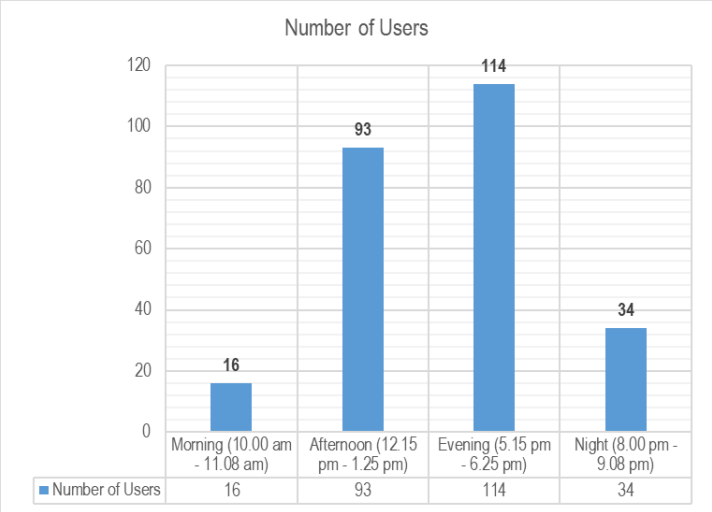
Overall, during the five days of observations, a total of 257 users were recorded in the four blocks of Poyntz Avenue. Among all the blocks, the highest number of users were observed in block G (68, 26.5%); block E had 59 (23.0%) users, block F had 63 (24.5%) users, and block H had 67 (26.0%) users. The following graph illustrates the total number of users on each block at Poyntz Avenue.

Graph 7-21: Number of users on each block at Poyntz Avenue.

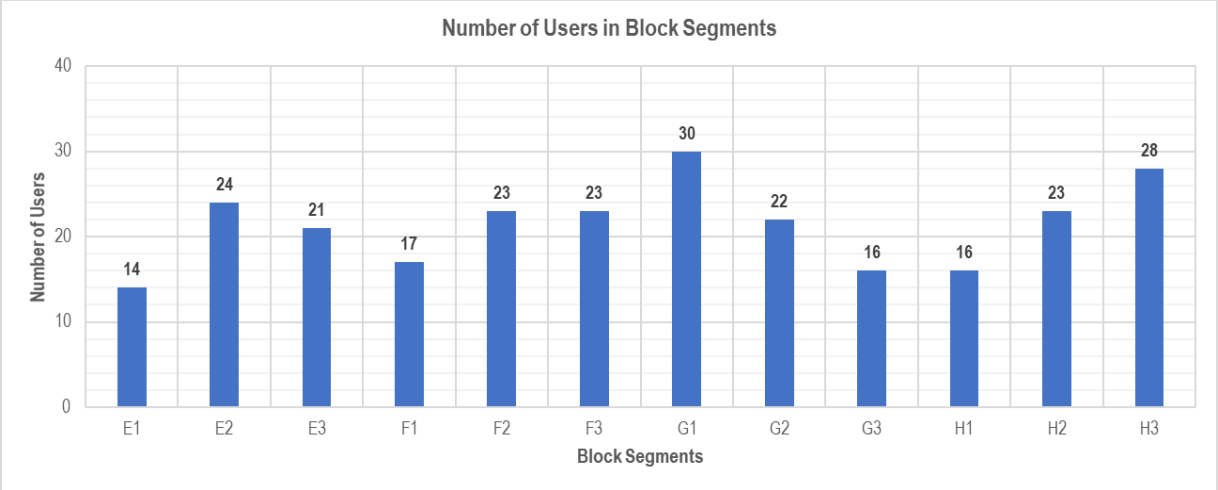


In terms of observation periods, the highest number of users were observed during the evening observation periods. As illustrated in graph 6-22, 114 (44.4%) users were observed during evening observations, 93 (36.2%) users were observed during afternoon observations, 34 (13.2%) users were observed during night observations, and 16 (6.2%) users were observed during the morning observations in the four study blocks.

Graph 7-22: Number of users in different observation periods.



Graph 7-23: Number of users in block segments of Poyntz Avenue.



In terms of block segments, the number of users was similar on most of the segments. The highest number of users (30) was observed in block segment G1 and the lowest number of users (14) was observed in block segment E1. Unlike the block segments at Mass Street (Figure 7.29), none of the Poyntz blocks had distinct zones of activity. Other than sitting activities on benches, there was no recurrent stationary activity at any block segments of Poyntz (Figure 7.39).

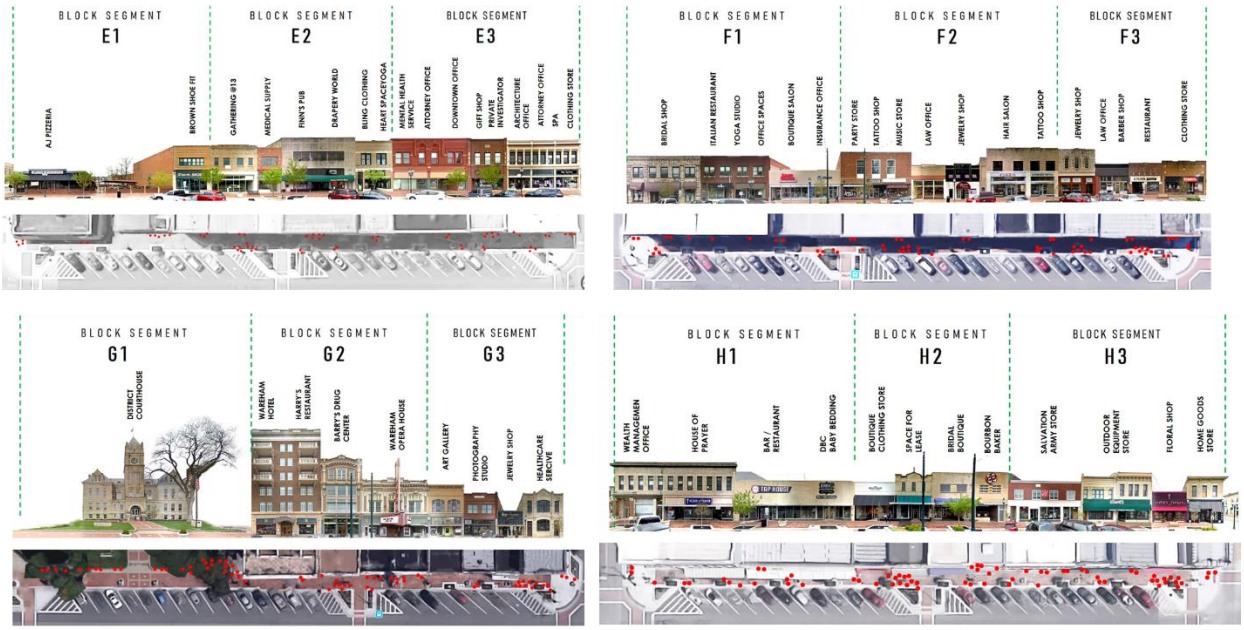


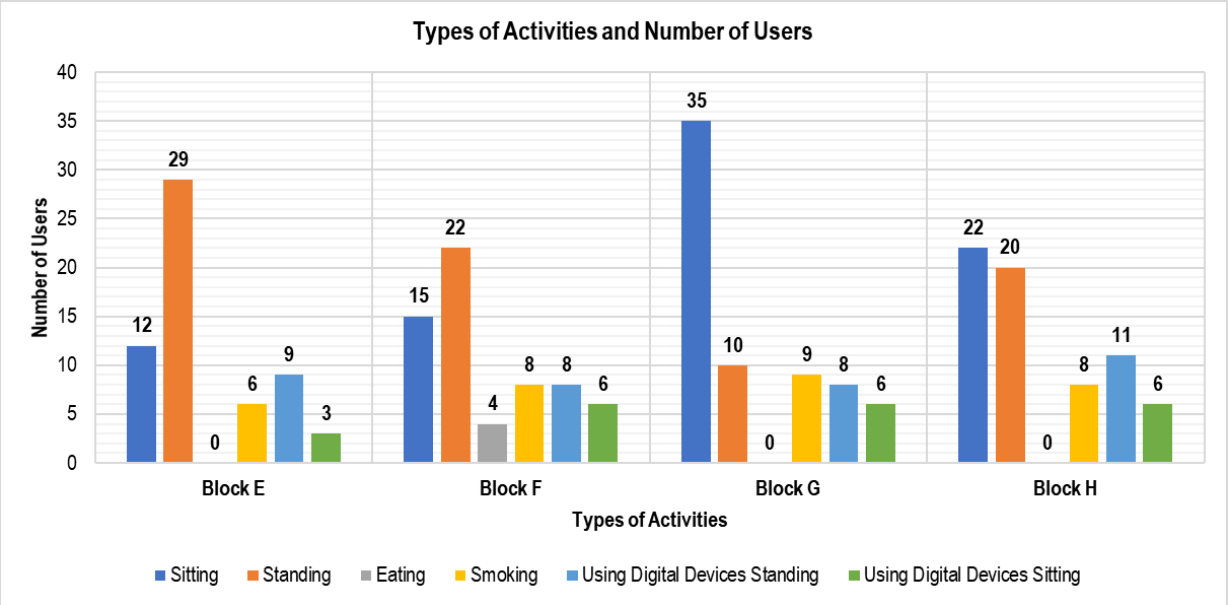
Figure 7.39: Stationary activity in four blocks at Poyntz Avenue.

In terms of types of activities, 84 (32.7%) users were sitting and 81 (31.5%) users were standing. The highest number of users (35) were sitting in block G, which had two public benches. Unlike Mass Street, a very low number of users (4) were eating due to the lack of restaurants and outdoor seating areas. 31 (12.1%) users were smoking and 36 (14.0%) users were using digital devices while standing; a few users (21) were also using digital devices while sitting. The following table and graph illustrate the type of activities and number of users in the four study blocks at Poyntz Avenue.

Table 7-4: Types of activities and number of users in four blocks of Poyntz Avenue.

Type of Activity	Block E	Block F	Block G	Block H	Total
Sitting	12	15	35	22	**84**
Standing	29	22	10	20	**81**
Eating	0	4	0	0	**4**
Smoking	6	8	9	8	**31**
Using Digital Devices Standing	9	8	8	11	**36**
Using Digital Devices Sitting	3	6	6	6	**21**

Graph 7-24: Types of activities and number of users in four blocks of Poyntz Avenue.



Overall, the above analysis provides us with a summary of various stationary activities and the number of users in the four study blocks of Poyntz Avenue. One notes that block segments of Poyntz Avenue had a very low number of users compared to the number of users on Mass Street. These differences between Mass Street and Poyntz Avenue are discussed further in Chapter 9. Before that, however, in the next section, I discuss the pedestrian flow and frequency at the study blocks of Mass Street and Poyntz Avenue.

Chapter 8: Observing Pedestrian Flows and Movement Patterns

Directed observations were carried out on each of the four study blocks at Mass Street and Poyntz Avenue to record pedestrian flows and movement patterns. Recording pedestrian activity on the study blocks was essential in identifying how many users were visiting the downtown streets during the four observation periods each day. Each study block was observed for ten minutes in each observation period and to get an overall idea of the number of users in motion, both ends of a block was observed for five minutes. To record the number of users on the base map, each end of a block was marked with an 'end line' (Figure 8.1) and users crossing the end lines were counted to get the total number of users.

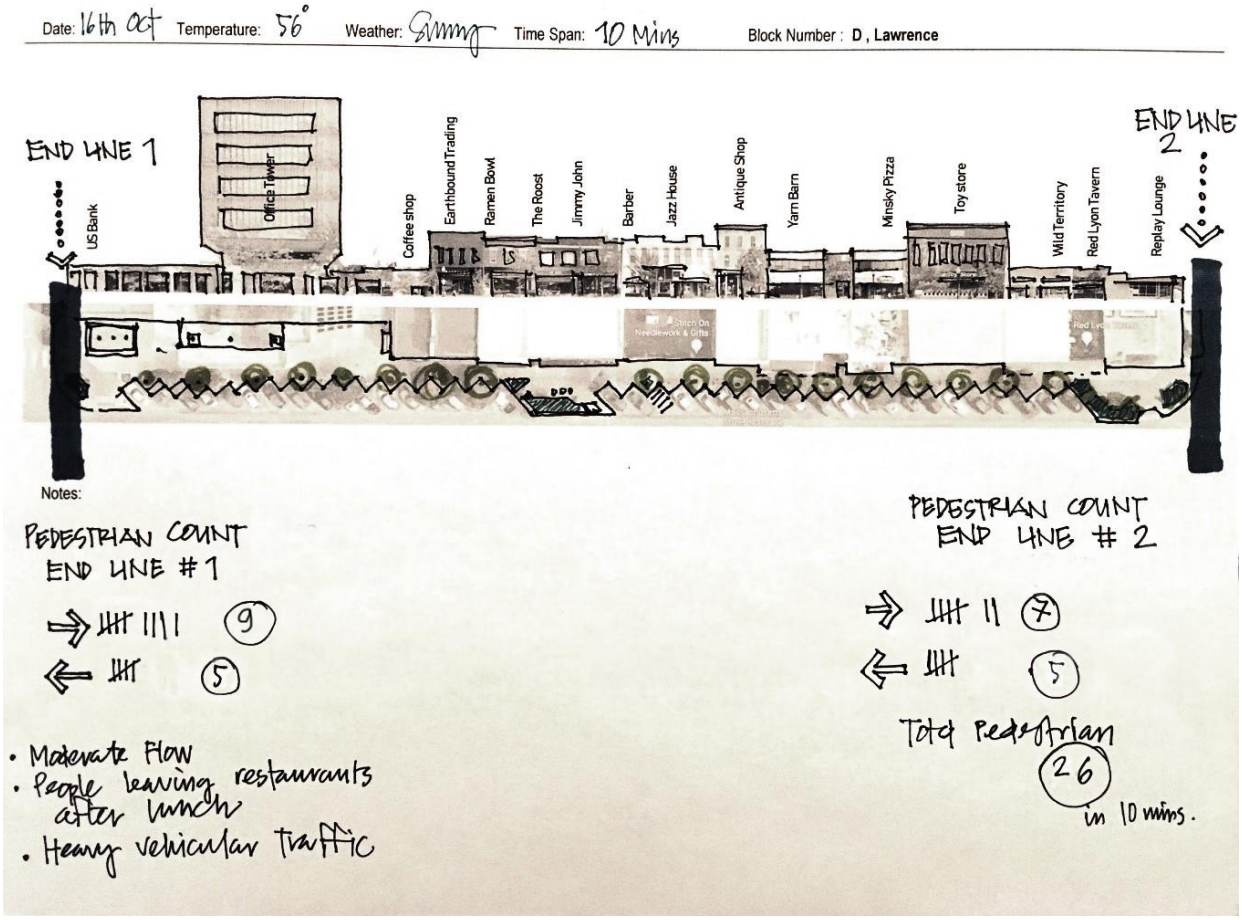


Figure 8.1: Sample of base map used for pedestrian observations.

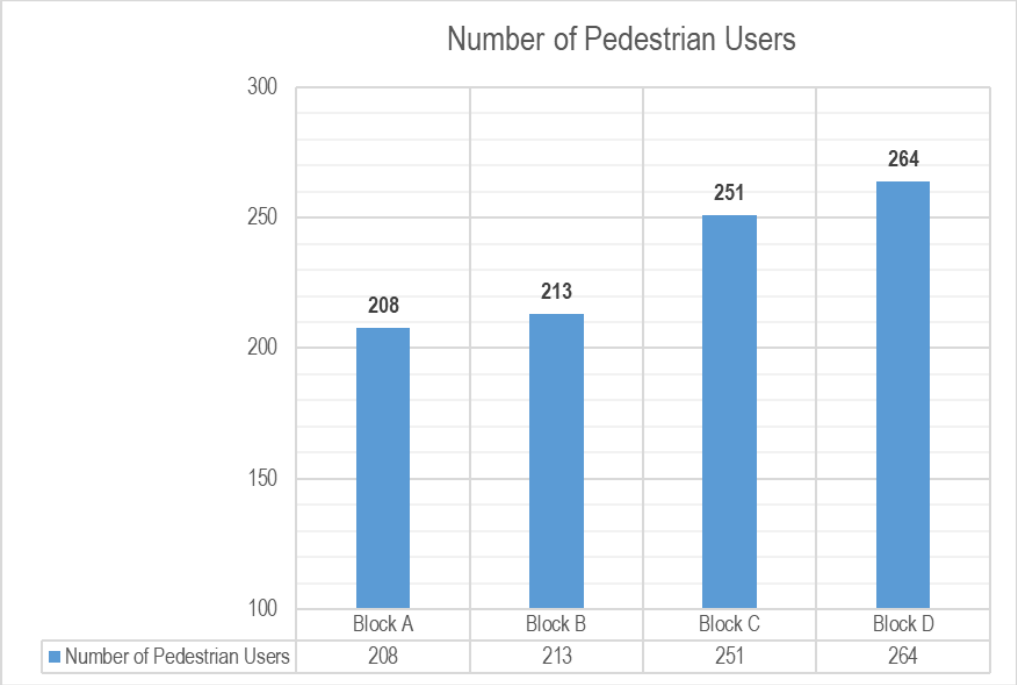
Pedestrian Movement on Massachusetts Street

To record pedestrian movement in the four study blocks of Massachusetts Street, observations were carried out at four different time periods each day for five days from Tuesday, 16th October, to Saturday, 20th October. The following table illustrates the schedule of observation periods in Mass Street.

Table 8-1: Schedule of observations of pedestrian movement in Mass Street.

Observation Period	Time Span
Morning	11.10 am - 12.04 pm
Afternoon	01.28 pm - 02.22 pm
Evening	06.30 pm - 07.24 pm
Night	08.40 pm - 09.34 pm

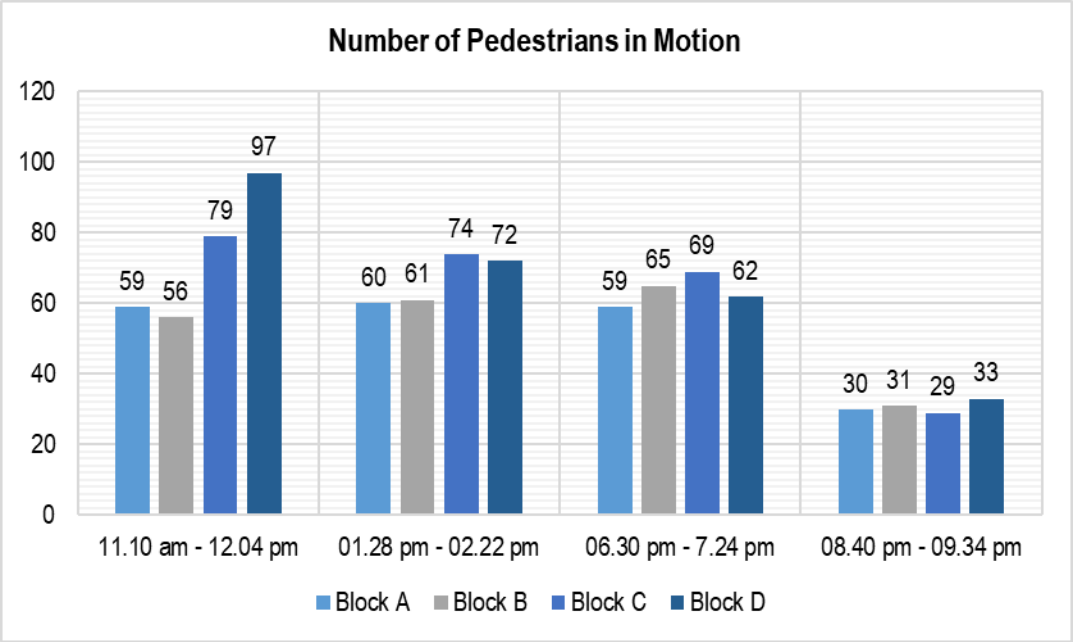
Graph 8-1: Number of users in motion in each study block of Mass Street.



Overall, in terms of pedestrian movement, a total of 936 users were observed in the four study blocks of Mass Street. As illustrated in Graph 8-1, the highest number of users (264) were recorded in block D, followed by block C with 251 users. Block A (208) and block B (213) also had a good number of pedestrian users during the five days of observations.

Figure 8.2: Pedestrian activities in study blocks of Mass Street.

Graph 8-2: Number of pedestrians in motion in different time periods of a day.



In terms of time periods, the highest number of pedestrian users (291) was recorded during morning observation periods from 11.10 a.m. to 12.04 p.m. and a total of 267 pedestrian users were observed during the afternoon observations from 01.28 p.m. to 02.22 p.m. It can be inferred that the high intensity of pedestrian flow in these two time periods is due to the number of available restaurants on the study blocks, as many people come to Mass Street to have their lunch and return to work after the lunch hour. Since there are several offices and institutions nearby, it was observed that many users preferred to walk to various restaurants from their respective workplaces, and this contributed to the high intensity of pedestrian flow. In the evening observations from 06.30 p.m. to 07.24 p.m., a total of 255 pedestrian users were observed. During these hours, many pedestrians used the sidewalks to jog, or have a stroll, or walk their pets. The number of pedestrian users (123) decreased significantly during the night observations from 08.40 p.m. to 09.34 p.m.; this could be due to the low temperatures (44f – 54f) at night as it was not entirely comfortable to stay outdoors during these hours. Apart from the restaurants, many stores were closed during the night observations.

Graph 8-3: Number of pedestrians in motion in each day of observation in Mass Street.

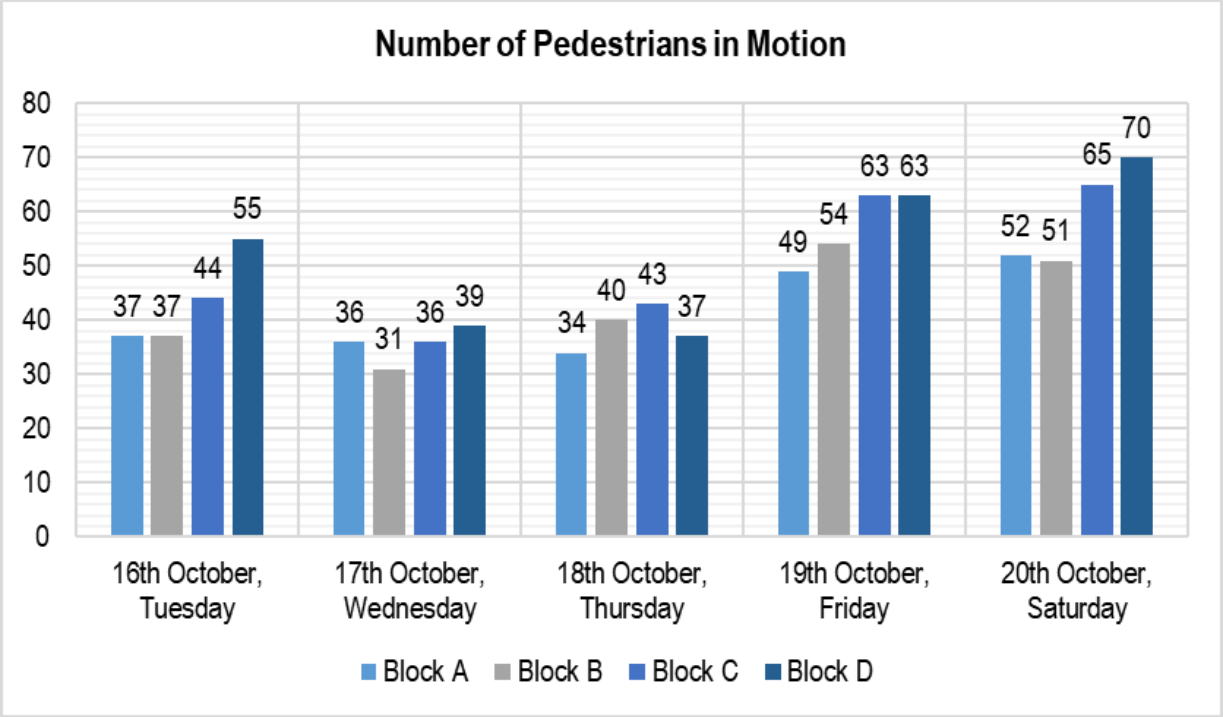


Table 8-2: Number of pedestrians in motion in each day of observation at Mass Street.

	Temperature Range	Block A	Block B	Block C	Block D	Total
16th October, Tuesday	43 F - 64 F	37	37	44	55	**173**
17th October, Wednesday	48 F - 69 F	36	31	36	39	**142**
18th October, Thursday	53 F - 66 F	34	40	43	37	**154**
19th October, Friday	52 F - 66 F	49	54	63	63	**229**
20th October, Saturday	44 F - 64 F	52	51	65	70	**238**

As illustrated in Graph 8-3 and Table 8-2, the number of pedestrians was similar on Tuesday (173), Wednesday (142), and Thursday (154). However, the numbers increased on Friday (229) and Saturday (238). A good number of pedestrian users were observed during Friday evening hours as it was the end of the week and many people came to Mass Street blocks for shopping, food, and recreation. The highest number of pedestrian users (238) was observed on Saturday as it was a weekend and a large number of users visited Mass Street during lunch hours and evening hours.

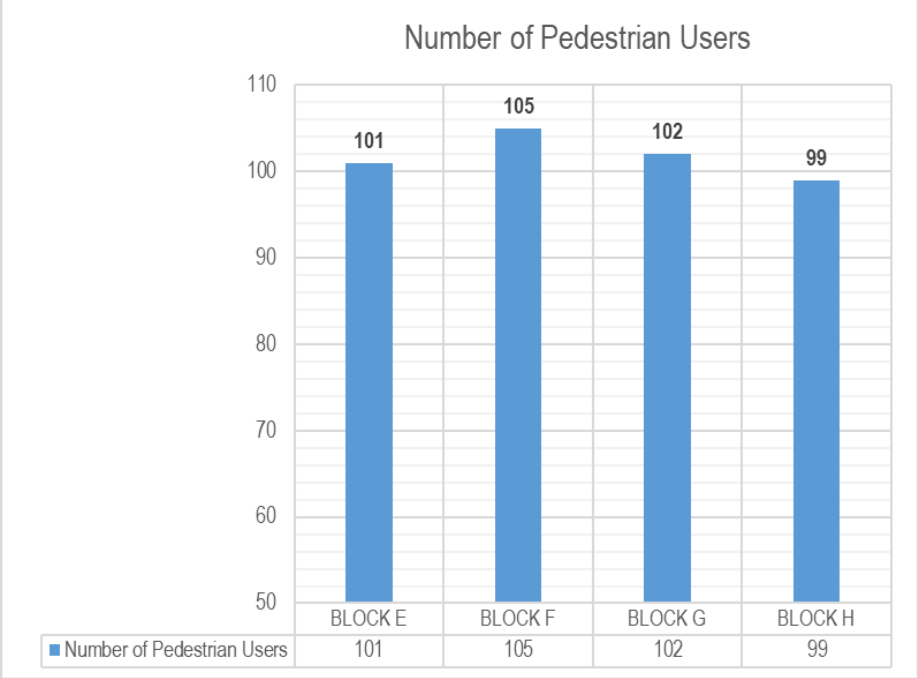
Pedestrian Movement on Poyntz Avenue

To record pedestrian movement in the four study blocks of Poyntz Avenue, observations were carried out for five days from Tuesday, 23rd October, to Saturday, 27th October. The following table illustrates the schedule of observation periods in Poyntz Avenue.

Table 8-3: Schedule of pedestrian observations in Poyntz Avenue.

Observation Period	Time Span
Morning	11.10 am - 12.04 pm
Afternoon	01.28 pm - 02.22 pm
Evening	06.30 pm - 07.24 pm
Night	08.40 pm - 09.34 pm

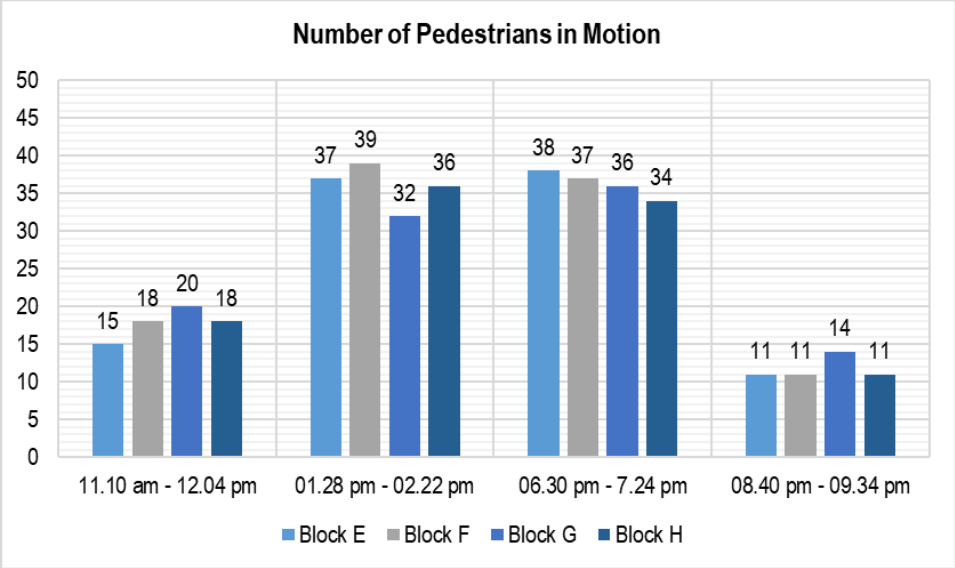
Graph 8-4: Number of pedestrians in motion in each block of Poyntz Avenue.



Overall, a total of 407 pedestrians were observed in the four study blocks of Poyntz Avenue. As illustrated in Graph 8-4, there was a similar number of pedestrians in all four study blocks during the five days of observations. 101 users were observed in block E, 105 users were observed in block F, 102 users were observed in block G, and 99 users were observed in block H.

Figure 8.3: Pedestrian activities in study blocks of Poyntz Avenue.

Graph 8-6: Number of pedestrians in motion in different time periods of a day.



In terms of observation periods, several pedestrians were observed during afternoon observations from 01.28 p.m. to 02.22 p.m. and during evening observations from 06.30 p.m. to 07.24 p.m. A total of 144 users were observed during afternoon observations, and a total of 145 users were observed during evening observations. As illustrated in Graph 8-6, the number of pedestrian users was significantly lower during morning observations from 11.10 a.m. to 12.04 p.m., and during night observations from 08.40 p.m. to 09.34 p.m.

Graph 8-5: Number of pedestrians in motion in each day of observation in Poyntz Avenue.

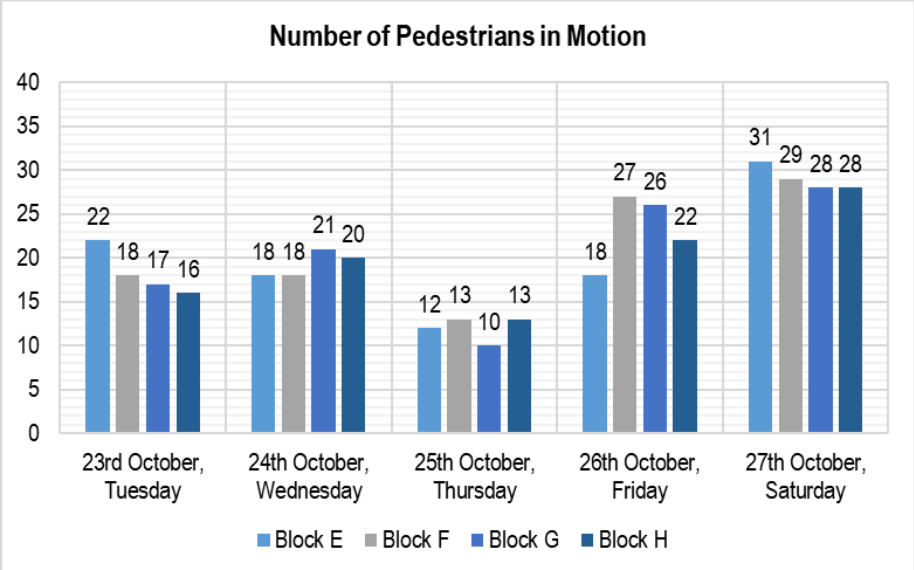
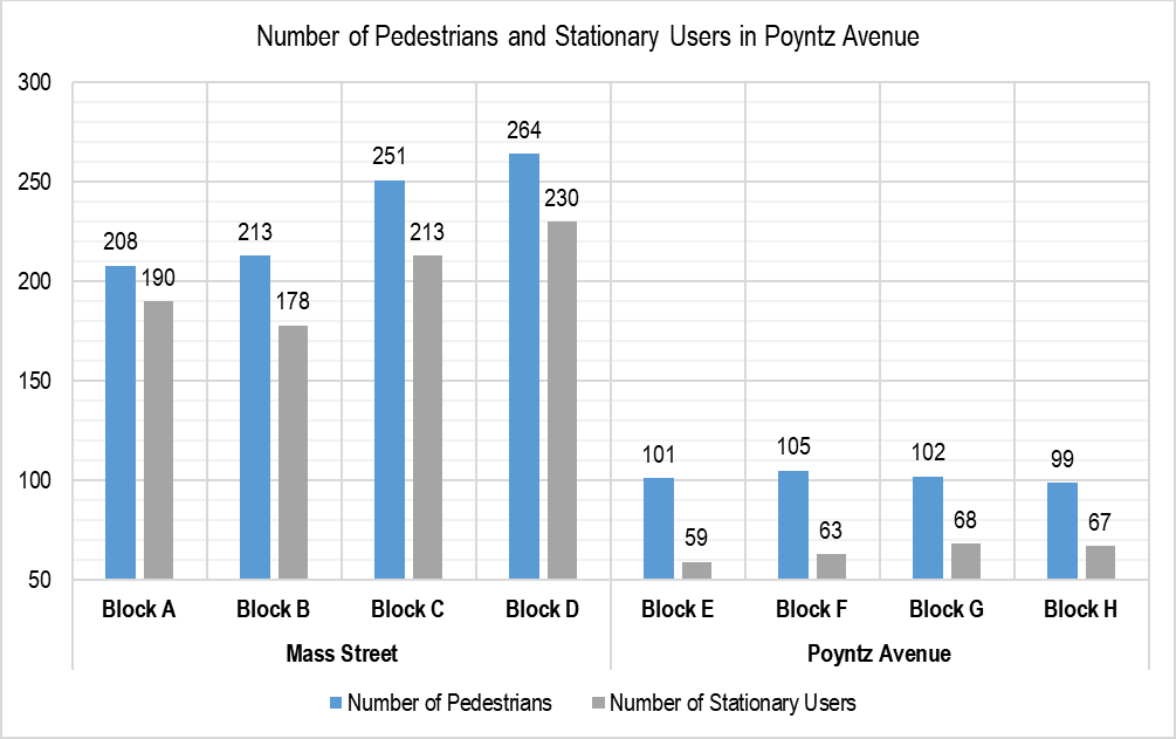


Table 8-4: Number of pedestrians in motion in each day of observation at Poyntz Avenue.

	Temperature Range	Block E	Block F	Block G	Block H	Total
23rd October, Tuesday	48 F - 64 F	22	18	17	16	**73**
24th October, Wednesday	45 F - 63 F	18	18	21	20	**77**
25th October, Thursday	47 F - 50 F	12	13	10	13	**48**
26th October, Friday	48 F - 52 F	18	27	26	22	**93**
27th October, Saturday	55 F - 71 F	31	29	28	28	**116**

As illustrated in Table 8-4 and Graph 8-5, the number of pedestrians was similar on Tuesday (73) and Wednesday (77). However, the number dropped significantly on Thursday (48) as it was comparatively a colder and windy day (Temperature range: 47 F to 50 F). Even though the temperature range was similar, there was an increase in the number of pedestrians on Friday as it was the last day of the week and a good number of people were observed during the evening and night hours. The highest number of pedestrians (116) was observed on Saturday as it was the weekend with a good weather and many people came to visit the downtown shops and stores during the afternoon and evening hours.

Graph 8-7: Number of pedestrians and stationary users in Mass Street and Poyntz Avenue.



Overall, it is evident from Graph 8-7 that Mass Street blocks had greater number of pedestrians than Poyntz Avenue throughout the five days of observations. By looking at Graph 8-7, one notes that the number of pedestrians and stationary users in Mass Street blocks are nearly similar. This can be an indication that the pedestrian flow in Mass Street positively impacts and contributes to stationary activities as well. Conversely in Poyntz Avenue, the number of stationary users is almost half of the number of pedestrians, which indicates that even though there is a steady pedestrian flow in each block of Poyntz Avenue, these pedestrians do not contribute much to stationary activities. Unlike Mass Street, pedestrians in Poyntz Avenue do not remain on the sidewalks for longer periods of time.

In the previous chapters, I have discussed the uses, sidewalk design, physical characteristics, and behavioral observations of both study sites. In the next chapter, I elaborate on these findings and I also discuss the positive and negative aspects of design elements and how the design and physical characteristics of the study sites impact user behavior and activity. Finally, I discuss how sidewalk design can be improved to encourage stationary and social activities, and ultimately, how design elements can contribute in creating livelier street environments for people.

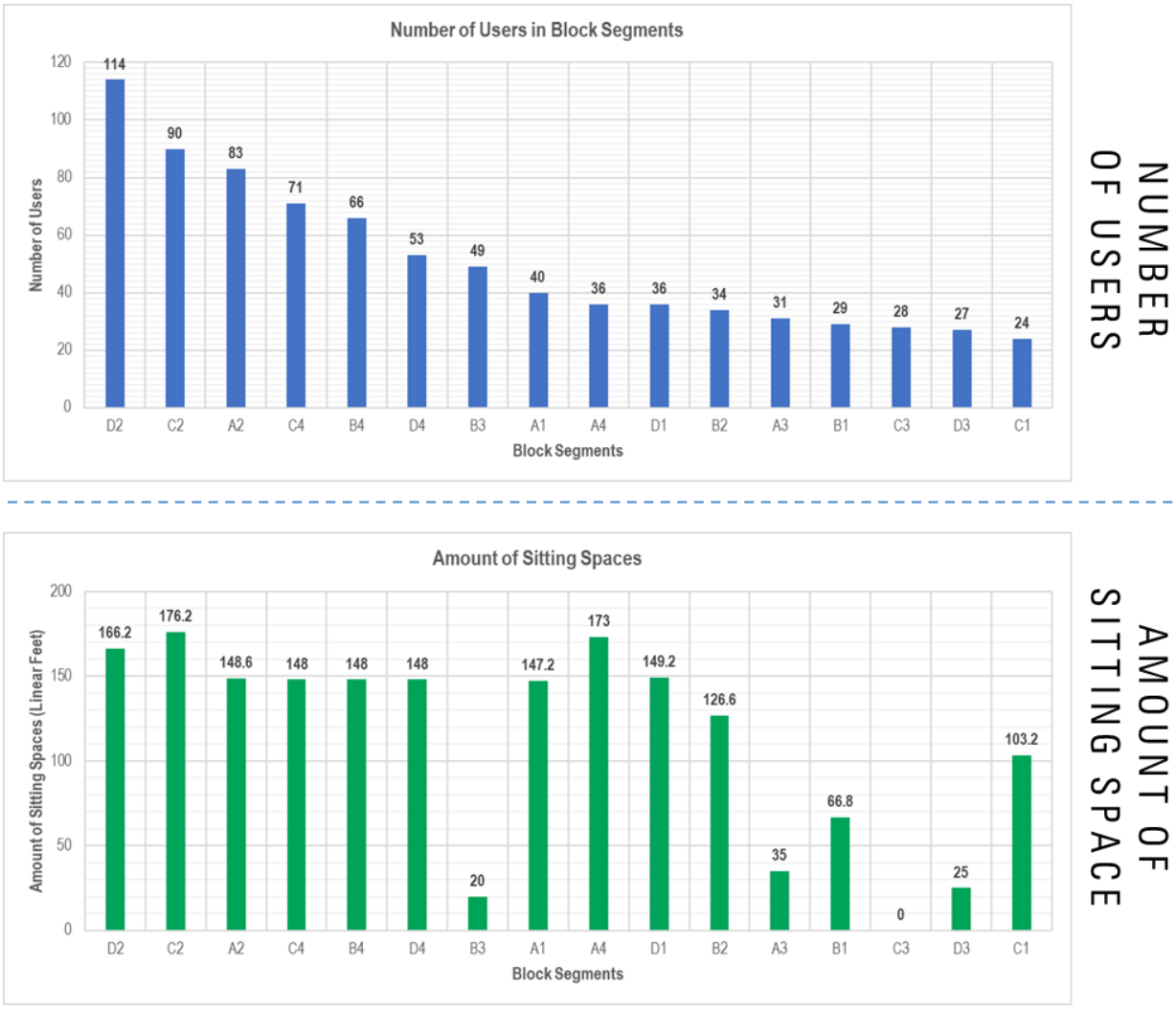
Chapter 9: Analysis, Interpretation, and Implication

So far, in the previous chapters of this thesis, I have described and discussed the design and layout, various primary and secondary uses, and physical characteristics of the study blocks in both study sites. I have also discussed behavioral observations, various stationary activities, and pedestrian movement on the study blocks. In this concluding chapter, I discuss, distill, and analyze the behavioral data in terms of block segments to understand why some blocks segments are more active and livelier than others, and to determine if certain physical features and characteristics of the study blocks impact user activity and behavior. Overall, I point out the positive and negative aspects of the sidewalk design of both study sites and how they might be modified and improved to create more lively, vibrant, and sociable street environments. In the following sections of this chapter, I discuss some key factors that I found to be important in supporting social activities and social engagement on the sidewalks, including: (1) sitting spaces; (2) shading elements and physical comfort; (3) sidewalk width; (4) street artifacts and impulse use; (5) variety of uses; and (6) street performers and triangulation.

(1) Sitting Spaces

In chapter 6, I have discussed seating options and the amount of sitting space in each block segment of both study sites. In this section, I analyze and compare the corresponding behavioral activity data to understand if there is any correlation between the amount of sitting space and user activity on the study blocks. In terms of stationary activity, one notes that some of the block segments in Mass Street are more active and have a higher number of stationary users than other segments; after comparing the user activity data with corresponding amount of sitting space in each block segment, I found that there is a pattern of correlation between the two.

Graph 9-1: Number of stationary users and amount of sitting space in block segments of Mass Street.



As illustrated in Graph 9-1, one notes that block segments D2, C2, A2, C4, B4, and D4 have a higher number of stationary users along with a good amount of sitting space. Conversely, block segments A3, B1, C3, D3, and C1 have comparatively lesser amount of sitting space and, reciprocally, a lower number of stationary users. This pattern of correlation, however, is not true for some of the other block segments, such as block segment A1, A4, D1, and B2. Even though these segments have a good amount of sitting space, the number of stationary users is not as high; and this discrepancy in correlations could be a result of the lack of activity-generating stores and the location of restaurants and cafes.

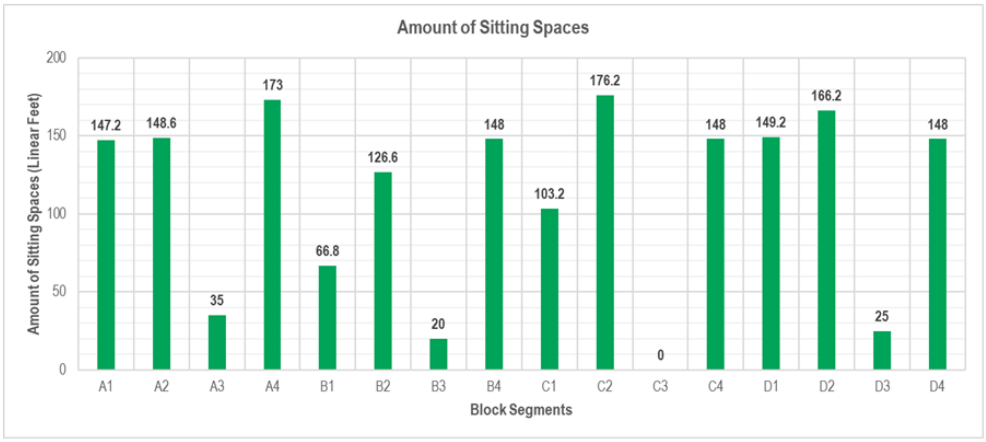
Figure 9.1: Sitting spaces and stationary activity in block segments of Mass Street.

By analyzing the activity data, I have found that block segments that contain cafes and restaurants, along with a good amount of outdoor sitting space, usually have higher numbers of stationary users. Block segments D2, C2, and B4 have a high number of stationary users and all these segments provide a good combination of restaurants and cafes along with adjacent sitting spaces that encourage and facilitate further stationary activity. Block segments D2, C2, and B4, all contain a number of restaurants and cafes; and along with commercial outdoor seating areas, there are additional nearby public sitting spaces (Figure 9.1). It has been observed that many users preferred to have their food while sitting in these outdoor areas with planter boxes. This combination of food shops and adjacent sitting spaces attracts a good number of users and thus creates a lively, active environment. Conversely, block segment A1 and A4 both contain one restaurant and a few public sitting spaces; however, they do not complement each other as sitting spaces in these segments are not close enough to the restaurants to facilitate further activity. Similarly, block segments D1, and B2 have a good amount of sitting space but they do not have complementary shops to generate stationary activity and thus these sitting spaces are less used.

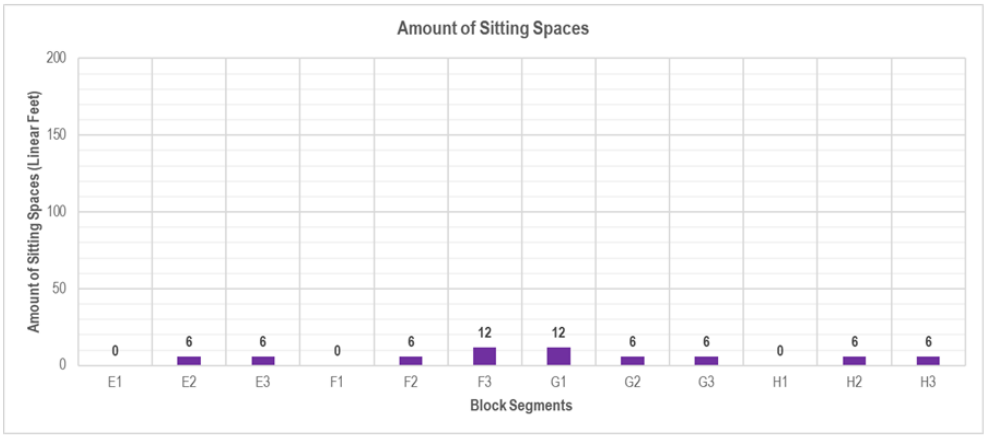
Unlike Mass Street, there is a clear shortage of sitting spaces in study blocks of Poyntz Avenue. As illustrated in Graph 9-2, the considerable difference in the amount of sitting space between Mass Street and Poyntz Avenue is clearly evident. This lack of sitting space along Poyntz Avenue negatively impacts stationary activities; as I have already mentioned in chapter 7, compared to Mass Street, the number of stationary users is significantly less in study blocks of Poyntz Avenue. Many researchers have mentioned the importance of sitting space in public places. In *Social Life of Small Urban Spaces,* for example, urbanist William Whyte (1980) suggested that there should be one linear foot of sitting space for every thirty square feet of area. According to Whyte's suggestion, each study block in Mass Street should have at least 260 linear feet of sitting space and it was pointed out in chapter 6, that all the blocks in Mass Street have adequate amount of sitting space (Block A= 503.8 feet, Block B= 361.4 feet, Block C= 427.4 feet, Block D=

488.4 feet). Similarly, study blocks in Poyntz Avenue should have at least 180 linear feet of sitting space, whereas, none of the blocks have more than 12 feet of sitting space.

Graph 9-2: Amount of sitting space (linear feet) in study blocks of Mass Street and Poyntz Avenue.



MASS STREET



POYNTZ AVENUE

From the above discussion and analysis, it can be inferred that the amount of sitting space can play a vital role in impacting stationary activities on the sidewalk. In terms of design and arrangement of use, it can be suggested that a combination of food shops and an adequate amount of outdoor sitting space can facilitate and encourage stationary sidewalk activities, and thus create a lively, active street environment.

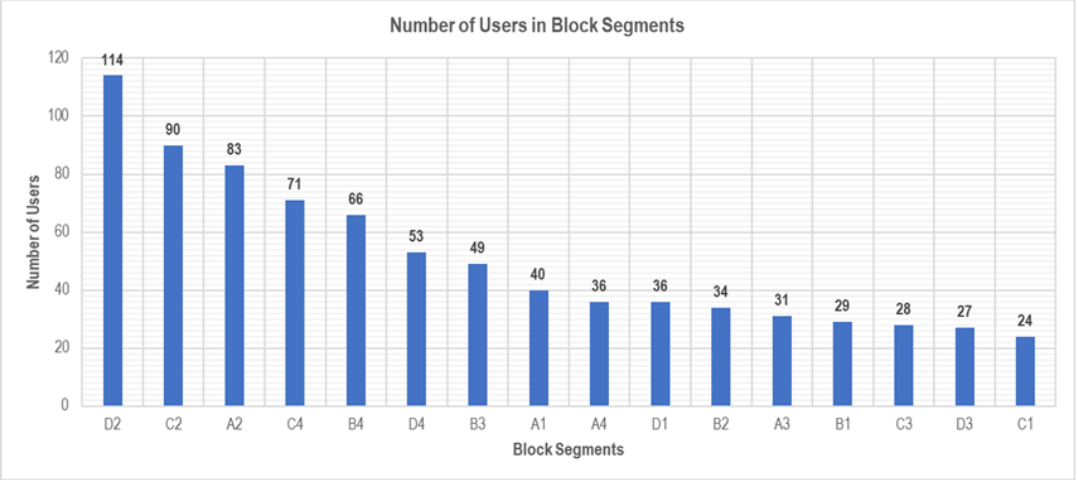
(2) Sidewalk Width and Stationary Activities

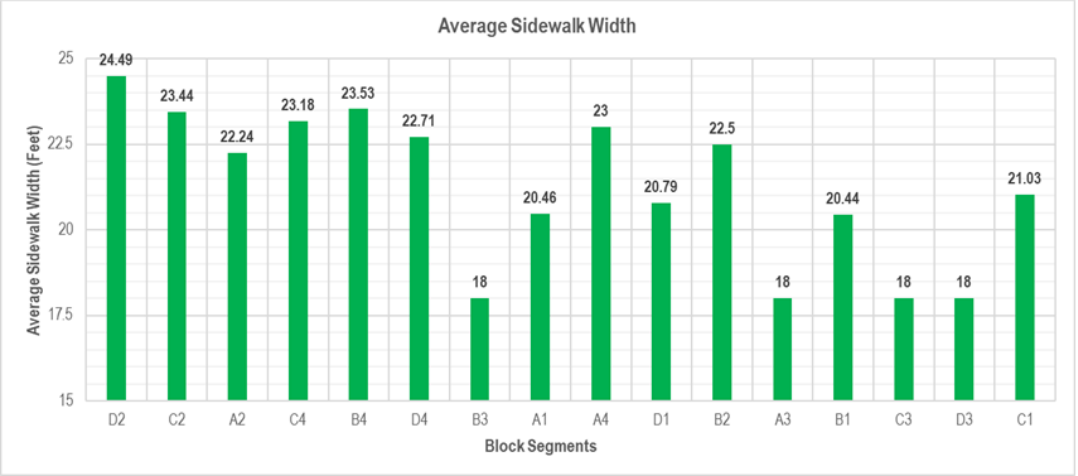
Sidewalk design and sidewalk width can be crucial in facilitating stationary sidewalk activities. Adequate sidewalk width is not only essential for the smooth flow of pedestrians, but also for the accommodation of various sidewalk elements and artifacts. Sidewalks are not merely a pathway to go from one place to another; people use and occupy sidewalks for various activities like sitting, eating, smoking, reading, window-shopping, people-watching, and so forth. Sidewalks are often used by street-vendors to sell various goods and food. This juxtaposition of numerous activities makes a street-environment lively and vibrant. Wider sidewalks can accommodate and enable users to conduct these various activities along with pedestrian movement.

In terms of sidewalk width, blocks in Mass Street have wider sidewalks than Poyntz Avenue blocks. Out of all the block segments in Mass Street, some of the segments have wider sidewalks than the others. I compared the average sidewalk width of each block segment with corresponding stationary activity data and found that segments with a higher number of stationary users also have wider sidewalks. As illustrated in Graph 9-3, block segments D2, C2, A2, C4, and B4 have a higher number of stationary users, and the average sidewalk width of these segments is above twenty-two feet. Conversely, block segments A3, B1, C3, and D3 have a lower number of stationary users and the average sidewalk width of these segments is comparatively lesser than the other segments.

It has been noted during the stationary observations that block segments with wider sidewalks generally had more stationary users. As illustrated in Figure 9.2; Figure 9.3; Figure 9.4; and Figure 9.5, most of the active zones in the four study blocks have wider sidewalk areas containing additional sitting spaces, various seating choices, and different sidewalk elements to interact with. Wider sidewalk areas also allow store owners to put outdoor displays and advertisements which attract users and contribute to

Graph 9-3: Number of users and sidewalk width.





the visual richness of the street environment. It was observed during the weekend that, some street vendors occupied the wider sidewalk areas to sell fast-food in food carts, which attracted a lot of users and as a result, further stationary activities occurred on the sidewalks. Wider sidewalk areas at regular intervals break the monotony of sidewalk design and provide users with spaces to sit and relax.

On the other hand, study blocks in Poyntz Avenue have comparatively narrower sidewalks. Other than the starting zone and the end zone with crosswalks (chapter 6, page 94), the total width of sidewalks in Poyntz Avenue is uniform (thirteen-and-a-half feet); unlike Mass Street, sidewalks in Poyntz Avenue don't have much variation in sidewalk width. Due to the narrower width of sidewalks, there are no additional

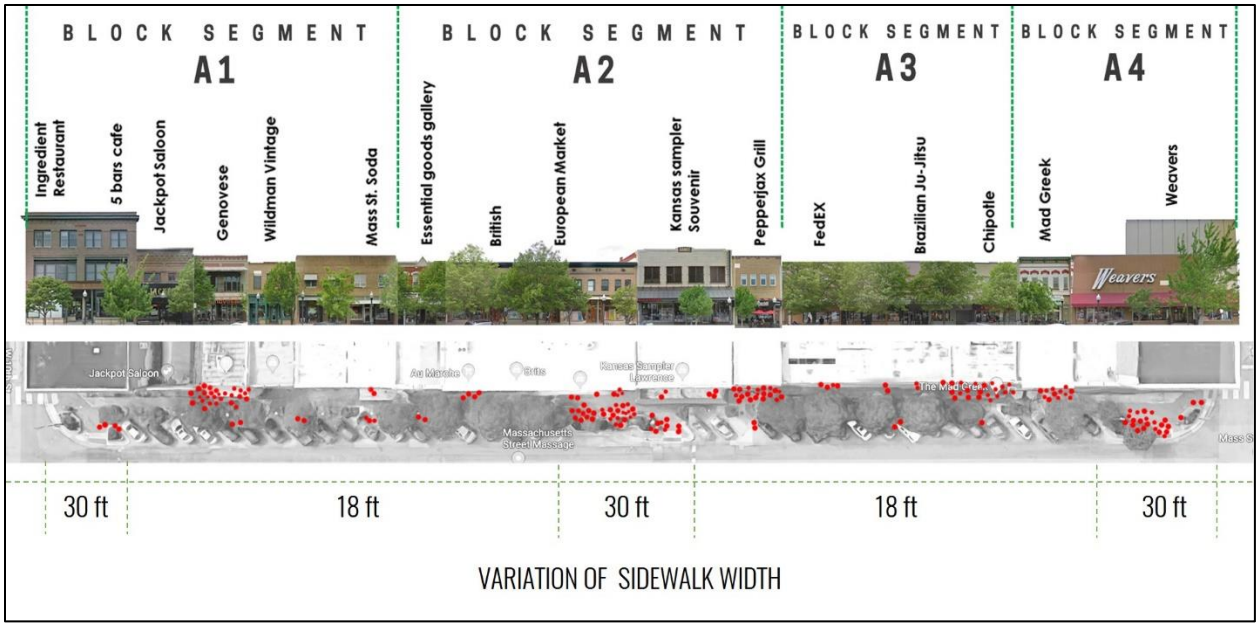


Figure 9.2: Variation in sidewalk width of block A.

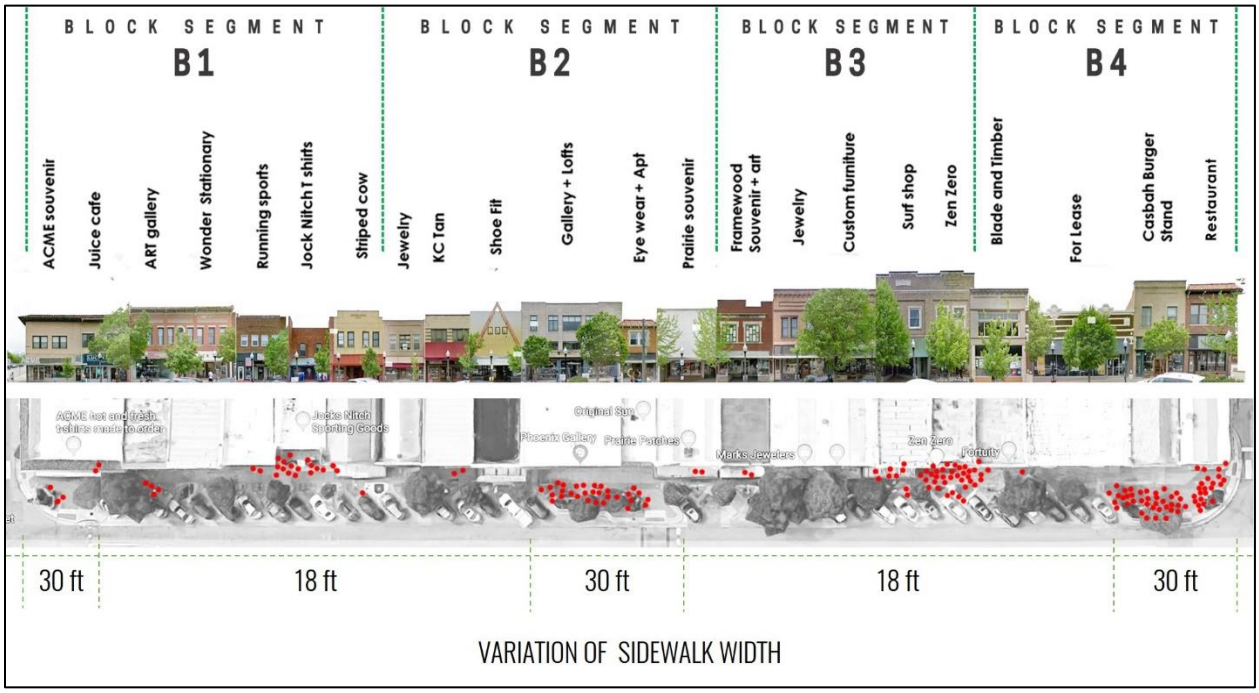


Figure 9.3: Variation in sidewalk width of block B.

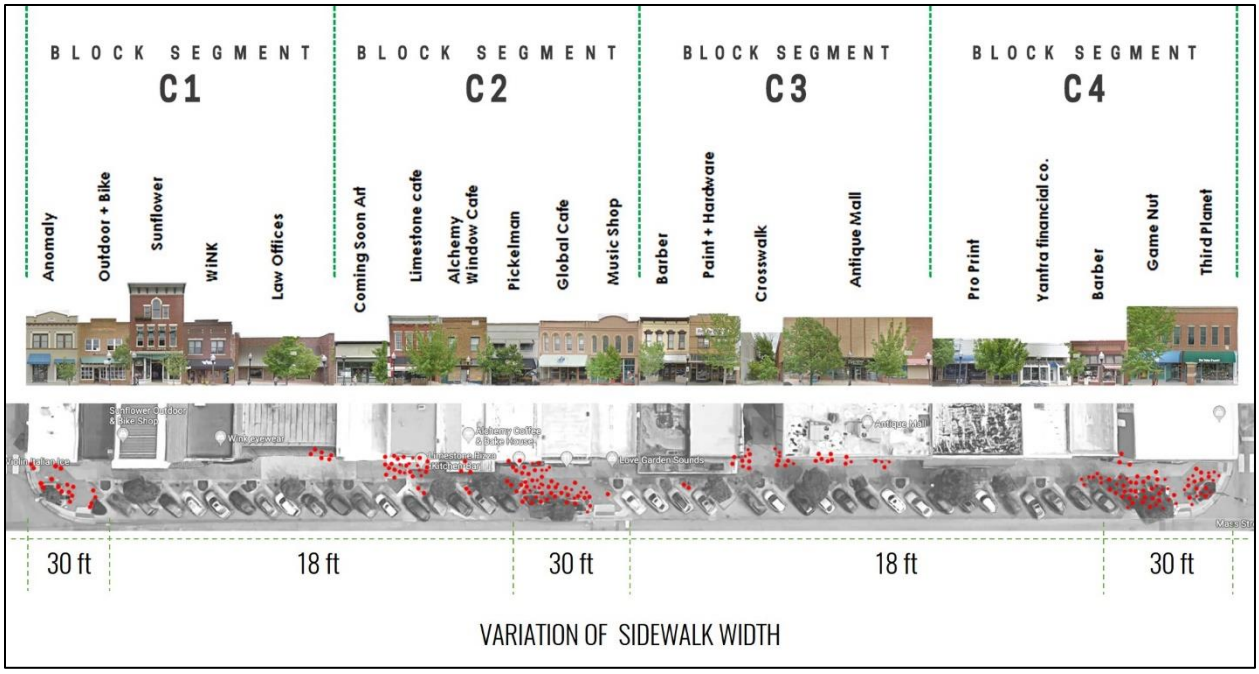


Figure 9.4: Variation in sidewalk width of block C.

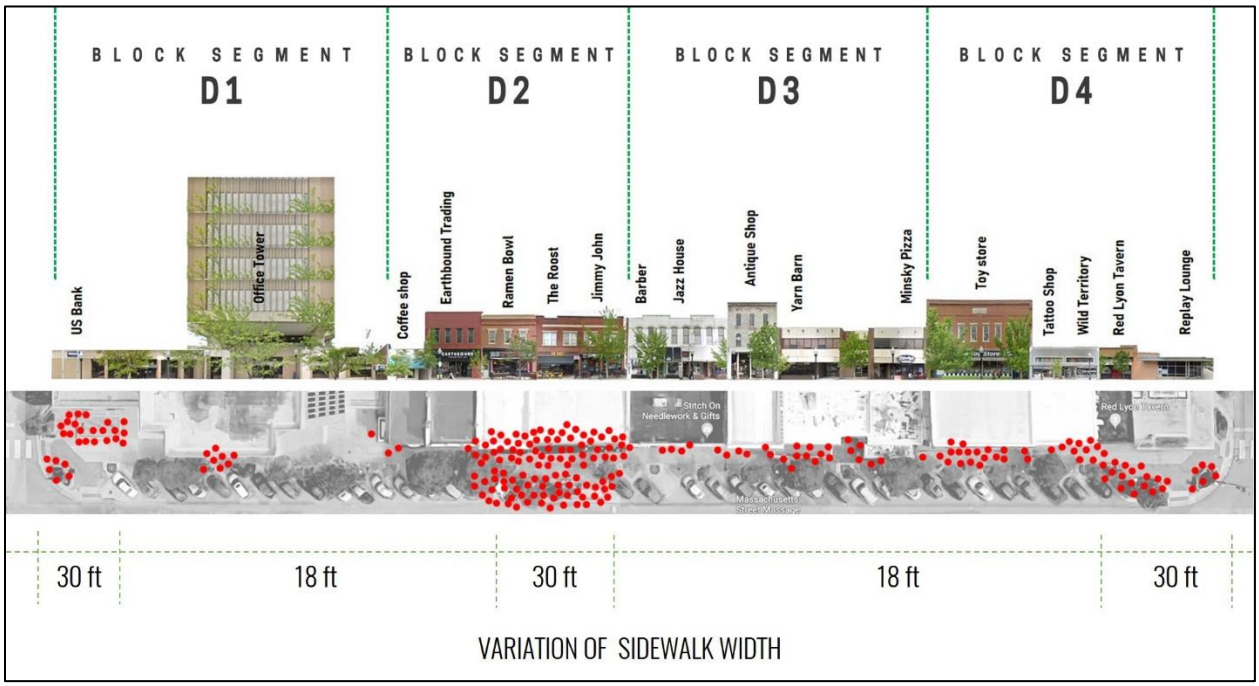


Figure 9.5: Variation in sidewalk width of block D.

sitting spaces, and the restaurants are unable to provide any outdoor seating either. A portion of the sidewalk width is used for planter boxes, but they are not suitable for sitting or any other activity. Overall, narrower sidewalk width of Poyntz Avenue blocks fails to accommodate and encourage various activities and elements; and as a result, negatively impacts user engagement.

Overall, from the observations and analysis, I found that an adequate width of the sidewalk is crucial in supporting stationary activities. Wider sidewalks can accommodate street furniture and street objects, and thus, enable users to use the sidewalks for various stationary sidewalk activities along with pedestrian movement. It can be suggested that, in terms of design and planning of the sidewalks, proper attention should be given to people's activities on the sidewalks. Designers should plan and design in such a way that sidewalks can accommodate and support additional stationary activities along with smooth pedestrian movement.

(3) Sidewalk Elements and Impulse Use

When people are casually standing in a public place alone or in a group, there is a tendency to find some kind of shelter or anchor point. They often try to find something to hold on to or lean on to or something to put their foot on (Mehta 2013). People generally do not like to stand or stay in empty public spaces; there is almost always an instinctive need to find some sort of refuge (Whyte 1980). This is why street elements and artifacts are important as they give people points of reference and a sense of anchorage. These elements include street signs, light poles, bicycle stands, parking meters, railings, newspaper-dispensing boxes, trash cans and so on. People tend to hold on to or lean on or just stand next to these objects. These elements also contribute to the visual richness of the street environment and often provide different sitting heights and vantage points for viewing street activity and people-watching. For this research, I observed and counted these street elements on each block segment and noted how people interacted with them.

Study blocks in Mass Street have several street elements and artifacts on the sidewalks. The starting zone and end zone (chapter 6) of the sidewalks contain a traffic light pole, a parking citation box, a fire hydrant, two trash cans, and a bike rack. During the observations, it was noted that the bike racks were mostly unused; instead of using the racks, people used street elements like light poles and trees to park their bicycles (Figure 9.6). Sidewalk users often stopped in front of the two trashcans to reorganize their belongings and waited near planter boxes before moving to the next block (Figure 9.7).

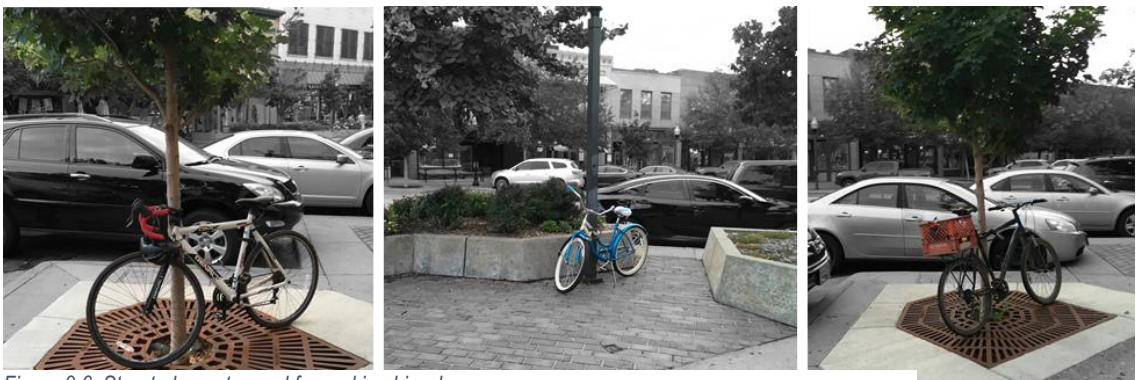


Figure 9.6: Street elements used for parking bicycles.

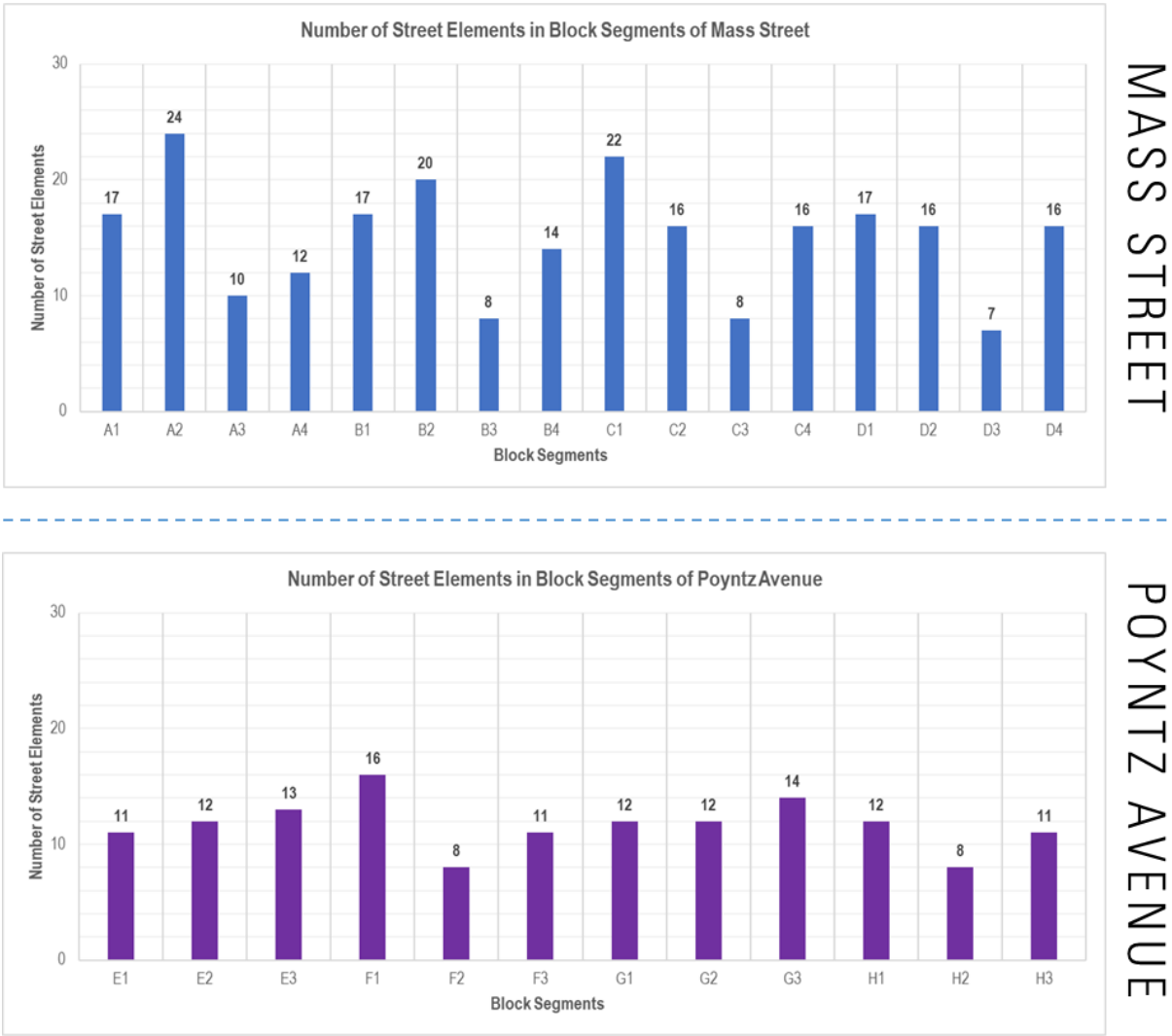
Figure 9.7: Sidewalk elements in the starting zone.

The intermediate zone contains of a series of sidewalk elements. Trees, light poles, and parking meters are placed in this zone at regular intervals. The central sidewalk zone contains a water fountain, two street signs, a trash can, three newspaper-dispensing boxes, and a fire hydrant. Generally, people preferred to stand near-by these elements while talking, or smoking. It was observed that many users leaned on trees and light poles while standing and talking, and several users were smoking under the trees and near-by the light poles. These sidewalk elements provided users with anchor points for their stationary sidewalk activities (Figure 9.8).

Figure 9.8: Use of sidewalk elements as anchor points for stationary activities.

Sidewalks in Poyntz Avenue are narrower in width and they contain fewer elements and artifacts. The starting zone, end zone, and central zone of sidewalks contain street signs, fire hydrants, and low height planter boxes; the intermediate zone includes a series of light poles, a few circular planter boxes, and benches. Unlike Mass Street, I did not observe many users interacting with these elements; only a few users were observed smoking under the trees. The following graphs illustrate the number of sidewalk elements in different block segments of both Mass Street and Poyntz Avenue.

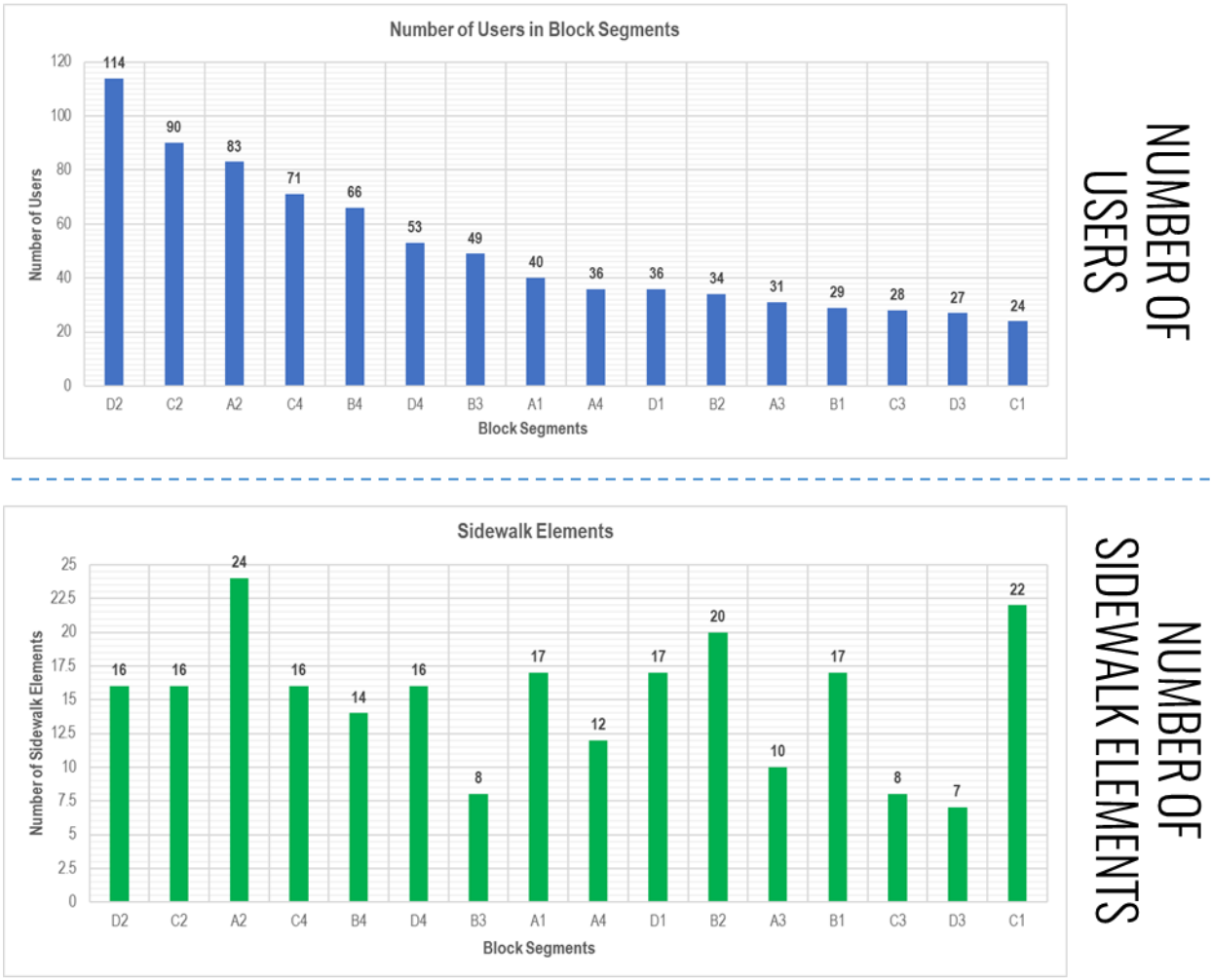
Graph 9-4: Number of street elements in block segments of Mass Street and Poyntz Avenue.



As illustrated in (Graph 9-4), study blocks in Mass Street have a higher number of sidewalk elements than the study blocks of Poyntz Avenue. For Mass Street, block A has 63 sidewalk elements, block B has 59

sidewalk elements, block C has 62 sidewalk elements, and block D has 56 sidewalk elements. In contrast, for Poyntz Avenue, block E has 36 sidewalk elements, block F has 35 sidewalk elements, block G has 38 sidewalk elements, and block H has 31 sidewalk elements.

Graph 9-5: Number of users and number of sidewalk elements in blocks segments of Mass Street.



To analyze the observational data, I compared the number of sidewalk elements with the number of users in each block segment to find out if there is any correlation. As illustrated in Graph 9-5, no significant correlations were found, however, it was noted during the observations that the street elements often encourage and ensure further stationary sidewalk activities. For example, water fountains in block segment A2, B2, C2, and D2 were frequently used as some users stopped to take a break or relax in the

central sitting space. Similarly, the newspaper dispensing boxes encouraged users to take a look at the newspapers, and a number of users were observed reading newspapers while sitting on the adjacent planter boxes. The railings around the outdoor eating areas were also used by some users to casually lean on while talking or smoking. Overall, these various sidewalk objects in Mass Street contributed as supporting elements for stationary activities and retained users on the sidewalks for longer periods of time. In contrast, I did not find any noticeable elements in Poyntz Avenue being used or interacted with by users. This lack of activity-supporting elements negatively impacted user activity and participation in Poyntz Avenue.

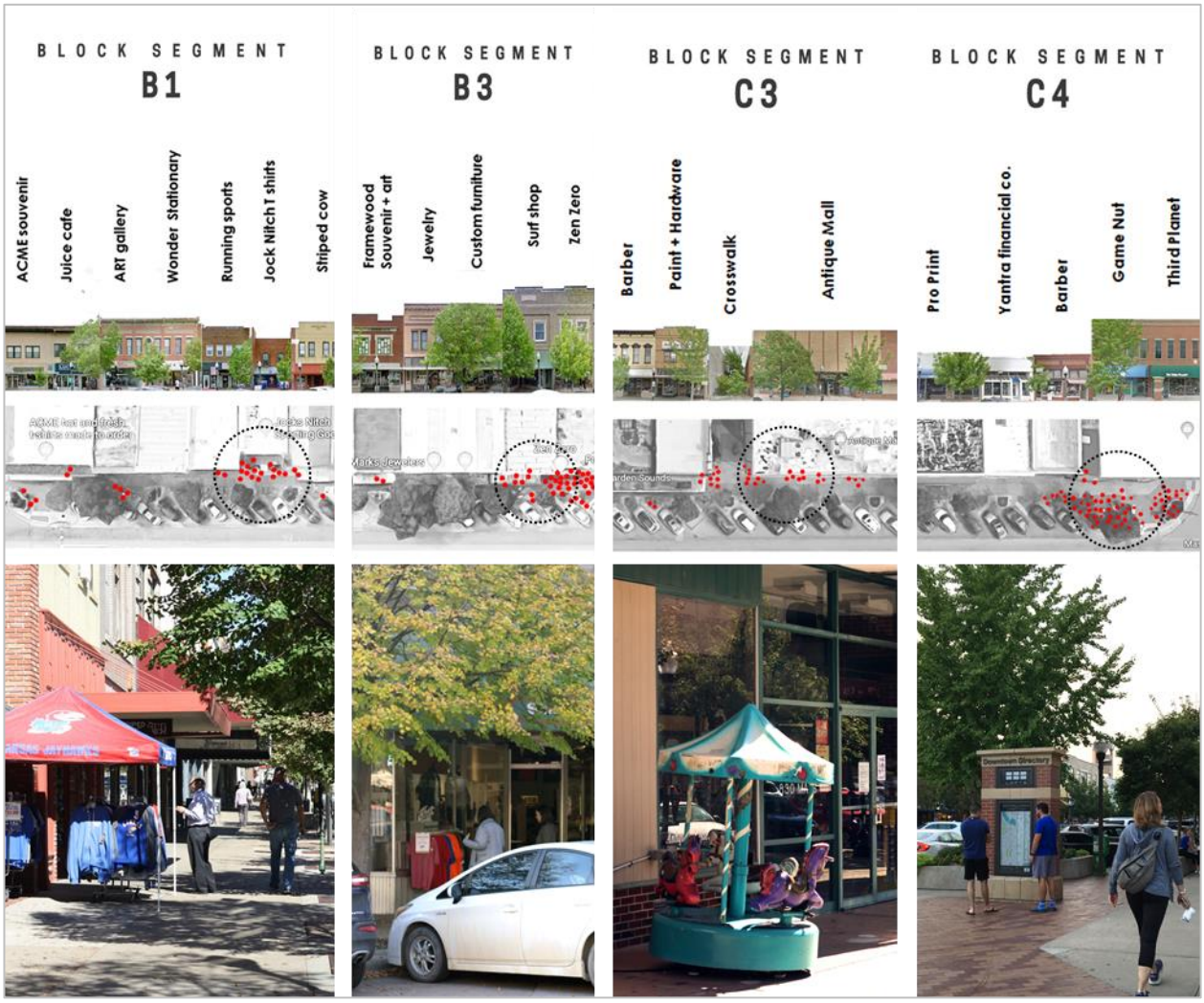


Figure 9.9: Sidewalk elements and impulse use in block segments of Mass Street.

An important behavioral phenomenon that I observed in Mass Street is *impulse use,* which William Whyte defined as a quality of space that spontaneously draws people in without conscious decision (Whyte 1980, pg.57). During the observations, I noticed that some of the stores put goods on display on a portion of the sidewalk. These outdoor displays attracted a lot of impulse use as pedestrians stopped to take a look and examine the goods on display. In block segment B1 and B3, there were two stores with outdoor displays, and it can be seen on the activity map (Figure 9.9) that the outdoor display of both stores attracted a good number of users. Similarly, in block segment C3, there is a large street toy (Figure 9.9) which attracted children and generated casual interactions among people who didn't know each other. Block segment C4 contains a large directory board (Figure 9.9) and a number of users were observed looking at the board for directions. Overall, these various street elements generated *impulse use* and contributed significantly in terms of user participation and activity.

(4) Shading Elements and Physical Comfort

Satisfaction of basic physiological needs is essential for people to remain in outdoor spaces. Studies regarding the effects of environmental factors on human behavior suggest that comfortable microclimatic conditions such as temperature, sunlight, shade, and wind are important factors in supporting outdoor activities (Bosselmann et al. 1984; Haas-Klau et al. 1999; Zacharias et al, 2001). William Whyte's (1980) study on New York city plazas demonstrated that, even though sunlight was sought after in the winter months, people preferred shaded and semi-shaded areas during the warmer summer months. A good balance between sunlight and shade is the most preferable condition for people using outdoor spaces. Tree cover, canopies, awnings, and overhangs can provide this balance and also create a sense of prospect and refuge among users on sidewalks. For this research, I counted the number of shading elements in each block segment and observed how shaded areas were being used in comparison with areas without shade. Shading elements included canopies, awnings, overhangs, trees, and any other elements that provided protection from the sun.

The study blocks of Mass Street contain several shading elements, including canopies, awnings, overhangs, and umbrellas in outdoor seating areas. There are twenty-four trees in each of the four study blocks which provide a good balance between sunlight and shade. It has been noted during the stationary observations that shaded areas were frequently occupied by users during the day and many users were observed standing, conversing or smoking under trees and overhangs. In block A, there are four restaurants with shaded outdoor seating area and six stores with canopies and overhangs. Similarly, in block B, there are eleven stores that have canopies and overhangs, and one restaurant contains a shaded outdoor seating area. In block C, there are twelve stores with canopies and awnings, and two restaurants have shaded outdoor seating area. Block D contains eight stores which have overhangs and there are four restaurants with outdoor seating (Figure 9.10).

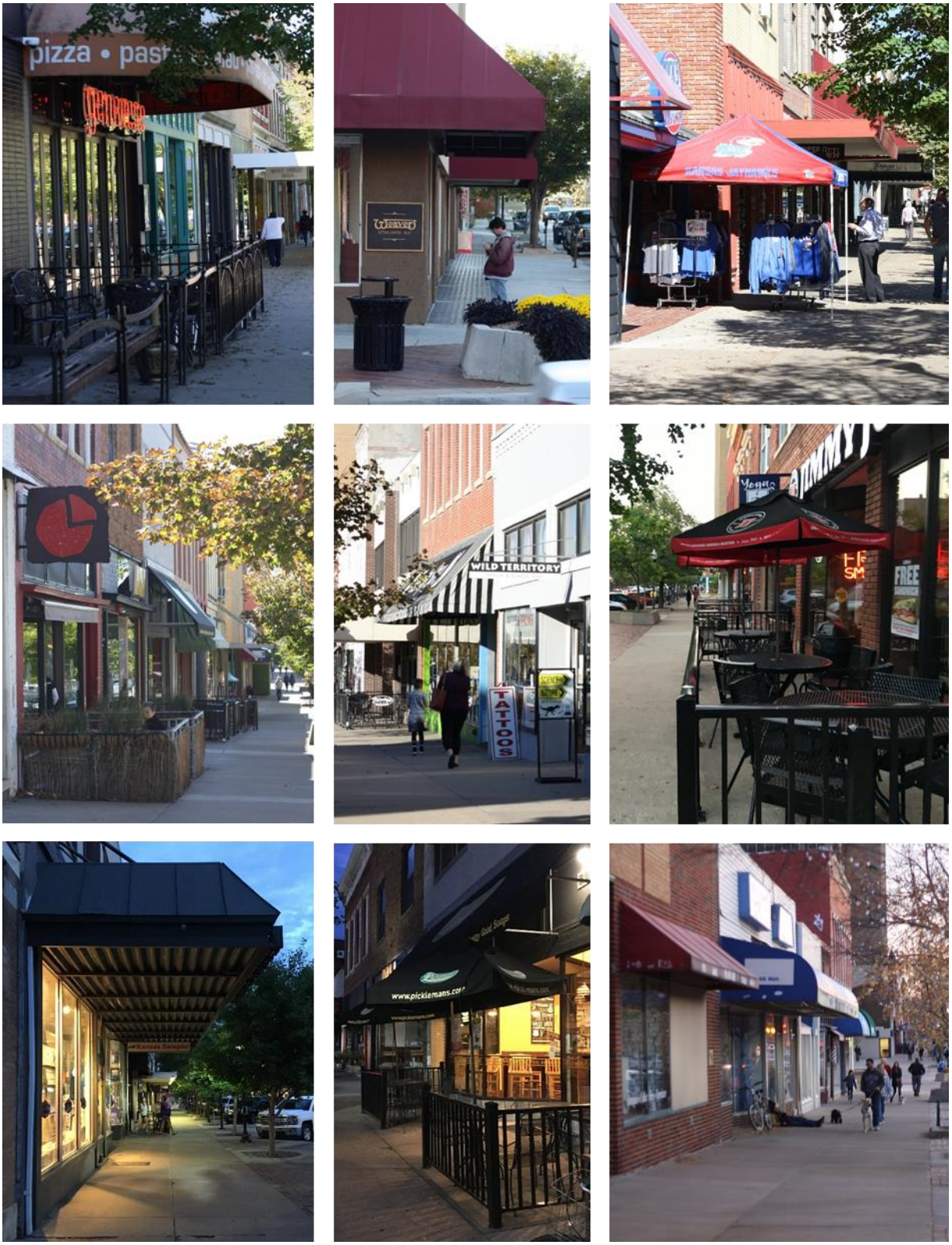


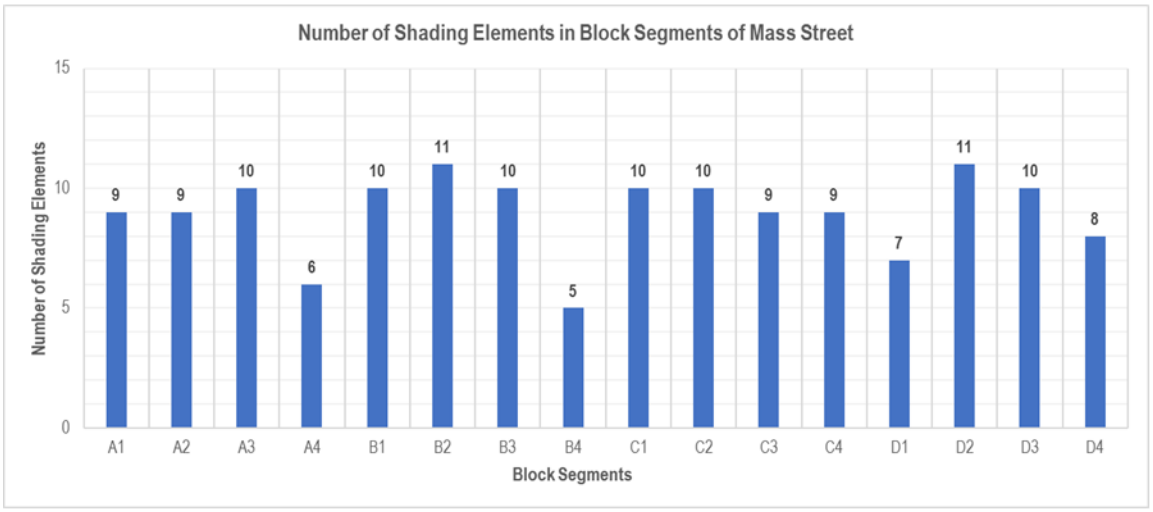
Figure 9.10: Various shading elements in block segments of Mass Street.

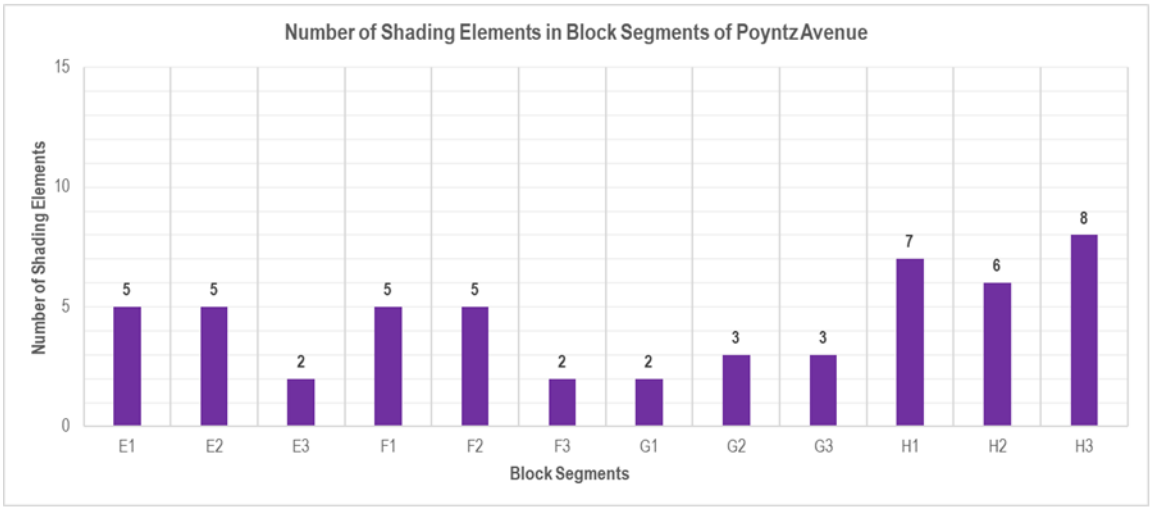
In contrast, the study blocks of Poyntz Avenue have a fewer number of shading elements. This lack of shade creates a negative impact on stationary activities as it is difficult for users to remain on the sidewalks for a longer period of time during sunny days with higher temperatures. It was noted during the observations that most of the stationary users were standing, conversing, or smoking either under a tree or a canopy. In terms of shading elements, block E has a total of nine trees; three stores have canopies. Block F has ten trees and two stores with overhangs. Block G has the lowest number of shading elements with five trees and three stores with overhangs. Finally, block H has a total of ten trees and eleven stores with canopies and overhangs.

Figure 9.11: Shading elements in block segments of Poyntz Avenue.

The following graph illustrates the total number of shading elements in each block segment of Mass Street and Poyntz Avenue.

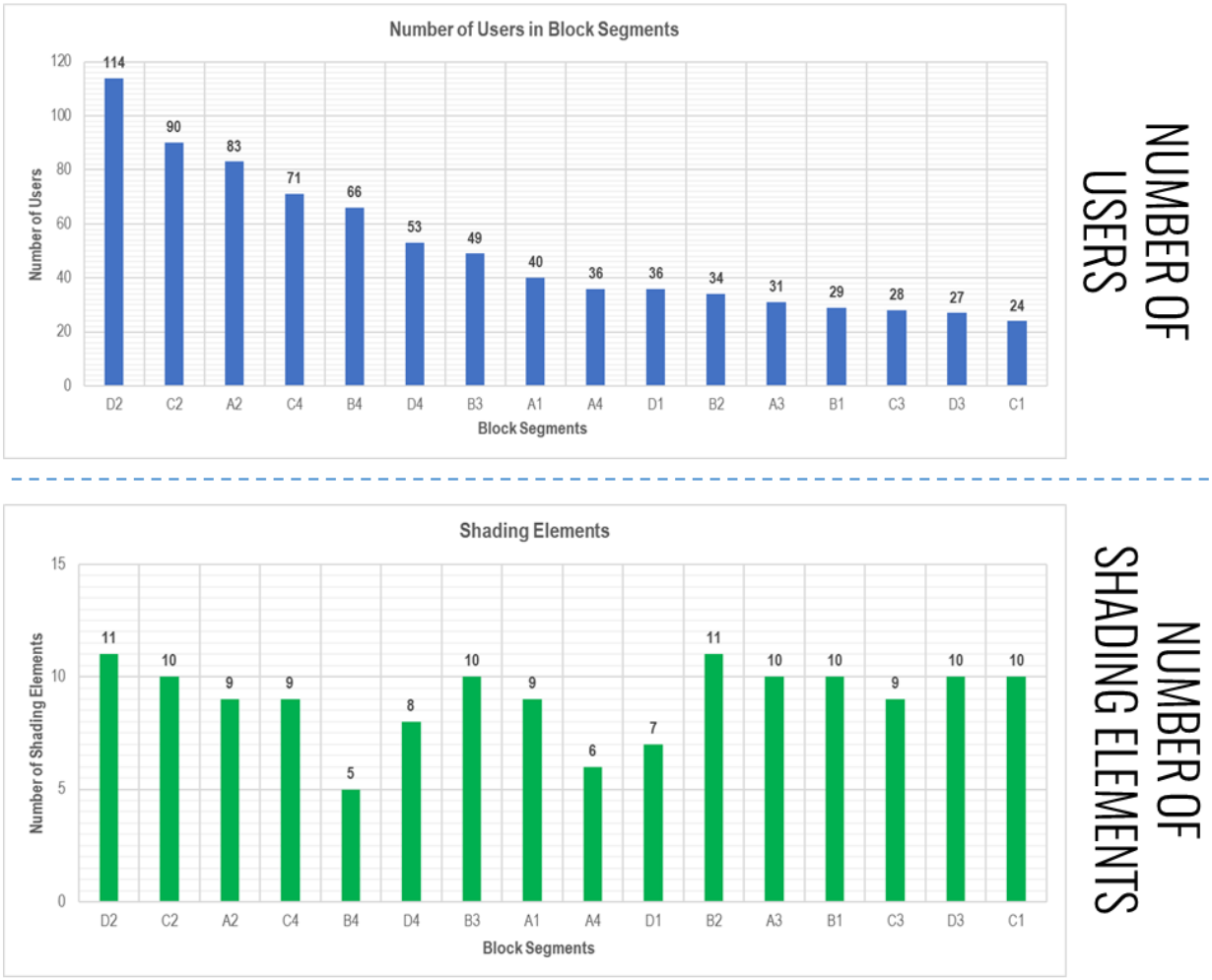
Graph 9-6: Number of shading elements between blocks of Mass Street and Poyntz Avenue.





As illustrated in Graph 9-6, the total number of shading elements in block segments of Mass Street is higher than the number of shading elements in block segments of Poyntz Avenue. In total, block A contains 34 shading elements, block B contains 36 shading elements, block C contains 38 shading elements, and block D contains 36 shading elements. In Poyntz Avenue, block E and block F contains 12 shading elements, block G contains 8 shading elements, and block H contains 21 shading elements.

Graph 9-7: Number of users and number of shading elements in each block segment of Mass Street.



In terms of analysis, I compared the number of shading elements with the number of users in each block segment. As illustrated in Graph 9-7, no significant correlations were found, however, it was observed that the shading elements positively supported stationary activities. In block D, the most used and active block segment is D2 and the central sidewalk area in this segment has a good amount of shade. Similarly, in block A, block B, and block C, the central sidewalk zone was frequently used and active. A good number of users were observed sitting, eating, standing, and smoking in these zones (Figure 9.12). During stationary observations I found that most of the stationary activities took place in areas with a good mixture of sun and shade. The shading elements and trees in Mass Street provide a good balance of prospect and

refuge. Various awnings and canopies provide a sense of enclosure and transform the scale of the sidewalk into an intimate one.

Figure 9.12: Good balance of sun and shade in the central sidewalk zones of Mass Street.

In contrast, due to the lower number of shading elements and trees in Poyntz Avenue, there is lack of enclosure and the sense of intimacy is lost. While walking on the sidewalks of Poyntz Avenue, one feels somewhat over-exposed and a lack of buffer between the street and sidewalk can be easily felt. Overall, it can be suggested that an adequate amount of shading elements is necessary not only for a good balance of sun and shade but also to create a sense of enclosure and an intimate scale on the sidewalks.

(5) Variety of Uses

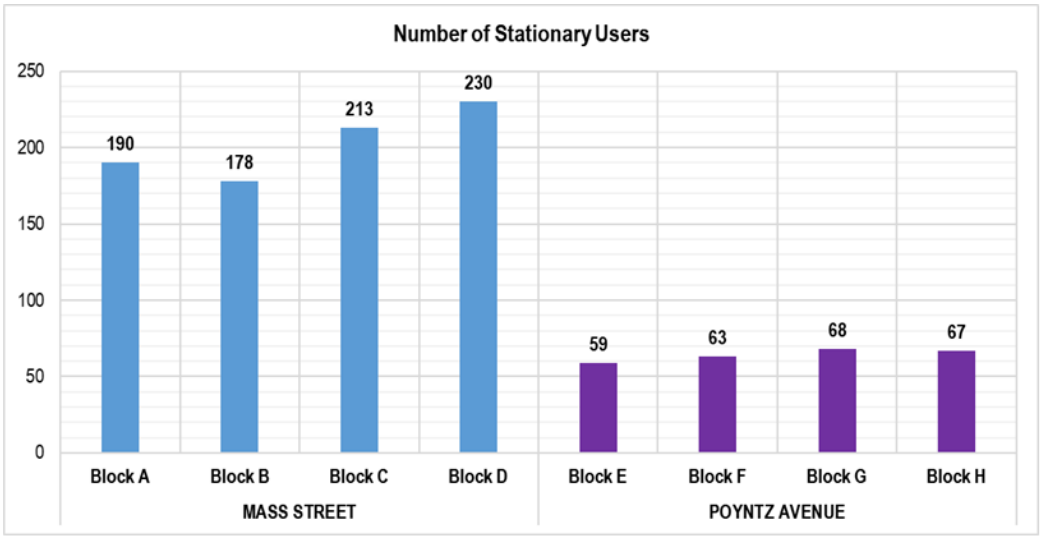
Variety refers to the range of functional and experiential choices within a space. Variety of uses and activities can attract different groups of people at different times and thus, it is another essential quality for the liveliness of an environment. The authors of *Responsive Environments* (Bentley et al., 1985) suggest that urban diversity functions as an intricate matrix of uses, forms, people, and meanings and it is essential to have closely grained variety of uses, which can widen the range of experiential choices for a wide range of people. The idea of variety is partly derived from urbanist Jane Jacob's concept of primary mixed uses. Jacobs defines primary uses as "those which in themselves bring people to a specific place because they are anchorages" (Jacobs, 1961). These uses are associated to places where people necessarily go on a daily basis, such as work, school, home. Secondary uses emerge in response to these primary uses and are dependent on the people drawn by the primary uses. Secondary uses can be places like grocery stores, restaurants, pubs, libraries, theatres, churches, and small businesses. In order to generate variety with an area, it is essential to find out the primary uses and then introduce other secondary uses accordingly. For this research, I mapped the different types of uses in the study blocks and counted them to find out the range of variety in each block and consequently, I compared the corresponding user-activity data to understand if the variety of uses influence overall activity in the study sites.

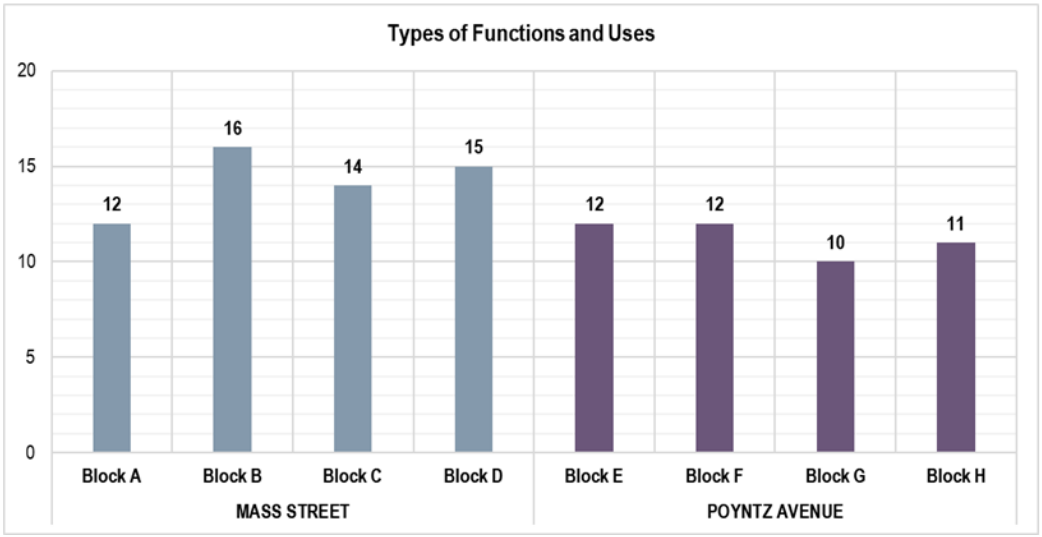
I have already discussed the various types of primary and secondary uses of each study block in chapter 4 and chapter 5, in this section I analyze and compare the number of different types of uses with the number of stationary users at each block to find out if there is any correlation between the two. I counted the different uses in each block and as illustrated in Table 9-1, block A contains twelve uses, block B contains sixteen uses, block C contains fourteen uses, and block D contains fifteen uses. Similarly, in Poyntz Avenue, block E contains twelve uses, block F contains twelve uses, block G contains ten uses, and block H contains eleven uses.

Table 9-1: Types of uses in blocks of Mass Street and Poyntz Avenue.

Mass Street				Poyntz Avenue			
Block A	**Block B**	**Block C**	**Block C**	**Block E**	**Block F**	**Block G**	**Block H**
Restaurant	Souvenir Shop	Gift Shop	Bank	Restaurant	Bridal Shop	Courthouse	Office
Café	Juice Café	Sports Store	Coffee Shop	Shoe Store	Restaurant	Hotel	Prayer House
Bar	Gallery	Eyewear Store	Restaurant	Office	Yoga Studio	Office	Bar
Office	Office	Café	Café	Medical Supply	Office	Restaurant	Bedding Store
Gift Shop	Residence	Restaurant	Barber	Pub	Residence	Drug Store	Bridal Store
Soda Shop	Stationary Store	Residence	Antique Shop	Drapery Store	Salon	Opera House	Restaurant
Gallery	Sports Shop	Music Store	Bar	Clothing Store	Party Shop	Art Gallery	Residence
Home Goods	Clothing Store	Barber	Yarn Store	Yoga Center	Tattoo Shop	Residence	Clothing Store
Residence	Gift Shop	Office	Residence	Mental Health Service	Music Store	Photo Studio	Sports Shop
Souvenir Shop	Jewelry Store	Hardware Store	Office	Residence	Jewelry Store	Jewelry Store	Floral Shop
Printing Store	Tanning Salon	Antique Shop	Toy Store	Gift Shop	Barber Shop	Healthcare Center	Home Goods
Training Center	Shoe Store	Printing Store	Tattoo Shop	Spa	Clothing Store		
Total **12** types of Use	Eyewear Store	Game Shop	Science Store	Total **12** types of Use	Total **12** types of Use	Total **11** types of Use	Total **11** types of Use
	Furniture Store	Souvenir Shop	Tavern				
	Restaurant	Total **14** types of Use	Lounge				
	Café		Total **15** types of Use				
	Total **16** types of Use						

Graph 9-8: Number of users and types of uses in study blocks of Mass Street and Poyntz Avenue.





As illustrated in Graph 9-8, by comparing the number of stationary users with the number of uses, I did not find any significant correlations. Even though Poyntz Avenue blocks have a variety of uses in each block, the number of stationary users is significantly lower than the study blocks of Mass Street. This suggests that, only a good variety of uses is not effective enough to retain users on the sidewalks.

To analyze further, I examined the active block segments to find out the types of uses that attract more users. In Mass Street, the most active block segment D2 contains three restaurants and a coffee shop. All three restaurants in this segment have outdoor seating area and in addition there is a central sidewalk zone for sitting. During the stationary observations, I noted that there is a six-storied office tower nearby and presumably, a lot of users from this building come to the restaurants to have food at different times. Block segment C2 having the second highest number of users contains three cafes, a restaurant, and a music store. Similarly, a total of sixty-six users were observed in block segment B4 and it contains two popular restaurants and a sports shop. Block segment D4 having a total of fifty-three users contains two bars, a tattoo shop, and two toy stores. Conversely, block segments that had lower number of users, such as block segment B1, C3, D3, C1, D1, and B2 do not have any food shops or adjacent sitting spaces.

Overall, one notes that block segments containing food shops and restaurants had more stationary users than the other segments. In terms of design and planning, it can be suggested that appropriate placement of uses along with complimentary sitting spaces can encourage and support sustained stationary activities and thus create a lively, active street environment.

(6) Street Performers and Triangulation

An important factor that I observed in the study blocks of Mass Street is *triangulation*—a term used by urbanist William Whyte (1981, pg. 94) to describe the characteristic of a public space that can bring people together. It is usually an external stimulus that attracts people and prompts strangers to talk to each other as though they are not. The stimulus can be a physical object, a sight, or an occurrence.

In Mass Street, I have observed several instances of triangulation in the form of street performances as they attracted a good number of people. During the stationary observations, I noticed a number of street musicians performing at various spots on the sidewalks. In block segment A2, I observed a guitarist each day during the afternoon playing guitar on the central sidewalk zone (Figure 9.13). In block segment C4, I observed a flute player and a violinist playing at different times. Similarly, in block segment D4, I observed a banjo player performing on the public bench. Another guitarist was observed near the office tower in block segment D1 (Figure 9.13).

Figure 9.13: Street performances at various block segments of Mass Street.

I noticed that, the most active zone for street performances was block segment C4. Several street performers were observed in this zone at various times during the stationary observations. This segment contains a large directory board and a some sittable planter boxes. Street performers preferred this segment probably because the directory board provided them with a backdrop and the planter boxes worked well as viewing seats for spectators. This inadvertent juxtaposition of various elements provided a suitable setting for the street performers to perform; and these performances attracted a good number of people and prompted casual interactions among spectators. Overall, this series of elements and phenomenon created a lively urban place for people to enjoy.

In contrast, I did not notice any kind of street performances in Poyntz Avenue during the observations. The reason for this could be the lack of suitable setting and the lack of sitting spaces on the sidewalks as people need suitable sitting spaces to enjoy the performances and similarly, performers need adequate space on the sidewalks to setup their acts. I noticed that public benches in Poyntz Avenue are street-facing and they do not provide any support for the street performances either. Overall, it is evident that street performances can attract a good number of people and generate casual interactions between strangers. These performances have a beneficent impact on stationary activities and social interactions. Adequate amount of sidewalk space and variety of sitting space in Mass Street provide essential support for the street performances and thus create a lively, sociable environment for the users on the sidewalks.

Recommendations

The primary objective of this thesis research was to study the designed environment and gather insights about the factors that impact and influence user behavior and activity. So far, I have pointed out several factors that I found to be crucial in supporting stationary activities on the sidewalks. It is evident from the above discussion that study blocks in Poyntz Avenue lack some major elements and amenities that can encourage human participation and interactions. In the following sections, I provide some brief recommendations that can be implemented to modify and improve the sidewalks in Poyntz avenue, so that they can support various stationary activities, and thus create a lively, vibrant, and active environment.

Sitting Spaces

As discussed earlier, there is a significant lack of sitting spaces in Poyntz Avenue. It has been observed in Mass Street that the availability of sitting spaces and the choices of seating significantly improves user participation. In terms of design, Poyntz Avenue has the potential to incorporate more sitting spaces within the sidewalks. The first recommendation in this regard would be to replace the circular planter boxes and add planter boxes with ledges that are suitable for sitting; this will not only increase the amount of seating but also provide different seating options, as the ledges can be used by the users to sit in different orientations. Secondly, the existing low height planter boxes can be modified to provide a suitable sitting height; this extrusion in height can also improve the sense of enclosure. Finally, the extended sidewalk zones can be redesigned to incorporate small sitting spaces for people to rest and relax.

Sidewalk Width

It has been observed that the sidewalk width in Poyntz Avenue is narrower and this hampers the scope of various activities on the sidewalk. I have found that unlike Mass Street, the parking spaces in Poyntz Avenue are not integrated within the sidewalk. In terms of design, if the parking spaces in Poyntz Avenue

can be integrated diagonally within the sidewalk it will increase the effective sidewalk width and the extra space will enable various activities to take place.

Shading Elements

Shading elements provide essential physiological comfort and protect users from sun and wind.; moreover, they contribute to the sense of enclosure and provide users with a sense of prospect and refuge. The lack of shading elements in Poyntz Avenue negatively impacts user behavior and activities. In terms shading elements, it can be suggested that trees should be planted more densely in Poyntz Avenue to provide an adequate balance of sun and shade. Similarly, policy makers and city officials should encourage store owners to provide shading elements like awnings and canopies to support stationary activities and retain users on the sidewalk.

Sidewalk Elements

Sidewalk elements and street artifacts provide users with points of reference and sense of anchorage. People often interact with these elements and these element support further stationary activities. As discussed previously, the lack of street elements in Poyntz Avenue negatively impacts user participation. In terms of design, it can be suggested that more street elements like water fountains, newspaper dispensers, directory boards, and so on should be incorporated into the sidewalk design as they can significantly encourage stationary activity and also contribute to the visual richness of the street environment.

Activity-generating Stores

It has been observed in the study blocks of Mass Street that food shops with outdoor seating areas often attract a good number of people. This is also true for Poyntz Avenue as it was observed that the outdoor seating area of the pizza shop in block segment E1 was often occupied by users and many people preferred to eat outdoors. In terms of planning, it can be suggested that if the distribution of stores can be

arranged in such a way so that each block contains at least two or three food shops with outdoor seating. Food shops tend to generate further stationary activities and the adjacent stores can benefit from this too in terms of user participation.

Street Performers and Triangulation

Street performers contribute greatly to the liveliness of the street environment; they often attract a good number of people and prompt casual interactions between spectators. As discussed previously, I observed this triangulation effect several times in Mass Street. The effectiveness of triangulation can be observed in Poyntz Avenue only during special events. I observed this phenomenon in Poyntz Avenue during a special event named 'Third Thursday', where a few street performers came to perform; however, due to the lack of sitting spaces the spectators were unable to enjoy the performances properly and I noticed that many people were sitting on the ground. Due to the street-facing orientation of the sidewalk benches, they did not support the audience either. In terms of design, the designers should understand the positive effects of street performances and if not a separate space, designers should at least design sitting spaces in such a way that they support and encourage street musicians to perform.

Conclusion

Vitality and liveliness of streets can depend upon a number of large-scale factors. Many scholars have identified various physical, social, economic, and physiological factors that influences people's activities and behavior on streets and thus impact the liveliness. In *The Death and Life of Great American Cities* (1961), urbanist Jane Jacobs mentions the importance of factors like diversity, safety, primary mixed uses, small blocks, aged buildings, aged buildings, and concentration. Similarly, the authors of *Responsive Environments* pointed out several factors such as permeability, variety, legibility, and so on. In *The Street,* urbanist Vikas Mehta also discusses the importance of large-scale factors like culture, convenience, sense of belonging, sense of control, and so on. Overall, it is understandable that there can be several large-scale factors and aspects that impact the liveliness and vitality of a street environment; however, this thesis stresses on the fact that small-scale design elements and aspects can also greatly impact user behavior and activity. In this thesis, I have only focused on several small-scale physical elements and factors because the interactions between users and these sidewalk elements can be studied and analyzed through simple direct observations.

Overall, in this research, I have tried to gain insights about the designed environment through structured observations and analysis, and it can be suggested that this research was able to identify some key aspects that can have significant impact on user participation and liveliness of the street environment. Ultimately, I believe this thesis can be used as a reference to conduct similar studies on larger scales and different contexts, and the environment-behavior research approach used in this thesis can be helpful in identifying other important aspects that makes a street environment joyful, vibrant, and full of life.

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