

**PUBLIC SPACE USE IN NEW YORK CITY, ITS RELATIONSHIP TO SPACE DESIGN
CHARACTER, SURROUNDING CONTEXT, AND USER'S PERCEPTION OF PUBLICNESS
THROUGH SPACE MANAGEMENT AND CONTROL**

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Abstract

New York City initiated incentive zoning in 1961 to encourage the private sector to provide public space through bonusing allowable building floor area. Such incentive zoning brought a boom in quantity of public space in New York City, the bonus developers gained is yet to be justified by the resulting space quality, in addition to the provision of light and air at street level. Numerous studies have evaluated public space quality and investigate factors influencing space quality. This thesis investigates the relationship between the design and management of public space, surrounding social context of public space in New York City. This thesis will also tackle the question raised by previous studies, of whether there is a difference between the actual adoption of control methods in public spaces and public perceptions of such methods.

Introduction

The concept of public space comes from the Greek ‘agora’, which was generally considered as where citizens could make free speech, share intellectual opinions and enjoy convenience from market exchange (Mitchell, 1995).

Stephen Carr in *Public Space*, 1992, summarized the evolution of public space in United States. During the 17th and 18th centuries, streets were the primary settings for public spaces in US, which were mostly used for commercial activity. The United States adopted the idea of commons and squares from Europe, which were usually built in combination with a town hall, church, and markets. In the 19th century, boulevards and landscaped public parks were built under European influence. This old form of public space provided places to celebrate the wealth of upper-class life and offer relaxation to the working-classes from the stress of work (Carr, 1992).

The suburbanization of the United States saw private lawns becoming the new key locations for ‘public life’, whose main theme is security and pleasure of private life. Subsequently, this movement left many city centers vacant and dangerous (Carr, 1992)

After World War II, urban planners urged a revival of public space to improve urban quality of life. In the late 1950s, pedestrian mall movement made cities strive to improve downtown retail and office areas by creating new plazas, parks, and other public spaces (Carr, 1992). The dissatisfaction of empty landscaped spaces called for specific types of activities supporting public life in public spaces. According to Carr (1992), goals that were the most often cited by producers and managers of public spaces include: public welfare, visual enhancement, environmental enhancement and economic development. This changed the way zoning worked as a tool for separation of use and led cities to adopt higher flexibility in zoning. The 1961 incentive zoning in New York City was a good example of such intention. The zoning allows private developers to build beyond existing floor-area-ratios and height restrictions if they provide public space within their private property.

As Whyte (1988) documented, between 1961 and 1973, some 1.1 million square feet of new open space was created in New York City – more than in the rest of the country combined. According to Kayden (2000), New York City has accumulated 503 privately owned public spaces under the influence of 1961 incentive zoning, with a total area of around 82 acres, which would cover 10% of Central Park. This tool of public-private partnership of providing public spaces was adopted in other cities and the number of new public spaces produced under such incentive zoning demonstrated its effectiveness. The need to regulate private provision of public space and society's growing demand for better public space pushes planning organization to adopt higher design standards.

In this thesis, I will investigate factors influencing the use of public spaces in Community District 5 and 6 in New York City. The actual use evaluation is based on Kayden et al (2000) classification method. I will examine whether public spaces' own design, management and surrounding land use condition have effect on public space usage. By conducting user interviews, I will investigate whether there is a difference between users' perceptions and actual uses of control methods in public spaces.

Background

The shift in focus from quantity to quality of public space has triggered more critical review on actual performance of public space, especially on privately owned public spaces.

From the adoption of the 1961 incentive zoning until 1974, before the latter zoning reform, developers provided 136 plazas and 57 arcades out of 231 privately owned public spaces (Kayden, 2000). According to the Voorhees report, these plazas accomplished the zoning goal of fostering greater light and air at street level, but they fell short of becoming usable open spaces. The private sector's minimal compliance to zoning code produced many accessible yet barely functional spaces for public use.

The city has been fine-tuning its design regulation on public space ever since, yet the extensive inventory in *Privately Owned Public Space, the New York Experience* still shows uneven results in qualitative measurements. Zoning reforms from the mid-1970s onwards that introduced higher design standards have resulted in substantially better outdoor public spaces. In the meantime, some public spaces have been privatized or closed by operational methods, for example, locking up the space during daytime, therefore diminishing the enjoyment of public.

However, design is not the sole element determining the quality of public space. In research undertaken in England and Wales, Worpole and Knox concluded that 'the success of a particular public space is not solely in the hands of the architect, urban designer or town planner; it relies also on people adopting, using and managing the space – people make places, more than places make people' (Worpole, Knox, 2007).

Space providers and users are both contributors in shaping public spaces. Privately owned public spaces have long been criticized for using controlling management methods to filter the users and activities on their property, usually for commercial profit. Traditional shopping malls and amusement parks are typical examples of such cases. These themed settings create an illusion of public space, from which the risks and

uncertainties of everyday life are carefully edited out (Banerjee, 2001). Therefore, users in such public space have far less control in place-making than do space providers.

Ownership might explain some level of exclusion in public space; however it does not tell the full story. The recent Occupy Wall Street is a good example showing how privately owned public space sometimes has a higher level of tolerance than publicly managed spaces. Zuccotti Park's flexibility in operation time and management methods made it ideal for protestors, though First Amendment Right isn't technically protected in privately owned public spaces.

Another reason for the filtration of user and activity can be traced back to the origin of public spaces. The political freedom in agora was denied to slaves, women and foreigners. Though slaves and women could work in agora, they were formally excluded from the political activities of this public space (Mitchell, 1995). In terms of limitation of activity happening in agora, Aristotle described the ideal public space as a place for discussion and exchange of ideas but also as a site from which all commercial activities and all merchants and vendors should be exiled. (Drucker and Gumpert, 1991)

In Aristotle's book *the Politics*, he wrote:

Near this spot should be established an agora, such as that which the Thessalians call the 'freemen's agora;' from this all trade should be excluded, and no mechanic, husbandman, or any such person allowed to enter, unless he be summoned by the magistrates (Jowett, 1885).

Forms of public space have been evolving since, as well as methods for excluding users and activities. Instead of stone-cold law in ancient agora, Haussmann's boulevards in Paris were constructed as public spaces to facilitate the state's protection of bourgeois private property. Commissioned by Napoleon III, Haussmann designed the boulevards as a tool to reform Paris, which later was seen as a space of militarization, surveillance, and control. The boulevards shouldn't be open to those who might challenge the bourgeois social order (Harvey, 2006). The boulevard produces an unforgettable image of modern Paris, yet it also represents an artificial social order and class homogeneity in public space.

Staeheli and Thompson explained social exclusion in public space within a political theory framework.

According to their theory,

Rights of citizenship are contrasted with the responsibilities of citizens. In liberal theory, the rights of individuals are the hallmarks of justice and democracy, and all individuals in a society have a claim on those rights. In republican theory, individuals can claim rights only insofar as they operate within the moral boundaries of society (Staeheli and Thompson, 1997).

Homeless people, whose appearances in public space are usually associated with unsafe environment, are also reflected in privately owned public space regulations. In 1979, a zoning amendment allowing the City Planning Commission to authorize owners to close certain through block plazas and contiguous arcades at night if upgrade provided. And in 1996 owners of urban plazas were given the right to apply for authorization to close at night (Kayden, et al, 2000).

Literature Review

New York City Zoning Text

To protect light and air on street level, ‘sky exposure plane’ was adopted to control building bulk. Yet a rezoning study by the Voorhees in 1958 suggested that ‘in attempting to solve this problem, a fixed geometric setback plane was established above a specified height, which has the now familiar limitation of producing rigid and complex building shapes which are not only uneconomic to construct but inefficient to use’ (Kayden, 2000). Therefore, the 1961 rezoning introduced an incentive zoning for developers to provide a ‘privately owned public space’ in front of building in exchange for higher allowed FAR in high density commercial and residential districts. Requirement of open and unobstructed plaza include minimal depth and size, elevation from curb level, and a series of permitted objects within the plaza. As it turns out, the incentive zoning was very effective: 67 out of 95 commercial office buildings constructed between 1966-1975 earned bonus FAR by providing public space (Kayden, 2000). However, the ‘as-of-right’ nature of such a bonus made it impossible for the City Planning Commission to control the quality of the plazas and arcades.

Between 1968 to 1973, the City Planning Commission and Department of City Planning opened up categories of public spaces to further encourage public space provision by private developers. Usually under the influence of catalyst buildings, new categories were adopted in Zoning Resolution. Yet the new categories, including elevated plazas, through block arcades, covered pedestrian spaces, sunken plazas and open air concourses, were not 'as-of-right' but had to go through a discretionary review by City Planning Commission to be eligible for bonus floor area (Kayden, 2000).

City's Board of Standards and Appeals has the power to grant special permits or variances to developers, either giving an additional bonus or allowing modifications in height and setback rules, resulting in some 'uniquely crafted public space not formally described by the text of the Zoning Resolution' (Kayden, 2000).

Between 1967 to 1973, the city introduced five special purpose zoning districts that 'would assign public spaces to specifically development on the site or street, in advance of any new development on the site or street, making them either mandatory, sometimes leavened with a floor area allowance, or voluntary encouraged by a floor area bonus' (Kayden, 2000). These special districts include the Special Theatre District, Special Lincoln Square District, Special Greenwich Street Development District, Special Fifth Avenue District, and Special Manhattan Landing District. Some special districts mapped out specific locations for public spaces, or in the case of Special Fifth Avenue District, public space is not allowed along Fifth Avenue and bonus space is given for retail floor area above minimum requirement.

A zoning reform in 1975 responded to the unsatisfactory 'as-of-right' plazas, replacing them in most commercial areas with three types of space: urban plaza, sidewalk widening and pre-existing open air concourse' (Kayden, 2000). The new category of sidewalk widening and its lower bonus level is a signal of city's attention on space quality. Another big change is that such open space associated with commercial buildings are no longer 'as-of-right' and must be reviewed by the Chairperson of City Planning Commission and then to be certified by the Buildings Department for construction. Meanwhile,

open spaces associated with residential building in both commercial and residential districts are now called ‘residential plazas’, and remained as ‘as-of-right’.

Design standards for new commercial plazas and residential plazas were substantially raised in the zoning reform. Location requirements, limits on the number of urban plazas that could occupy any given full block front, visibility from street line, elevation changes, seating, lighting, and other functional amenities were specifically spelled out in the zoning amendment. Kiosks, open air cafes and canopies were permitted in open spaces, to activate the space.

As summarized by Kayden, successive governments have fine-tuned regulations for privately owned public spaces since 1977. The Special Midtown District introduced new public space category ‘pedestrian circulation space’, which is mandatory at ground level. Through block galleria were introduced in the Midtown Special District and the Special Theatre District, which could be used for stationary public uses other than circulation. The 1996 zoning amendment banned residential plazas from being ‘as-of-right’ and required the City Planning Commission’s review, like with other urban plazas. Bonus for sidewalk widening, open air concourses, and through block gallerias were eliminated in the zoning amendment.

The 2007 zoning amendment updated design regulations, consolidated the definition of residential plaza and urban plaza into urban plaza, and streamlined the provision of plaza-related open-air cafes and kiosks. In 2009, a further amendment was adopted to update design rules, location restriction, compliances (Department of City Planning, 2009).

Following is the summary of permitted bonus Floor Area Ratio for residential, commercial and manufacture districts with a provision for a public plaza or arcade. (According to the zoning resolution, a “public plaza” is an open area for public use and an "arcade" is a continuous covered space fronting on and opening to a street or publicly accessible open area).

District	Use	Permitted Additional Square Feet of Floor Area per Square Foot of Public Plaza
F9, R10	Residential	6 square feet
C1-8, C1-9, C2-7, C2-8	Community facility use and/or commercial	6 square feet
C5-3, C5-5, C6-6, C6-7, C6-9	Commercial	10 square feet
C4-7, C5-2, C5-4, C6-1A, C6-4, C6-5, C6-8	Commercial	6 square feet
C6-1, C6-2, C6-3	Commercial	4 square feet
C5-3, C5-5, C6-6, C6-7, C6-9	Community facility use and/or commercial	10 square feet
C4-6, C4-7, C5-1, C5-2, C5-4, C6-3, C6-4, C6-5, C6-8	Community facility use and/or commercial	6 square feet
C6-1, C6-2	Community facility use and/or commercial	4 square feet
M1-6 (except for M1-6D)	Manufacture	6 square feet

District	Use	Permitted Additional Square Feet of Floor Area per Square Foot of Arcades
F9, R10	Residential	3 square feet
C4-7, C5-2, C5-3, C5-4, C5-5, C6-1A, C6-4, C6-5, C6-6	Commercial	3 square feet
C6-1, C6-2, C6-3	Commercial	2 square feet
C1 or C2 when mapped in F9 or R10, C1-8, C1-9, C2-7, C2-8, C4-6, C4-7, C5, C6-3, C6-4, C6-5, C6-6, C6-7, C6-8, C6-9	Community facility use and/or commercial	3 square feet
M1-6 (except for M1-6D)	Manufacture	3 square feet

The following is a summary of design standards of privately owned public spaces in commercial districts in New York City, where the majority of such spaces are located.

The minimum area for a public plaza is 2,000 square feet and permitted obstructions in the plaza include seats, tables, water features, planters, public restrooms, artworks, and so on. The maximum percent of

plaza area for such permitted obstructions ranges from 50% to 60%, based on the plaza size and whether there is a permitted open air cafe. There is a location restriction of public plaza that “no public plaza, or portion thereof, shall be located within 175 feet of an existing publicly accessible open area or public park as measured along the street line”. This restriction may be waived if the public plaza is “located directly across the street from the existing publicly accessible open area or Public Park” and if the Chairperson of the City Planning Commission finds that the location of the public plaza at such location would create or contribute to a pedestrian circulation network connecting the two or more open areas (*New York City Zoning Resolution*).

The design standard of public plazas encourages south-facing plazas, maximizing the sun-exposure of the open space and reflecting the initial intention to promote air and sun at street level. Required amenities in public plazas include seating, planting and trees, lighting and electrical power, litter receptacles, bicycle parking, drinking fountains, and public space signage. Additional amenities include artwork, moveable tables and chairs, children’s play areas, game tables and associated seating, and food service. For public plazas ranging from 5,000 to 10,000 square feet in size, at least one additional amenity must be provided: for public plazas in more than 10,000 square feet, a minimum of three additional amenities must be provided. Food service is also required for public plazas larger than 10,000 square feet if associated with a commercial building.

The section describing a performance bond system in zoning resolution that was intended to act as a compliance-inspection and enforcement system was deleted in the 2009 amendment and replaced by a compliance reporting system. Basically, a report is provided by a registered architect, landscape architect or professional engineer to monitor public spaces’ compliance to regulation, and to be submitted to the Director of the Department of City Planning and the affected Community Board, once every three years. Failure of compliance “shall constitute a violation of the Resolution and may constitute the basis for

denial or revocation of a building permit or certificate of occupancy, or for a revocation or such authorization or certification, and for all other applicable remedies” (*New York City Zoning Resolution*).

Design standard for arcades are less strict. Minimum and maximum depths are set, and no vehicle use is allowed within arcades or within 10 feet of any bonusable portion. Arcades must be accessible to the public at all times.

Incentive Zoning Review by Scholars

Whyte’s book *City* (1988) summarized the evolution of the 1961 incentive zoning. His Street Life Project was initiated to evaluate the result of incentive zoning. Developed from Whyte and his research team’s rigorous observation of pedestrian life and public space, new guidelines were adopted in 1975. Yet soon after, the financial crisis ended the building boom, causing a decline in the provision of new privately owned public spaces. Additionally, the city’s shortage of good sites to build on further limited the effectiveness of updated guidelines. This depressed social context pushed planning commissions to initiate more incentives for construction and development. New kinds of bonuses were given for through-block corridors, covered pedestrian areas, arcades and atriums. In addition to the multiple newly-permitted forms of public space, the flexibility from special permit applications further compromised the quality of bonus spaces. As the city’s focus shifted to bonusing off-street spaces as covered pedestrian areas, developers failed to provide amenities they promised. After analyzing different kinds of bonus spaces, Whyte suggested that besides plaza and urban park, all other amenities should be mandated rather than given bonuses for. He recommended giving bonuses to developers by providing off-site urban parks, instead of using on-site space at the bottom of those tall buildings with less potential for street life.

Kayden et al’s (2000) more recent review of privately owned public space was a great addition to Whyte’s work that fed into Department of City Planning’s revision of incentive zoning.

Space-by-space evaluation and index

Privately Owned Public Space, the New York City Experience by Kayden, Department of City Planning and the Municipal Art Society of New York is a major contribution to the record and evaluation of public space performance in the city. Categories used in the inventory include general information, legal basis, zoning computations, type and size of public space, hours of access, amenities, access of disabled, compliance and enforcement, comments, and owner communications. A use classification system was developed to evaluate the actual and potential use of the space, based on long-term empirical observation and expert judgment. The system classifies each space into Destination, Neighborhood, Hiatus, circulation, and marginal spaces. Observations were based on two principles of the space: how individuals actually used the space, and the design and operation of the space, especially with attention paid to how it supported or discouraged potential use.

By focusing exclusively on privately owned public space, this database is a great reference of how to evaluate public space quality. Physical condition, management methods and user's experience are all considered in the evaluation.

Náneth and Schmidt developed an index to measure the security of publicly accessible spaces. There are four major approaches of the index: laws and rules, surveillance and policing, design and image, and access and territoriality. The index is composed of 20 variables that are grouped into four categories, of which 10 indicate control of users and 10 indicate free use of the space.

The scoring rubric (0, 1 or 2) is based on presence and intensity of each variable. The overall index score for a given space is calculated by subtracting the total score for all variables indicating control from the total score for all variables indicating free use. A lower the score indicates a higher level of restriction on use.

This index was then used to test whether publicly owned public space has lower control over use than privately owned space. The result is that on balance, privately owned public spaces are more controlled or behaviorally restrictive than publicly owned spaces. However, analysis on score of features encouraging

and discouraging use within same ownership type shows that both types of spaces present equally emphasis on encouragement of use, though privately owned space also feature attention on controlling use and behavior. Further comparison of variables on four approaches show that privately owned space has a higher tendency to use surveillance cameras and security guards. (N émeth, Schmidt, 2009)

Based on this security index, N émeth conducted a principal components analysis of the data to see a more straightforward interpretation of relationship between different variables and represent a typology of management approaches in bonus spaces. Based on the different loading of variables, each space is categorized into filtered spaces, uninviting spaces, fortified environments, panoptic spaces, consumption spaces, and eyes on the street and small scale design. This analysis demonstrates the impact of each management technique and indicates that management approaches in such spaces are comprised of broader packages of measures (N émeth and Schmidt, 2007; N émeth, 2009)

N émeth, Schmidt and Botsford later used the security index to test whether policy reform has improved use of bonus spaces in Midtown Manhattan, measured by sociability index. No significant impact of 1970-reform was found in comparisons among post-1970 and pre-1970 bonus spaces, though different approaches to encourage and discourage use were observed between the two types.

N émeth and Schmidt also developed a conceptual model of measuring publicness. It is assessed on three core components: ownership, management, and uses/users. The three components are modeled as intersecting axes, each presenting a linear value. Space's public-ness is measured as the plotted area by connecting three points on the intersecting axis. (N émeth and Schmidt, 2009) Though this model was not completed, it suggests a multi-faceted way of measuring public-ness. Their paper suggests that a user-intercept survey would provide valuable information not only about the users of the spaces themselves, but also about how these users interpret and value publicly accessible spaces.

This thesis is built on the above studies and responds to the question raised by the scholars on the difference between public's perception and the actual level of publicness in public spaces.

General measurement and dimension

Whyte (1988) documented street life in New York City in terms of pedestrian, physical street, sensory street, space design, water, wind, tress, management of space, carrying capacity, steps and entrances, blank wall, sun and shadow, bounce light, etc. His analysis of how space works through narrating specific sites' condition provides empirical proof of key elements in successful public space creation. For example, he concluded that people prefer relatively smaller places, ranging from 5,000 – 10,000 square feet. Despite the amenities and spaces designed by architects and developers, he pointed out that 'what attract people the most, it would appear, is other people'.

In the record of a dialogue among 4 professionals in 1990 on public space from *Harper's Magazine*, Zimmerman suggested that the engineer's regulations on railing dimension and step depth, and the fire department's opposition to creative design solution prohibited lively use of public space. Fleming explained the concept of triangulation of activity, which is the stimulus that could ignite conversation between two strangers in public space.

In another study of public spaces in Cardiff, Preston and Swindon suggest some rules of engagement that create shared social spaces. The rules include accessibility and availability, invitations by peers and others, exchange-based relationships, discreet management and flexibility for self-organization, diversity of user and activity, and security management through active use instead of over-regulation (Mean and Tims, 2005).

Stephen Carr in *Public Space* constructed a human dimension to see relationships between places and people, aiming to manage the space more efficiently. The central argument is that public spaces' value grow out of an understanding of why people go to spaces, how they actually use them, and what they mean to their users over time. The human dimension system is to provide a general design and management guideline for public spaces. There are three critical dimensions: needs, rights and meanings.

Basic user needs for public space include comfort, relaxation, passive engagement, active engagement and discovery. Passive engagement usually takes the form of people-watching and active engagement takes the form of more intense physical interaction. Methods suggested by Carr to improve space performance towards user's satisfaction include provision of sun exposure, seating, toilet provision, separation from vehicle traffic, natural elements, formal events, public art, change in design, and so on.

Users' rights are composed of access, freedom of action, claim and change. Claim is the ability to control and represent the right of individual or group to appropriate spaces for personal use. Change indicates the flexibility of space, how reversible changes are once made, of which graffiti is one typical example. Related design and management suggestions for this dimension include barrier to entry, connection to circulation, symbolic access, physical layout, special attention for disadvantaged groups, design of 'loose part', ownership, and so on.

The third dimension is meaning and connections. Carr adopted this dimension based on Lynch's understanding of a good place as 'in some way appropriate to the person and her culture, makes her aware of her community, her past, the web of life, and the universe of time and space in which these are contained.' (Lynch, 1981)

The first two dimensions, needs and rights, are more or less covered in the security index by Németh and Schmidt and the sociability index by Kayden et al. However, this final dimension of meaning and connections to culture and society seems to be left out in most evaluations. One obvious reason is that it is hard to measure public spaces' social connection in a quantitative form. Yet examination of social background of such models of public spaces would help explain the missing evaluation element of meaning and connection.

Since privately owned public space has become the major form of public space provision in the city, this market-driven method is not based on a comprehensive plan in producing a geographically equitable distribution of public space. The result is a clustering of similar spaces in high-rise areas where additional floor area would generate maximum economic sense, and rare appearances in low-rise area where such bonus would not yield as much economic benefit. This lack of supervening organizational principle leads to the fact that each space is self-sustaining and there is no link among adjacent similar spaces.

In the *Social Value of Public Space* report, the authors suggest that though careful design and management of space would offer a higher level of interest and comfort, wrong location with poor connections to retailing, transport and public amenities can offset the benefit created by good design.

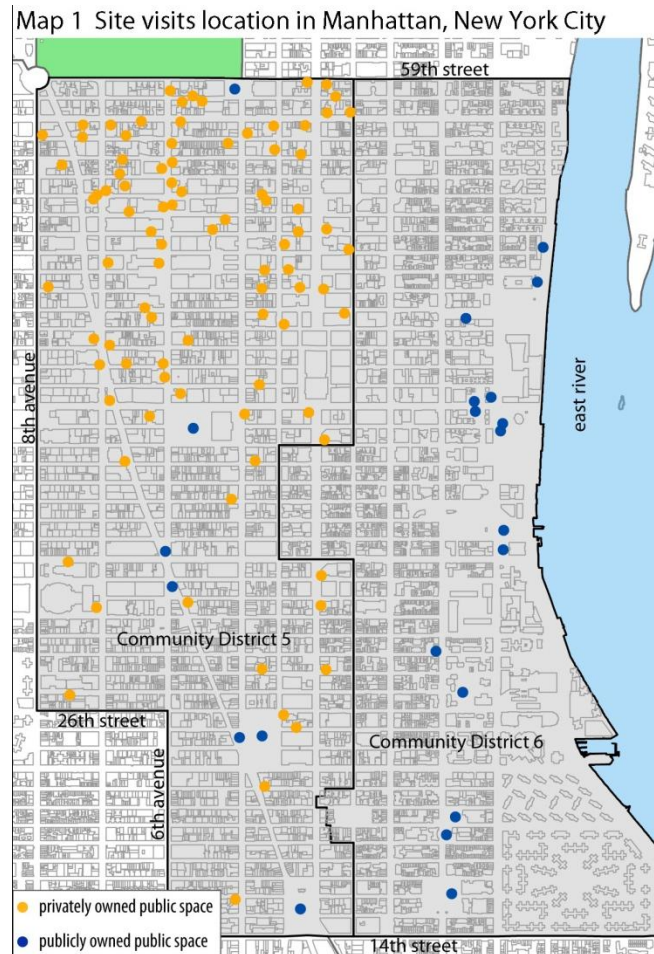
In 'Public Space and Communication: the Zoning of Public Interaction', Drucker and Gumpert suggested that though intending to promote mix-use, incentive zoning's result of pocketed public spaces is limited by zoning code's control over city by segregating use. As a result, a lot of such public places deserted after work hours, even though their design and management methods are dedicated to stimulate interaction.

However, according to Kayden et al., though the pattern of public spaces as a whole does not demonstrate an organizing principle, a finer-grained examination reveals several significant micro-patterns. In their investigation, certain through-block pedestrian network and special district zoning have shown potential of inter-relationship between such spaces. Zoning resolution also reflects a certain level of consideration in geographic distribution of public space. For example, covered pedestrian spaces and through block connections are only allowed within commercial districts rather than residential areas, due to the belief that primary users of such spaces would be employees and visitors rather than residents. (Kayden et al, 2000)

Therefore, in this thesis, I am investigating social context of public spaces, in addition to their inherent design characters, to understand each factor's influence on space usage.

The Data

I visited 90 privately owned public spaces and 22 publicly owned public spaces in Community Districts 5 and 6 in Manhattan, bounded by 59th street, 8th Avenue, 26th Street, 6th Avenue, 14th Street and East River Drive. Map 1 shows location of visited privately owned and publicly owned public spaces.



There were five privately owned public spaces under construction or renovation, which made use evaluation impossible. Therefore I dropped these data from the final database. All the 85 privately owned spaces are located within Community Board 5. Site visits were conducted during late January to late February, around 12pm – 2pm on weekdays for observation of peak hour usage during winter time. A description of each site is presented in Appendix I. Below I describe the variables in the dataset.

Description of Variables

The following variables are directly adopted from Kayden's (2000) *Privately Owned Public Space, the New York City experience* and other accessible data:

Kayden classification is to classify the use of public space, from the highest level of Destination, to Neighborhood, Hiatus, Circulation and the lowest, Marginal. (Definition of the five use categories is in Appendix II). The classification of use of public space is to 'examine the use or potential use of public spaces to learn how they actually function, or might function' (Kayden, 2000). The classification describes the type of activities in the space, where users come from, major design characteristics of the spaces that might attract or discourage usage. For example, the covered pedestrian space in Trump Tower on 5th Avenue is a Destination space, in which activities include eating, shopping, sitting, working, etc. It is a tourist spot that attracts people from beyond the immediate neighborhood. The amenities in the space make it more than a pure public space for stationary activities and circulation. The retail and food service functionally attracts users. On the contrary, marginal spaces, as the lowest use category, barely attracts users and provide little to no amenities for users to enjoy. In between Destination and Marginal are Neighborhood, which is mainly used by residents or workers within a 3-block radius and typical activities include group socializing, taking care of children, reading and relaxing; Hiatus space are generally used for a brief stop and not used for more active activities in Destination and Neighborhood spaces, typical activities include waiting, sitting on planter edge, smoking, talking on the phone, etc; Circulation space's main function is circulation and sometimes provides protection from weather, usually there is no other functional amenities to attract longer stay within the space.

Area is the recorded size of the public space. (Since Kayden's data only covers privately owned spaces, data of public parks is obtained from Department of Parks and Recreation website).

Building area is obtained from PLUTO by the Department of City Planning (2009). PLUTO provides an estimate of square footage of each building allocated for retail, office, commercial, residential and other

uses. I used ArcGIS to calculate the percentage of residential and office use within 3-block radius from the key public space. The intention for this variable is to test whether the percent of residential and office use in the area is a factor for different usage levels in public spaces.

Score has been kindly shared by Professor N ́meth and Schmidt, as they used an observation-based index to quantify the degree to which usage is controlled in publicly accessible spaces (N ́meth, Schmidt, 2007) Detailed index is shown in Appendix III. This variable is used to investigate whether spaces presenting more management methods in encouraging activity in public space actually have higher usage. The index is a numeric score evaluating each space's public-ness, based on 4 key principles, laws/rules, surveillance/policing, design/image, and access/territoriality. Each key principle is comprised of further detailed categories. Based on site visits, a score of 0, 1, or 2 is given to each category, indicating the existence and intensity of features. Detailed features include visible sets of rules (under the principle of Law/rules), diversity of seating types (Design/image), entrance accessibility (Access/territoriality) and security personnel (Surveillance/policing), etc. The overall score is the sum of scores for features encouraging usage, minus the sum of score for features discouraging usage. Therefore, the higher the overall score, the higher level of public-ness does the public space has.

For this study I collected additional data for each site that includes:

New classification is the result of my re-evaluation of use of these public spaces. Following Kayden's definition of these use categories and also adjusting strategy based on limitation of weather and manpower, my evaluation is based on the level of activities, number of people in the space, and potential usage of space as suggested by existing amenities.

Use is a numerical translation of New classification for further data analysis. As Kayden's category definition shows that they present an ordinal level of space usage, ordered in Destination, Neighborhood, Hiatus, Circulation, and Marginal. Therefore, Destination spaces are assigned the number 5, indicating the

highest level of usage; Neighborhood as 4; Hiatus as 3; Circulation as 2; and Marginal as 1, indicating the lowest level of usage. This is the dependent variable in the following statistical analysis.

Amenity is the number of amenities provided within or at the immediate boundary of public spaces. Typical amenities include seating, tables, trees, drinking fountains, roof coverage, and café. Amenities provide the basic equipment for activity in public space. I expect that places with more amenities will have more users and higher levels of activity.

Station is a dichotomous variable that indicates the existence of transit stations at the immediate perimeter of the space. 1 is given to spaces that have such stations; 0 means there is no immediate transit station. This variable is inspired by interviews with public space users that the proximity to a transit station sometimes influences users' choice to stay in some public spaces.

Indoor is also a dichotomy data indicating whether the space is indoor or outdoor. A score of 1 is given to spaces with roof coverage and 0 is given to outdoor spaces. The related hypothesis is that indoor space tends to attract more users with its better protection against weather, especially during winter season.

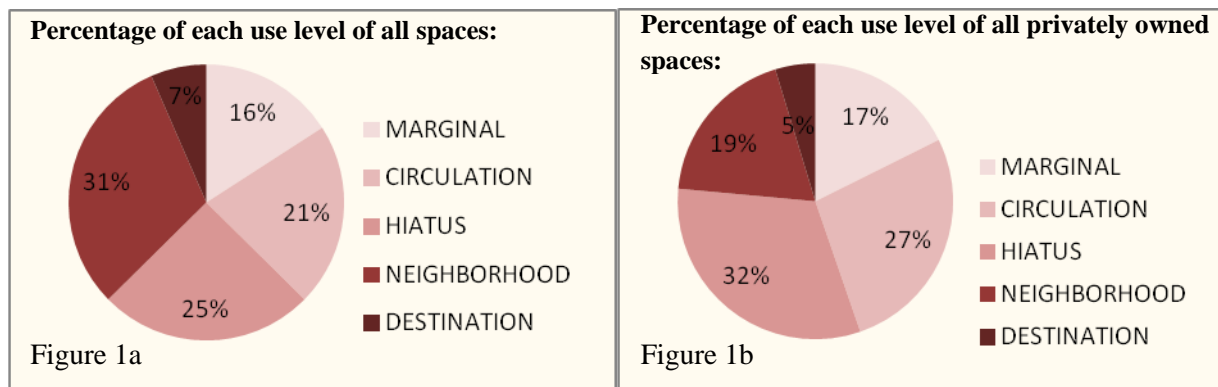
POPS is the number of other public spaces within 3 blocks from the target public space. Though no privately owned public spaces in Community Board 6 were included in site visits, they were counted in this category for publicly owned public spaces by using maps in Kayden's book. My hypothesis is that tight clustering of public space decreases actual use. This originates from Kayden's analysis that huge continuous plazas surely provide more light and air, but can 'sometimes be too much of a good thing' which 'totally obliterate the street wall and harm the street vitality'. In his book, he used the continuous public plazas along Sixth Avenue between 49th street to 52nd street as an example. My hypothesis is developed from this example that not only contiguous clustering is not good; concentration within walkable area is also problematic.

Transit is the number of all transit stops within 3 blocks from the target public space. This data is obtained from Google maps and manually counted. My hypothesis in this variable is that the higher number of transit stops in the area would generate higher levels of foot traffic on streets, therefore increasing the possibility of pedestrians discovering public spaces along their routes and encouraging higher space usage.

Analysis

This thesis examines the relationship between actual usage levels of public space, their design characteristics (number of amenities, square footage, indoor or outdoor space, and publicness) and surrounding environment conditions (land use, transit, cluster of public space in the area). Interviews with public space users are conducted to see whether there is a difference between users' perceptions and actual publicness levels in such spaces.

General impression from site visits



After all site visits, it is my general impression that public parks tend to exist in areas with higher residential use and generally are categorized as Neighborhood spaces. Public parks usually are designed for specific types of activity; most often these are sports and children's recreational use. Typical activities in public parks include walking dogs, children playing, people talking in groups and eating. The majority of privately owned public spaces is in commercial districts and categorized as Hiatus spaces, where the

typical activities observed during site visits were smoking, making phone calls and having a quick lunch bought from nearby vendors. In addition to different types of activity, differences in design, program and location between privately owned and publicly owned public spaces also results in diverse peak-use hours. Privately owned public spaces usually are occupied during lunch hour, while public parks, especially playgrounds are occupied more often during the afternoon when school ends.

Descriptive statistics on locational variables

The following section is a summary of descriptive statistics on variables presenting condition in the neighboring area (percent of residential and office use, number of other public spaces, and number of transit stops) in order to preliminarily observe their implication on space usage.

- *Percent of residential and office use*

USE	0-0.1	0.1-0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1.0	Total
MARGINAL	5	4	5	2	1	0	0	0	0	0	17
CIRCULATION	14	7	2	0	0	0	0	0	0	0	23
HIATUS	13	8	4	0	2	0	0	0	0	0	27
NEIGHBORHOOD	12	1	8	3	2	1	1	1	2	2	33
DESTINATION	2	3	2	0	0	0	0	0	0	0	7
Total	46	23	21	5	5	1	1	1	2	2	107

* residential square footage ratio = total residential usage footage / total floor area within 3 block radius

USE	0.1-0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1.0	Total
MARGINAL	0	0	1	0	4	4	4	3	1	17
CIRCULATION	0	0	0	1	3	5	10	2	2	23
HIATUS	0	0	4	3	3	2	4	9	2	27
NEIGHBORHOOD	6	3	0	3	4	5	8	3	1	33
DESTINATION	0	0	0	2	0	2	1	2	0	7
Total	6	3	5	9	14	18	27	19	6	107

* office square footage ratio = total office usage footage / total floor area within 3 block radius

As most sites are located within Community Board 5, which is mainly for commercial use, it is reasonable that the majority of public spaces are built in an area with minor residential use (less than

30%) and major office use (more than 50%). This suggests that these public spaces tend to have a higher probability of being used by office workers.

Typical activities in these public spaces are smoking, talking on the phone, and having lunch. Normally, food vendors gather around these spaces and act as gathering points for users. A typical example of this is the continuous public plazas along 6th Avenue between 49th and 52nd street. During one visit on a sunny day, almost all seating along the fountain at 1251 Sixth Avenue was taken, with a comfortable distance between strangers. Many users were eating lunch while enjoying the sun, and there was a line of 15 people at one vendor around the corner, most of whom were office workers, judging from their clothes.

Of the 7 public spaces built within area with more than 50% of residential use, only one is privately owned public space and the rest 6 are public owned space. All of them are categorized as Neighborhood space. The only privately owned space belongs to the Fashion Institution of Technology and is located in front of a dormitory compound. Figure 2a is photo of 1251 Sixth Avenue and Figure 2b is the Fashion Institution of Technology:



Figure 2a



Figure 2b

The 6 spaces in the area with less than 10% office use are all publicly owned space. They are mainly playgrounds and basketball fields, with design and amenities for targeted user groups and associated focus on residential neighborhoods.

The dominant commercial use around privately owned public spaces and residential use around public parks is clearly associated with different motivation of such spaces. Though privately owned public spaces are meant for public use, their associated bonused commercial value is still the key reason for developers to build such spaces. Public parks are built on city-owned land, design and managed by the Department of Parks and Recreation, aiming to provide open spaces and public amenities for residents. Limitations of land, ownership and resources determine the number and location of public parks. Yet the fact that most of public parks are categorized as Neighborhood spaces demonstrates higher usage of such space than privately owned public spaces.

- *Number of other public spaces within 3-block radius*

USE	1-5	6-10	11-15	16-20	21-26	Total
MARGINAL	3	4	5	2	3	17
CIRCULATION	2	5	7	1	8	23
HIATUS	4	9	8	2	4	27
NEIGHBORHOOD	13	8	6	5	1	33
DESTINATION	2	1	1	2	1	7
Total	24	27	27	12	17	107

USE	1-5	6-10	11-15	16-20	21-26	Total
MARGINAL	13%	15%	19%	17%	18%	16%
CIRCULATION	8%	19%	26%	8%	47%	21%
HIATUS	17%	33%	30%	17%	24%	25%
NEIGHBORHOOD	54%	30%	22%	42%	6%	31%
DESTINATION	8%	4%	4%	17%	6%	7%
Total	100%	100%	100%	100%	100%	100%

Table 2.2b illustrates that of all public spaces located within area with more than 20 other public spaces, the majority are Circulation and Hiatus spaces. Among all spaces with the least level of public space clustering (with 1 to 5 other public spaces in the area), Neighborhood spaces are dominant.

There are 11 publicly owned spaces among the 24 spaces within the least clustered group. All 17 spaces in the highest clustered group are privately owned. After dropping all publicly owned space data, the result is as follows:

Table 2.3a number of public spaces within 3-block radius (private spaces)

USE	1-5	6-10	11-15	16-20	21-26	Total
MARGINAL	3	3	5	1	3	15
CIRCULATION	2	5	7	1	8	23
HIATUS	4	9	8	2	4	27
NEIGHBORHOOD	4	3	5	3	1	16
DESTINATION	0	1	0	2	1	4
Total	13	21	25	9	17	85

Table 2.3b percent of number of public spaces within 3-block radius (private spaces)

USE	1-5	6-10	11-15	16-20	21-26	Total
MARGINAL	23%	14%	20%	11%	18%	18%
CIRCULATION	15%	24%	28%	11%	47%	27%
HIATUS	31%	43%	32%	22%	24%	32%
NEIGHBORHOOD	31%	14%	20%	33%	6%	19%
DESTINATION	0%	5%	0%	22%	6%	5%
Total	100%	100%	100%	100%	100%	100%

Table 2.3a shows that the majority of privately owned public spaces is built in an area with 6-15 other public spaces within 3-block radius. In the least clustered group, Hiatus and Neighborhood spaces are the majority, while in the highest clustered group, Circulation spaces are dominant. The decrease of usage as clustering gets more severe confirms my hypothesis that too much clustering of public space is not beneficial to overall usage. However, the sudden change in dominant type of space from Neighborhood spaces in the 16-20 Group into Circulation spaces in the 21-26 Group, suggests that there might be a threshold for public space clustering to start affecting space usage.

Another thing to notice is that the three Destination spaces in this observation of private spaces, SONY plaza, IBM plaza and TRUMP tower, are all indoor spaces. Therefore, the spatial impact from other nearby public spaces is highly limited, compared to the original 6th Avenue scenario described by Kayden, where continuous and outdoor public spaces form a large urban void in the high density context.

- *Number of transit stops*

Table 2.4a number of transit stops within 3-block radius

USE	1-5	6-10	11-15	16-20	21-25	26-30	Total
MARGINAL	0	1	9	5	2	0	17
CIRCULATION	0	0	8	10	5	0	23
HIATUS	0	0	13	10	4	0	27
NEIGHBORHOOD	4	5	14	5	4	1	33
DESTINATION	0	0	4	2	1	0	7
Total	4	6	48	32	16	1	107

Table 2.4b number of transit stops within 3-block radius

USE	1-5	6-10	11-15	16-20	21-25	26-30	Total
MARGINAL	0%	17%	19%	16%	13%	0%	16%
CIRCULATION	0%	0%	17%	31%	31%	0%	21%
HIATUS	0%	0%	27%	31%	25%	0%	25%
NEIGHBORHOOD	100%	83%	29%	16%	25%	100%	31%
DESTINATION	0%	0%	8%	6%	6%	0%	7%
Total	100%	100%	100%	100%	100%	100%	100%

Table 2.4a shows that the majority of public spaces have 11-20 transit stops in the surrounding area. In Table 2.4b, the highest percentage of spaces shifts from Neighborhood, to Hiatus and Circulation as the number of transit stops in the area increases. Though in the group of highest number of transit stops there is 100% Neighborhood space, there is only 1 space in this group, therefore not making any meaningful suggestion. This observation suggests that as number of transit stops gets higher, actual use of public space decreases, which is the reverse of my hypothesis. To further examine the influence of transit condition on space usage, I analyze variable Station that describes the existence of transit stops at the immediate boundary of the public space. This variable describes a more direct transit condition in the target public space.

Table 2.5a				Table 2.5b			
transit stop at immediate boundary of space				transit stop at immediate boundary of space			
USE	no	yes	Total	USE	no	yes	Total
MARGINAL	16	1	17	MARGINAL	18%	6%	16%
CIRCULATION	20	3	23	CIRCULATION	22%	19%	21%
HIATUS	22	5	27	HIATUS	24%	31%	25%
NEIGHBORHOOD	29	4	33	NEIGHBORHOOD	32%	25%	31%
DESTINATION	4	3	7	DESTINATION	4%	19%	7%
Total	91	16	107	Total	100%	100%	100%

As shown in Table 2.5a, of all 107 public spaces, 16 have transit stops at the immediate boundary. This small sample size limits any further interpretation of this comparison. However, having a transit stop at the boundary could potentially be one of the reasons to explain the highest proportion of Hiatus spaces among the 16 spaces, as people tend to wait for friends at transit, which is typical activity in Hiatus spaces. Besides, as suggested from dialogues with the public space users, the existence of a transit stop encourages users to come and stay in the space. One lady with some disability in her legs told me that she always sits on the edge of planters in the public space at 5 E 22nd street, after she comes out of the subway.

Ordered logistic regression

To fully examine the relationship between relationship among public space usage, space design character and surrounding environment, I use STATA to conduct a regression model on all data. Because the dependent variable (Use) is ordinal, I use an ordered logistic regression model to examine. The result of ordered logistic regression model is as follows:

Result 1a Regression on all data

```

Iteration 0: log likelihood = -161.71798
Iteration 1: log likelihood = -115.69268
Iteration 2: log likelihood = -111.43846
Iteration 3: log likelihood = -109.32972
Iteration 4: log likelihood = -109.26147
Iteration 5: log likelihood = -109.26101
Iteration 6: log likelihood = -109.26101

```

```

Ordered logistic regression          Number of obs   =      107
                                   LR chi2(9)        =     104.91
                                   Prob > chi2       =      0.0000
Log likelihood = -109.26101         Pseudo R2      =      0.3244

```

use	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
amenity	3.453563	.6440005	6.65	0.000	2.396295	4.977308
station	.3945676	.250374	-1.47	0.143	.1137599	1.368528
indoor	2.141577	1.124938	1.45	0.147	.7649106	5.995933
pops	.9852103	.0331799	-0.44	0.658	.9222788	1.052436
transit	.9953202	.0648899	-0.07	0.943	.8759287	1.130985
area	1.00002	7.66e-06	2.67	0.008	1.000005	1.000036
res	16.32277	33.68271	1.35	0.176	.2859598	931.7147
office	1.198111	2.144722	0.10	0.920	.0358735	40.01481
score	1.196744	.0746546	2.88	0.004	1.059015	1.352385
/cut1	1.966136	1.785429			-1.533241	5.465513
/cut2	3.751727	1.793438			.2366525	7.266802
/cut3	5.770688	1.860538			2.1241	9.417276
/cut4	10.31103	2.119235			6.157407	14.46466

The p value of chi2 indicates that this model as a whole is statistically significant. In the parameter estimates, Amenity, Area and Score have statistical significance affecting the probability of the dependent variable.

After dropping all insignificant variables, the ordered logistic regression result is as follows:

Result 1b Regression on all data						
Iteration 0: log likelihood = -161.71798						
Iteration 1: log likelihood = -118.94484						
Iteration 2: log likelihood = -114.77944						
Iteration 3: log likelihood = -114.3102						
Iteration 4: log likelihood = -114.30652						
Iteration 5: log likelihood = -114.30651						
Ordered logistic regression				Number of obs	=	107
				LR chi2(3)	=	94.82
				Prob > chi2	=	0.0000
Log likelihood = -114.30651				Pseudo R2	=	0.2932
use	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
amenity	3.023461	.5141854	6.51	0.000	2.166429	4.21953
area	1.000024	8.74e-06	2.73	0.006	1.000007	1.000041
score	1.158405	.060167	2.83	0.005	1.046284	1.282542
/cut1	1.25155	.4612642			.347489	2.155611
/cut2	3.002424	.5131127			1.996742	4.008107
/cut3	4.860463	.6414434			3.603257	6.117669
/cut4	8.959115	1.083632			6.835236	11.08299

Result 1b means that one unit increase in Amenity would result in a 3.02 unit increase in the odds ratio of being in a higher Use category while the other variables in the model are held constant. A one unit increase in Area would result in a 1.0 unit increase in the odds ratio of being in a higher Use category while the other variables in the model are held constant. A one unit increase in Score would result in a 1.15 unit increase in the odds ratio of being in a higher Use category while the other variables in the model are held constant.

From this initial analysis, public spaces with more amenities, a larger area and higher level of management methods that encourage use would result in greater likelihood of use.

Result 1b includes all 107 data. In order to investigate the influence of factors on high-use spaces, I conduct a second regression test on all Hiatus, Neighborhood and Destination spaces. The reason to drop all data of Marginal and Circulation spaces is that they are not typically designed to attract users for long stays. This regression is intended to analyze high-use spaces and to provide insight on general tendency of factors among such high-performance spaces.

Result 2b Regression on Hiatus, Neighborhood and Destination spaces

```

Iteration 0:  log likelihood = -63.72069
Iteration 1:  log likelihood = -40.032746
Iteration 2:  log likelihood = -37.198317
Iteration 3:  log likelihood = -36.587854
Iteration 4:  log likelihood = -36.586062
Iteration 5:  log likelihood = -36.586062

```

```

Ordered logistic regression      Number of obs   =      67
                                LR chi2(4)      =     54.27
                                Prob > chi2       =     0.0000
Log likelihood = -36.586062     Pseudo R2      =     0.4258

```

use	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
amenity	3.555706	1.130708	3.99	0.000	1.906537	6.631416
indoor	5.599156	4.789203	2.01	0.044	1.047256	29.93591
area	1.000021	7.87e-06	2.68	0.007	1.000006	1.000037
res	79.93999	117.6683	2.98	0.003	4.465099	1431.189
/cut1	5.411878	1.28579			2.891776	7.93198
/cut2	10.82661	2.149883			6.612912	15.0403

A comparison between Result 1b and Result 2b shows that Amenity and Area are significant in both regression tests. In regression on all 107 data, SCORE shows statistical significance in influencing likelihood for higher usage, yet in the test of the 67 higher-performance spaces, Score is no longer significant and replaced by Indoor and Res. This comparison indicates that while design and management methods that encourage or discourage use influence the likelihood of higher space usage, this influence is limited when space performance has reached a certain level. Instead, being an indoor space and located in an area with higher residential use affects the likelihood of higher use among all Hiatus, Neighborhood and Destination spaces.

In order to compare the net effect of each variable, regardless of its weight, I use percentage change in odds for standard deviation change in each variable in STATA:

Result 3 percent change in odds of Hiatus, Neighborhood and Destination spaces

ologit (N=67): Percentage Change in Odds

Odds of: >m vs <=m

use	b	z	P> z	%	%StdX	SDofX
amenity	1.26855	3.989	0.000	255.6	568.9	1.4981
indoor	1.72262	2.014	0.044	459.9	94.5	0.3863
area	0.00002	2.684	0.007	0.0	342.2	70431.3612
res	4.38128	2.976	0.003	7894.0	184.1	0.2383

b = raw coefficient
z = z-score for test of b=0
P>|z| = p-value for z-test
% = percent change in odds for unit increase in X
%StdX = percent change in odds for SD increase in X
SDofX = standard deviation of X

Result 3 shows that one standard deviation increase in the number of amenities would result in a 568.9% increase in the odds of a public space enjoying a higher usage level, if all other variables are held constant. Basically, what this test tells is that the increase in number of amenities provided in public space would result in the largest increase in level of usage, compared to the other variables, such as whether it is an indoor space, the total square footage of space, and the percentage of residential use in the area. This result corrects the illusion in ordered logistic regression result that Area has a tiny coefficient, which is caused by its much higher numeric value compared to all other variables. Therefore, the effect of each independent variable on the possibility of increase in public space use now is comparable.

The above prediction test results are supported by real conditions that public spaces with more amenities have higher possibilities to attract users. For example, public space at 55 East 52nd Street, is an indoor space with chair, table, security guard, water feature, landscape, café retail and piano performance. People in this space were eating, talking, playing chess and working on laptops during my visit. It is categorized as a Destination place. Another indoor space, 499 Park Avenue, has a painting, seating and trees. During my visit, there were no users in this space. However due to its potential usage, I categorized it as Hiatus space where office workers could make phone calls and quick talks during lunch hour. These two spaces are both within an office building, therefore the office workers, who are main users in both

public space have similar behavior habits and preferences. The difference of usage is influenced by the extra amenities that make the space much more hospitable.

Figures 3a and 3b show the current condition at 55 East 52nd street and 499 Park Avenue:



Indoor spaces tend to increase the likelihood of higher usage, conforming to my hypothesis. It is reasonable that such spaces are less weather-prone and provide greater flexibility in space usage. Since data was collected during January and February, I expect the factor from indoor space to be smaller in spring and summer time, when there are fewer constraints from weather.

Since Amenity seems to have the largest influence on the possibility of higher public space usage, I conduct a linear regression test on Amenity to see whether it is related to other variables:

Result 4a Linear regression on Amenity of all data						
Source	SS	df	MS	Number of obs = 107		
Model	45.3859172	8	5.67323965	F(8, 98) =	2.42	
Residual	230.015952	98	2.34710155	Prob > F =	0.0199	
				R-squared =	0.1648	
				Adj R-squared =	0.0966	
				Root MSE =	1.532	
Total	275.401869	106	2.59813084			
amenity	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
station	1.055984	.4569779	2.31	0.023	.1491257	1.962841
indoor	.4522864	.3899351	1.16	0.249	-.3215271	1.2261
pops	-.0155831	.0260181	-0.60	0.551	-.0672151	.036049
transit	.0166462	.0482772	0.34	0.731	-.0791584	.1124508
area	6.26e-06	2.88e-06	2.18	0.032	5.53e-07	.000012
res	.0976248	1.550473	0.06	0.950	-2.979239	3.174489
office	.1015626	1.37551	0.07	0.941	-2.628091	2.831217
score	.055821	.045753	1.22	0.225	-.0349742	.1466163
_cons	2.158551	1.341367	1.61	0.111	-.5033486	4.820451

The test is overall statistically significant as the P value is within the 0.05 threshold. Of all other variables, Station and Area are statistically significant related to Amenity. Dropping all insignificant variables, the result is as follows:

Result 4b Linear regression on Amenity of all data						
Source	SS	df	MS	Number of obs = 107		
Model	39.7985588	2	19.8992794	F(2, 104) =	8.78	
Residual	235.60331	104	2.26541645	Prob > F =	0.0003	
				R-squared =	0.1445	
				Adj R-squared =	0.1281	
				Root MSE =	1.5051	
Total	275.401869	106	2.59813084			
amenity	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
station	1.060425	.4339811	2.44	0.016	.1998245	1.921026
area	6.45e-06	2.72e-06	2.37	0.020	1.05e-06	.0000119
_cons	2.617267	.1630071	16.06	0.000	2.294017	2.940516

Therefore, public spaces with a transit station at the immediate boundary would have 1 more amenity provided than spaces without a transit station in the prediction; each 100,000 square foot increase in area would result in 0.645 unit increase in predicted Amenity.

The positive relationship between Station and Amenity suggests that a transit stop at the immediate boundary of public space should be counted as an amenity in data collection. The positive correlation between Area and Amenity suggests that larger spaces would have more amenities. This can be backed up

by the city's zoning resolution that the number of required additional amenity provided in public plazas changes from 1 to 3 as the plaza size exceeds threshold of 5,000 and 10,000 square feet, respectively.

Figures 4a and 4b show the largest public space (Bryant Park, 418176 sq ft, with 6 recorded amenities) and the smallest (Building entrance recess area of Saks on 5th Avenue, 174 sq ft, without any amenity).



Qualitative Analysis

Of all visited spaces, 82 privately owned public spaces have been classified by Kayden et al in 2000.

After comparing their Use category in 2000 with my re-evaluation, 26 have different use patterns now. 10 spaces have been re-categorized as less-active spaces, either changed from Hiatus to Marginal, or from Neighborhood to Hiatus. 16 spaces show higher levels of use compared to their condition in 2000.

Luckily, Kayden's book included very detailed descriptions of all the privately owned public spaces in the city, which enables me to conduct a thorough qualitative analysis to see what has changed in these 10 years.

- *Less used spaces*



Figure 5 shows the current condition at 120 Park Avenue. It is a covered pedestrian space within an office building. Kayden's category in 2000 for it was Destination space and my evaluation is Neighborhood. My re-evaluation is due to the lower level of interaction among users and a lack of other amenities, compared to a typical Destination space - IBM plaza. Comparing my photo with Kayden's note, it seems that the basic physical environment and amenities have not changed a lot, except for a sculpture display and food kiosk. According to Kayden, 'over the years, sculptures have been scattered about, in close proximity with users, spawning an informal immediacy delightfully at variance with the customary formal museum setting.', and 'a food kiosk at the southwest corner provides refreshment.' Yet during my visit, I saw no sculpture or food kiosk. The missing sculpture and food kiosk would explain the lower level of use. However, even without the sculpture and food kiosk, this space is still very user-friendly and attracted a fair number of people during lunch hour on a weekday. People were eating, reading newspapers, and talking. The indoor space with a high ceiling and large windows provided a very nice environment, with abundant daylight and comfortable temperature on a winter afternoon.

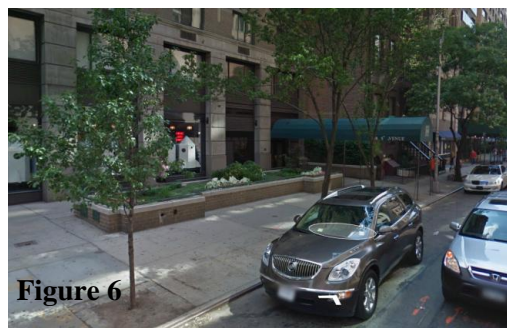


Figure 6 is the current condition at 108 Fifth Avenue, a small residential plaza. Its category is changed from Hiatus to Marginal. Compared to Kayden's data, the two wooden benches nestled into the planter were removed. Now, the only seating area left in this space is the uncomfortable planter edge. Though I did observe activities such as smoking during my visit, which are typical activities in Hiatus spaces, the low level of hospitality and inadequate size put this space into the Marginal category.

The other spaces that have lower use classification have not experienced major physical change compared to Kayden's description and picture. Therefore, the reason for their lower level of use is weather.

- *Higher used spaces*



1250 Broadway is a plaza at street intersection, as shown in Figure 7. In Kayden's description, it was an empty plaza space and was categorized as Marginal use. In my observation, now there are planters and litter bins in the middle of the plaza, forming pathways and gathering locations for users, and adding more context to the relatively large space. Besides, wooden benches were installed along the plaza edge, with a street vendor nearby. Activities in this space include talking, eating, and smoking. The new planter and seating definitely have positive impact on space revitalization. Though the planter edge is too high to sit on, it decreased the edge-less and emptiness of the previous design and acted as focal points for users.



Figure 8

Figure 8 is photo of 1350 Sixth Avenue. It is a Marginal plaza according to Kayden, as ‘most of the plaza is extra sidewalk wrapping around the building.’ A new sculpture featuring the word ‘LOVE’ is now installed at the corner of W 55th street and 6th Avenue, acting as a major activity anchor. People not only took photos with the sculpture, they also sat on sculpture’s edge for talking and resting. There were a few street vendors and a bus stop along the sidewalk of the space. These extra amenities encourage more activities and users in this space, improving its use category to Hiatus.



Figure 9

110 East 59th Street is a plaza space with a bronze sculpture and steel bench along the building edge, as shown in Figure 9. Seating was not recorded in Kayden’s description, yet the sculpture was there in 2000. Interestingly, the sculpture used to be ‘jauntily angled to the street’ and now it is parallel to the street, making the plaza easier to access and view. In addition to the seating and sculpture, a gourmet store and public library are located on first floor of the hosting office building, making this space more active than the Marginal use scenario in 2000.



Figure 10 is photo of 230 West 27th street, a small front yard for a dormitory compound of the Fashion Institute of Technology. In Kayden's description and photo, there was a 'low black metal fence surrounding the space, making it appear more private dedicated exclusively to the building's occupants'. Now, the fences are gone, turning the space's appearance more public. Wooden benches have been upgraded to steel benches, and the stone edge is built around tree foundation for protection and also acts as seating. Students of the Fashion Institute were talking and eating lunch in this space during my visit. Though it seems that the students are still the main users of the space, despite its higher level of openness compared to 2000 condition, the level of activity and number of users suggests it is a Neighborhood space.



Figure 11 is photo of 1633 Broadway Paramount Plaza, a combination underground concourse and a street-level plaza. Kayden criticized the sunken plaza portion on the grounds that it has not been put to lively use and lacks retail and commercial use. 'Much of the northern sunken space was covered by an ornamental fountain rendered unapproachable by a cordon of white planters'. And he further documented the changing condition in the space that 'over the past 10 years, the owner has removed the fountains and

installed in the northern space a flying saucer sculpture, a bench and fixed seats. Public-engaging retail uses and restaurants have been promised.’ Nowadays, there are restaurants and commercial uses open at the sunken plaza, yet the main active use from my observation is still pedestrian circulation from the subway station. Restaurants are now open at the plaza’s street level, and benches directly facing the restaurant facades were fully occupied by people enjoying food and sun, in winter at lunchtime. Planters are located in the middle of the plaza, visually separating the northern and southern parts of the plaza. Based on the observed level of activity and number of people in the space, I categorized it as Neighborhood space.

Users’ Perception of Openness/Control

Interviews on users were conducted to respond to Nemeth and Schmidt’s question on difference between the actual open/control methods taken in a public space and how users actually feel. Surprisingly, almost all public space users choose ‘appropriate level of control’ to answer the question, ‘how do you rate the control/management level of this space based on your feeling?’ (Examples of control/management methods were also provided in the questionnaire: Public signage; visible sets of rules; security camera and personnel; availability of restroom, seating, food vendor, art; accessibility of entrance; orientation to street; restricted or conditional use; operation hours.) After several rounds of interviews with similar answers, I changed the question to, ‘how welcome you feel in this space?’ and still people gave very positive answers, despite of the obvious quality differences among public spaces. For example, in Madison Square Park, most people were very happy with the park, some of them said that it was their favorite park in the city. At 101 Park Avenue, which is a plaza surrounding a commercial building, users’ answer were mostly ‘feel very welcomed’. Yet comparing these two places, Madison Square Park has plenty of amenities and a friendly atmosphere, while 101 Park Avenue provides just some stone seating on steps, and the modest plaza size and tall building height limits the place’s sun exposure. The difference in the number of amenities provided in the space affects the level of activities. As a Destination space,

Madison Square Park was filled with people walking dogs, talking in groups, lining up for food, walking their baby stroller. 101 Park Avenue, as shown in Figure 12, is a Hiatus space. It provides only basic seating to users, leaving little possibility for more active activities than sitting, talking and making phone calls.



Figure 12

One reason to explain the lack of diversity in answers to the interview is that the interviews were conducted within the public spaces, where users have already shown their preference of the space by physically being there. One way to improve the effectiveness of the interview would be to ask people at the close-by sidewalk or entrance, so that people not liking the space could also be included.

Conclusion

The ordered logistic regression results show a positive relationship among the number of amenities, area, score of public-ness, indoor space and ratio of residential floor area towards usage of public spaces.

Though the other variables are not statistically significant, descriptive statistic analysis shows number of public space and number of transit stops in 3-block radius having negative influence on space usage.

The statistical insignificance of variables describing contextual conditions might be explained by limited sample size and lack of diversity of samples due to site selection. There are over 500 privately owned public spaces in New York City, plus public parks and playgrounds. I expect there would be different statistic analyses if site visits could have covered more public spaces around the city. Community Boards 5 and 6 were chosen because of their high density of privately owned public space that could provide me

an opportunity to investigate the issues in densely located public spaces. However, such selection resulted in high level of similarity for social context, in terms of land use and transit conditions that restricted the analysis's accuracy in investigating social context's influence on public space usage. Similarly, the concentration on high-density areas of public spaces limits the potential of comparing condition in area with low-density of public spaces, which could cast different implication from analysis result in this study.

The ordered logistical regression shows that the number of amenities and public spaces' square footage have the largest influence on the likelihood of higher space usage. This explains why most of the Destination spaces are larger than those most commonly seen public spaces, providing sufficient space to accommodate a critical mass of active social interaction and activities among strangers. The combination of large spaces with various amenities would provide enough attractions for visitors to actually enjoy each space and facilities, which was the initial goal of the incentive zoning, as suggested in Voorhee's report (Kayden, 2000).

Zoning resolution has strict control over some variables, yet issues raised by some variables are barely touched upon. Responding to the positive relationship between public space size and usage, the bonus floor area for privately owned public spaces are directly associated with public space's size, which is an incentive for developers to build larger public plazas. Furthermore, the bonus ratio for each square foot of public plaza is larger than for arcades, which encourages developers to provide public plazas that are more user-friendly than arcades.

The required amenities for public spaces also are associated with square footage, which further increases the possibility of the public plaza having a higher usage. The Zoning Resolution specifically requires at least two types of seating in public plazas, and the number rises to three when the plaza exceeds 5,000 square feet in size. Additional moveable seating is required in spaces larger than 10,000 square feet. To

avoid the space being too crowded by amenities and facilities, the Zoning Resolution puts limits on the percentage of space that can be covered by obstructions.

The design standard in Zoning Resolution reflects the index by Nemeth and Schmidt measuring the public-ness of public spaces, though their index also includes more micro-scale management methods usually taken by property owners, such as cameras and security guards, which are not covered in Zoning Resolution.

In addition to the above-mentioned design and management controls of the public spaces, their social context is also addressed in Zoning Resolution, though in much less intensity. Even though public space guidelines in zoning resolutions are organized within different districts' frameworks, the only policy concerning social context outside of the proposed public space is the location restriction for public plazas. The 175 feet threshold in zoning resolution is much less than the distance I adopted in this study, as a 3-block radius would equal 600 feet. Yet as clearly stated in the resolution, the rationale for waiver from this location restriction is that the proximity to other public spaces would contribute to a pedestrian network among open areas. Pedestrian networks are valuable, yet attention should be shifted onto the second goal of incentive zoning during its initiation: public's ability to enjoy the space.

The office-use-dominant condition in privately owned public space and the residential-use-dominant condition for public parks suggest different target groups for the two types of public spaces. Though there are privately owned residential plazas, they generally do not exhibit high usage levels, compared to public parks and playgrounds. The most direct difference between residential plazas and public parks or playgrounds is the basic amenities. Children's play facilities and seating for parents are vital in attracting such populations and usage, which was never observed in residential plazas during my site visits. Hence, another limit of my thesis is that I am mainly focusing on privately owned public spaces and their related regulations. A detailed study on process of selecting sites for public parks and playground and the design standards are missing from this investigation. Further study on works by the Department of Parks and

Recreation should offer more suggestions on how to design public spaces for higher usage, which is generally not the prioritized goal for privately owned public space design.

There is no mention of transit stops in Zoning Resolution for privately owned public spaces. Developers are sometimes required to relocate or renovate a nearby subway station at their site. The previous analysis shows that as number of transit stops in the area increases, the usage of public spaces decreases, which is the reverse of my hypothesis. This might be because too much foot traffic generated by high concentration of transit stops reflects a higher level of targeted travel, and such travel has less flexibility than the usual lingering on street. During interviews with public space users, a large portion of the respondents that were alone said that they were in that space while waiting for a meeting in a nearby office building or waiting for a friend. This suggests that besides Destination spaces that are usually a target for a planned visit, people are more likely to visit other types of public spaces during a casual pass-by or for a short stay due to their proximity to user's next destination. The high concentration of transit stops in an area indicates a high circulation demand, and the associated high level of targeted travels would decrease the possibility for pedestrians to stop at the public spaces that they pass by. However, such phenomena might justify the need for more circulation space on the ground floor of private developments to ease the pressure from pedestrian circulation on street.

Policy Recommendations

The negative impact from too much concentration of public space within a 3-block radius suggests that there is a need for policy to address the spatial distribution problem of privately owned public spaces in the city, especially in area already with high density of such spaces. As suggested by Whyte, government should give bonuses developers by providing off-site urban parks instead of using on-site space at the bottom of those tall buildings, with less potential for street life. Despite imbalanced distribution of privately owned public spaces around the city, such off-site provision of public space could be combined

with public park construction, which could help balance the supply of public park and privately owned public spaces in the city.

In the 1975 zoning reform, there was a limit on the number of public spaces in each full blockfront. Though this regulation was replaced by a 175-foot locational restriction for public spaces, it is a potentially valuable reference on how to control the provision of privately owned public spaces under free market. Using a quota system for high density areas is one way to address this problem of unregulated concentration under the force of the free market. The quota could be a ratio of built floor area in the district. Therefore, the total square footage of privately owned public space allowed in the area is associated with total floor area. The higher density suggested by the higher total floor area would justify a greater need for public spaces. However, the ratio would put a cap on new developments if the allowed amount is already maxed out. Additionally, this link between built floor area and total public space's square in the area would allow flexibility when buildings are torn down or changes are made in existing public spaces. However, further study should be conducted as how to designate the boundary of each area to control levels of concentration and to consider the varying quality and usage of existing public spaces when calculating their total square footage.

When certain areas have seen a cap already topped, then government should adopt off-site provision of public space as an alternative way for bonus-earning. In this case, the original site for private development would be given extra allowable floor area on-site, and the impact on street level by the extra bulk would be justified by the already existing numerous public spaces in the area. The off-site provision of public space could be a physical public space being constructed in off-site location, or it could be an equivalent amount of investment to be given to city agency or community board for future construction or maintenance of existing public spaces. The amount of investment to be put in the off-site provision should be associated with the bonus floor area and their market value by certified appraisal. According to Kayden et al, 2000, the ratio of market value gain by bonus floor area and the invested amount in

privately owned public spaces is 48 to 1. This drastic ratio suggests a demand for public policy to control developer's huge profit from the incentive zoning.

Besides giving extra floor space as bonus, the city should consider giving tax breaks as an alternative form of bonus. In this way, light and air at street will not be an after-thought trade-off for public spaces with varying quality and usage. A portion of such tax breaks should then be put aside for off-site public space construction or current space maintenance. Another advantage of using capital investment as a way of off-site public space provision is that it brings the possibility of combining multiple investments and build a larger public space than any one investment would allow. As suggested by previous analyses, the square footage of public space has a positive relationship with actual space usage. Therefore it might be more socially beneficial to build one larger space with appropriate amenities that has high level of attraction for user and activities than a number of segregated spaces with limited potential for active usage.

A city-wide system documenting both public parks and privately owned public space should be developed in order to start an overall review of usage and spatial distribution of public space. Public awareness to information on such space can be promoted through internet and other related events. Occupy Wall Street is a recent example of promoting public awareness, and it does set a vivid demonstration that public spaces could be highly integrated into city life instead of remaining empty pieces of land with some trees and chairs.

Additional policies could encourage developers to build more indoor spaces and on locations that are adjacent to transit stops. Policy could be in the form of increasing bonus floor area for such spaces, or by legitimizing indoor space and adjacency to transit stop as additional amenities in the zoning resolution.

Food vendors play an important role in attracting users and acting as stimuli for interaction in public spaces, especially in those actively-used plazas around commercial buildings, according to my general impression from all the site visits. Through an information platform to be built between city-wide public

space system and vendor organization, vendors could be distributed for higher market efficiency while helping to activate some less-used public spaces.

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Appendix I: full data

ADDRESS	Kayden	New	USE	AMENITY	STATION	INDOOR	POPS	TRANST	AREA	RES	OFFICE	SCORE	
1095 Sixth Avenue	Neighborhood	Crculation		2	1	0	0	8	12	17034	0.02003	0.683274	6
108 Fifth Avenue	Hiatus	Marginal		1	1	0	0	1	18	1900	0.457833	0.243953	4
457 Madison Avenue	Hiatus	Marginal		1	3	0	0	11	16	5914	0.014404	0.832833	3
810 Seventh Avenue	Hiatus	Marginal		1	2	0	0	11	12	6575	0.109075	0.622179	4
51 West 52nd Street	Hiatus	Crculation		2	1	0	1	21	17	9766	0.049229	0.693337	4
1185 Sixth Avenue	Hiatus	Crculation		2	0	0	0	11	22	9991	0.043829	0.61776	5
1411 Broadway	Hiatus	Crculation		2	3	0	0	4	15	15114	0.024563	0.644365	4
9 West 57th Street	Hiatus	Crculation		2	2	0	0	16	13	16365	0.191963	0.538034	2
420 Fifth Avenue	Neighborhood	Hiatus		3	2	0	0	3	15	3765	0.083949	0.42858	9
120 Park Avenue	Destination	Neighborhood		4	3	0	1	4	14	5103	0.040107	0.816873	-1
500 Park Avenue	Crculation	Crculation		2	1	0	0	11	18	1479	0.11163	0.361543	8
145 West 44th Street	Crculation	Crculation		2	2	0	1	12	23	3012	0.028312	0.627114	-5
1548 Broadway	Crculation	Crculation		2	1	0	1	9	17	3012	0.035007	0.616266	-4
114 West 47th Street	Crculation	Crculation		2	3	0	1	11	20	3012	0.040631	0.627475	-4
151 West 54th Street	Crculation	Crculation		2	1	0	1	22	20	3012	0.137351	0.567253	1
899 Seventh Avenue	Crculation	Crculation		2	3	0	1	21	18	3563	0.239089	0.448906	-4
560 Lexington Avenue	Crculation	Crculation		2	4	1	1	12	14	3576	0.022285	0.797153	6
156 West 56th Street	Crculation	Crculation		2	1	0	1	22	20	3842	0.137351	0.567253	0
383 Madison Avenue	Crculation	Crculation		2	3	1	1	8	14	5706	0.00154	0.805886	-6
135 West 52nd Street	Crculation	Crculation		2	1	0	1	22	21	6683	0.062418	0.652503	3
1325 Sixth Avenue	Crculation	Crculation		2	3	0	1	26	20	6781	0.109015	0.60696	4
2 Pennsylvania Plaza	Crculation	Crculation		2	4	1	0	3	13	18124	0.23396	0.496773	3
1301 Sixth Avenue	Crculation	Crculation		2	3	0	0	22	21	18192	0.062418	0.652503	5
1535 Broadway	Crculation	Crculation		2	3	0	1	9	15	24950	0.116109	0.49648	-5
725 Fifth Avenue	Destination	Destination		5	6	0	1	17	15	7922	0.150714	0.596415	-2
590 Madison Avenue	Destination	Destination		5	6	0	1	17	15	8261	0.150714	0.596415	3
550 Madison Avenue	Destination	Destination		5	7	0	1	23	20	10398	0.118702	0.636614	0
55 East 52nd Street	Destination	Destination		5	6	0	1	10	17	13000	0.030879	0.797977	7
499 Park Avenue	Hiatus	Hiatus		3	5	0	1	8	19	1450	0.138708	0.287878	4
450 Park Avenue	Hiatus	Hiatus		3	2	0	0	10	16	3900	0.121177	0.719627	3
40 East 52nd Street	Hiatus	Hiatus		3	4	0	0	11	18	4125	0.02522	0.798398	11
1155 Sixth Avenue	Hiatus	Hiatus		3	3	0	0	12	22	4258	0.028312	0.627114	4
146 West 57th Street	Hiatus	Hiatus		3	1	0	0	21	18	4375	0.239089	0.448906	4
1370 Sixth Avenue	Hiatus	Hiatus		3	2	1	0	22	16	4449	0.148022	0.544452	4
1755 Broadway	Hiatus	Hiatus		3	3	0	0	6	14	4954	0.468756	0.295559	1
12 East 49th Street	Hiatus	Hiatus		3	3	0	0	10	15	6387	0.008719	0.746687	3
65 East 55th Street	Hiatus	Hiatus		3	2	0	0	11	15	6437	0.071948	0.773227	5
1285 Sixth Avenue	Hiatus	Hiatus		3	2	0	0	20	21	9944	0.070615	0.674084	9
437 Madison Avenue	Hiatus	Hiatus		3	1	0	0	13	13	11044	0.013946	0.824802	4
101 Park Avenue	Hiatus	Hiatus		3	3	0	0	1	11	13874	0.115944	0.70968	0
299 Park Avenue	Hiatus	Hiatus		3	2	0	0	11	13	15313	0.026336	0.779236	-1
1114 Sixth Avenue	Hiatus	Hiatus		3	5	0	0	11	22	18873	0.016568	0.753325	0
345 Park Avenue	Hiatus	Hiatus		3	4	0	0	10	15	20690	0.031948	0.797081	6
1221 Sixth Avenue	Hiatus	Hiatus		3	5	1	0	12	21	28613	0.050373	0.688931	2
611 Fifth Avenue	Marginal	Marginal		1	0	0	0	12	23	174	0.00922	0.780775	3
489 Fifth Avenue	Marginal	Marginal		1	1	0	1	5	15	510	0.033495	0.755836	-3
6 East 43rd Street	Marginal	Marginal		1	2	0	0	6	21	1403	0.013832	0.754412	0
36 Central Park South	Marginal	Marginal		1	1	0	0	13	12	1958	0.228133	0.491331	3
712 Fifth Avenue	Marginal	Marginal		1	1	0	1	25	16	2100	0.148022	0.544452	-4
825 Seventh Avenue	Marginal	Marginal		1	1	0	0	26	20	2555	0.109015	0.60696	0
407 Park Avenue South	Marginal	Marginal		1	2	1	1	5	11	3170	0.292611	0.471314	-1
211 West 56th Street	Marginal	Marginal		1	3	0	0	12	14	4774	0.255786	0.45791	-2
41 Madison Avenue	Marginal	Marginal		1	1	0	0	6	14	4785	0.25403	0.531833	5
58 West 58th Street	Marginal	Marginal		1	0	0	0	16	13	4918	0.191963	0.538034	-1
230 West 55th Street	Marginal	Marginal		1	3	0	0	8	13	5320	0.253477	0.454443	-3
1330 Sixth Avenue	Marginal	Marginal		1	1	0	0	25	20	5933	0.080175	0.649107	8
520 Madison Avenue	Neighborhood	Neighborhood		4	4	0	0	18	27	2892	0.063384	0.696434	7
135 East 57th Street	Neighborhood	Neighborhood		4	4	0	0	8	16	4820	0.224335	0.560086	8
575 Fifth Avenue	Neighborhood	Neighborhood		4	4	0	1	7	22	7400	0.012369	0.745512	-2
888 Seventh Avenue	Neighborhood	Neighborhood		4	3	0	0	12	14	12194	0.255786	0.45791	3
31 West 52nd Street	Neighborhood	Neighborhood		4	4	0	0	25	20	12340	0.080175	0.649107	6
5 East 22nd Street	Neighborhood	Neighborhood		4	4	1	0	4	14	12617	0.26382	0.365214	6
1166 Sixth Avenue	Neighborhood	Neighborhood		4	6	0	0	11	19	17035	0.014409	0.735965	7
767 Fifth Avenue	Neighborhood	Neighborhood		4	6	0	0	13	12	23723	0.228133	0.491331	0
1251 Sixth Avenue	Neighborhood	Neighborhood		4	4	0	0	17	22	29820	0.057747	0.688951	7
1 Pennsylvania Plaza	Neighborhood	Neighborhood		4	4	0	0	3	16	50096	0.053548	0.62457	3
10 East 53rd Street	Marginal	Crculation		2	1	0	1	14	22	3724	0.037784	0.721153	2
40 West 57th Street	Marginal	Crculation		2	2	0	1	22	16	4366	0.170963	0.525576	3

Continued

ADDRESS	Kayden	New	USE	AMENITY	STATION	INDOOR	POPS	TRANST	AREA	RES	OFFICE	SCORE	
1515 Broadway	Marginal	Circulation		2	1	0	0	9	18	5800	0.095681	0.512584	-1
280 Park Avenue	Marginal	Circulation		2	2	0	1	11	15	17603	0.014525	0.815863	7
1133 Sixth Avenue	Circulation	Hiatus		3	2	0	0	11	20	5080	0.017388	0.714341	6
1700 Broadway	Circulation	Hiatus		3	3	0	0	17	16	7747	0.108713	0.602331	6
230 West 27th Street	Hiatus	Neighborhood		4	2	0	0	1	11	3094	0.547521	0.141112	6
115 East 57th Street	Hiatus	Neighborhood		4	4	0	1	8	16	7420	0.224335	0.560086	4
645 Fifth Avenue	Hiatus	Neighborhood		4	6	0	1	20	21	8881	0.032114	0.719524	4
1633 Broadway	Hiatus	Neighborhood		4	5	1	0	11	15	24029	0.010544	0.659229	10
110 East 59th Street	Marginal	Hiatus		3	3	0	0	8	19	5132	0.138708	0.287878	5
1350 Sixth Avenue	Marginal	Hiatus		3	4	1	0	26	18	5644	0.11226	0.582282	1
475 Park Avenue South	Marginal	Hiatus		3	2	1	1	6	15	6425	0.401019	0.333612	3
118 West 57th Street	Marginal	Hiatus		3	3	0	1	21	18	6820	0.239089	0.448906	0
1250 Broadway	Marginal	Hiatus		3	3	1	0	2	13	8469	0.136308	0.377997	-2
245 Park Avenue	Marginal	Hiatus		3	2	0	1	4	14	19138	0.031764	0.804488	1
Madison Sq. Park		Destination		5	6	1	0	5	21	271379	0.281525	0.371423	6
Union Sq. Park		Destination		5	4	1	0	1	13	283576	0.296266	0.334832	8
Bryant Park		Destination		5	6	1	0	11	15	418176	0.02979	0.733303	5
10 East 29th Street	under construction	Hiatus		3	2	0	0	6	15	12699	0.234801	0.368925	7
235 West 48th Street	undergoing alteration	Hiatus		3	2	0	0	8	12	7173	0.252238	0.226835	7
Trygve Lie Plaza		Marginal		1	1	0	0	10	8	4356	0.399286	0.552782	7
(U.N.Plaza) Ralph J Bunche Park		Marginal		1	3	0	0	16	15	18295	0.32946	0.600937	5
745 Seventh Avenue	under construction	Neighborhood		4	3	0	0	12	21	15648	0.050373	0.688931	9
Greeley Square		Neighborhood		4	6	1	0	2	15	6098	0.097783	0.456515	1
Tudor Grove		Neighborhood		4	3	0	0	16	15	8276	0.29016	0.60627	5
Herald Square		Neighborhood		4	6	1	0	3	15	9148	0.073682	0.526898	3
Mary O'Connor Pgd (Tudor City)		Neighborhood		4	3	0	0	13	13	10019	0.276251	0.63821	5
Worth Square		Neighborhood		4	4	0	0	5	14	11761	0.279574	0.370623	6
McArthur Park		Neighborhood		4	4	0	0	9	4	14375	0.792254	0.133385	9
Mary Collins Playscape		Neighborhood		4	2	0	0	6	5	15246	0.88315	0.037353	3
Peter Detmold Park		Neighborhood		4	5	0	0	5	3	25700	0.855015	0.055017	3
Grand Army Plaza		Neighborhood		4	3	0	0	8	11	27007	0.179402	0.575932	9
Augustus Street Gardens Playground		Neighborhood		4	4	0	0	4	8	27878	0.925797	0.008435	4
34 Street & Ferrylanding		Neighborhood		4	3	0	0	4	5	30492	0.312894	0.05489	5
JHS 104 Peter's Field		Neighborhood		4	1	0	0	4	11	38333	0.949448	0.024228	4
Robert Moses		Neighborhood		4	1	0	0	10	8	47480	0.399286	0.552782	4
Sutton Place Plaza		Neighborhood		4	3	0	0	19	8	69260	0.423648	0.458042	-1
Bellevue south park		Neighborhood		4	3	0	0	3	7	69260	0.453009	0.312172	7
St Vartan Park		Neighborhood		4	4	0	0	10	12	120225	0.310522	0.079328	7
Stuyvesant Park		Neighborhood		4	4	0	0	3	7	171191	0.675823	0.166955	6

Appendix II: Kayden et al (2000) definition of public space usage classification:

Destination space is high-quality public space that attracts employees, residents, and visitors from outside, as well as from, the space's immediate neighborhood. Users socialize, eat, shop, view art, or attend a programmed event, although they may also visit the space for sedentary, individual activities of reading and relaxing. The design supports a broad audience: spaces are usually sizable, well proportioned, brightly lit if indoors, aesthetically interesting, and constructed with first-class materials. Amenities are varied and frequently include some combination of food service, artwork, programmatic activities, restrooms, retail frontage, and water features, as well as seating, tables, trees, and other plantings. From time to time, a single amenity like a museum will be so compelling that it alone transforms the space into a destination space.

Neighborhood space is high-quality public space that draws residents and employees from the immediate neighborhood, including the host building and surrounding buildings within a three-block radius. Users go to neighborhood space for such activities as group socializing, taking care of children, and individual reading and relaxing. Neighborhood spaces are generally smaller than destination spaces, are strongly linked with the adjacent street and host building, are oriented toward sunlight, are made with good

construction materials, and are carefully maintained. Amenities typically include seating, tables, drinking fountains, water features, planting, and trees, but not food service and programmatic uses sometimes found at destination spaces.

Hiatus space is public space that accommodates the passing user for a brief stop, but never attracts neighborhood or destination space use. Usually next to the public sidewalk and small in size, such spaces are characterized by design attributes geared to their modest function, and include such basic functional amenities as seating. Hiatus spaces range from high to low quality in terms of design, amenities, and/or aesthetic appeal.

Circulation space is public space that materially improves the pedestrian's experience of moving through the city. Its principal purpose is to enable pedestrians to move faster from point A to point B, and/or to make the journey more comfortable by providing weather protection for a significant stretch. Circulation space is sometimes uncovered, sometimes covered, and sometimes fully enclosed. It is often one link in a multiblock chain of spaces. Size, location, and proportion all support its principal mission. Functional amenities that provide a reason to linger are not taken into account when classifying a space as a circulation space.

Marginal space is public space that, lacking satisfactory levels of design, amenities, or aesthetic appeal deters members of the public from using the space for any purpose. Such spaces usually have one or more of the following characteristics: barren expanses or strips of concrete or terrazzo, elevations above or below the public sidewalk, inhospitable microclimates characterized by shade or wind, no functional amenities, spiked railings on otherwise suitable surfaces, dead or dying landscaping, poor maintenance, drop-off driveways, and no measurable public use.

Jerold S. Kayden, Department of City Planning of the City of New York, and The Municipal Art Society of New York, *Privately Owned Public Space: the New York Experience*, John Wiley & Sons, 2000

Appendix III: Index by Jeremy Nemeth and Stephan Schmidt, 2007

Subjective/judgment rules posted	Laws/rules	2 = two or more signs 0 = none present 1 = one rule visibly posted
In business improvement district (BID)	Surveillance/policing	2 = two or more rules visibly posted 0 = not in a BID 1 = in a BID with maintenance duties only
Security cameras	Surveillance/policing	2 = in a BID with maintenance and security duties 0 = none present 1 = one stationary camera
Security personnel	Surveillance/policing	2 = two or more stationary cameras or any panning/moving camera 0 = none present 1 = one private security guard or up to two public security personnel
Secondary security personnel	Surveillance/policing	2 = two or more private security or more than two public personnel 0 = none present 1 = one person or space oriented toward reception
Design to imply appropriate use	Design/image	2 = two or more persons or one person w/ space oriented at reception 0 = none present 1 = only one or two major examples
Presence of sponsor/advertisement	Design/image	2 = several examples throughout space 0 = none present 1 = one medium sign or several small signs 2 = large sign or two or more signs
	Approach	Scoring criteria
Areas of restricted or conditional use	Access/territoriality	0 = none present 1 = one small area restricted to certain members of the public 2 = large area for consumers only or several smaller restricted areas
Constrained hours of operation	Access/territoriality	0 = open 24 h/day, 7 days/week, most days of year 1 = at least part of space open past business hours or on weekends 2 = open only during business hours or portions permanently closed
<i>Features encouraging freedom of use</i> Sign announcing "public space"	Laws/rules	0 = none present 1 = one small sign 2 = one large sign or two or more signs
Public ownership/management	Surveillance/policing	0 = privately owned and privately managed 1 = publicly owned and privately managed 2 = publicly owned and publicly managed
Restroom available	Design/image	0 = none present 1 = available for customers only or difficult to access 2 = readily available to all
Diversity of seating types	Design/image	0 = no seating 1 = only one type of stationary seating 2 = two or more types of seating or substantial movable seating
Various microclimates	Design/image	0 = no sun or no shade or fully exposed to wind 1 = some sun/shade, overhangs/shielding from wind and rain 2 = several distinct microclimates, extensive overhangs, trees
Lighting to encourage nighttime use	Design/image	0 = none present 1 = one type or style of lighting 2 = several lighting types (e.g., soft lighting, overhead, lampposts)
	Approach	Scoring criteria
Small-scale food consumption	Design/image	0 = none present 1 = one basic kiosk or stand 2 = two or more kiosks/stands or one larger take-out stand
Art/cultural/visual enhancement	Design/image	0 = none present 1 = one or two minor installations, statues, or fountains 2 = one major interactive installation or frequent free performances
Entrance accessibility	Access/territoriality	0 = gated or key access only, and at all times 1 = one constricted entry or several entries through doors/gates only 2 = more than one entrance without gates
Orientation accessibility	Access/territoriality	0 = not on street level or blocked off from public sidewalk 1 = street level but oriented away from public sidewalk 2 = visible with access off sidewalk (or fewer than five steps up/down)

<i>Laws/rules</i>	
Visible sets of rules posted	Official, visible signs listing <i>sets</i> of rules and regulations (not individual rules) on permanent plaques or “table tents.” Listed rules should generally be objective and easily enforceable, like prohibitions against smoking, sitting on ledges, passing out flyers without permit, or drinking alcohol
Subjective/judgment rules posted	Official, visible signs listing individual rules describing activities prohibited after personal evaluations and judgments of desirability by owners, managers, or security guards. Such rules include no disorderly behavior, no disturbing other users, no loitering, no oversized baggage, or appropriate attire required
<i>Surveillance/policing</i>	
In business improvement district (BID)	Spaces located in business improvement districts (BIDs) are more likely to have electronic surveillance and private security guards and less likely to include public input into decisions regarding park management. BIDs can employ roving guards to patrol especially problematic neighborhood spaces
Security cameras	Although cameras must be visible to observer to be counted, many cameras are hidden from view. Cameras are often located inside buildings or on surrounding buildings but are oriented toward space. Stationary cameras are more common, often less intimidating than moving/panning cameras
Security personnel	Scoring dependent on time of visit. Publicly funded police, park rangers, private security guards. For index, score only when security is dedicated to space. Since private security only directed by property owner, often more controlling (and score higher on index) since police trained more uniformly
Secondary security personnel	Scoring dependent on time of visit. Includes maintenance staff, doorpersons, reception, cafe or restaurant employees, bathroom attendants. Also, spaces often oriented directly toward windowed reception or information area to ensure constant employee supervision
<i>Design/image</i>	
Design to imply appropriate use	Small-scale design to control user behavior or imply appropriate use. Examples might include metal spikes on ledges; walls, barriers, bollards to constrict circulation or to direct pedestrian flow; rolled, canted, or overly narrow and unsittable ledges; or crossbars on benches to deter reclining
Presence of sponsor/advertisement	Signs, symbols, banners, umbrellas, plaques tied to space’s infrastructure, not to immediate services provided (e.g., cafes, kiosks). While non-advertised space is important for seeking diversion from city life, sponsored signs/plaques can push sponsors to dedicate resources for upkeep since company name is visible
<i>Access/territoriality</i>	
Areas of restricted/conditional use	Portions of space off-limits during certain times of day, days of week, or portions of year. Can also refer to seating/tables only open to cafe patrons, bars open only to adults, dog parks, playgrounds, corporate events open to shareholders only, spaces for employees of surrounding buildings only
Constrained hours of operation	While some spaces are permitted to close certain hours of day, spaces not open 24 h inherently restrict usage to particular population. Also, while usually due to lack of adequate supervision, spaces open only during weekday business hours clearly prioritize employee use over general public
<i>Laws/rules</i>	
Sign announcing public space	Most zoning codes require publicly accessible spaces to exhibit plaques indicating such. Some spaces are clearly marked with signs denoting their public nature (e.g., New York’s Sony Plaza), but when a sign or plaque is hidden by trees/shrubs or has graffiti covering it, its intent becomes null
<i>Surveillance/policing</i>	
Public ownership/management	Could fall in “laws/rules” approach, but more likely to impact type/amount of security, electronic surveillance in a space. Management often by conservancy or restoration corporation. Spaces can be publicly owned/publicly managed, publicly owned/private managed, or privately owned/private managed
<i>Design/image</i>	
Restroom available	Clearly some spaces are not large enough to merit public restroom. Realizing that free public restrooms often attract homeless persons, managers often remove them altogether or locate them in onsite cafes or galleries available to paying customers only (or providing keyed access for “desirable” patrons)
Diversity of seating types	Amount of seating is often most important factor for encouraging use of public space. Users often evaluate entry to space based on amount of available seating and ability to create varying “social distances.” Movable chairs allow maximum flexibility and personal control in seating choice
Various microclimates	Spaces with various microclimate enclaves enlarge choice and personal control for users. Potential features might include shielding from wind; overhangs to protect from rain; areas receiving both sun and shade during day; or trees/shrubs/grass to provide connection with natural landscape
Lighting to encourage nighttime use	Studies indicate that vulnerable populations often avoid public spaces at night if not well lit. Lighting spaces encourages 24-h use, which has been shown to make visitors feel safer/more secure. However, critics argue that night lighting aids surveillance efforts and implies authoritative control
<i>Small-scale food consumption</i>	
Small-scale food consumption	Most agree that food vendors enhance activity and vitality. This variable only includes small cafes, kiosks, carts, or stands selling food, drinks, or simple convenience items. Sit-down restaurants, clothing stores, and other full-scale retail establishments are not described by this variable
<i>Art/cultural/visual enhancement</i>	
Art/cultural/visual enhancement	Art and aesthetic attraction can encourage use. Variable can include stationary visual enhancements like statues, fountains, or sculptures, also rotating art exhibits, public performances, farmers’ markets, street fairs. Interactive features encourage use and personal control by curious patrons (often children)
<i>Access/territoriality</i>	
Entrance accessibility	If a space has locked doors or gates, requires a key to enter, or has only one constricted entry, it often feels more controlled or private than one with several non-gated entrances. In indoor spaces where users must enter through doors or past checkpoints, symbolic access and freedom of use diminished
Orientation accessibility	Spaces must be well integrated with sidewalk and street, as those oriented away from surrounding sidewalk, or located several feet above or below street level, make space less inviting. Well-used spaces are clearly visible from sidewalk, and users should be able to view surrounding public activity