

Analysis of the Interrelation between Urban Transitional Patterns and Urban Programs

Woo-Hyoung Lee

*Department of Architecture, Namseoul University, Cheonan, 331-707,
South Korea.
wlee@nsu.ac.kr*

Abstract

The purpose of this study is to analyze the interrelation between urban transition and urban programs based on changing patterns in urban data. The study aim is to identify the inherent characteristics of urban transition due to specific urban program implemented in the target area by comparing the changing patterns in urban data before and after implementing the urban program. The analyzed target area is the Clinton/Chelsea district in Manhattan, New York City, and the urban programs are special purpose districts (SPD) designated within the target area. The number of new construction and alteration projects and their floor areas in each SPD from the urban data is used as physical urban indicators which provide the basis of analysis. Analyzing changes in physical indicator over time before and after SPD designation, allows identifying changes in transition patterns caused by the designation and proposing analogous interpretations of the analysis results. The study provides grounds for more effective urban program and successful urban projects by improving the predictability of the impact of urban programs.

Keywords: *Urban Data, Urban Transition, Special Purpose Districts*

1. Introduction

Urban transition takes place through the interactions between a city's endogenous evolution and intentional public sector interventions, particularly urban programs. Urban transition is not the predictable outcome of a single-dimensional program but, rather is the complex outcome of the supplementary—sometimes conflicting—interrelations of multiple programs and policies related to socioeconomic contexts. Due to the lack of analytical tools for understanding the features of urban transition, the predictability of urban policy is reduced and, in many cases, urban policies aimed at addressing urban issues are applied simplistically, giving rise to new problems [1].

Avoiding this situation requires a comprehensive analysis that broadly considers a city's physical environment and its social, economic, and cultural contexts. Such analysis should demands a new research methodology based on an empirical analysis of cities' operational mechanism and the causes and patterns of urban transition. For this purpose, new resources based on state-of-the-art digital urban data can be useful. These resources enable overcoming the limitations of traditional perspectives and shed new light on inherent complexity of how a city functions and how its dwellers and environment interact [2].

The objective of this study is to conduct a data-based analysis of the inherent characteristics of urban transition in special purpose districts (SPD) in Manhattan, New York City, by analyzing changes in the patterns of urban transition before and after implementing this urban program. Regarding the theoretical background of this research, an overview of the characteristics of the selected SPDs is provided, and the interrelations between the physical changes and policy interventions in the SPDs are analyzed. Changes

in the number of new construction and alteration projects and floor area of new construction in three SPDs within the surveyed region over time before and after designation as SPDs are analyzed as physical indicators. This enables identifying changes caused by SPD designation and providing analogous interpretations.

The study goals are to propose the grounds for more effective urban programs and successful urban projects and to contribute to future research on urban transition by improving the predictability of the impact of urban programs on physical changes in a city.

2. Background Study

The indicators of an urban condition can be identified from either an academic or a legal perspective. These two dominant perspectives have distinctive purposes and inherent policy directions. This research follows the legal perspective, which is seen as a pure spatial strategy that regards the physical condition of a city as an embodiment of its socioeconomic contexts [3].

The Urban Planning Committee of New York has issued the SPD designation since 1969 with the goal of ensuring that urban planning and design reflect areas' unique features. Each SPD has a set of customized regulations and incentives for land-use zoning designed to reflect unique local conditions, circumstances, and values not captured by homogeneous land-use zoning.

The first SPD was designated to revitalize the then-deteriorating Time Square, which was successfully restored as the center of New York City [4]. Many SPDs have been implemented in various regions. SPDs in the Clinton/Chelsea district designated at different times: Special Clinton District (1974), Special Midtown District (1982), Special Garment Cent District (1987), Special Hudson Yards District (2005), and Special West Chelsea District (2005). The most recent project, the Special West Chelsea District has progressed successfully amid redevelopment of the High Line, a north-south freight rail network which used to operate in the area [5].

The aim of this designation was to provide a regulatory framework for the development of a vital residential area and a sustainable commercial area around the open public space created by the restoration of the High Line. The district covers an area bounded by 10th and 11th avenues and West 30th and West 16th Streets.

To help the public fully appreciate this area with sunlight, air circulation, and views, the project has focused on the transfer of development rights and development incentives related to open space and access to. Development density has also been adjusted in consideration of the areas surrounding the High Line and West Chelsea: the Hudson River to the west, high-density Special Hudson Yards District to the north, and small-scale Chelsea Historic District to the east [6].

The distinctive features of the surveyed Clinton/Chelsea district are as follows. By administrative code, it comes under Manhattan Community Board 4, which covers the Hell's Kitchen neighborhood. Geographically, the Clinton/Chelsea district lies between the Avenue of the Americas, 26th Street, and 8th Avenue to the east, 14th Street to the south, the Hudson River to the west, and 59th Street to the north. Historically, the Clinton was occupied mostly district mostly by poor Irish immigrant laborers, but the population composition began to change in the 1970s due to the area's proximity to Midtown.

Under pressure from the development of Midtown, eviction of poor tenants in the Clinton/Chelsea district began, but the area maintained relatively low property prices compared to other areas of Manhattan. However, since the early 1990s, residential gentrification and rents have surged amid the development of nearby Time Square and Midtown [7].

Historically, Chelsea was a manufacture district, but the Hudson River area north of 23rd Street has been hollowed out with the decline of industry. Today, the district is defined

by the High Line which passes through the entire area. A large population with diverse cultural backgrounds lives in Chelsea, and it is home to many ethnic restaurants, groceries, and high-end clothing shops, reflecting both the tradition of the area and the social diversity of its population.

More recently, Chelsea has grown into an alternative shopping area with many luxury brand stores. The establishment of Chelsea Market has also made it a major hub for food aficionados. The restoration of the High Line into open public place, in particular, led to many development projects in West Chelsea, transforming it into a center of the New York art scene as art galleries moved out of SoHo [8].

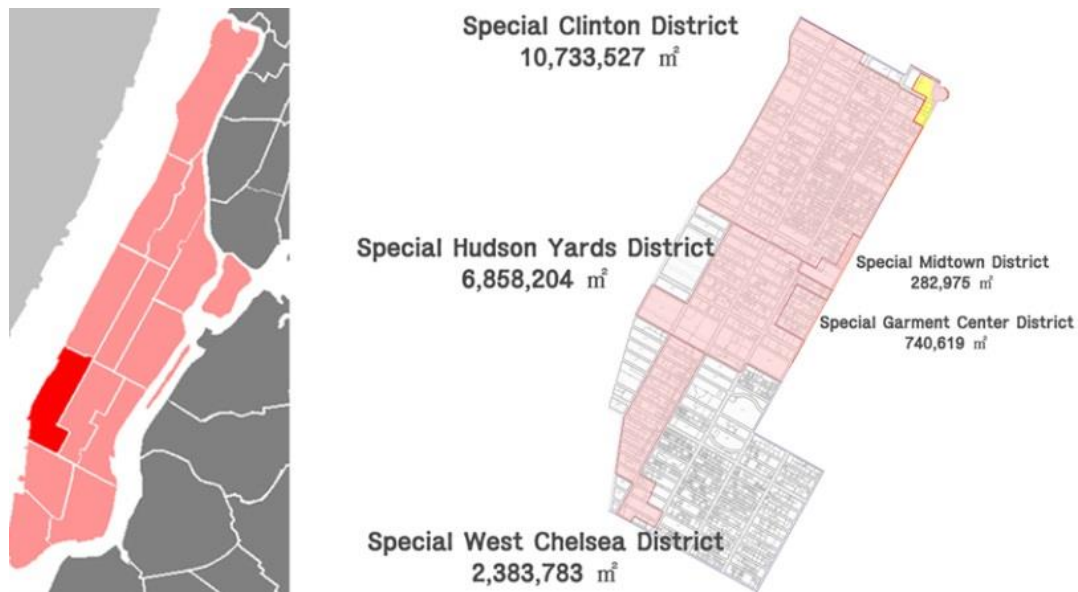


Figure 1. Location of the Target Area and the Detailed Map of the SPD Implemented Area

3. Implementation

In this study, the spatial scope of analysis is the Clinton/Chelsea district in Manhattan, New York City, a leading metropolis in United States which has a wide variety of industries and populations, and is undergoing vibrant urban transition.

Regarding the subdivision of the scope, three districts of five SPDs in the area are analyzed because their entire area is within the SPD. The Special Midtown District and Special Garment Center District are excluded from the analysis because only parts of their peripheral areas are in the SPD. In addition to the selected three SPDs, a non-SPD area is analyzed as a comparison. Regarding the time period of analysis, annual urban transitions from 1950 to 2015 are analyzed.

The amount of physical changes over time are tracked by the number of new construction or alterations and the floor area of new construction projects obtained from local GIS data in PLUTO, comprehensive geographical database on land use provided by the New York Department of City Planning. PLUTO contains information on more than 70 items, including tax lots [9].

For analysis, yearly data on new construction and alterations and the floor area of new construction projects for each lot are used based on the block number of each district. The number of buildings and their floor area are plotted on the vertical axis of graphs to allow for a more comprehensive comparison of changes.

The analysis results are used for two comparisons. First, the three surveyed SPDs are examined to detect physical changes before and after the SPD designation. Second, physical changes in the SPDs are compared to those in the non-SPD area. Based on these results, the impact of this urban program on urban transitions is examined, and analogous interpretations are derived.

4. Results

4.1 Changes in the Special Clinton District

The floor area of new construction was highest in 1976, 1987, 2005, and 2008, with wide fluctuations over the years. The number of new construction project showed steady change without large fluctuations. The pace of increase has generally slowed since the 1970s, with notable accelerations in 1987 and since the 1990s.

The number of alterations peaked in 1987 and grew at an unprecedented pace between 1980 and 1990. Alterations fell to nearly none in the early 1990s and were steady with minor fluctuations between 1994 and 2015.

After the designation of the Special Clinton District in 1974, the floor area of new construction increased sharply around 1976. The number of new construction and alterations projects stayed low until 1979 but then surged in 1987. A three-year gap was observed between the introduction of the SPD and explosive growth in the floor area of new construction.

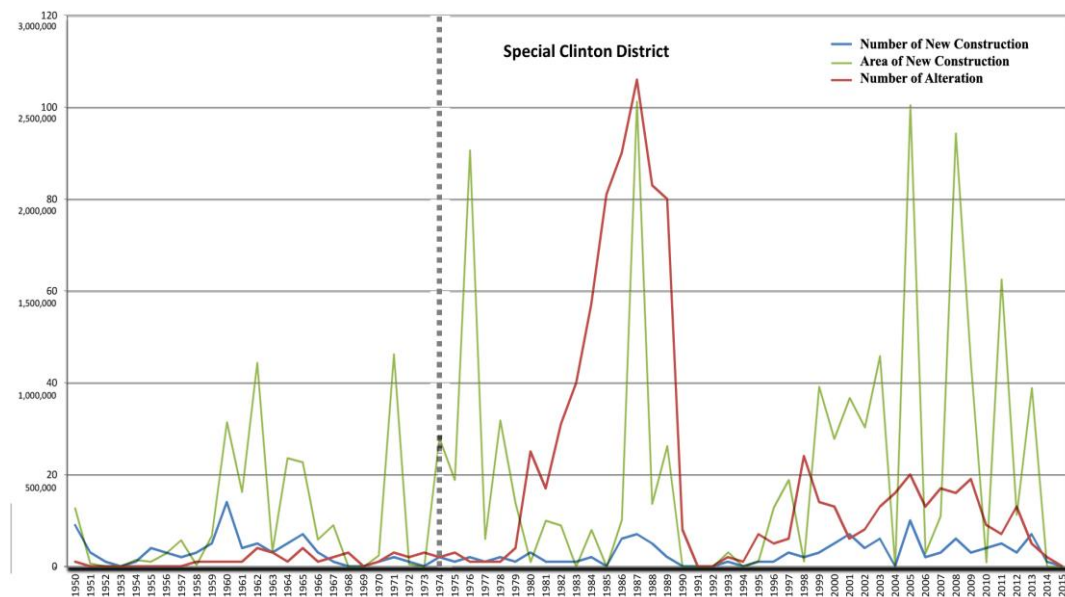


Figure 2. Changes in the Special Clinton District [10]

4.2 Changes in the Special Hudson Yards District

The floor area of new construction peaked in 1969 and showed sharp increases in 2000, 2008, and 2014. It was near zero between 1969 and 1999 and has fluctuated since 2000. The number of new construction project displays a similar pattern as the floor area of new construction.

The number of alterations underwent the most changes in the 1980s: it peaked in 1984 and increased at an unprecedented from 1982 to 1990. Similar to new construction,

alterations were stagnant for three years through 1993 and have fluctuated since the late 1990s.

After the SPD designation was issued in 2005, all indicators in the area picked up. One year after SPD designation, the number of new construction projects rose to an all-time high for the 2000s, and three years after SPD designation, the floor area of new construction started to rise sharply, peaking in 2013.

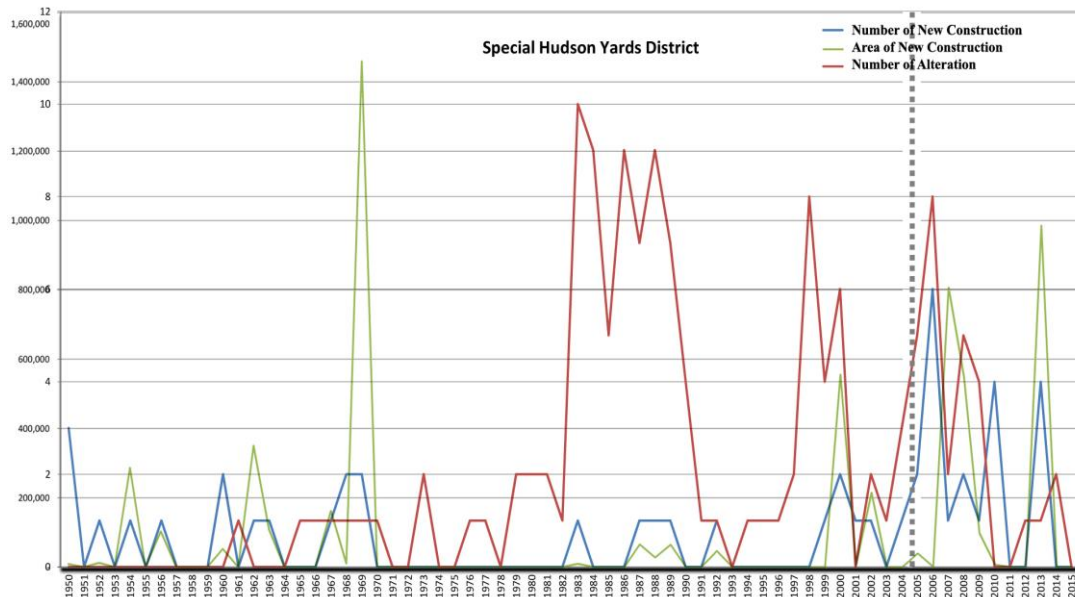


Figure 3. Changes in the Special Hudson Yards District [10]

4.3 Changes in the Special West Chelsea District

The floor area of new construction was generally stagnant and remained near zero until 2000. Starting in 2000, it increased, peaking in 2013, fluctuating between 2005 and 2009, and declining between 2009 and 2012.

The number of new construction projects exhibited almost the same movement and peaked in 2013. The number of alterations was highest in the 1980s, peaked in 1988, and grew at an unprecedented level between 1982 and 1990. It stayed low for three years through 1993 and surged to the previous peak level in 2004.

After the area was designated as a SPD in 2005, the number of new construction projects and their floor area rose sharply, while the number of alterations steadily decreased. Seven years after SPD designation, the number of new construction projects and their floor area peaked and then became stagnant for three years starting in 2009 but have generally fluctuated.

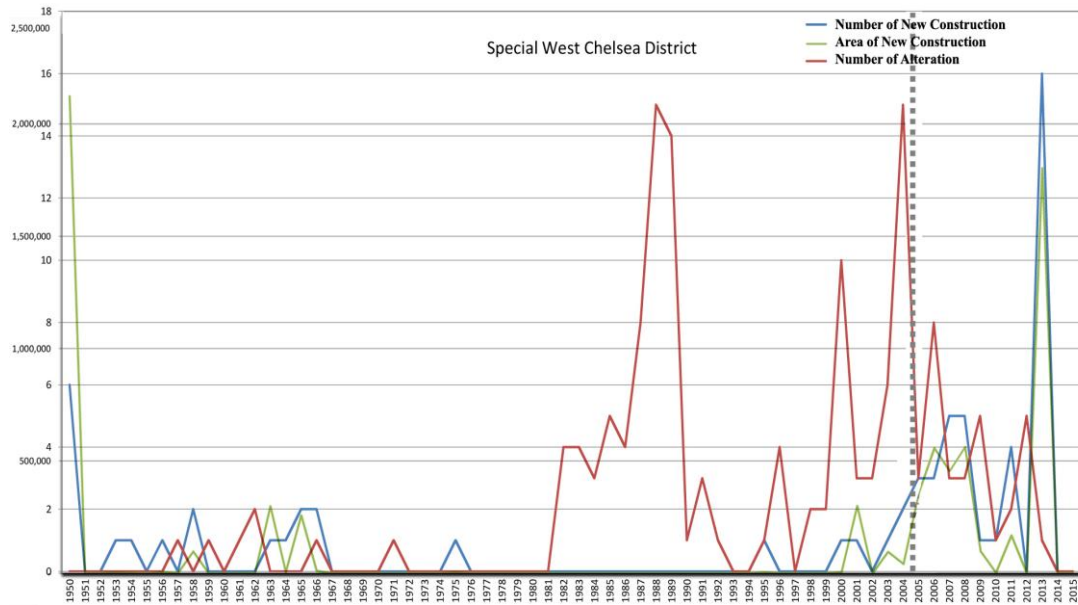


Figure 4. Changes in the Special West Chelsea District

4.4 Changes in the non-SPD area

During the period analyzed, the floor area of new construction in the non-SPD area peaked in 1963 and remained high during the 1990s through the early 2000s. Afterward, it declined slightly but also exhibited fluctuations.

The number of new construction exhibited similar patterns. The number of alterations underwent the highest level of changes in the 1980s, peaked in 1988, and increased at an unprecedented level from 1982 to 1990. Alterations remained low for three years starting in 1993, picked up again in 1997, and have since fluctuated.

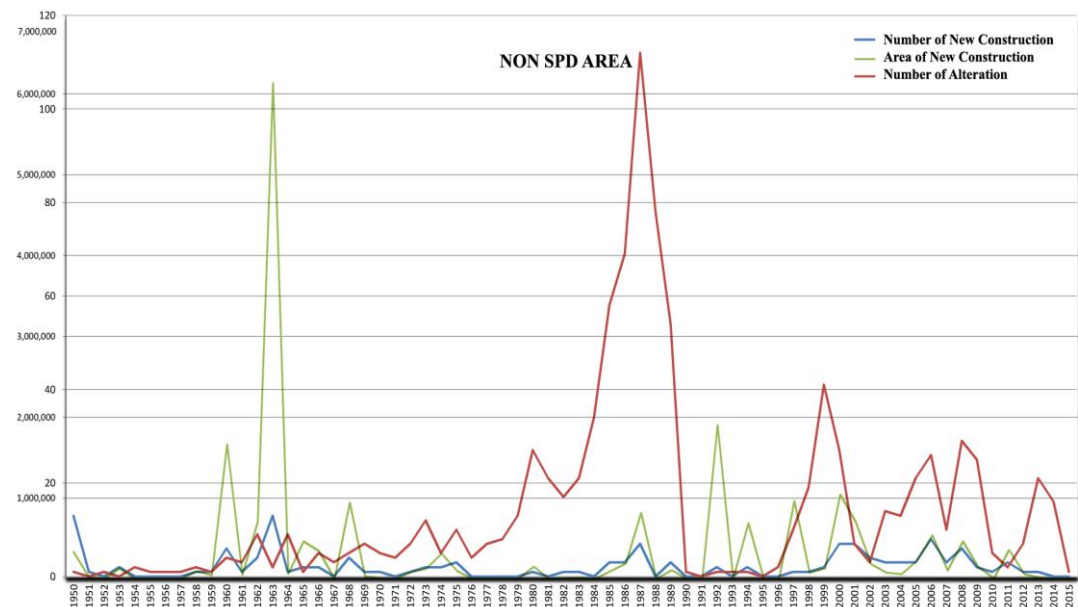


Figure 5. Changes in the Special West Chelsea District

4.5 Analogous Interpretations of the Analysis Results

From the physical changes of the surveyed SPDs and the non-SPD area, the following analogous interpretations are derived.

One, areas with similar trends of physical changes and a relatively small range of fluctuations were designated as SPDs. Two, in the surveyed areas, the establishment of new construction has been slow, and alterations have led urban transition. Three, in all the surveyed areas, the number of new construction projects peaked in 1987, and the sharp growth in the 1980s was not tied to designation as an SPD. Four, the number of new construction projects and their floor area declined between 2009 and 2012 in all the surveyed areas during the aftermath of the global financial crisis. Five, designation as a SPD contribute more to increased new construction than increased alterations. Six, changes in the Special Clinton District showed a similar movement as the non-SPD area and were insignificant for a long time after designation as a SPD, indicating that the designation had little influence. The small, short-lived rise in new construction projects with large floor area suggests that large-scale developments drove the changes. Seven, before SPD designation, the Special Hudson Yards and Special West Chelsea districts showed little changes for a long time, expect during common periods of sharp growth, indicating that they were less-developed areas. Developments in both districts picked up immediately after SPD designation.

Instead of merely tracking urban transitions in selected areas, future research should be aimed at identifying the interrelationship among the areas and formulating a quantitative function to explain the pattern of changes. This could enable identifying the impact of the provision of particular urban programs on specific areas.

Acknowledgments

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Author



Woo-Hyoung Lee

Education

Sep.1998 – Feb.2000	School of Architecture, Pratt Institute, New York
Degree	Master of Architecture
Mar.1992 – Feb.1998	School of Architecture, Kyungpook National University, Korea
Degree	Bachelor of Science in Architecture

Experience

Aug. 2009 - Present	Namseoul University
March. 2008 – May. 2009	DA Global Group NY, USA
Feb. 2004 – May. 2008	FX FOWLE ARCHITECTS, P.C. NY, USA
Oct. 2002 - Feb. 2004	RAFAEL VINOLY ARCHITECTS, P.C. NY, USA
Aug. 2000 - Oct. 2002	TAMS CONSULTANTS INC, NY, USA