Transforming Long Island City:
Examining the Impacts of Rezoning

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ABSTRACT

In response to non-contextual development occurring in the early 20th Century, became the first city in the United States to develop zoning regulations in 1916 to control land use and bulk throughout the city. These regulations, however, are not finite as the city is continuously evolving. Since the comprehensive overhaul of the zoning text in 1961 the City has taken a more piecemeal approach and began to target specific areas for rezoning. These piecemeal rezonings have occurred over much of New York City beginning in 2001 and minimal research has been done to determine the ability of the rezonings to meet their projected goals or to determine the impacts caused on their respective communities. The aim of this thesis is to understand the changes that have occurred as a result of the rezoning of the Long Island City Queens by comparing the changes that have occurred in specified socio-demographic categories within the boundaries of the rezoning to those outside the rezoning in Long Island City from 1990 to 2013 and to examine the changes in local economy from 2000 to 2012. The thesis will use both quantitative and qualitative methods in order to gain an understanding of the changes that have resulted from the rezoning.

I. Introduction

In response to non-contextual development occurring in the early 20th Century, became the first city in the United States to develop zoning regulations in 1916 to control land use and bulk throughout the city. These regulations, however, are not finite as the city is continuously evolving. Since the comprehensive overhaul of the zoning text in 1961 the City has taken a more piecemeal approach and began to target specific areas for rezoning.[1] These piecemeal

[1] NYC DCP: http://www.nyc.gov/html/dcp/html/zone/zonehis.shtml

rezonings have occurred over much of New York City beginning in 2002 and minimal research has been done to determine the ability of the rezoinigs to meet their projections and the impacts on the community.

In New York there is often resistance to upzoings due to a fear that current residents will be forced to move from due to an increased cost of living. An analysis of the draft Environmental Impact Study for the proposed contextual rezoning (now in effect) of the East Village and Lower East side. This rezoning would protect the neighborhood character of the East Village and LES, but would push development to Chinatown creating increased displacement and gentrification.[2]

Since the rezonings in New York City have only begun in 2002, not a lot of research on the actual impacts of said rezonings have been completed. Many of the available articles are purely speculative and focus on Manhattan.

Understanding the outcomes of rezonings is integral to ensuring that the city is able to grow in an orderly fashion and accommodate the population influx projected in PlaNYC 2030.

This thesis is exploratory in nature and aims to understand the changes that have occurred as a result of the rezoning of Long Island City in 2001 and will seek to understand if the zoning was able to accomplish its mixed use goals of preserving industrial uses and promoting residential and commercial growth. The thesis will use PLUTO, U.S. Census and NAICS data to understand the physical, demographic and economic changes that have resulted

[2] Li, B. Y. (2009). Zoned out: Chinatown and Lower East Side Residents and Business Owners Fight to Stay in New York City. *Asian American Policy Review, 19*, 91-97.

from the rezoning. The thesis will also interview stakeholders in order to better understand the transformation through the eyes of those who are directly affected by the rezoning.

II. Literature Review

Zoning is an important tool that is used all over the world to guide where and how development can occur. In cities where there is no comprehensive plan, zoning is the primary tool used to plan the city so it is important to know how the zoning is impacting its respective area and if it able to obtain its goals it was expected to reach.

There have been numerous studies on the impacts of zoning and land use regulations on property or housing values. Glaser and Gyourko (2003) conducted a study to determine the impacts of zoning and other land use restrictions on housing affordability. They found that there is a positive correlation between zoning and housing price increases noting that in areas where high housing costs are found, zoning and other land use regulation tend to be the most responsible. Contrary to neo-classical views, Glaser and Gyourko (2003) found that density is not significantly related to high housing costs. Higher housing prices tend to be found in areas of greater density, but this is arbitrary when a control for income is added and there is actually a statistically negative relationship between density and high housing costs.[3] Although compelling, the impacts identified by Glaser and Gyouko (2003) are purely speculative. Additionally the evidence for high housing prices related to zoning were based primarily off of

[3] Glaeser, E. L., & Gyourko, J. (2003). The impact of building restrictions on housing affordability. *Economic Policy Review - Federal Reserve Bank of New York, 9*(2), 21.

requests for rezonings in single family subdivisions and does not account for rezonings that occur in metropolitan regions.

A study by Grether and Mieskowski (1980) examines the effects of non-residential uses on nearby housing. They find that land use does not have any methodical effects on the values of housing. Adding low density apartment housing complexes or small commercial centers to single family residential developments will not have significantly harmful effects, but the introduction of heavy industrial uses or public housing can negatively affect the prices of residential property that is in close proximity.[4]

Another study by Mark and Goldberg (1986) studied the impacts that zoning caused on housing values over time. This study tested three different hypotheses. The first hypothesis sought to determine if the zoning of a parcel affects its sale price and stays consistent in magnitude and direction over time. They found that the classification of a parcel can sometimes affects the sale price of properties, but the magnitude and direction are not consistent over time. The second hypothesis sought to determine whether or not the value of a parcel is lowered by permitting uses other than single family residential. The idea behind this hypothesis stems from the neo-classical view that the integration of multi-family residential, commercial and retail into single family residential neighborhoods will cause negative externalities and will in turn lower property values. The study found that there is little evidence to support this claim, the only element that was shown to negatively affect property values in single family residential

[4] Grether, D. M., & Mieszkowski, P. (1980). The Effects of Nonresidential Land Uses on the Prices of Adjacent Housing: Some Estimates of Proximity Effects. Journal of Urban Economics, 8(1), 1-15.

developments consistently over time in the areas studied were cemeteries. The third and final hypothesis sought to determine if zoning that allow for higher densities and mixed uses would increase the property value of a parcel. The study found that the impacts of rezoning are very diverse and difficult to predict.[5]

Both the Grether and Mieskowski (1980) and Mark and Goldberg (1986) studies are interesting because they seem to claim that creating mixed uses in single family residential developments will not cause significant externalities as people in the 1980's would have believed. These claims were made ahead of their time, but the results needs to be updated as the research is over 25 years old. Additionally both studies only take single family residential into account; it is important to look at the impacts of zoning on urban environments especially as more people are making a choice to move to cities.

Another relevant area of literature is that of the impacts that zoning has on industrial uses. Many areas that were once predominantly industrial are now being targeted for mixed use development. This phenomenon can be partially attributed to the economic shift in the United States from industry to the service sector but is also a result of a change in perception as to what type of architecture and neighborhood is desirable to live in. A study by Curran (2007) gathered the experiences of people who were directly affected by industrial displacement in Williamsburg, Brooklyn. These experience varied from people who found the displacement to be mutually beneficial to them and to the people who moved into the buildings since both ends were able to realize profits to those who were forced to close their business due to increased

[5] Goldberg, M.A., & Mark, J.H. (1986). A study of the impacts of zoning on housing values over time. *Journal of Urban Economics*, 20(3), 257-273.

rents or a lost customer base and were left with nowhere else to go.[6] When land values increase, rents and costs to expand existing business increase to rates that small business owners cannot afford causing the business to bankrupt.[7]

This study is very important as it illuminates a point that is often ignored when it comes to the impacts of zoning. The majority of studies on the impacts of zoning or land use regulations focus on how these regulations effect property values of single family residential and seem to ignore the fact that there many integral parts for a healthy neighborhood.

Manufacturing still serves an important purpose in the current economy as the industry offers unskilled laborers jobs that are generally full time and well paid with benefits.[8] This is a preferable alternative to many service sector jobs which often only offer part time employment in order to avoid providing their employees with benefits. Although personal accounts of people who have been affected by industrial displacement humanizes the issue, but the data could have been further supported with quantitative data.

Although there have been a number of studies on the impacts of zoning, there are still important gaps in the data obtained that should be addressed. Life in cities is becoming a more desirable alternative to suburbia for many Americans and understanding the impacts of zoning of urban regions is integral, especially for those areas that are targeted for growth. Long Island

[6] Curran, W. (2007). 'From the frying pan to the oven': Gentrification and the experience of industrial displacement in Williamsburg, Brooklyn. *Urban Studies, 44*(8), 1427-1440.
[7] Huffman, J.L. (2001). The impact of land use regulations on small and emerging businesses. *The Journal of Small and Emerging Business Law*, *5*(1), 49-56.
[8]Phillips-Fein, K. (1998, Sep). The still-industrial city: Why cities shouldn't just let manufacturing go. *The American Prospect*, 28-37.

City in Queens New York is an area that has been targeted as a destination for growth due to its proximity to Manhattan and numerous transit options.[9]

III. Background

Zoning in New York City

The idea of controlling bulk, height and use of land parcels though zoning arose when the Equitable Building was completed in 1915. The building, having no setbacks and a height of 538 feet, cast a 7 acre shadow which adversely affected the property values of those parcels that were in the path of the massive shadow. This coupled with industrial uses creeping into areas of prestigious shopping and rapid growth in the city called for a new method to control development.

With the enactment of The Zoning Resolution of 1916, New York became the first city to use laws to govern land use and bulk of development. After the implementation of the resolution, the idea of using zoning to control matters of land use and development became a very popular tool all over the United States.

As time went on, the regulations in the Zoning Resolution of 1916 were losing their pertinence. Not only had New York City grown immensely, but design standards changed and cars became an important part of the daily lives of people. Instead of the 3 to 6 story residential buildings that the prior zoning code idealized, the 1961 Zoning Resolution promoted Le

[9] Wolf-Powers, L. (2005). Up-zoning New York City's mixed-use neighborhoods. Property-led economic development and the anatomy of a planning dilemma. *Journal of Planning Education and Research, 24*(4), 379-393

Corbusier's "tower in the park" development and required that new developments provide a required amount of parking.[10]

Zoning has not remained static since 1961. According to the New York City Department of City Planning, "Cities never stand still, nor should zoning". There has not been a comprehensive overhaul of the zoning text since 1961, instead the city is taking a more piecemeal approach to rezoning and identifying areas that can sustain additional growth.

Long Island City, Queens

The origin of Long Island City date back to the early 1630's. The land was originally a 160 acre farm and was known for its rich land. The property changed hands multiple times, but was granted to William Hallett by Mayor Stuyvesant. Hallett had to abandon the land due to hostilities by local Native Americans but was able to purchase the farm, and an additional 2040 acres which encompassed Long Island City in addition to parts of what is now Astoria and Steinway, in 1664 from Native American Chief Mattano sachem of Staten Island and the Noyack Indians. The land remained in the hands of the Hallett family until the late 19th Century.[11]

During the 19th Century roads were laid and the area quickly began to be urbanized and was home to many houses, mansions and hotels. In the mid to late 1860's, the transportation system to and from the present day Manhattan and other boroughs was greatly enhanced and sparked a growth in industrial uses. Then in 1870, the communities that made up Long Island City consolidated to form their own municipality.

[10] NYC DCP. *About Zoning: Background*. Website. http://www.nyc.gov/html/dcp/html/zone/zonehis.shtml
[11] Greater Astoria Historical Society. Website. www.astorialic.org

Railroading became one of the most prominent industries in the newly incorporated city and increased the local economy as well as the city's population. The change in the city dynamic pushed many of the more affluent residents out leaving their mansions to be repurposed for industrial purposes.

Then in 1897, a charter was drafted to consolidate Greater New York and Long Island City, in addition to all of present day western Queens, became a part the entity known as The City of New York. Before consolidations there were many undeveloped swaths of land, but the City of New York soon converted those areas to residential or industrial uses.[12]

Long Island City Rezoning

In 1993, the Department of City Planning (DCP) released its intentions to create a central business district (CBD), that similar to the CBD in Downtown Brooklyn, due to its convenient location to a multitude of transit lines. This plan, however, was put on hold due to an economic recession that occurred in the mid-1990's but was re-established in the late 1990's.[13] Long Island City was identified as an area with "significant potential for office, retail and residential development" due to proximity to transit and availability of underdeveloped land. Long Island City was rezoned on July 26, 2001. The rezoning consisted of adding 34 blocks to 3 blocks, centered around Court Square, that were previously zoned for high density development for a total of 37 blocks at the eastern end of the Queensboro Bridge, generally between 23rd street to

[12] Seyfried. V.F. (1984). *300 years of Long Island City, 1630-1930*. Garden City, NY : V.F. Seyfried, (Printed by Edgian Press).

[13] Wolf-Powers, L. (2005). Up-zoning New York City's mixed-use neighborhoods. Property-led economic development and the anatomy of a planning dilemma. *Journal of Planning Education and Research, 24*(4), 379-393.

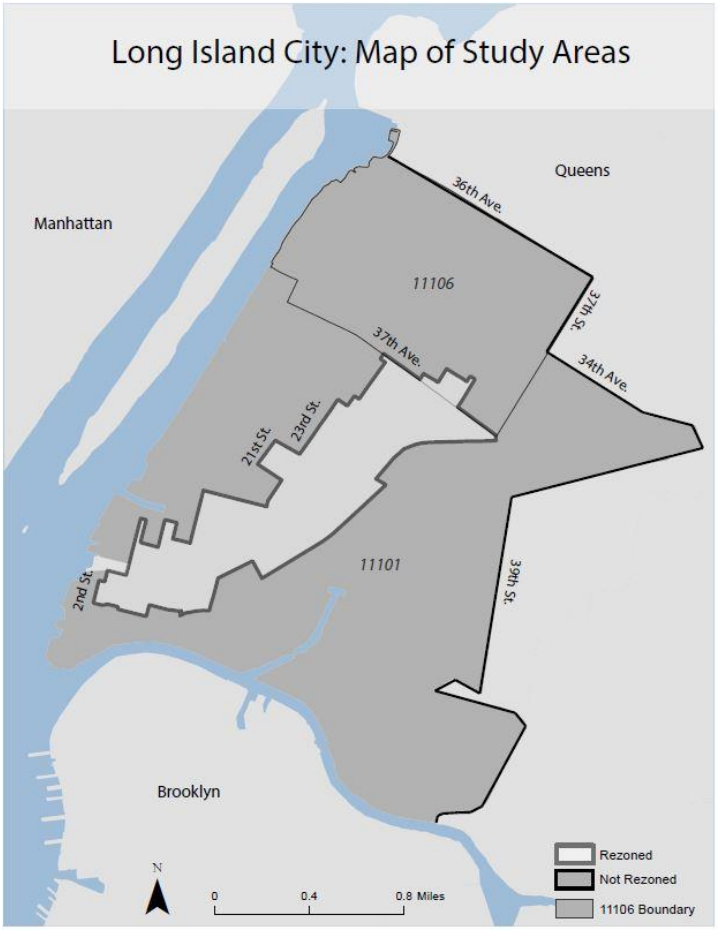
the west, 41st Avenue to the north and the Sunnyside Yards to east. This rezoning established the Special Long Island City Mixed Use District (LIC District). The goal behind the rezoning was to encourage redevelopment and reinvestment through increasing allowable commercial densities and allowing residential uses to intermix with the existing commercial and light industrial uses in the area in an area that was well served by transit. The allowable FAR would be highest around the transit located at Queens Plaza and Court Square and would taper down in order to create an increase in density that seemed more natural and was more contextual to the low density neighborhoods that surround the rezoning area. [14]

IV. Study Design and Statistical Procedures

This research will be a case study and will primarily use secondary data. Data will be normalized for ease of understanding and accurate representation. The study will compare the changes that have occurred in within areas that have been rezoned in Long Island City to those have not since the year 2000. There are many different opinions as to what the boundaries are for Long Island City, but for the purposes of this study, the boundaries will be defined as the land within the boundaries of zip codes 11101 and 11106. The zip codes of 11101 and 11106 are generally bounded by Newton Creek to the South, 36th and 34th Avenues to the North, East River to the West and 39th Street to the East.

[14] NYC DCP: Long Island City Rezoning. Website. http://www.nyc.gov/html/dcp/html/lic/lic1.shtml.

Figure 1: Map of Study Areas



Study Procedures

Secondary Data Analysis

Geographic Information Systems (GIS) was used to extract all relevant data from the datasets obtained from PLUTO and the U.S. Census Bureau.

Once the relevant PLUTO data was obtained, maps were produced in order to visualize the changes in land use and FAR utilization by comparing the data from 2002 to 2014.

After all the pertinent socio-demographic information was extracted through GIS, the percent of change was calculated for the socio-demographic data from 1990 to 2000 and from 2000 to 2013 of each area of interest will be determined. The difference in differences

statistical technique was used in order to measure the difference between the area of interest (rezoned portion of Long Island City) and the control group (the portion of Long Island City that was not rezoned) and determine the level of statistical significance for the aforementioned differences. The difference in difference analysis was used to compare changes in population density, ethnic distribution, median age, median income, median rent, number of housing units, educational attainment levels and occupations held by residents. All socio-demographic data was obtained at the census block level.

Economic base analysis was also conducted for Long Island City since the rezoning was intended to preserve manufacturing uses in addition to allowing for increased residential development. The economic base analysis will use North American Industry Classification System (NAICS) 2000 and 2012 datasets to compare the economic changes in Long Island City to that in NYC Metropolitan Region by determining how the industry has changed from 2000 to 2012 using shift-share analysis. The economic base analysis will also use a location quotient in order to determine if LIC has the ability to produces enough goods and services to fulfill the needs of the community in any certain industry than the rest of NYC metro area. The economic base analysis will use the zip codes 11101 and 11106 for LIC and will use all of New York City Metropolitan Statistical Area as a comparison as NAICS data is not available at a smaller geographic unit. The economic base analysis will look at all of the 2 digit industry groups and will further examine the Manufacturing industry.

The data will be obtained from the following sources: socio-demographic data, U.S. Census 1990, 2000, ACS 2009-2013; land use, PLUTO 2002 & 2014; and types of industry, North

American Industry Classification System (NAICS). Since the data is being obtained from comprehensive sources, the sample size will be assumed to be population for the study area.

Primary Data Analysis

Interviews were conducted with the Long Island City Partnership and the New York City Department of City Planning Queens Borough Office to gain a better understanding of how the Long Island City neighborhood has change through the eyes of people who are personally affected.

All research was conducted in accordance with International Review Board (IRB) guidelines after approval was granted.

V. Expected Outcomes

By using the information presented in the Grether and Mieskowski (1980) and Mark and Goldberg (1986) studies that claim that creating mixed uses in single family residential developments will not cause significant externalities[15][16], with this knowledge one could expect that an increase of density in Long Island City would not result in an increase of socio-demographic categories that are deemed negative such as an increase in the population that have educational attainment levels of less than high school or an increase in unskilled labor positions.

[15] Grether, D. M., & Mieszkowski, P. (1980). The Effects of Nonresidential Land Uses on the Prices of Adjacent Housing: Some Estimates of Proximity Effects. Journal of Urban Economics, 8(1), 1-15.
[16] Goldberg, M.A., & Mark, J.H. (1986). A study of the impacts of zoning on housing values over time. *Journal of Urban Economics*, 20(3), 257-273.

Additionally, the study by Mark and Goldberg (1986) noted that rezoning had diverse trends related to property values[17] which could lead to an assumption that a particular directionality of changing socio-demographic trends may or may not be related to the rezoning in Long Island City.

Finally, with regards to the manufacturing uses in Long Island City, it could be assumed that manufacturing uses would decline when using the results of the study presented by Curran (2007) about the decline in manufacturing in Williamsburg after its rezoning[18].

VI. Research Limitations

Land Use Data

The 2002 PLUTO data designates the built Floor Area Ratio (FAR) and the maximum allowable FAR by tax lot whereas the 2014 PLUTO continues to identify the built FAR by tax lots but states the maximum allowable FAR as was is allowed by the zoning. This is problematic since public facilities are typically granted higher allowable FARs so some of the FAR utilization may be over or under represented.

Socio-demographic Data

Although Census data is a great resource for understanding populations, changes in the way information is recorded can be problematic. With regards to this research, the majority of the changes in recording information occurred between 1990 and 2000 Census datasets. In

[17] Goldberg, M.A., & Mark, J.H. (1986). A study of the impacts of zoning on housing values over time. *Journal of Urban Economics*, 20(3), 257-273.

[18] Curran, W. (2007). 'From the frying pan to the oven': Gentrification and the experience of industrial displacement in Williamsburg, Brooklyn. *Urban Studies, 44*(8), 1427-1440.

1990, averaged household size and median age were not reported. In order to address these issues, the average household size for 1990 was left out of calculations and the median age was approximated by determining which five year age cohort had the highest population and designating the middle age in that cohort as the median age.

Another limitation of the Census data is the change that occurred in the occupational codes that the Census used to determine the labor force of populations. The occupational code used in the 1990 Census were based on a hierarchical system, the 1980 Standard Occupational Classification system, that considered the level of skill and knowledge necessary for each position. Then in 2000, the Census began using a classification structure, 1998 Standard Occupational Classification system, which groups all occupations according to the particular "job family" without regard to the level of skill required for each particular position.[19] This discrepancy could create the illusion that an increased percentage of the population have transitioned into the managerial or professional fields.

NAICS Data

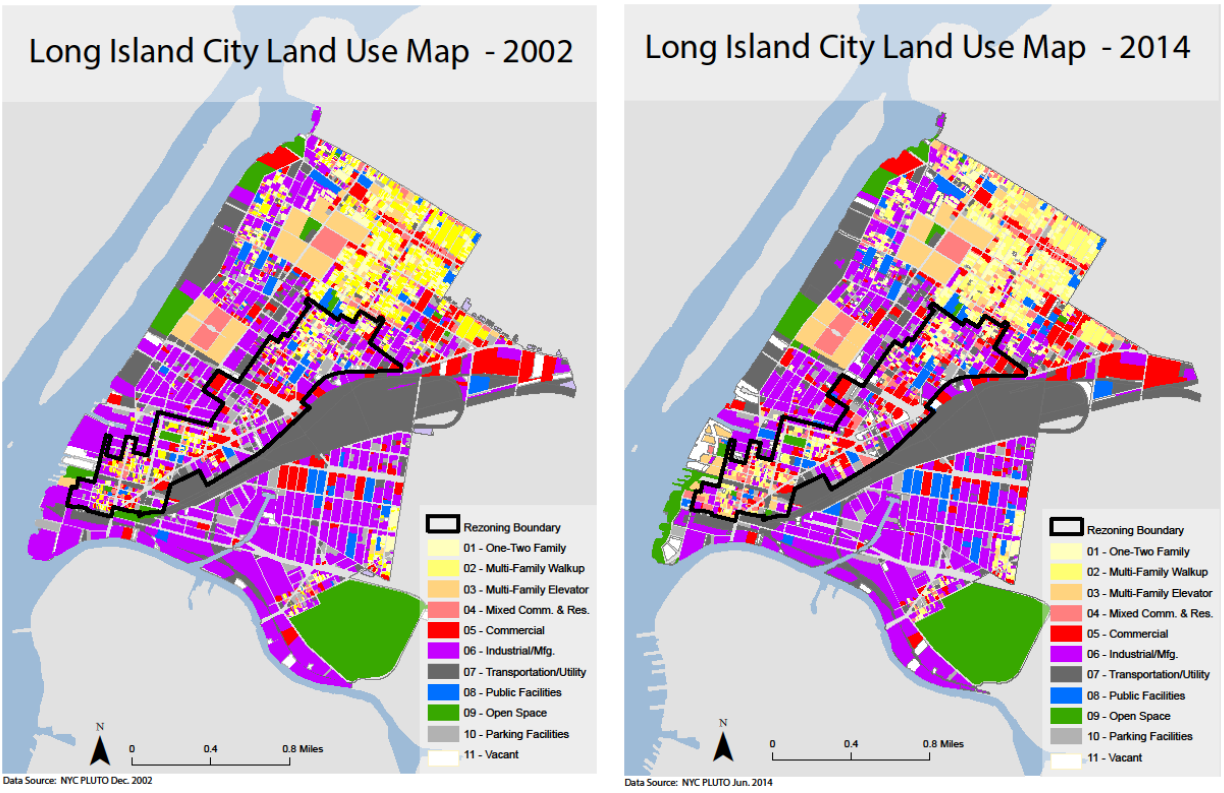
The U.S. Census Bureau has no formal role in determining the NAICS classification of an industry and there is no standardized method for determining NAICS codes other central agency in charge of NAICS code designations. Each individual establishment is given a NAICS code based on methods deemed most appropriate by the assigning agency.[20] Using a multitude

[19] Deane, G., & Shin, H. (2002). Technical Report: Comparability of the 2000 and 19990 Census Occupation Codes. *Lewis Mumford Center for Comparative Urban and Regional Research University at Albany.*
[20] United States Census Bureau. *North American Industry Classification System: Frequently Asked Questions*. Website. https://www.census.gov/eos/www/naics/faqs/faqs.html.

of methods and agencies to designate NAICS codes could result in over or under representation of an industry of interest.

VII. Land Use Analysis

Figure 2: Land Use Maps

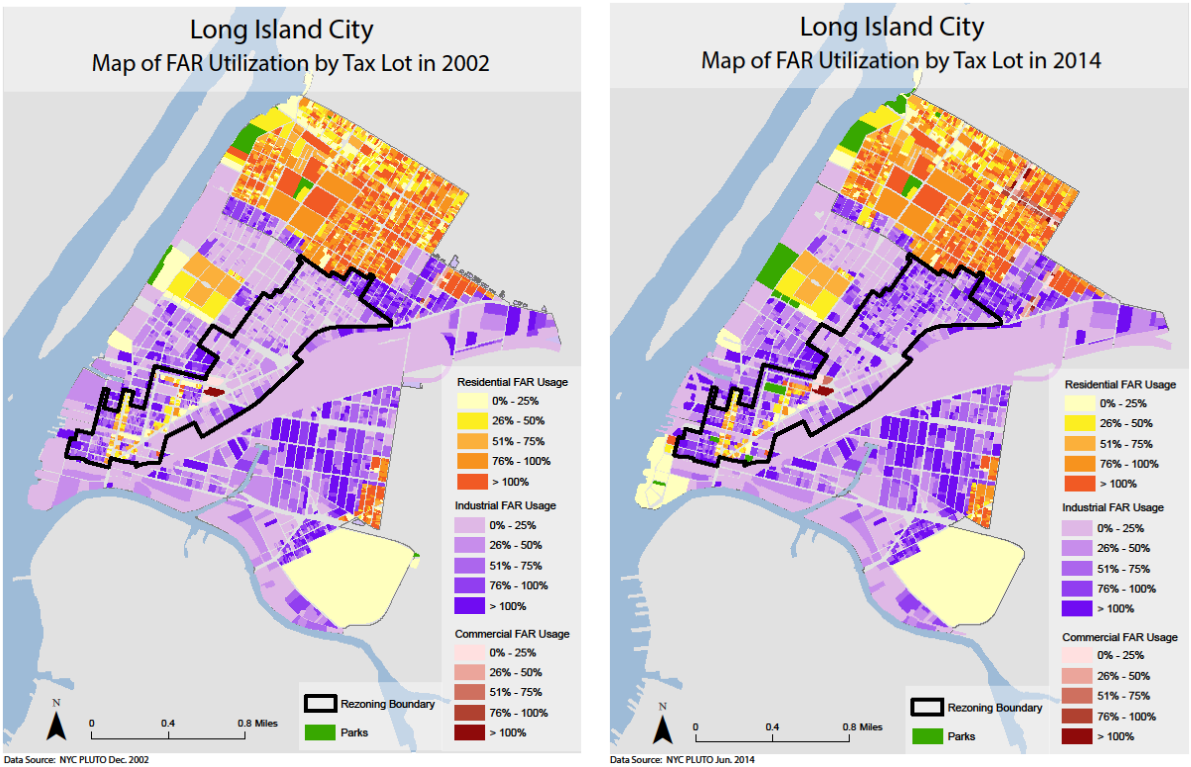


One change that has resulted from the rezoning of Long Island City is the way that the land is utilized and how much of the allowable Floor Area Ratio (FAR). In order to compare land use and FAR usage, maps were created with 2002 PLUTO[21] and 2014 PLUTO data. When comparing the land use data from 2002 and 2014 there are not many noticeable changes. The most significant change in land use can be seen in the southwest portion of the study area. This

[21] 2002 PLUTO is the earliest data provided by the NYC Department of City Planning

area, also known as Hunter's Point, was transformed from an area that was primarily industrial into an area that is primarily multifamily and mixed use development with increased amounts of open space on the waterfront. Another area with noticeable change is in the center of the rezoned portion of Long Island City. In this center portion of Long Island City, there is an obvious increase in commercial and mixed use development. Increased commercial and mixed use development in this area is logical since this is the junction for a multitude of subway lines including the E,M & R at Queens Plaza, N,Q & 7 at Queensboro Plaza and the E,G & 7 at Court Square.

Figure 3: FAR Utilization Maps



When comparing the maps of FAR utilization in Long Island City, the changes that have occurred in the neighborhood appear more dramatic. Once again, changes in the southwest

portion of the map show a change from industrial uses to residential and also shows an increase in utilization of available FAR in the remaining industrial zoned areas. Another area of change that can readily be seen is the northeast portion of the map that change in designation from residential to commercial uses. Finally, the third and perhaps most apparent change from 2002 to 2014 is the increased use of the available FAR in the rezoned portion of Long Island City. Although the primary zoning designation for the majority of these tax lots is for light manufacturing, the Special LIC District allows for mixed use in these areas to promote residential growth.

Overall, from 2002 until 2014, Long Island City has experienced a slight decrease in the areas the parcels of land that are zoned for residential and manufacturing and a large increase in the parcels of land that are zoned as commercial. All zoning designations throughout the neighborhood are increasing the utilization rates of the available FAR; in fact, a number of these tax lots are exceeding the maximum allowable FAR. The increased use of FAR indicates that a significant amount of development has spurred throughout the neighborhood.

Figure 4: FAR Utilization Chart

	Residential			Commercial			Manufacturing		
	2002	2014	% Change	2002	2014	% Change	2002	2014	% Change
Total Tax Lots	3,419	3,332	-2.54%	55	207	276.36%	3,000	2,916	-2.80%
0% to 25%	4.91%	3.24%	-34.04%	61.82%	15.94%	-74.21%	29.77%	16.02%	-46.20%
26% to 50%	15.94%	13.36%	-16.22%	21.82%	19.32%	-11.43%	20.90%	24.49%	17.16%
51% to 75%	22.37%	23.86%	6.64%	0.00%	35.75%	35.75%	14.33%	15.98%	11.49%
75% to 100%	22.32%	23.02%	3.15%	5.45%	13.53%	147.99%	12.37%	13.82%	11.75%
> 100%	10.56%	32.65%	209.25%	3.64%	5.80%	59.42%	12.03%	16.98%	41.07%
Mean	86.51%	90.67%	4.81%	22.87%	50.15%	119.28%	53.06%	64.46%	21.49%
Median	79.20%	80.00%	1.01%	11.93%	55.00%	361.02%	39.89%	50.00%	25.34%

VIII. Socio-Demographic Data

Percent Change

Figure 5: Percent Change in Socio-Demographic Data from 1990 to 2013

	Not Rezoned				Rezoned			
	1990-2000		2000-2013		1990-2000		2000-2013	
	Percent Change		Percent Change		Percent Change		Percent Change	
Total Pop.	11.92%		-16.28%		31.64%		0.04%	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Pop. Density	13.56%	17.93%	-3.78%	-18.65%	24.59%	27.41%	-6.21%	12.23%
Median Age	5.21%	7.74%	6.97%	5.69%	-0.06%	2.81%	5.90%	4.10%
White Population	-24.17%	-26.37%	16.34%	24.27%	-19.80%	-23.19%	21.20%	19.87%
Black Population	5.79%	10.87%	-13.13%	57.80%	-48.14%	-30.48%	106.55%	20.14%
American Indian Population	41.61%	173.89%	93.01%	-100.00%	81.51%	0.00%	-58.23%	-100.00%
Asian Population	37.35%	37.18%	7.44%	-5.92%	-1.32%	4.36%	25.18%	-5.18%
Other Population	44.53%	60.87%	-30.50%	-57.62%	38.16%	44.91%	-54.56%	-66.00%
Avg. Household Size	N/A	N/A	-2.43%	-10.36%	N/A	N/A	-9.45%	-16.19%
Number of Housing Units	0.16%	-3.12%	-6.35%	-8.65%	13.27%	21.76%	21.76%	5.26%
Median HH Income	2.11%	2.06%	8.44%	3.65%	6.06%	-0.08%	17.84%	10.93%
Median Rent	-1.96%	-1.07%	29.96%	25.24%	-13.77%	-8.41%	52.20%	42.77%
Pop. 25 & up	9.39%		-8.51%		18.70%		11.12%	
Less than HS	-7.02%	-16.75%	-34.40%	-39.00%	-23.22%	-23.54%	-45.77%	-44.59%
HS	-1.69%	-0.24%	-10.28%	-20.55%	-11.60%	-17.84%	-14.65%	-3.19%
Some College	5.53%	6.76%	17.67%	4.15%	22.89%	33.06%	6.43%	6.11%
Bachelor's	22.15%	25.34%	53.54%	58.58%	33.22%	41.97%	63.94%	56.68%
Graduate	13.79%	22.08%	52.03%	62.73%	77.82%	46.16%	46.81%	60.55%
Employed Pop. 16 & up	-2.27%		8.70%		14.85%		22.64%	
Management	2.10%	0.47%	37.64%	31.09%	8.68%	-20.44%	48.05%	95.32%
Professional	33.95%	20.62%	29.77%	33.96%	46.04%	50.20%	21.77%	9.78%
Technical	19.17%	-31.48%	-41.26%	-100.00%	-40.90%	-68.46%	-11.54%	64.04%
Sales	30.66%	35.19%	0.04%	-16.20%	24.50%	55.70%	36.33%	11.01%
Office & Administrative	-13.71%	-23.22%	-19.59%	-21.24%	-5.86%	-25.64%	-20.21%	-19.40%
Protective Services	-0.04%	21.72%	4.91%	-81.19%	-35.96%	-68.60%	98.15%	-34.47%
Other Services	-34.33%	-42.36%	29.40%	21.53%	-42.04%	-29.26%	-7.07%	2.42%
Farming	-100.00%	0.00%	0.00%	0.00%	-46.90%	0.00%	-56.22%	0.00%
Precision Production, Maintenance & Repair	14.48%	38.96%	7.24%	-12.72%	48.10%	27.20%	-22.46%	-27.80%
Production	-29.65%	-30.92%	-64.60%	-86.91%	-29.50%	-31.19%	-80.36%	-89.23%
Transportation & Utilities	72.74%	26.17%	-11.38%	16.23%	70.33%	191.14%	3.77%	-13.24%

Sources: 1990 & 2000 U.S. Census and 2013 ACS 5 Year Estimates

In order to better understand how the neighborhood of Long Island City is changing, socio-demographic data trends were compared from 1990, 2000 and 2013. This data was obtained from the 1990 and 2000 U.S. Census and the 2013 American Community Survey (ACS)

5-Year Estimates. Data was gathered at the census block level to allow for a larger sample set to determine significance in statistical analysis.

In both the rezoned and nor rezoned portions of Long Island City population increased from 1990 to 2000, but saw a decline in the areas that were not rezoned form 2000 to 2013 and remained constant in the areas that were rezoned.

The white population decreased in both the rezoned and not rezoned areas of Long Island City from 1990 to 2000 and experienced an increase from 2000 to 2013. The black population experienced a slight increase in population from 1990 to 2000 in the area of Long Island City that kept their original zoning designation and, on average, saw a decrease in population from 2000 to 2013 whereas the opposite trend was seen in the areas of Long Island City that were eventually rezoned. The Asian population experienced an increase in population from 1990 to 2000 and a slight decrease in population from 2000 to 2013 in both study areas. The population who identified themselves as other experienced a similar trend as the Asian population but on a larger scale.

From 1990 to 2000 the median rents were falling in all areas of Long Island City, 1.07 percent in the areas that were not rezoned, and 8.47 percent in the areas that were to be rezoned. Rents then increased in both study areas of study between the years of 2000 to 2013, 25.54 percent in the areas that were not rezoned and 42.77percent in the areas that were rezoned. Median Household income also increased in Long Island City as a whole, but as with many neighborhoods in New York City, the median income did not rise at the same pace as the median rent. Median rent increased 2.06 percent in the areas that were not rezoned from 1990

to 2000 and then increased an additional 8.44 percent from 2000 to 2013 whereas median income decreased 0.08 percent from 1990 to 2000 in the area that was rezoned and experienced a 10.93 percent growth from 2000 to 2013.

The population for people aged 25 and up increased from 1990 to 2000 in all of Long Island City, but from 2000 to 2013, decreased in the areas of Long Island City that were not rezoned and increased in the areas that were rezoned. From this population, there is a trend of people becoming more educated. The percent of individuals with only a high school degree or less are increasingly decreasing over time in both areas of study whereas the opposite trend is being seen in individuals with Bachelor's degrees or higher. This overall educational attainment trend implies that the residents of Long Island City were becoming more highly educated, or more people with higher educations were moving to the neighborhood, before the rezoning occurred, but its acceleration increased after the rezoning.

The population of Long Island City residents aged 16 and up that were employed was decreasing in areas that were not rezoned from 1990 to 2000 but experienced an increase from 2000 to 2013 whereas those areas that were rezoned continually experienced an increase in its workforce from aged 16 years and up from 1990 to 2013. Changes in the types of employment that workforce of Long Island City was employed in also occurred from 1990 to 2013. The management field was experiencing slight increases from 1990 to 2000 and the rate at which the field was increasing accelerated from 2000 to 2013 in the areas that were not rezoned. The areas that were rezoned, however, were experiencing a loss of people employed in the management field from 1990 to 2013 and more dramatic increase in people employed in management positions from 2000 to 2013 than the areas of Long Island City that were not

rezoned. The percent of people employed in a professional field steadily increased from 1990 to 2013 in the study area that was not rezoned and the areas that were rezoned experienced an overall increase in the percentage of people employed in a professional field but the rate at which the employment was increasing, decreased from 2000 to 2013. The percent of people working in office and administrative positions has been steadily declining over time throughout the Long Island City neighborhood. The percent of people employed in the service industry jobs was decreasing in both the rezoned areas of the neighborhood and the areas that were rezoned from 1990 to 2000 but this employment sector began to experience growth in the areas of the neighborhood that were not rezoned from 2000 to 2013 when the sector remained relatively static in the census blocks that were rezoned. The precision production and maintenance and repair job sector experienced growth throughout all of Long Island City from 1990 to 2000 and a decline from 2000 to 2013, although this decline was more pronounced in the rezoned portion of the neighborhood. There was an overall decline in the percent of people employed in production sector that required less skill and this decline was felt at relatively equal rates in both the areas that were rezoned and those that were not rezoned.

The socio-demographic data seems to indicate that Long Island City is experiencing an increase in educational attainment and a decrease in unskilled labor positions, but it is unclear as to whether or not any of these changes were a result of the rezonings that occurred in 2001 and 2004.

In order to better understand if the changes that were occurring in Long Island City were a result of the rezoning a difference in differences statistical analysis was performed. This type of analysis is often preformed to determine the statistical significance of the impacts of a policy

over time by comparing changes that occur in a control study area that was not impacted by a new policy to those changes that occur in a study area that was impacted by the new policy. It is the purpose of this study to determine if the changes that have been occurring in Long Island City can be attributed to the rezoning.

Difference in Differences Analysis:

The regression equation to test the impact of the rezoning on the selected socio-demographic areas of interest aforementioned in the percent change analysis is as follows:

$sociodemographic = \beta_0 + \delta_0 \text{After\_Rezoning} + \beta_1 \text{Rezoned} + \delta_1(\text{After\_Rezoning}*\text{Rezoned}) + \varepsilon$

where sociodemographic is the locational outcome of interest (educational attainment, type of occupation, Median Rent, etc.). After_Rezoning is a dummy variable for time where the value 1 is given if the data is from after 2001 (after the rezoning occurred). Rezoned is a dummy variable that indicates where the observation is located; if the observation was located in an area that was rezoned it given a value of 1, if it was not in an area that was rezoned then it was given a value of 0. The After_Rezoning*Rezoned is an interaction term that receives a value of 1 if the observation is found in an area that was rezoned after the rezoning occurred and receives a value of 0 if it did not.

The following socio-demographic characteristics were found to have a statistical significant to time: increased levels of education, increased median rent, increased percentage of the employed residents working in management and professional fields and a decrease in the employed residents working in office/administrative, production and precision production and maintenance fields. Since these socio-demographic characteristics are only significantly

related to a change in time and not the rezoned areas, it is reasonable to conclude that these changing trends were emerging before the rezoning of Long Island City occurred.

The changes in total population, population density, number of housing units, median rent, percentage of Black, Asian and Other residents employed in the office/administrative, and production fields. Since the aforementioned socio-demographic characteristics are significantly related to the area of Long Island City that was rezoned, an assumption could be made that this area is and was a desirable location to develop due to the increase in population density and increased housing production. The people who work in the job sectors that are significantly related to the rezoned area could be decreasing due to changes in the local economy, increased levels of educational attainment or increased costs of living in the neighborhood.

The percentage of people with who identify as a race other than White, Black, American Indian or Asian or work in precision production and maintenance are significantly related to living in the rezoned area of Long Island City after the rezoning occurred in 2001 which means there is a possibility that the changes in the socio-demographic characteristics can be related to the rezoning.

IX. Economic Base Analysis

In order to better understand how the Long Island City local economy is faring in comparison to the New York Metro Area, an economic base analysis was conducted.

Location Quotient

The location quotient determines the ratio of an industries impact on local economy to the impact the same industry has on a larger regional economy. The location quotient (LQ) is calculated as follows: LQ = ((Local industry x /total local economy)/ (industry x in the regional economy/total regional economy)). If the LQ equal to 1, then the local industry is providing enough output to satisfy local consumption. If the LQ is greater than 1, then the local industry is producing excess goods or services that can be exported. If the LQ less than 1, then the local industry is not providing sufficient goods or services and these goods and services must be imported to support the needs of the community.

For the purposes of this study, the local economy for Long Island City is defined as the industry that is situated within the zip codes 11101 and 11106 and the regional comparison is defined as the New York City MSA[22]. The industry data was compiled for through the North American Industry Classification System (NAICS) for the years 2000 and 2012.

[22] In order to address the differences in MSA definitions from 2000 to 2012, the following counties data was added to the 2000 MSA dataset: Carbon, PA; Lehigh, PA; Monroe, PA; Northampton, PA; and Ulster, NY.

Total Industry Location Quotient

Figure 6: Percent Change and Location Quotient Chart for all Industry Groups from 2000 to 2012

		LIC	NYC-MSA	LIC	NYC-MSA	LQ	LQ	Pctg. Chag	Pctg. Chg.
Industry Group	NAICS	2012	2012	2000	2000	2012	2000	LIC	NYC-MSA
Total		3932	556888	3497	614260			12.44%	-9.34%
'Forestry, fishing, hunting, and agriculture support'	11----	0	392	0	442				
'Mining'	21----	0	118	0	247				
Utilities	22----	3	583	5	553	0.728798	1.588186	-40.00%	5.42%
Construction	23----	422	45356	582	52302	1.317747	1.954615	-27.49%	-13.28%
Manufacturing	31----	483	16292	557	28085	4.198818	3.483673	-13.29%	-41.99%
Wholesale trade	42----	438	38028	482	47655	1.631267	1.776623	-9.13%	-20.20%
Retail trade	44----	335	78349	341	89567	0.605572	0.668749	-1.76%	-12.52%
Transportation and warehousing	48----	295	14570	148	14569	2.867588	1.784385	99.32%	0.01%
Information	51----	89	11225	49	13149	1.122944	0.654576	81.63%	-14.63%
Finance and insurance	52----	111	29752	67	36183	0.528398	0.325257	65.67%	-17.77%
Real estate and rental and leasing	53----	219	33250	226	32789	0.932839	1.210701	-3.10%	1.41%
Professional, scientific, and technical services	54----	308	69938	160	74934	0.623723	0.375057	92.50%	-6.67%
Management of companies and enterprises	55----	82	3033	15	3989	3.829092	0.660517	446.67%	-23.97%
Administrative and Support and Waste Mang and R	56----	99	28854	98	31867	0.485941	0.540184	1.02%	-9.45%
Educational services	61----	64	8875	16	6884	1.02133	0.408259	300.00%	28.92%
Health care and social assistance	62----	85	60803	102	57813	0.197992	0.309907	-16.67%	5.17%
Arts, entertainment, and recreation	71----	122	11176	29	10021	1.546065	0.508327	320.69%	11.53%
Accommodation and food services	72----	243	48249	212	41776	0.7133	0.891386	14.62%	15.49%
Other services (except public administration)	81----	412	57526	345	60565	1.014349	1.000585	19.42%	-5.02%
Auxiliaries (exc corporate, subsidiary & regional mg	95----	0	0	8	982	#DIV/0!	1.430985	-100.00%	-100.00%
Industries not classified	99----	124	519	55	9888	33.83831	0.977037	125.45%	-94.75%

Sources: 2000 & 2012 NAICS data

As can be seen from Figure , in 2000, Long Island City had a LQ <1 and were not able to accommodate sufficient products or services for the following industries: Retail Trade; Information; Finance and Insurance; Professional, Scientific and Technical Services; Management of Companies and Enterprises; Administrative and Support and Waste Management and Remediation Services; Educational Services; Healthcare and Social Assistance; Arts, Entertainment and Recreation; Accommodation and Food Services and Industries not classified. The industries preforming at par for the needs of the local community, or LQ=1, was Other Services. The remaining industries: Utilities; Construction; Manufacturing; Wholesale Trade; Transportation and Warehousing; Real Estate, Rental and Leasing and Auxiliaries all provided more than sufficient goods and services for the neighborhood with a LQ >1.

In 2012, the following industries continued to under produce goods and services for the community with a location quotient of less than 1 but that increased from their respective 2000 Location Quotient: Finance and Insurance and Professional, Scientific and Technical Services. The following industries continue to retain a Location Quotient of less than 1 and has decreased since 2000: Retail Trade; Administrative and Support and Waste Management and Remediation Services; Health Care and Social Assistance and Accommodation and Food Services. A number of industries that were under producing goods and services in 2000 are now either producing enough to serve the community or producing a surplus. Both the Information and Educational Services industries have grown enough to sustain the needs of the local community with a location quotient of just over 1 and the Management of Companies and Enterprises and Arts, Entertainment and Recreation industries have grown tremendously in Long Island City and are able to serve the local and regional economies with location quotients of 3.83 and 1.55 respectively. The Other Services industry retained its 2000 location quotient of 1 and its ability to continue to serve the needs of the Long Island City community whereas the Unclassified Industries far surpassed production of goods and services for the neighborhood and is able to export the excess.

Of those six industries that were able to produce excess goods and services in 2000, two lost their ability to provide enough goods and services for the neighborhood, two decreased in their production capability but retained the ability to produce and excess amount of goods and services and two industries grew and have increased their exporting power. The Construction and Real Estate, Rental and Leasing industries went from having location quotients of greater than 1 to less than one; in both cases, this industry saw growth in the NYC MSA but experienced

a loss in Long Island City. The Wholesale Trade and Manufacturing industries retained a location quotient of greater than 1, but decreased in their ability to produce excess goods and services; these industries both experienced losses at the regional and local levels, but the loss at the regional level was greater than that at the local level. The industries that were able to increase their export power were Transportation and Warehousing; and Manufacturing. The Transportation and Warehousing industry increased its exporting power due to an industry growth in Long Island City and a lack of growth in the region whereas the Manufacturing industry experienced losses in Long Island City and the NYC MSA region, but this loss greater in the NYC MSA region than for Long Island City.

Overall, the Location Quotient analysis indicates that Long Island City has increased diversification in the industries that are able to provide sufficient or excess goods and services for the region. A portion of this diversification can likely be attributed to the fact that Long Island City has experienced a 12.44 percent growth in total industry whereas the NYC MSA has experienced a 9.34 percent loss in total industry. The most substantial growth in the ability to produce excess goods and services in Long Island City can be found in the following industries: Educational Services, Arts, Entertainment and Recreation and Management of Companies and Enterprises industries with growth rates of 300.00 percent, 320.69 percent and 446.67 percent respectively.

Manufacturing Industry Location Quotient

Figure 7: Percent Change and Location Quotient Chart for the Manufacturing Industry from 2000 to 2012

		LIC	NYC-MSA	LIC	NYC-MSA	LQ	LQ	Pctg. Chag	Pctg. Chg.
Industry Group	NAICS	2012	2012	2000	2000	2012	2000	LIC	NYC-MSA
Manufacturing	31----	361	16292	557	28085			-35.19%	-41.99%
Food Mfg.	311	26	2111	32	2411	0.555843	0.669225	-18.75%	-12.44%
Bev. & Tobacco Product Mfg.	312	1	130	2	120	0.347155	0.840365	-50.00%	8.33%
Textile Mills	313	2	207	5	753	0.436041	0.334807	-60.00%	-72.51%
Textile Product Mills	314	8	335	19	642	1.077736	1.492237	-57.89%	-47.82%
Apparel Mfg.	315	54	1189	151	3647	2.049647	2.087663	-64.24%	-67.40%
Leather & Allied Product Mfg.	316	4	102	4	204	1.769812	0.988665	0.00%	-50.00%
Wood Product Mfg.	321	1	261	7	393	0.172913	0.8981	-85.71%	-33.59%
Paper Mfg	322	4	237	13	471	0.761691	1.391687	-69.23%	-49.68%
Printing & Related Support Activities	323	48	1946	60	3656	1.113181	0.827493	-20.00%	-46.77%
Petroleum & Coal Products Mfg.	324	1	83	1	141	0.543737	0.357602	0.00%	-41.13%
Chemical Mfg.	325	8	850	16	1189	0.424755	0.678512	-50.00%	-28.51%
Plastic & Rubber Products Mfg.	326	10	549	14	1022	0.822044	0.690711	-28.57%	-46.28%
Nonmetallic Mineral Product Mfg.	327	10	471	11	681	0.958178	0.814451	-9.09%	-30.84%
Primary Metal Mfg.	331	3	169	5	343	0.801128	0.735013	-40.00%	-50.73%
Fabricated Metal Product Mfg.	332	32	2092	64	3668	0.690328	0.879771	-50.00%	-42.97%
Machinery Mfg.	333	16	779	25	1611	0.926936	0.782463	-36.00%	-51.64%
Comp. & Electric Product Mfg.	334	6	759	7	1400	0.35676	0.25211	-14.29%	-45.79%
Elec. Equip., Appliance & Component Mfg.	335	9	347	9	633	1.170524	0.716899	0.00%	-45.18%
Transport. Equip. Mfg.	336	4	271	10	467	0.666128	1.079698	-60.00%	-41.97%
Furniture & Related Mfg	337	50	1075	42	1474	2.099079	1.436716	19.05%	-27.07%
Misc. Mfg	339	58	2329	80	3126	1.123895	1.290388	-27.50%	-25.50%

Sources: 2000 & 2012 NAICS data

Since preserving industrial uses in the Special Long Island City Mixed Use District a Location Quotient analysis was also conducted for the Manufacturing industry in Long Island City. The data for this analysis assumes the same local and regional context as defined in the total industry location quotient analysis.

According to the Location Quotient analysis, in 2000, the following 15 of the 21 different subcategories of manufacturing had a location quotient of less than one and were unable to provide sufficient goods and services to the Long Island City neighborhood: Food Mfg.; Beverage & Tobacco Product Mfg.; Textile Mills; Leather & Allied Product Mfg.; Wood Product Mfg.; Printing & Related Support Activities; Petroleum & Coal Products Mfg.; Chemical Mfg.;

Plastic & Rubber Products Mfg.; Nonmetallic Mineral Product Mfg.; Primary Metal Mfg.; Fabricated Metal Product Mfg.; Machinery Mfg.; Computer & Electrical Product Mfg. and Electrical Equipment, Appliance & Component Mfg. The remaining six subcategories of manufacturing had a location quotient of greater than one and were able to provide the neighborhood with sufficient of excess goods and services. These categories are as follows: Textile Product Mills; Apparel Mfg.; Paper Mfg.; Transportation Equipment Mfg.; Furniture & Related Mfg.; and Miscellaneous Mfg.

In 2012 the Paper and Transportation Equipment subcategories of the manufacturing industry lost their ability to provide sufficient goods or services to Long Island City as both industries experienced a decline at both the local and regional levels, but the decline occurred at a faster rate at the local level. The Leather & Allied Product, Electrical Equipment and Printing subcategories of manufacturing all gained the ability to provide an excess of goods and services for the neighborhood because the regional manufacturing industry suffered greater losses in theses subcategories than the local manufacturing industry.

Overall the manufacturing industry suffered losses from 2000 to 2012 locally and regionally, however the losses at the regional level occurred at a greater magnitude than the local level. The only manufacturing subcategory that experienced growth at the local level was Furniture & Related Mfg, all other subcategories either suffered losses or remained constant. At the regional level the only manufacturing subcategory to experience growth was the Beverage & Tobacco Product Mfg., all of the remaining 20 subcategories suffered losses.

Shift-Share Analysis

Shift-share analysis is used to measure if the growth or decline of industry in a specific region can be attributed to unique regional factors or if the changes are synonymous with changes occurring within a larger economy. The total shift-share consists of three components: national share (NS), industry mix (IM) and the regional share (RS).

The national share calculates the total local industry as if the local industry had grown at the same rate as the regional economy. The national share is calculated as follows: Local industry x at the beginning of the study period * Total regional economy at the end of study period/ Total regional economy at the beginning of the study period.

The industry mix determines the degree at which a local area specializes in specific industries by determining how much industry x would have grown or declined if it followed the same growth pattern as the region and then compared to the change that actually occurred. The industry mix is calculated as follows: (Local industry x at the beginning of the study period * Regional industry x at the end of the study period/ Regional industry x at the beginning of the study period) – NS.

The regional share determines the amount of growth or decline in industry x that can be directly attributed to the local economy. The regional share is calculated as follows: Local industry x at the beginning of the study period * (Local industry x the end of the study period/ Local industry x at the beginning of the study period – Regional industry x at the end of the study period/ Regional industry x at the beginning of the study period).

Total Industry Shift-Share Analysis

Figure 8: Shift-Share Analysis Chart for all Industry Groups from 2000 to 2012

		NS	IM	RS
Industry Group	NAICS			
Total				
Utilities	22----	5	1	-2
Construction	23----	528	-23	-83
Manufacturing	31----	505	-182	160
Wholesale trade	42----	437	-52	53
Retail trade	44----	309	-11	37
Transportation and warehousing	48----	134	14	147
Information	51----	44	-3	47
Finance and insurance	52----	61	-6	56
Real estate and rental and leasing	53----	205	24	-10
Professional, scientific, and technical servic	54----	145	4	159
Management of companies and enterprises	55----	14	-2	71
Administrative and Support and Waste Mar	56----	89	0	10
Educational services	61----	15	6	43
Health care and social assistance	62----	92	15	-22
Arts, entertainment, and recreation	71----	26	6	90
Accommodation and food services	72----	192	53	-2
Other services (except public administratio	81----	313	15	84
Auxiliaries (exc corporate, subsidiary & regi	95----	7	-7	0
Industries not classified	99----	50	-47	121

Sources: 2000 & 2012 NAICS data

According to the industry mix data, 11 of the 19 categories of industry experienced growth in Long Island City whereas the remaining 8 experienced a loss.

Of the 11 industries that experienced growth, one grew less than what would have occurred if the local industry grew at the regional growth rate, six grew at a faster rate than the regional growth rate and four experienced growth instead of loss that would have occurred if the regional growth rate applied. The industry that experienced growth, but less than that would have occurred at the regional growth rate is Accommodation and food services. The six industries that grew at a rate faster than the regional growth rate are as follows: Transportation and Warehousing; Professional, Scientific and Technical Services; Administrative, Support and

Waste Management; Educational Services; Arts, Entertainment and Recreation; and Other Services. The following six industries would have experienced a loss at the regional growth rate but experienced a growth instead: Information; Finance and Insurance; Management of Companies and Enterprises; and industries not classified.

Of the eight industries that experienced a decline, three decreased at a rate slower than the region, one declined at a rate faster than the region and four experienced a loss instead of a gain that was experienced in the region. The Manufacturing, Wholesale Trade and Retail Trade industries all experienced a loss, but at a rate that was slower than for the rest of the region. The Construction industry decreased at a rate greater than the rest of the region. The remaining four industries that experienced a decline at the local level but growth at the regional level are as follows: Utilities; Real Estate, Rental and Leasing; Health Care and Social Assistance; and Auxiliaries.

The regional share data shows that Long Island City has a strong economy with only 5 of the 19 industries struggling due to conditions specific to the locality.

The five industries that are faring the best in Long Island City are: 1. Manufacturing; 2. Professional, Scientific and Technical Services; 3. Transportation and Warehousing; 4. Industries not classified; and 5. Arts, Entertainment and Recreation.

The top five industries that are experiencing loss due to conditions specific to Long Island City are: 1. Construction; 2. Health Care and Social Assistance; 3. Real Estate, Rental and Leasing; 4. Accommodation and Food Services; and 5. Utilities.

Manufacturing Industry Shift-Share Analysis

Figure 9: Shift-Share Analysis for the Manufacturing Industry from 2000 to 2012

		NS	IM	RS
Industry Group	NAICS			
Manufacturing	31----			
Food Mfg.	311	19	9	-2
Bev. & Tobacco Product Mfg.	312	1	1	-1
Textile Mills	313	3	-2	1
Textile Product Mills	314	11	-1	-2
Apparel Mfg.	315	88	-38	5
Leather & Allied Product Mfg.	316	2	0	2
Wood Product Mfg.	321	4	1	-4
Paper Mfg	322	8	-1	-3
Printing & Related Support Activities	323	35	-3	16
Petroleum & Coal Products Mfg.	324	1	0	0
Chemical Mfg.	325	9	2	-3
Plastic & Rubber Products Mfg.	326	8	-1	2
Nonmetallic Mineral Product Mfg.	327	6	1	2
Primary Metal Mfg.	331	3	0	1
Fabricated Metal Product Mfg.	332	37	-1	-5
Machinery Mfg.	333	15	-2	4
Comp. & Electric Product Mfg.	334	4	0	2
Elec. Equip., Appliance & Component	335	5	0	4
Transport. Equip. Mfg.	336	6	0	-2
Furniture & Related Mfg	337	24	6	19
Misc. Mfg	339	46	13	-2

Sources: 2000 & 2012 NAICS data

The industry mix for the Manufacturing industry indicates that of the 21 categories, one experienced growth more at a rate higher than that of the region, three experienced the same growth rate as the region, 11 experienced a loss at a rate higher than that of the region and the remaining six categories experienced a loss at the local economy when growth occurred in the region.

The only category in the Manufacturing industry to experience local growth at a higher rate than the region is Furniture and Related Mfg. However, the Leather and Allied Product

Mfg., Petroleum and Coal Products Mfg., and Electrical Equipment Mfg. all grew at the same rate as the region.

The following 11 categories of the Manufacturing industry that declined at a higher rate at the local level than at its regional counterpart: Textile Mills; Textile Product Mills; Apparel Mfg.; Paper Mfg.; Printing and Related Support Activities; Plastic and Rubber Products Mfg.; Primary Metal Mfg.; Fabricated Metal Product Mfg.; Machinery Mfg.; Computer and Electric Product Mfg.; and Transportation Equipment Mfg. The remaining six categories that experienced loss at the local level but would have seen growth at regional level are: Food Mfg; Beverage and Tobacco Product Mfg.; Wood Product Mfg.; Chemical Mfg.; Nonmetallic Mineral Product Mfg.; and Miscellaneous Mfg.

According to the results of the regional share calculations, the top five preforming categories in the Manufacturing industry that can directly attribute growth (or slower pace of decline) to Long Island City are: 1. Furniture and Related Mfg.; 2. Printing and Related Support Activities; 3. Apparel Mfg.; 4. Machinery Mfg.; and 5. Electrical Equipment. The categories with the lowest performance levels are: 1. Fabricated Metal Product Mfg.; 2. Wood Product Mfg.; 3. Paper Mfg.; 4. Chemical Mfg.; and 5. (four way tie) Food Mfg., Textile Product Mills, Transportation Equipment Mfg. and Miscellaneous Mfg.

X. Interviews

Dana Frankel of The Long Island City Partnership, a Business Improvement District created in 2005, stated that the rezoning of Long Island City was intended to spur the development of central business district, similar to that in Downtown Brooklyn, but things have

not worked out as they were intended. The lack of commercial development can be partially attributed to the economic recession since it is difficult to find financing for major commercial buildings if there is not anchor tenant to entice other potential tenants to lease space in the building.[23] Another reason that commercial development is not moving into Long Island City is that the cost of construction costs in Queens are similar to construction costs in Manhattan. Other than tax incentives for the moving costs and energy conservation, there is not much motivation to move commercial development outside of Manhattan.[24] Recently there has been a resurge in the desire to develop in Long Island City, but this development is predominantly residential with ground floor retail and the ground floor commercial space is only being provided due to the zoning requirements.[25]

The residential development that is being built in the neighborhood is leasing quickly at rents similar to those in Manhattan due to the extra amenities being provided in the new development.[26]

Many of the industrial uses in the neighborhood have continued to thrive as they serve local clientele so they are unable to move too far from Manhattan[27] and the area is well served by transit and truck routes. A number of industries are beginning to shift to high tech or niche industries that have a lot of future market demand such as 3D Printing, jewelers, etc.[28]

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[23] Frankel, D. Long Island City Partnership. Phone Correspondence. February 5, 2015.
[24] Lee, P. New York City Department of City Planning, Queens Borough Office. Phone Correspondence. March 6, 2015
[25] Frankel, D. Long Island City Partnership. Phone Correspondence. February 5, 2015.
[26] Frankel, D. Long Island City Partnership. Phone Correspondence. February 5, 2015.
[27] Lee, P. New York City Department of City Planning, Queens Borough Office. Phone Correspondence. March 6, 2015
[28] Frankel, D. Long Island City Partnership. Phone Correspondence. February 5, 2015.

Although this shift to a high tech industry is apparent, there is no certainty that these industries will want to continue operating in Long Island City since the people who work for these trendy industries are likely to want an abundance of goods and services near their workplace. Uber recently decided to move out Long Island City and back into Manhattan due to employee complaints that there were not enough places to get lunch or coffee in the vicinity of the Long Island City location.[29]

XI. Planning Implications

According to the Furman Center's "How have recent rezonings affected the city's ability to grow?" there is little empirical work done on the impacts that zoning has on the neighborhoods in New York City. Understanding how the effective rezonings are will help guide New York City Policy makers in their attempts to ensure that there is room to accommodate the projected population growth for 2030 and to ensure there are minimal adverse effects that result from rezoning. Examining the impacts of the 2001 rezoning of Long Island City are particularly pertinent since city official are looking to rezone Long Island City once again. Before this rezoning occurs, it is important to know the types of impacts the previous rezoning had.

Long Island City has experienced a growth in population and development. Much of this growth has occurred in the area of the neighborhood that was rezoned in 2001. Although much of the growth portrayed in the FAR utilization maps seems to indicate that the highest levels of growth are being realized in those areas zoned for commercial and manufacturing, but it is the residential zoning that has the greatest utilization of its available FAR. Additionally, as evidence

[29] Lee, P. New York City Department of City Planning, Queens Borough Office. Phone Correspondence. March 6, 2015.

from the interviews suggest, the increase in FAR utilization for the tax lots within the Special LIC District is likely a result of new residential development as the special district allows for mixed use. This claim is further supported by the evidence of a decreasing manufacturing industry seen in the location quotient analysis and the increase of housing stock in the rezoned portion of Long Island City.

Another change that is evident from the aforementioned data is the increasing educational attainment of the people residing in the Long Island City neighborhood and the change in their occupations. The change in occupations from labor positions to management and professional positions is logical and is further supported by evidence from the location quotient analysis which showed an increase of 446.67 percent in the Management of Companies and Enterprises industry. Furthermore, these results are consist with the aforementioned expected outcomes for socio-economic data which presumed since there was not an increase in socio-demographic categories that are deemed negative such as an increase in the population that have educational attainment levels of less than high school or an increase in unskilled labor positions.

The final question at hand is whether or not Long Island City was able to retain its manufacturing industry. Opposite to the findings in the Curran (2007) study in the Williamsburg neighborhood of Brooklyn[30], the manufacturing industry in Long Island City is shown to decline in the location quotient analysis, but has declined at slower rate than that in the New York City Metropolitan Statistical Area. The slower rate of decline seems like a good indicator that Long

[30] Curran, W. (2007). 'From the frying pan to the oven': Gentrification and the experience of industrial displacement in Williamsburg, Brooklyn. *Urban Studies, 44*(8), 1427-1440.

Island City has been able to retain its manufacturing industry, especially since some of the areas in the NYC MSA likely have lower rents per square foot. The regional share data in the shift-share analysis also asserts that the Manufacturing industry is the strongest industry in Long Island City when compared to the NYC MSA. Statements asserting that many of the manufacturing industries have continued to thrive in the neighborhood after the rezoning further validate this claim. It is particularly interesting that the manufacturing industry continued to thrive since much of the new residential development that has been occurring is luxury according to the interviewees Frankel and Lee, but there is no indication as to if the industry is located near the residential development or if it is relocating away from the center of Long Island City. There is also no clear indication as to whether or not the change in the manufacturing industry can be attributed to the rezoning in particular or if its changes are solely related to time or the uniqueness of the Long Island City neighborhood.

XII. Recommendations:

Commercial development was the motivating factor behind rezoning Long Island City in 2001 but there has been little success in creating a "central business district" for Queens. Due to the competitive market in nearby Manhattan, it is likely that substantial incentives, such as tax credits or financing assistance, will be required to spur this desired development. Also, if companies like Uber are leaving the neighborhood due to a lack of amenities, the city could incentivize the development of cafes, other eateries and shops to make the neighborhood more desirable so employees will be compelled to go out for lunch or hang out after work and promote the economic vitality of those new shops.

Another question that could be asked is, if there is currently a demand for housing, should there be incentives for commercial development? Since a demand for housing is increasing in Long Island City and there has not been a market for commercial development, the promotion of affordable housing should be a priority instead of the promotion of commercial development in the neighborhood as the rents are already becoming comparable to those in Manhattan.

Finally, how can manufacturing continue to thrive in a changing neighborhood? It is important the manufacturing industry be monitored and if it becomes in distress the city should step in to ensure it is able to continue functioning. Even though people who work in the manufacturing industry in Long Island City are declining does not mean the jobs and products that these industries provide are no longer needed.

XII. Conclusion

Although interesting, it might be too early to determine the true impacts of the 2001 rezoning in Long Island City. There is a possibility that the Great Recession of 2008 and Hurricane Sandy in 2012 have had an impact on the types of development that have occurred in Long Island City so continued research would be necessary to determine the specific causation of the changes that have occurred in Long Island City.

XIII. Acknowledgements

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Appendix A: Difference in Differences Data

Tot_Pop	R-Squared =	0.0283	Observations:	227
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-166.0232	149.2914	-1.11	0.267
Rezoned	-444.4264	188.6879	-2.36	0.019*
Interaction	290.617	326.0541	0.89	0.374
Constant	1353.958	87.15118	15.54	0.000
Pop_Density	R-Squared =	0.1101	Observations:	227
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	1609.001	4804.648	0.33	0.738
Rezoned	-25724.43	6072.543	-4.24	0.000***
Interaction	-661.79	10493.4	-0.06	0.95
Constant	49026.34	2804.788	17.48	0.000
Med_HH_Income	R-Squared =	0.0366	Observations:	227
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	3083.152	3277.761	0.94	0.348
Rezoned	4789.444	4142.727	1.16	0.249
Interaction	7698.848	7138.664	1.08	0.283
Constant	45811.62	1913.444	23.94	0.000
Med_Rent	R-Squared =	0.1557	Observations:	227
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	230.3027	61.25108	3.76	0.000***
Rezoned	162.5118	77.41458	2.1	0.037*
Interaction	209.0168	133.773	1.56	0.12
Constant	910.4187	35.75626	25.46	0.000
Housing_Units	R-Squared =	0.0231	Observations:	227
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	9.395943	66.02831	0.14	0.887
Rezoned	-178.2675	83.45247	-2.14	0.034*
Interaction	102.1353	144.2065	0.71	0.48
Constant	558.4237	38.54505	14.49	0.000

% White	R-Squared =	0.0079	Observations:	221
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0117062	0.30711	-0.38	0.703
Rezoned	-0.0502851	0.038309	-1.31	0.191
Interaction	0.0551127	0.066188	0.83	0.406
Constant	0.06012379	0.079348	33.52	0.000
% Black	R-Squared =	0.0244	Observations:	221
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0024198	0.0267	-0.09	0.928
Rezoned	-0.0686124	0.033305	-2.06	0.041*
Interaction	0.0178057	0.057543	0.31	0.757
Constant	0.01060678	0.015592	6.8	0.000
% Amer_Indian	R-Squared =	0.0244	Observations:	221
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0059073	0.003106	1.9	0.058
Rezoned	0.0004274	0.003874	0.11	0.912
Interaction	-0.0081992	0.006694	-1.22	0.222
Constant	0.0045405	0.001814	2.5	0.013
% Asian	R-Squared =	0.0633	Observations:	221
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0284068	0.017423	1.63	0.104
Rezoned	0.0582498	0.021733	2.68	0.008**
Interaction	0.0189929	0.037549	0.51	0.613
Constant	0.1364334	0.010175	13.41	0.000
% Other	R-Squared =	0.065	Observations:	221
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0126597	0.013318	-0.95	0.343
Rezoned	0.0509944	0.016612	3.07	0.002**
Interaction	-0.0659692	0.028702	-2.3	0.022*
Constant	0.1153231	0.007777	14.83	0.000

Less_HS	R-Squared =	0.2115	Observations:	218
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.1188765	0.020103	-5.91	0.000***
Rezoned	0.0138408	0.025036	0.55	0.581
Interaction	-0.0617924	0.043171	-1.43	0.154
Constant	0.3277232	0.011843	27.67	0.000
HS	R-Squared =	0.0481	Observations:	218
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0345987	0.01546	-2.24	0.026*
Rezoned	-0.207296	0.019253	-1.08	0.283
Interaction	-0.016109	0.033199	-0.51	0.611
Constant	0.2795015	0.009108	30.69	0.000
Some_College	R-Squared =	0.0478	Observations:	218
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0328002	0.011864	2.76	0.006**
Rezoned	-0.0127356	0.014775	-0.86	0.39
Interaction	-0.0037136	0.025478	-0.15	0.884
Constant	0.1803117	0.006989	25.8	0.000
Bachelor's	R-Squared =	0.2004	Observations:	218
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0799466	0.015517	5.15	0.000***
Rezoned	0.0205458	0.019325	1.06	0.289
Interaction	0.0559091	0.033323	1.68	0.095
Constant	0.1350803	0.009141	14.78	0.000
Grad	R-Squared =	0.092	Observations:	218
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0407283	0.011691	3.48	0.001***
Rezoned	-0.0009214	0.014559	-0.06	0.95
Interaction	0.0265079	0.025106	1.06	0.292
Constant	0.0773832	0.006887	11.24	0.000

Mgmt%	R-Squared =	0.0607	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0324053	0.011543	2.81	0.005**
Rezoned	-0.0049417	0.014288	-0.35	0.73
Interaction	0.0200294	0.024651	0.81	0.417
Constant	0.1016656	0.006783	14.99	0.000
Prof%	R-Squared =	0.1012	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0632869	0.017196	3.68	0.000***
Rezoned	0.0290747	0.021284	1.37	0.173
Interaction	0.0185779	0.036721	0.51	0.613
Constant	0.1546575	0.010136	15.31	0.000
Tech%	R-Squared =	0.0151	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0073548	0.004739	-1.55	0.122
Rezoned	-0.0004249	0.005865	-0.07	0.942
Interaction	-0.0007284	0.01012	-0.07	0.943
Constant	0.0240045	0.002784	8.62	0.000
Sales%	R-Squared =	0.0329	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0115428	0.009868	1.17	0.243
Rezoned	-0.0094393	0.012214	-0.77	0.44
Interaction	0.0333998	0.021072	1.59	0.114
Constant	0.0972042	0.005798	16.77	0.000
Office_Admin%	R-Squared =	0.1142	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0511215	0.011965	-4.27	0.000***
Rezoned	-0.0378839	0.01481	-2.56	0.011**
Interaction	0.0172302	0.025552	0.67	0.501
Constant	0.187726	0.007031	26.7	0.000
Protect_Serv%	R-Squared =	0.012	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0001253	0.005366	-0.02	0.981
Rezoned	-0.0102345	0.006642	-1.54	0.125
Interaction	0.0072814	0.011459	0.64	0.526
Constant	0.0233138	0.003153	7.39	0.000

Other_Services%	R-Squared =	0.018	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0015085	0.01534	-0.1	0.922
Rezoned	0.0270449	0.018987	1.42	0.156
Interaction	-0.0526651	0.032758	-1.61	0.109
Constant	0.1432772	0.009013	15.9	0.000
Precision_Repair	R-Squared =	0.235	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0112663	1.198064	0.01	0.993
Rezoned	11.41263	1.482889	7.7	0.000***
Interaction	-11.44555	2.55844	-4.47	0.000***
Constant	0.1187111	0.703946	0.17	0.866
Produc%	R-Squared =	0.2518	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	-0.0606127	0.009429	-6.43	0.000***
Rezoned	0.0248383	0.11667	2.13	0.034*
Interaction	-0.0329508	0.020134	-1.64	0.103
Constant	0.0868719	0.00554	15.68	0.000
Transport%	R-Squared =	0.0071	Observations:	216
	Coef.	Std. Err.	t	P> |t|
After_Rezoning	0.0049935	0.00835	0.6	0.55
Rezoned	-0.0064924	0.010335	-0.63	0.531
Interaction	0.01114	0.017831	0.62	0.533
Constant	0.0589387	0.004906	12.01	0.000

Sources: 1990 & 2000 U.S. Census and 2013 ACS 5 Year Estimates

Notes: Significance levels are denoted as follows: ***p<0.001; **p<0.01.; *p<0.05

Appendix B: Interview Question Examples

1. How have the arts and culture change in Long Island City since the rezoning?

2. What type of businesses are gaining/losing popularity in the neighborhood?

3. Are residential developments providing affordable housing?

4. Is the local manufacturing industry continuing to thrive?

    a. Are there any complaints by residents who live near the manufacturing?

5. Have you noticed a change in the demographics of the neighborhood?

6. Do you think the rezoning accomplished its goals of providing additional housing and preserving a vibrant mixed use environment?

7. Have you heard of the proposed large scale rezoning of Long Island City?

    a. What are your thoughts on the proposal?