

The Undercount of Population Associated with the Misclassification of Housing Units as Vacant

New York City's Count Question Resolution Program Submission

Introduction

As per the Federal Register Notice of March 11, 2011 (75 FR 29508 - Volume 76 No. 45), the 2010 Census Count Question Resolution (CQR) Program addresses requests from the highest elected official of local governments for corrections to the 2010 Census count of housing units and/or group quarters (GQs) and associated population, based on three types of challenges (1) boundary, (2) geocoding, and (3) coverage.

This CQR Challenge is based on item 3 above – *coverage*. Regarding coverage challenges, the FR Notice states that “These [coverage] challenges, if upheld by the Census Bureau, result in the addition or deletion of specific living quarters and persons associated with them identified during the census process, but which were erroneously included as duplicates or excluded due to processing errors.” Thus, this submission is based on the possibility that the Census Bureau identified a specific address as existing on Census Day, conducted an enumeration at that address – either directly with the occupants, or indirectly through proxies – but then failed to process the resulting information correctly in the final 2010 Census results.

More specifically, this challenge is based on the occupancy status of addresses from the census enumeration. Information for many occupied housing units was not compiled and tabulated as part of the census results because processing errors may have caused these units to be erroneously determined to be vacant. Information from administrative records and survey sources will be used to demonstrate that errors were likely made in the determination of vacancy status. This information can then be used by the Census Bureau to review the processing of selected census records to determine where errors were made in the determination of units as occupied or vacant, leading to a subsequent undercount of population.

This submission has two parts:

1. A detailed analysis that shows the neighborhoods where the 2010 decennial census enumeration includes housing units erroneously classified as vacant. This section includes census tracts in the neighborhoods that were affected, along with tables and maps that summarize 2000 and 2010 Census data, and a variety of survey and administrative data used to identify the problem.

2. As required by CQR, a complete list of addresses in a sample of census blocks in neighborhoods with exceedingly high levels of vacant units. The list will contain street addresses (number, street, and apartment identifier) based on administrative data, such as parcel data from the New York City Department of Finance Real Property Assessment Division tax files, the New York City Department of Buildings data base, other administrative and utility sources, and field work.

Part I: Analysis of Increase in Vacant Housing Units at the Neighborhood Level

The analysis in this section first presents the total number of vacant units in New York City in 2010 and then focuses on the change in vacant housing units between 2000 and 2010, with a special emphasis on Brooklyn and Queens. We argue that the large size and concentrated geographic distribution of the observed increases between 2000 and 2010 in Brooklyn and Queens cannot be fully explained by actual changes in the status of the housing stock, as supported by local administrative data.

There are a number of reasons why an increase in the number of vacant housing units could occur. *Increases in the number of housing units*, in and of itself, can account for increases in vacant units, as when an abundance of new construction is combined with insufficient demand for that housing. *Economic stress* on households may result in an increase in mortgage delinquencies that ultimately end in foreclosures, causing more housing units to become vacant. Using information from a number of administrative and survey sources, we examine whether new construction and mortgage delinquencies can explain the increase in vacant units.

We also analyze whether the 2010 decennial census distribution of vacant units could be corroborated by other sources of data that provide information on vacant units. Toward this end, the count and distribution of vacant units in the 2010 census will be compared with the counts and distributions from 2010 data from the United States Postal Service, the 2008 New York City Housing and Vacancy Survey, and the 2009 American Community Survey.

A substantial increase in the number and percent of vacant housing units is likely to be reflected in housing values and rents charged in these neighborhoods. Thus, our final analysis will examine how well the marketplace reflects the rise in vacant units enumerated in the decennial census.

Increases in vacant housing units can also result from *enumerator error* in the determination of vacancy status, especially in a challenging environment like New York City, where fear may prompt residents to ignore enumerators. For example, undocumented immigrants may be fearful of the authorities, or landlords and/or neighbors may deny existing occupancy altogether in illegally subdivided buildings. While units throughout the city could have been

wrongly classified as vacant as a result of these issues, a disproportionate concentration of extreme vacancy might indicate a more local enumerator issue. Finally, it is possible that the information collected in the enumeration may have yielded incorrect results because of *data processing errors*, associated with incorrect scanning, coding, compiling, or tabulating of results. The Census Bureau needs to take a careful look at their operational data for housing units that were deemed to be vacant in selected places, in order to determine whether problems in the enumeration may have produced the anomalous results documented herein.

Vacant Housing Units in 2000, and Change in Vacant Units from 2000 to 2010

The city had 261,278 housing units that were vacant as of April 1, 2010, or 7.8 percent of all housing units (**Table 1 and Figure 1**). On the borough level, the percent of vacant housing units ranged from 5.6 percent in the Bronx to 9.8 percent in Manhattan.

Between, 2000 and 2010, the number of housing units in New York City increased from 3.2 million to 3.37 million – an increase of 170,200, or 5.3 percent. This growth in housing yielded the city an increase of 167,000 persons, or just 2.1 percent, because the number of vacant housing units increased by 82,000, an increase of 46 percent over 2000. A vacant unit is a housing unit deemed to be “inhabitable,” but does not have any occupants at census time. Citywide, vacant units made up 7.8 percent of all housing units in 2010, up from 5.6 percent in 2000.

On a borough level, Brooklyn and Queens saw especially large increases in vacant housing units when compared to the other boroughs and the city as a whole. In Brooklyn, the number of vacant housing units rose sharply, from 50,100 in 2000 to 83,400 in 2010, an increase of 66 percent; the percent of housing units that were vacant rose from 5.4 percent in 2000 to 8.3 percent in 2010. In Queens, the number of vacant units increased from 34,600 to 55,000, an increase of 59 percent; the percent vacant increased from 4.2 to 6.6 percent during the decade.

Increases in the level of vacancy at the borough level, however, failed to reveal the full seriousness of the issue. It is only when considering change in vacant housing units at the census tract level that the geographically concentrated nature of these changes emerges.

Figure 2 represents the absolute change in vacant housing units from 2000 to 2010 in 2010 census tracts. Since the citywide mean change in vacant units for census tracts was 38 and the citywide median change was 21,¹ we chose a threshold of change of 30 vacant housing units to highlight census tracts experiencing a large absolute change in the number of vacant units. Nine hundred, or nearly 42 percent, of the total 2168 census tracts in the city had a change of vacant units equal to 30 or more. These 900 census tracts cluster mainly in three areas: Manhattan, Northwest Queens, and Southern Brooklyn. Other areas with smaller clusters of tracts include

parts of Downtown Brooklyn, Williamsburg in Brooklyn, Flushing and Middle Village/Ridgewood in Queens, Riverdale and Pelham Bay/Throgs Neck in the Bronx, and Southern Staten Island. The analyses that follow examine these 900 tracts that had a change in vacant units of 30 or more.

Figure 3 shows the percent change in vacant housing units from 2000 to 2010. Six intervals show increasing levels in the percent change in vacant housing units. Over half (496) of the 900 census tracts with vacant unit increases of 30 or more showed a change in vacant units of 100 percent or more. Citywide, the average change in vacant units is 95 percent; for those census tracts with a change of vacant units of 30 or more, the average increase climbs to 209 percent. As in Figure 1, Northwest Queens and Southern Brooklyn again are the main areas with clustering of tracts with large percent increases in vacant units.

The clustering in southern Brooklyn and in northwest Queens occurs mainly within two Local Census Office (LCO) boundaries, LCO 2227 and LCO 2235, respectively. In fact, of the 242 census tracts in the top two intervals (those tracts with an increase of 200 percent or more), 129 (53%) of them are located in LCO 2227 and 46 (19%) of them are located in LCO 2235. The cluster across southern Brooklyn accounted for 66 percent of the increase in vacant housing units in Brooklyn, while the cluster in northwest Queens accounted for 49 percent of the increase in that borough. This large and extreme concentration of vacant unit increases suggests that some aspect of the census enumeration went awry in the determination of vacancy status in these two offices, including processing errors that may have hindered the proper reporting, compilation, and tabulation of census results.

Can the Increase in Vacant Units in the 2010 Census be Explained by New Construction and /or Foreclosures?

While the concentration of vacant units in sections of Brooklyn and Queens is unusual, we need to first examine whether large increases in new construction or foreclosures could explain these neighborhood concentrations.

Examining New Construction Using Certificates of Occupancy from the NYC Dept. of Buildings

It may seem plausible that increases in newly constructed housing units could account for the vacant unit increases in the city. Indeed, New York City had a net increase of more than 165,000 units of new construction between 2000 and 2010. Such increases in new construction were found in many of the city's neighborhoods, but were especially pronounced in Manhattan and Staten Island, and associated with areas where a rise in vacant units was reported.

In New York City, the Department of Buildings issues Certificates of Occupancy (CofOs) for new residential buildings, which were geocoded and aggregated to the census tract level. We

assume that **all** new housing in the 3 years and 3 months leading up to the Census (January 2007 to March 2010) remained vacant – a very conservative approach – and ask whether these newly constructed units that are assumed to be vacant can account for the overall increase in vacant units. **Figure 4** maps the certificates of occupancy for this period as a percentage of the overall increase in vacant units for census tracts with an absolute change in vacant units of 30 or more. It shows that for most of Southern Staten Island, for example, CofOs are equal to over 50 percent of the change in vacant housing in those tracts, indicating that new housing could have been largely responsible for increases in vacant housing there. In contrast, in LCO 2227 in Brooklyn, new construction is equal to less than 10 percent of the increase in vacant units in most census tracts, indicating that new construction cannot account for the large increase in vacant units in this area. In LCO 2235, there are multiple clusters of tracts with large amounts of new construction relative to the increase in vacancy, but in much of Jackson Heights, Steinway, and Astoria within this LCO, CofOs comprised a low percentage of the increase in vacant units.

Overall, new construction as recorded in the issuance of CofOs does not seem to be the cause of the large increase in vacant housing units in LCOs 2227 and 2235, as construction within most tracts usually accounts for less than 10 percent of that increase.

Examining Properties that are in Foreclosure Proceedings

Foreclosures are another factor that could heavily influence the amount of vacant housing in an area. The foreclosure process begins with the lender filing a notice called a *lis pendens* (LP), which may be done after a borrower is more than 90 days delinquent on mortgage payments. The filing of an LP is only the first step in the foreclosure process: Of the LPs filed in 2007 in New York City, over half of them remained without further action as of June 2009.² The number and distribution of LPs filed, however, can be a good indicator of economic instability in an area as many property owners fight to hold on to their properties. If foreclosure is an issue affecting vacancy, it is mostly likely to be happening in areas with a large concentration of filed LPs.

Figure 5 shows the number of LPs filed from October 2008 through March 2010 by census tract. Available data track LPs in the city for one- to four-unit buildings, which made up around 85 percent of all properties entering foreclosure between 1993 and 2009. Citywide, nearly 22,000 LPs were filed during the eighteen-month period from 2008 to 2010, with 7,328 (34 percent) and 9,589 (44 percent) of the total LPs filed in Brooklyn and Queens, respectively. Figure 5 shows that the concentration of LPs is greatest in central Brooklyn and southeastern Queens. Examining the numbers, LCO 2227 in Brooklyn had just over 1,100 filings, making up around 5 percent of the city total and 15 percent of the Brooklyn total; however, the area defined by the LCO is actually under-represented on the foreclosure front, because it contains over 11 percent of the city's 1-4-unit buildings and 36 percent of the borough's 1-4-unit buildings.³ LCO 2235 had nearly 1,200 filings, making up about 5 percent of the city total and 12 percent of the total

for Queens; the LP filings in this LCO more closely match the housing stock there since this LCO contains 5 percent of the city's 1-4-unit buildings and 13 percent of the borough's 1-4-unit buildings. Indeed this LCO reflects the borough-wide rate of foreclosures – and thus foreclosures in this area cannot explain the concentrated increase in vacant units in this LCO.

The area of the city disproportionately affected by foreclosure filings is LCO 2236 in Southeast Queens, where 23 percent of the city's filings and 53 percent of the filings in Queens occurred (over 5,000 total filings), though the area only contains 14 percent of the city's and 34 percent of the borough's 1-4-unit buildings. However, this area was not found to have a disproportionate increase in the number of vacant units.

After an LP filing, a number of events could end the foreclosure process. Borrowers may become current on payments, new mortgage agreements may be worked out with more manageable terms, or the property may be sold by the borrower at a higher price than the mortgage balance, thus settling the debt. If a borrower fails to make payments after the filing of an LP, eventually, the house may be seized and put up for public auction. If bidders fail to meet a lender's price threshold, the property may become "real estate owned" (REO) – in possession by the lender, usually a bank, government agency, or government loan insurer.

Of all LPs filed in 2007, only about 12 percent became REO by 2009.⁴ These properties are more indicative of vacancies produced by foreclosure as they are typically left vacant by investors who are waiting for market conditions to change, thereby making the properties more saleable. As of April 1, 2010, 818 total 1-4-unit properties were REO in the entire city. Sixty percent, or 487, of the citywide REO properties were located in Queens; fifteen percent (122 properties) were located in Brooklyn. **Figure 6** shows the geographic distribution of these REO properties in Brooklyn and Queens by census tract. The large majority of completed foreclosures ending in REO properties are in southeast Queens. In LCO 2235 in northwest Queens, there are a handful of tracts that contained fewer than 3 REO properties each as of April 1, totaling only 33 REO properties for the entire LCO. These properties represent, at most, 132 vacant units due to foreclosure (given that these data are for properties of 4 units or less). In LCO 2227 in Brooklyn, there are only a tiny number of tracts containing REO properties, totaling just 8 properties for the entire area (representing no more than 32 vacant units).

Thus, neither REOs, which are most likely to result in vacant units, nor an expansive view of foreclosures, indicated by LP filings, can adequately explain the dramatic rise in vacant units in LCOs 2227 and 2235.

Are the Increases in Vacant Units in the 2010 Census Corroborated by Other Sources of Data?

Data from the New York City Housing and Vacancy Survey (HVS), 2008

In addition to available administrative data, we used survey information from the 2008 New York City HVS to examine estimates of vacant units. The HVS is conducted every three years, under a contract with the Census Bureau, to estimate vacancy in order to comply with state and city laws aimed at a periodic evaluation of rent regulations in the city. Since the primary purpose of the HVS is to estimate vacancy in the city, it is considered the gold standard where this is concerned. Data are available at a sub-borough level for defined “subareas,” which are near exact representations of New York City Public Use Microdata Areas (PUMAs). The 2008 HVS has a sample size of approximately 18,000 housing units, selected to be representative of housing throughout the city. HVS subareas were aggregated to approximate the areas covered by LCOs – we label them pseudo LCOs – and 2010 decennial census data were also aggregated to the pseudo-LCO level for comparability (**Table 2**).

The percentage of vacant units in 2010 is a full point above the same percentage calculated from the 2008 HVS (7.8 percent versus 6.8 percent), which may be partly due to the economic and housing travails that have followed since 2008. In absolute numbers, the number of vacant units was 227,097 in the 2008 HVS and 261,278 in the 2010 census, an implied increase of 15 percent. Implied changes in the percent vacant varied across pseudo-LCOs, with some showing a decline in vacant units between 2008 and 2010. But for most pseudo-LCOs, the implied change in vacant units between 2008 and 2010 is in the range of -20 percent to 37 percent. The two pseudo-LCOs that stand out are 2227 and 2235, where, in less than two years, there is an implied increase in vacant units of 166 percent and 66 percent, respectively. Furthermore, the implied increases in vacant units in these two pseudo-LCOs represent 21,800 of the total citywide vacant increase of 34,200 units, or 64 percent of the total implied increase in vacant units in the city.

The huge implied increases in vacant units in the two pseudo-LCOs seem implausible, especially in the context of changes in the city, boroughs, and across other pseudo-LCOs, and highlight the erroneous enumeration of vacant units in these areas in the 2010 census.

American Community Survey (ACS) Data in 2009

To further examine the increase in vacant units between 2000 and 2010, we created a hypothetical picture of what vacant housing would look like if the 2000 percent vacant at the tract level was modified using the most recent housing data from the 2009 ACS and applied to 2010 total housing unit counts. Our goal was to update the figures for percent vacant in 2000 to

more accurately reflect conditions around the 2010 decennial census enumeration. To do this, we first calculated the percent of housing units deemed to be vacant in the 2000 Census and 2009 ACS at the PUMA level.⁵ The change in the percent vacant from 2000 to 2009 at the PUMA level was then used to update the 2000 percent vacant for each tract within a PUMA. These tract-level vacant percentages were then applied to the 2010 housing units to derive an “expected” number of vacant units for 2010 (of course, assuming that changes at the PUMA level reflected tract-level changes). We consider this to be a conservative approach, given that the citywide percent vacant in the 2009 ACS was higher than in the 2010 census (8.5 percent versus 7.8 percent).

We then subtracted the “expected” number of vacant housing units from those reported as vacant in the 2010 Census to get “excess” vacant units (**Figure 7**). In the two LCOs of interest, 2227 and 2235, the shades of blue indicate tracts where enumerated vacant units exceeded the number of expected vacant units. LCO 2227 is especially concentrated with excess vacant units according to the simulation, with over 14,000 total excess vacant units. LCO 2235 is less concentrated, but overall it still contains over 2,000 excess vacant units. With one exception, all other LCOs averaged over 2,000 *fewer* enumerated vacant units in 2010 than expected.

Since the above simulation examined the effect of change in units between 2000 and 2009, it was possible that new housing built after this period could explain the excess vacant units. To discount this possibility, we went a step further by including *all* new units with certificates of occupancy in 2009 and 2010 in our expected vacant count. In this ultra-conservative approach, there are no more excess vacant units in Brooklyn and Queens – the numbers are negative – not surprising since every new unit built in 2009-2010 was deemed vacant. Nevertheless, **Figure 8** shows that there are still large numbers of excess vacant units in LCOs 2227 and 2235, highlighting how anomalous the situation is in these areas. In LCO 2227, the number of excess vacant units remains especially high—even when considering the impact of new construction—only dropping from 14,448 to 13,781 excess vacant units. In LCO 2235, an area with a large amount of recent construction, the number of excess vacant units still remains above zero, dropping from 2,227 to 374. Compared to other LCOs and to Brooklyn and Queens as a whole, vacant units in these two LCOs are beyond what might be expected, even given recent trends toward greater numbers of vacant units recorded in the ACS and recent housing construction.

Vacant Units as Defined by the U.S. Postal Service in 2010

The Department of Housing and Urban Development provides quarterly counts of residential units where no one has collected mail for at least 90 days as noted by the US Postal Service. First-quarter data for 2010 show vacant residential units as of March 31, just prior to Census day. USPS also classifies some residential units as “no status”; these units can be under construction but not yet occupied, or determined to be “inactive” by a postal carrier. These

counts of vacant mail delivery points are a direct gauge of vacant housing and should mirror the census results.

The citywide total for housing units, according to USPS, is 3,105,632, compared to the Census-enumerated 3,371,062 units. This difference of 265,000 units or about 9 percent in total units is expected and mostly likely due to the fact that some buildings with multiple units receive mail for all units at a single address delivery point, with mail sorted internally (especially if some of the apartments are illegal). Moreover, the postal service did not have the benefit of the Census Bureau's 2010 Census address list review process. In Brooklyn, postal service data show a total of 873,272 housing units compared to 1,000,293 units recorded in the 2010 Census (15 percent higher). In Queens, the postal service housing units total 703,877, while the Census data show a total of 835,127 housing units (a 19 percent difference).

In addition to the lower total housing count from USPS, overall vacant numbers and percentages are lower than those recorded in the 2010 Census. Citywide, Census vacant units exceed postal service vacant housing by 137,549, with a vacant total of 261,278 from the Census and 123,729 from the postal service. Though overall city vacant numbers are twice as high in the Census as those from the postal service, for Queens and Brooklyn, the differences are even greater, 206 percent and 164 percent, respectively.

Despite these differences, the location of USPS-recorded vacant units is useful in determining whether or not the vacancies in the two LCOs of interest are plausible. **Figure 9a** (top left) includes the number of addresses in Brooklyn where mail has not been collected in the previous 90 days, considered "vacant" according to USPS, including addresses with "no status" – those determined by the postal worker to be under construction or "inactive." This provides us with the largest possible universe of vacant housing units and may, in fact, overstate the number of vacant units, because some number of "no status" units were under construction and not yet inhabitable at census time. The bottom left of Figure 9a shows the percent vacant units in the decennial census. While we know that the percent vacant at the census tract level is uniformly lower in the USPS data, we want to see how these data are distributed. Toward this end, 5 intervals are used to map vacant units in the USPS and census data, with each interval containing one-fifth of all vacant units. The right hand side of Figure 9a shows whether the census data quintile is higher, the same, or lower than the postal service data quintile. **Figure 9b** presents data for Queens.

What is notable is that in Brooklyn LCO 2227 and Queens LCO 2235, the percent vacant is usually in the top quintile, while in the USPS data, the percent vacant is primarily in the second or third quintiles. Thus, in Brooklyn LCO 2227 and Queens LCO 2235, not only is the percent vacant in the census uniformly higher, but it is in the highest quintile, while in the USPS data,

the percent vacant units in tracts are primarily in the lower quintiles. This suggests that an abundance of housing units in the census were erroneously determined to be vacant.

Comparing the Distribution of Vacant Units Across Multiple Data Sources

In this section we compare the distribution of vacant units by LCO in Brooklyn and in Queens in the 2010 census, with data from the 2000 census, 2008 HVS, 2009 ACS, and 2010 USPS. While the number of vacant units in the 2010 census is higher than in each of the above data sources (**Figure 10**), our focus is on the distribution of these vacant units.

The definition of a vacant housing unit can differ, depending on the survey. But it likely that irrespective of the definition of a vacant unit, the distribution of vacant units across a borough would be largely similar across the above surveys. Since data from the 2008 HVS and 2009 ACS are not available for the exact LCO boundaries, these data – along with data from the 2000 and 2010 censuses and from the 2010 USPS – are presented for areas that are similar to LCOs and are labeled pseudo-LCOs.

Figure 10 shows the relative distribution of vacant units for LCOs in Brooklyn and Queens. Focusing on Brooklyn (on the left hand side), pseudo-LCO 2227 comprised 16 percent of all vacant units in the 2000 census and the 2008 HVS, 17 percent in the 2009 ACS, 18 percent in the 2010 USPS, but 30 percent in the 2010 census. There was a similar picture – though not quite as stark – in Queens. Pseudo-LCO 2235 accounted for 16 percent of all vacant units in Queens, according to the 2000 census, 19 percent in the 2008 HVS, 24 percent in the 2009 ACS, and 19 percent in the 2010 USPS. In the 2010 census, however, 27 percent of the units in this pseudo-LCO were vacant.

The dramatically larger number of vacant units in Brooklyn and Queens was primarily due to their erroneous enumeration in LCOs 2227 and 2235, respectively, resulting in a disproportionate share of vacant units in these LCOs.

Do Housing Values and Rents Reflect the Increase in Vacant Units in the 2010 Census?

Changes in Market Value of Housing

The Real Property Assessment Division (RPAD) of the New York City Department of Finance tracks property value over time for taxation purposes. In New York City, generally one of three approaches is used to determine the market value of a property – nearby recent sales on similar properties, income made on the property, or construction and land costs – and the approach chosen is selected based on the tax class and/or age of the property.⁶ We chose to look at more recent RPAD data to get a sense of property values just prior to the 2010 Census.

These RPAD data show change in market values between the first quarter of 2009 and the first quarter of 2010. Mean percent changes in market value were calculated for all census tracts that met a threshold of 25 residential buildings with 10 or fewer units.⁷ We calculated percent changes for properties in each census tract and created a distribution of census tract values for Brooklyn and Queens, with a mean and standard deviation. **Figure 11** shows the changes in market value by census tract, which are expressed as z-scores or standard deviation units from the mean for each borough. In Brooklyn, the mean change in market value was -1.64 percent, with a standard deviation of 4.58 percent. Among tracts in Brooklyn, changes range from a decline in value of 9 percent to an increase of nearly 70 percent (z-scores from -1.68 to 15.17). In Queens, the mean change was -3.79 percent, with a standard deviation of 3.09 percent. Change ranged from a decline of 12 percent to an increase of 13 percent (z-scores from -2.61 to 5.50).

For the two LCOs that are our primary focus, market values do not seem to have changed in a manner that drastically differs from changes that occurred across their respective boroughs. Though both areas averaged declines in market values within their census tracts, these declines occurred in the context of borough-wide declines, and fail to stand out in a manner that would be expected, given the huge supposed increase in vacant housing units. Examining the changes at the LCO-area level, both LCO 2227 in Brooklyn and LCO 2235 in Queens show a mix of tracts falling above and below their respective borough means, a situation present in most LCOs and inconsistent with supposed large increases in vacant units. Averaging tracts within LCOs, the mean in LCO 2227 is a decline of 2.08 percent in market value, which translates into an average z-score of -.10. Only LCO 2225 and LCO 2226 had higher average changes in market values in Brooklyn, and these are areas where market values have increased quite considerably over the last several years. In LCO 2235 in Queens, the average change among tracts was a decline of 3.54 percent. This average actually falls above the borough-wide mean of -3.79 percent, with an average z-score of .15. It is exceeded in average change only by LCO 2234 (average z-score of .92). Though the decline in LCO 2235 market values seems large in comparison to the average change in LCO 2227 in Brooklyn, other LCOs in Queens fared much worse. For example, LCO 2236 in Queens had an average decline in market values of over six percent (an average z-score of -.79). This is the same LCO that seems to have been most affected by foreclosures in Queens.

Figure 12 displays the z-score distributions of tracts in Brooklyn and Queens, comparing borough-wide distributions with those within each LCO. Brooklyn tracts were nearly evenly distributed around the mean, with 56 percent (407) of the total tracts falling below the mean and 44 percent (320) of tracts at or above the mean. Tracts in Queens were similarly distributed, with 55 percent (348) below the mean and 45 percent (286) at or above the mean. In LCO 2227, z-scores range from -1.50 to 1.66, with 56 percent (131) of tracts falling below the Brooklyn mean and 44 percent (102) at or above the mean. This distribution of tracts is quite

similar to the borough-wide distribution in Brooklyn. In LCO 2235, z-score values range from -2.61 to 5.50 (the same range as for the entire borough). Forty-three percent (55 tracts) fall below the mean, and 57 percent (72 tracts) are at or above the borough-wide mean. The distribution in this LCO differs from the total borough in that more tracts fall above the mean, percentagewise, in this area than in the borough as a whole.

Many tracts within LCO 2227 and LCO 2235 showed declines in value between 2009 and 2010, but they seemed to follow along the lines of borough-wide declines, as the distribution of change in these areas falls neatly around their borough mean change in value. In addition, changes were not too different in these LCOs than in most of the other LCOs in Brooklyn and Queens, and they were, in some instances, actually closer to borough-wide changes than others, leading us to conclude that there is no evidence of the large decline in real estate values that would be expected in areas with such disproportionately large increases in vacant units.

Change in Gross Rent

Given that a majority of occupied units in both LCO 2227 and LCO 2235 are renter-occupied, we decided to evaluate whether increases in the stock of vacant housing may have spawned changes in the rental market in these two areas. Areas with increasing numbers of vacant units should see declines in rents as landlords lower asking prices to fill vacant housing. We decided to measure change in gross rents⁸ using the American Community Survey (ACS) to see if these areas have, in fact, seen substantial declines in rents in the years leading up to the decennial census. While the ACS was not intended to provide population counts like the decennial census, it is a good source of information on the characteristics of the population and housing.

Figure 13 shows the changes in median gross rent for occupied housing units in small buildings – those with 1 to 4 units. The focus was on rental units in buildings of this size since they are exempt from rent stabilization. Thus, rents charged for these units would more accurately reflect changes in market conditions. Data on rents are from the 2006 and 2009 ACS one-year estimates for PUMA approximations of LCOs in Brooklyn and Queens.⁹ A distribution of housing tenure for the areas is also shown, demonstrating that renters factor in at a much greater degree than owners, especially in LCO 2235, where 73 percent of the units are renter-occupied; in LCO 2227, the corresponding figure is 61 percent. The change in gross rent is adjusted for inflation and represented in 2009 dollars. The key question concerns whether the two LCOs of interest – 2227 and 2235 – stand out from the others, and, just as important, if there is any evidence that rents declined in real dollars over the period. For LCO 2235, there is a significant increase in gross rent between 2006 and 2009 – \$84, or about 8 percent. This is similar to most LCOs, where significant increases in rents occurred. No LCO showed a decline in rents, but in two LCOs – 2227 and 2234 – the increases were not significantly different from zero. The increase in 2235, and the likely absence of any decline in 2227, is consistent with the

interpretation that any changes in housing in these two LCOs did not trigger rent declines, as would be associated with high rates of vacancy.

Like market values, changes in gross rent for the two LCOs were not far off from borough-wide changes and changes in other LCOs. Even though LCO 2227 did not show a statistically significant increase in gross rent, it did not show a decline, either. If rents were to reflect a large increase in the number of vacant units, a pronounced decline in rents would have been likely, which neither LCO showed.

Summary

There is compelling evidence that errors were made in the 2010 Census regarding the occupancy status of housing units, resulting in excessive counts of vacant units, which are detailed in this Count Question Resolution (CQR) challenge. The concentrated geographic pattern to these erroneously enumerated vacant units, in both absolute counts and in relative changes over time cannot be explained. The large increase and concentrated nature of these vacant units is not corroborated by either administrative data or other large surveys. Nor do these data sources reflect adverse real estate conditions implied by such a high proportion of vacant units.

The sharp geographic patterns are most telling, especially with regard to the Local Census Office (LCO) boundary in southern Brooklyn. As noted, there is a sharp increase in vacant units within the boundaries of LCO 2227 in Brooklyn – a pattern not evident in the bordering census tracts of the adjacent LCO – despite the area being similar to the LCO in terms of housing stock, immigrant occupancy, and economic status. This pattern is also evident, although slightly less clear cut, in Queens LCO 2235. As in southern Brooklyn, the changes in vacant housing units imply a level of housing unit overcapacity and/or low demand that is not borne out in any other data.

Concluding Remarks

One last note concerns the possibility that the address list contains flaws that have led to problems in the enumeration. Perhaps added addresses, provided by the local government or the Census Bureau itself were erroneous. For southern Brooklyn, the local government submissions in the Local Update of Census Addresses (LUCA) program in 2000 and again in 2010 were minimal. In northwest Queens, however, address list additions as a result of the LUCA program were substantial in both 2000 and 2010. Our position, however, is that both the 2000 and 2010 Censuses were based on address lists that were far better than in any census, since the wide scale use of the mailout/mailback method began in 1970.

The housing unit list that was used in the 2010 Census enumeration was subjected to the scrutiny of field observation on multiple occasions. The original list was vetted with the local government in 2000, a product of the 2000 LUCA program and then checked in the field by the Census Bureau. This list was updated over the decade using the postal-service delivery sequence files (DSF), which has information on additions and deletions to the housing stock that is heavily informed by letter carriers. This whole list was then examined again by the local government in the 2010 Census LUCA program, followed by a full canvass of all blocks in New York City by the Census Bureau in March-May of 2009, and a final update with new construction submitted by the local government.¹⁰ The outcome of these multiple processes likely means that the list used by the census bureau in the 2010 census was among the best ever created.

Instead, it is likely that flaws occurred in the processes and/or operations surrounding the implementation of this list as part of the census enumeration itself that are responsible for the anomalous results identified in this document. Like with the address review process, the Census Bureau needs to identify ways in which local governments can become involved in the remediation of problems identified by the Census Bureau in the field at the time of the enumeration, much like outreach efforts currently involve making local communities aware in real time about shortfalls in their mail response rates. Had a mechanism been in place in 2010 to garner the assistance of local governments in real time to determine the reason for very high, and geographically concentrated, levels of vacant housing units, a CQR submission would likely not have been necessary. Of course, we recognize that the taking of the decennial census is a federal enterprise, and its size and complexity require that any local involvement be circumscribed within acceptable limits. Still, one cannot help but think about how local knowledge could have been used in 2010 to correct the problems we have identified, before the local census offices were closed.

The City of New York requests that the Census Bureau trace the life-cycle of the addresses for the sample blocks we have provided, to determine whether problems in the processing of these data have led to erroneous coding of occupancy status as vacant. Of special interest is whether any processing errors found with these cases may be indicative of a more widespread problem that could be remediated within the limits of the CQR program, such as errors involved in scanning questionnaires, routines for coding responses, and computer programs associated with substitution and/or imputation algorithms.

ENDNOTES

¹ The largest absolute decrease in vacant units occurred in Tract 210.01 in Parkchester in the Bronx – a decrease of 494 vacant units. On the other side of vacant-unit change, the largest absolute increase in vacant units occurred in Tract 555 in North Side in Brooklyn, which showed an increase of 1,332 vacant units.

² Furman Center for Real Estate and Urban Policy. “Foreclosed Properties in NYC: A Look at the Last 15 Years.” Retrieved from http://furmancenter.org/files/publications/Furman_Center_Fact_Sheet_on_REO_Properties.pdf.

³ One- to four-unit building totals from lot-level information available from DCP MapPLUTO database, version 11.1.

⁴ Furman, *ibid*.

⁵ While tract level data were available from the ACS, the time interval for the estimate was 2005-2009, and we believed that the timeliness of the estimate (i.e. data for 2009) was more important than having data at the census tract level.

⁶ The city is required by law to estimate the value of properties as of January 5th each year. Market values for Class 1 properties, consisting of one-, two-, and three-family homes, are almost always based on recent sales price of comparable properties in a geographic location. For Class 2 residential properties, market value is usually based on the current value of the projected future income stream from the building. To calculate the value of future income streams, the city has generally used capitalization of net operating income. For Class 1 and 2 cooperatives and residential condominium buildings, the city is required by state law to determine value as if the units were rental apartment units, calculating value by estimating the amount of rent that would be charged if the units were rented. For new construction the city estimates the land value and the cost of constructing the building.

⁷ We calculated change in market values between the first quarters of 2009 and 2010. The percent change was calculated for all lots with 10 or fewer units in census tracts with 25 or more residential buildings. We then averaged the percent change across all lots within a given census tract. We chose to restrict our analysis to a change in values for smaller buildings in order to remove the effect of outliers associated with small buildings torn down and replaced with large buildings. Borough-wide average percent changes were also calculated, in addition to borough-wide standard deviations. Together, the borough averages and standard deviations were used with tract averages to calculate z-scores for each census tract.

⁸ Gross rent is the contract rent plus the estimated average monthly cost of utilities (electricity, gas, and water and sewer) and fuels (oil, coal, kerosene, wood, etc.) if these are paid by the renter (or paid for the renter by someone else).

⁹ These two time points were selected because 1) no major cautions were issued by the Census Bureau over this period, indicating that value and gross rent data were comparable, and 2) change between 2006 and 2009 should reflect the effects of the economic recession.

¹⁰ In addition, northwest Queens was also home to a census test in 2004, where additional address information was compiled.

Table 1. Total Housing Units and Vacancy Status, New York City, Boroughs, and LCOs, 2000 and 2010

	2000			2010			Change in Vacant Units 2000-2010	
	Total Housing Units	Vacant Housing Units	Percent Vacant	Total Housing Units	Vacant Housing Units	Percent Vacant	Number	Percent
New York City	3,200,912	179,324	5.6	3,371,062	261,278	7.8	81,954	45.7
Bronx	490,659	27,447	5.6	511,896	28,447	5.6	1,000	3.6
LCO 2219	150,319	7,386	4.9	154,449	8,765	5.7	1,379	18.7
LCO 2220	122,921	5,874	4.8	124,552	7,281	5.8	1,407	24.0
LCO 2221	113,682	8,328	7.3	121,733	6,761	5.6	-1,567	-18.8
LCO 2222	103,737	5,859	5.6	111,162	5,640	5.1	-219	-3.7
Brooklyn	930,866	50,139	5.4	1,000,293	83,437	8.3	33,298	66.4
LCO 2223	162,435	7,481	4.6	163,772	8,971	5.5	1,490	19.9
LCO 2224	155,864	10,043	6.4	166,192	10,910	6.6	867	8.6
LCO 2225	156,729	13,932	8.9	183,964	17,910	9.7	3,978	28.6
LCO 2226	176,557	8,450	4.8	184,558	13,541	7.3	5,091	60.2
LCO 2227	279,281	10,233	3.7	301,807	32,105	10.6	21,872	213.7
Manhattan	798,144	59,500	7.5	847,090	83,244	9.8	23,744	39.9
LCO 2230	223,507	19,358	8.7	231,158	26,919	11.6	7,561	39.1
LCO 2231	144,783	10,096	7.0	145,894	9,985	6.8	-111	-1.1
LCO 2232	208,438	13,320	6.4	213,307	17,423	8.2	4,103	30.8
LCO 2233	221,416	16,726	7.6	256,731	28,917	11.3	12,191	72.9
Queens	817,250	34,586	4.2	835,127	55,010	6.6	20,424	59.1
LCO 2234	201,212	6,436	3.2	204,687	11,305	5.5	4,869	75.7
LCO 2235	200,431	5,722	2.9	209,518	15,660	7.5	9,938	173.7
LCO 2236	183,285	9,731	5.3	182,594	11,732	6.4	2,001	20.6
LCO 2237	232,322	12,697	5.5	238,328	16,313	6.8	3,616	28.5
Staten Island	163,993	7,652	4.7	176,656	11,140	6.3	3,488	45.6
LCO 2238	163,993	7,652	4.7	176,656	11,140	6.3	3,488	45.6

Source: U.S. Census Bureau, 2000 Census Summary File 1, 2010 Census Public Law 94-171 File

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Figure 1. Percent Vacant by Census Tract, 2010

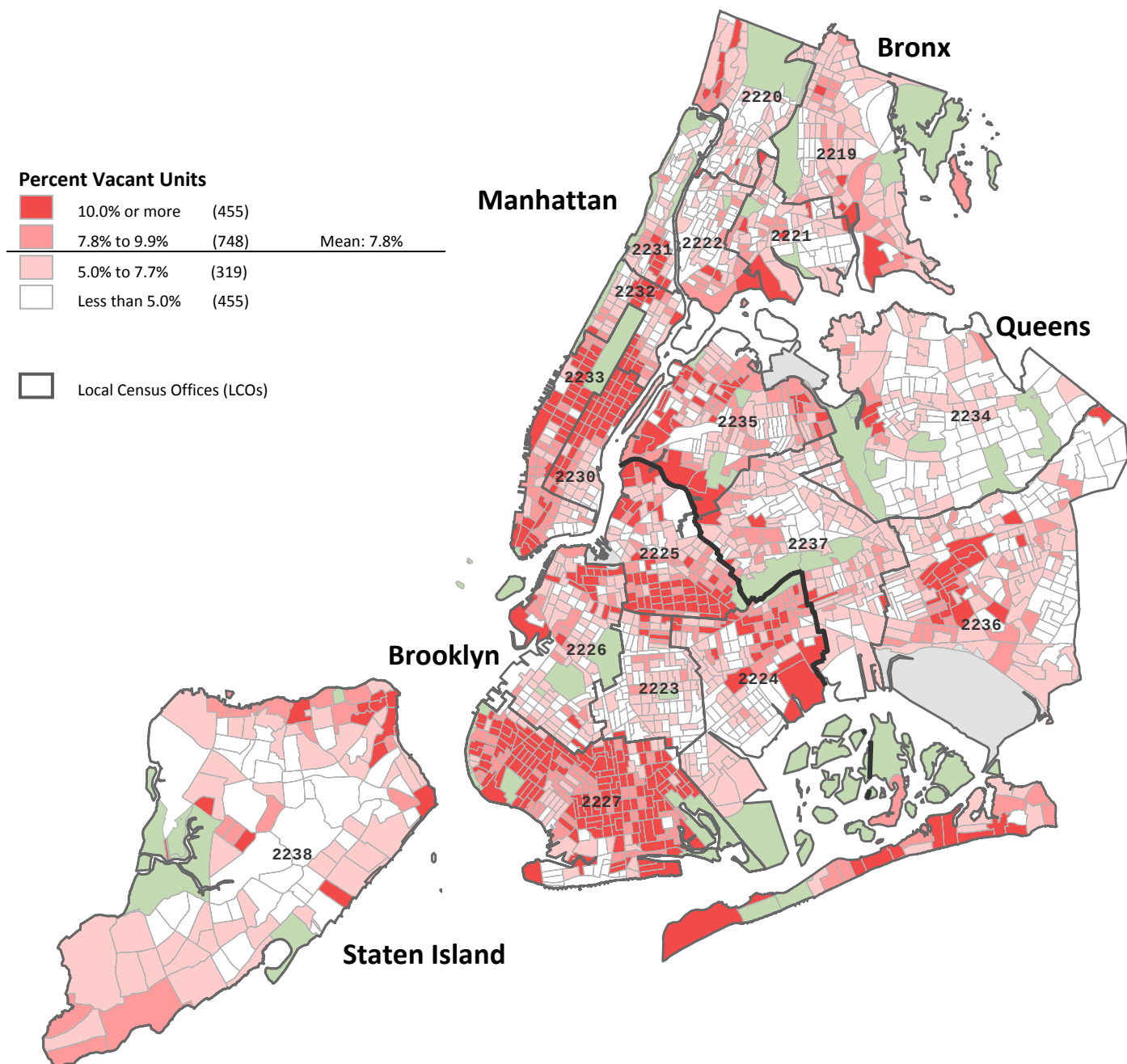


Figure 2. Change in Vacant Housing Units by Census Tract, 2000-2010

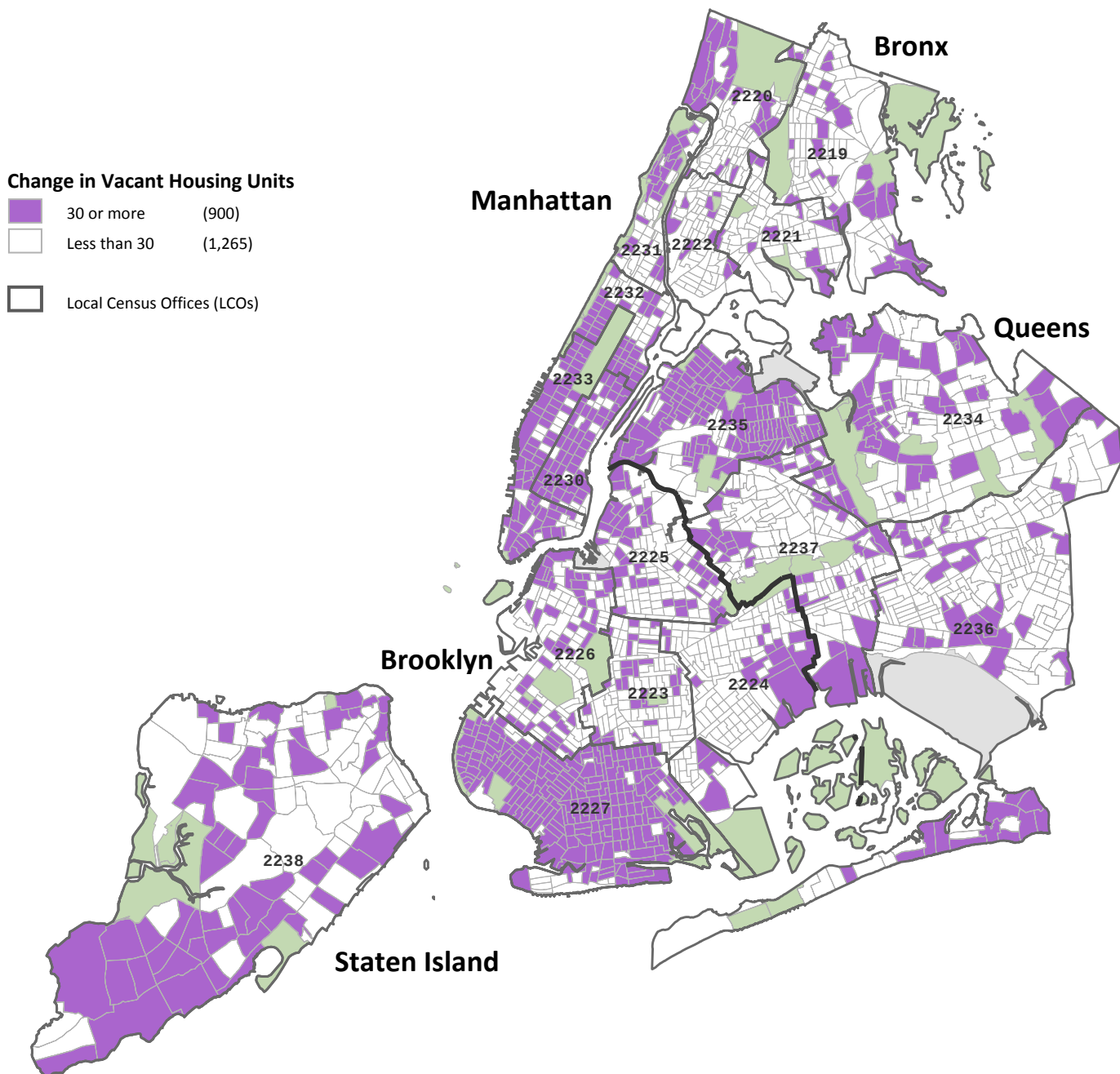


Figure 3. Percent Change in Vacant Housing Units by Census Tract, 2000-2010

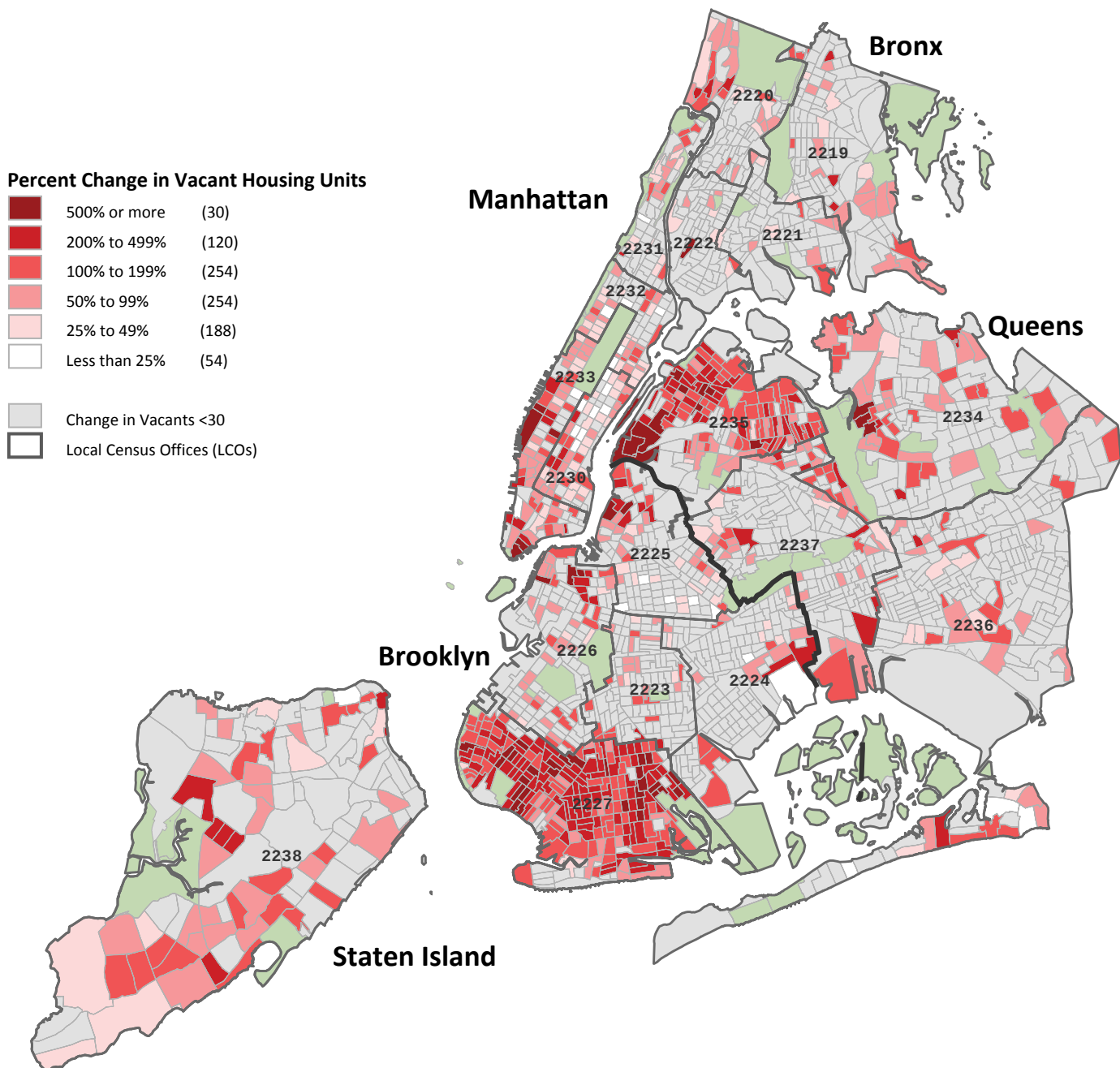


Figure 4. Certificates of Occupancy Issued 2007-2010 as a Percentage of the Change in Vacant Units, 2000-2010, by Census Tract

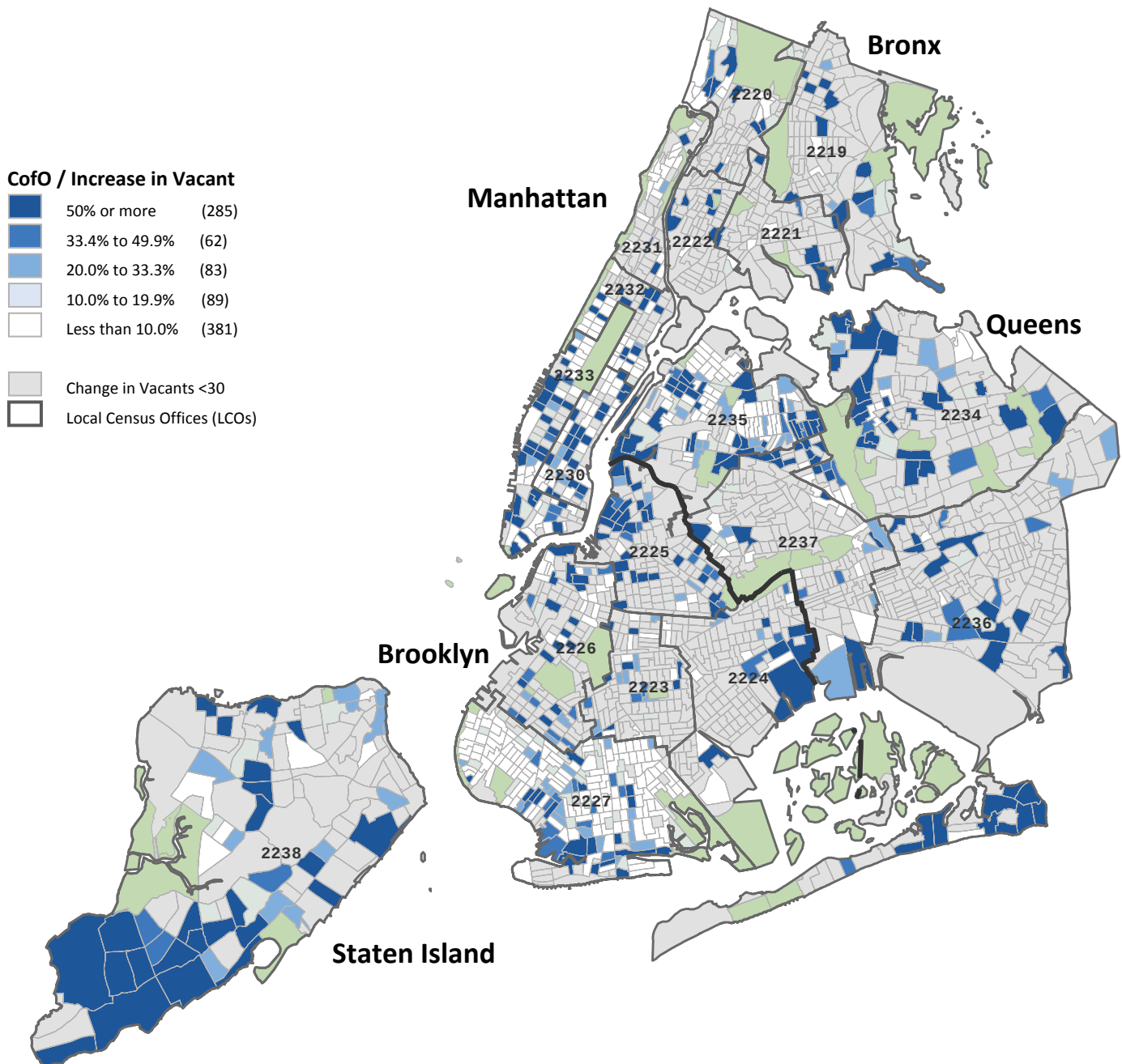
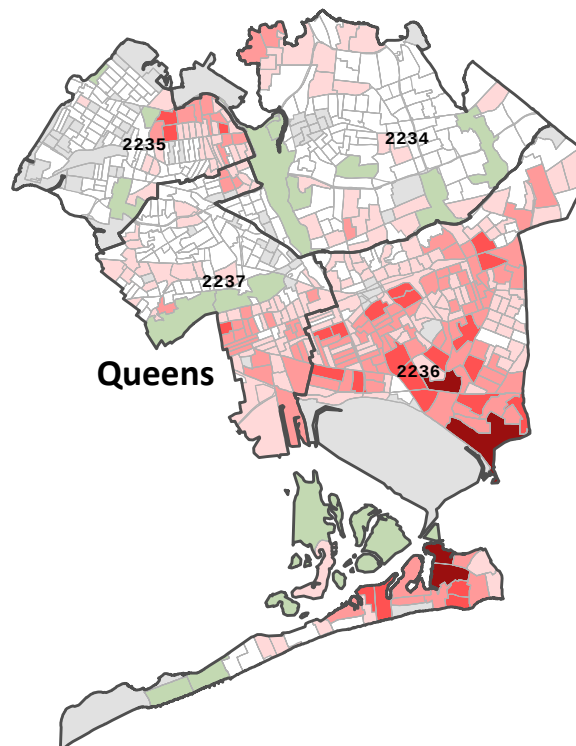
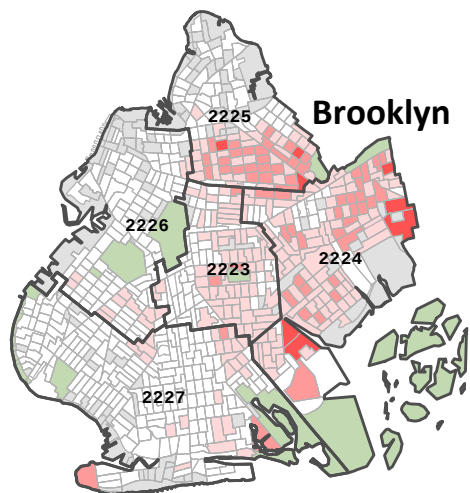
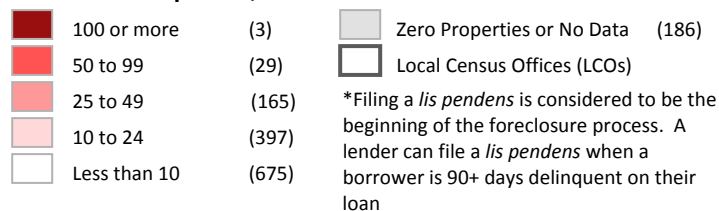


Figure 5. Properties with *Lis Pendens Filed between Oct '08 and Mar '10**

Number of Properties, 1-4 Units

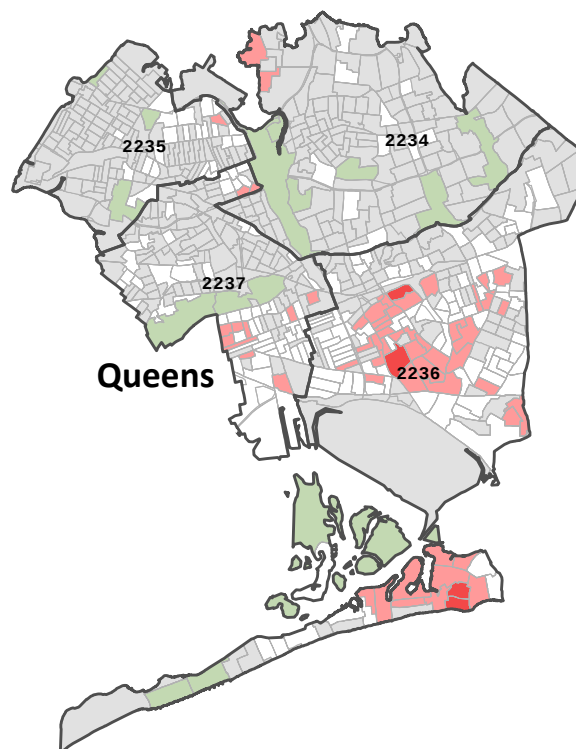
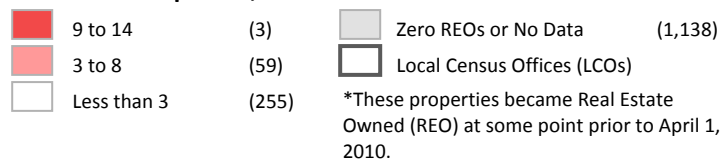


Source: NYU Furman Center for Real Estate and Urban Policy, Public Data Corporation

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Figure 6. Real Estate Owned (REO) Properties as of April 1, 2010*, by Census Tract

Number of Properties, 1-4 Units

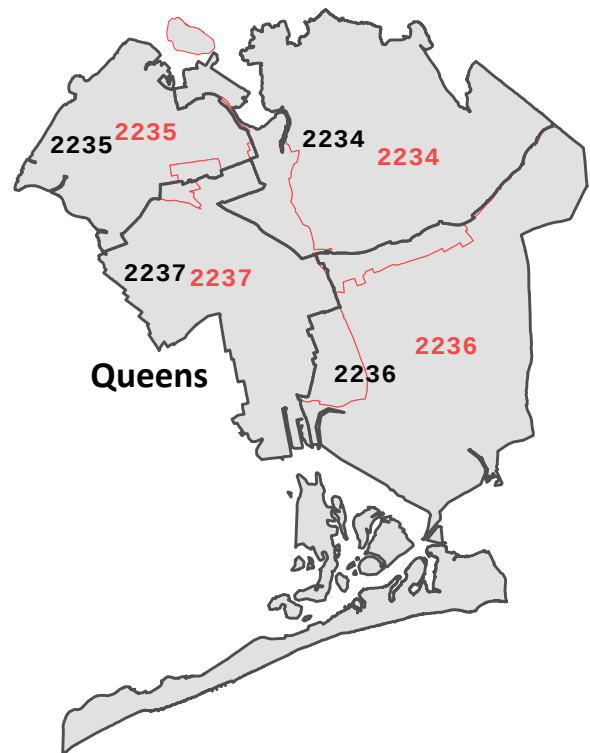
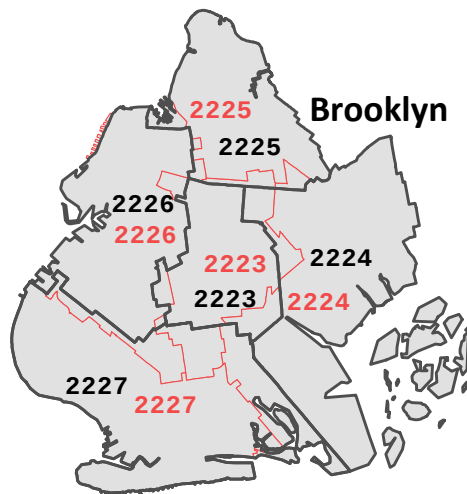


Source: NYU Furman Center for Real Estate and Urban Policy, Public Data Corporation

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Table 2. Vacant Housing Units in the 2010 Census and 2008 HVS by Pseudo-LCO


 Local Census Offices (LCOs)
 HVS Subareas Aggregated to Pseudo-LCOs

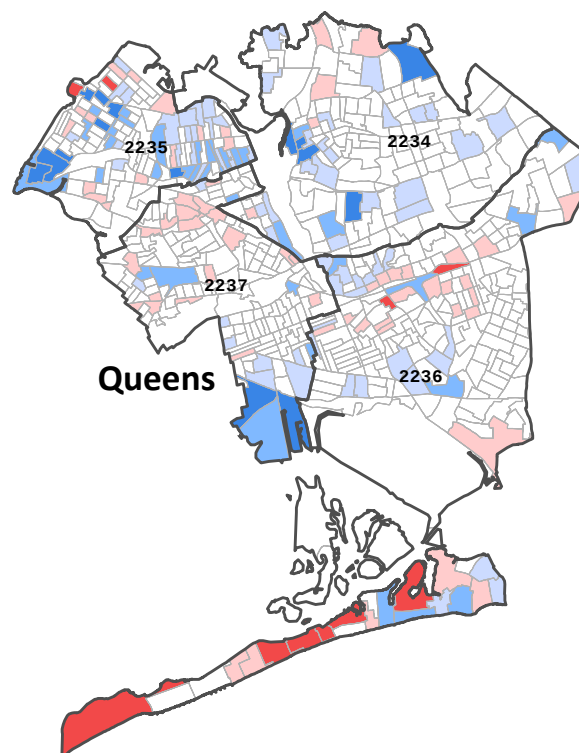
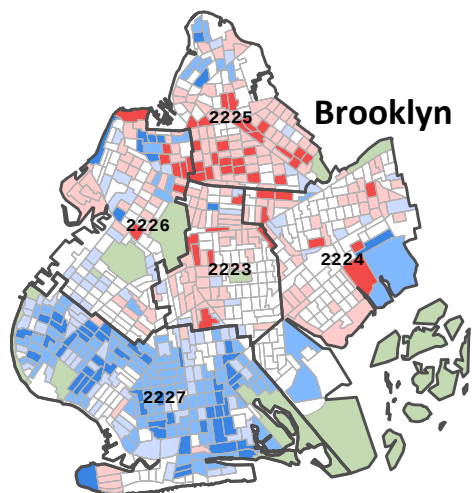
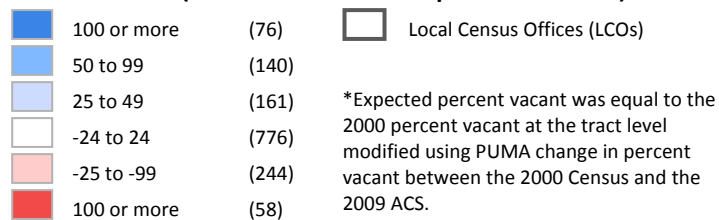


	Pseudo-LCOs	HVS 2008			Census 2010			Difference in Vacant Units	
		Vacant Units	Housing Units	Vacant Percent	Vacant Units	Housing Units	Vacant Percent	Number	Percent
Bronx	2219	8,517	148,417	5.7	8,419	150,189	5.6	-98	-1.1
	2220	9,270	145,647	6.4	8,163	140,825	5.8	-1,107	-11.9
	2221	5,894	118,038	5.0	6,701	125,246	5.4	807	13.7
	2222	6,013	97,581	6.2	5,289	99,119	5.3	-724	-12.0
Brooklyn	2223	13,070	208,029	6.3	13,363	207,600	6.4	293	2.2
	2224	9,002	162,182	5.6	12,309	171,493	7.2	3,307	36.7
	2225	13,404	153,386	8.7	15,572	165,611	9.4	2,168	16.2
	2226	13,495	202,907	6.7	16,692	210,377	7.9	3,197	23.7
	2227	9,587	236,243	4.1	25,501	245,212	10.4	15,914	166.0
Manhattan	2230	12,603	100,751	12.5	10,539	97,317	10.8	-2,064	-16.4
	2231	11,752	184,563	6.4	13,362	181,133	7.4	1,610	13.7
	2232	16,496	185,208	8.9	19,482	185,479	10.5	2,986	18.1
	2233	36,373	368,258	9.9	39,736	379,679	10.5	3,363	9.2
Queens	2234	10,131	202,451	5.0	10,846	199,124	5.4	715	7.1
	2235	8,993	191,173	4.7	14,899	194,779	7.6	5,906	65.7
	2236	9,971	142,742	7.0	9,290	138,543	6.7	-681	-6.8
	2237	18,582	302,348	6.1	19,975	302,680	6.6	1,393	7.5
Staten	2238	13,943	178,471	7.8	11,140	176,656	6.3	-2,803	-20.1
New York City Total		227,097	3,328,395	6.8	261,278	3,371,062	7.8	34,181	15.1

Source: U.S. Census Bureau, 2010 Census Public Law 94-171 Files, 2008 Housing and Vacancy Survey Population Division – NYC Department of City Planning

Figure 7. Excess Vacant Units by Census Tract

Excess Vacants (2010 Enumerated – Expected* Vacants)

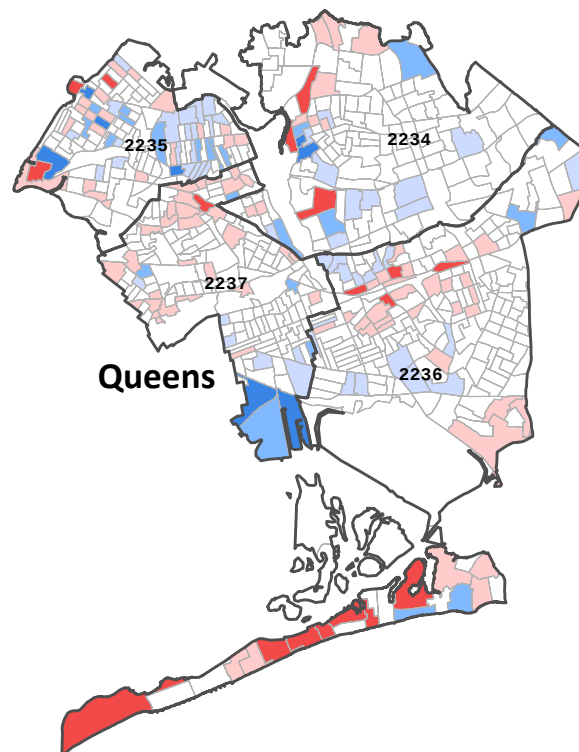
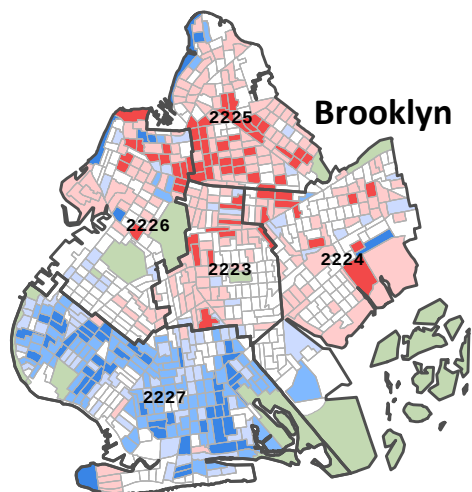
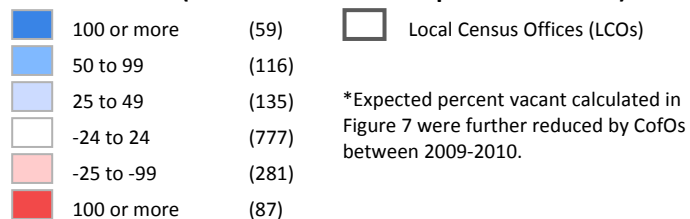


Source: U.S. Census Bureau, 2000 & 2010 Census Public Law 94-171 Files, 2009 ACS 1-Year File

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Figure 8. Excess Vacant Units by Census Tract with 2009-2010 New Construction Included as Vacant

Excess Vacants (2010 Enumerated – Expected* Vacants)

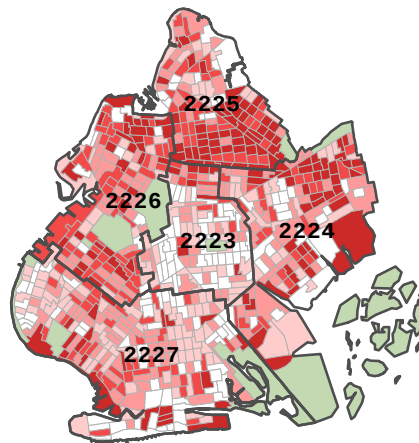
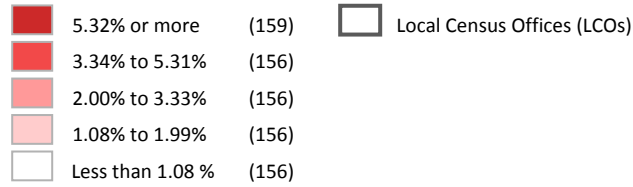


Source: U.S. Census Bureau, 2000 & 2010 Census Public Law 94-171 Files, 2009 ACS 1-Year File

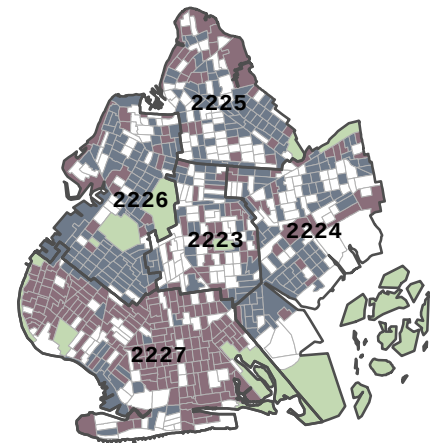
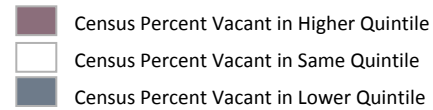
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Figure 9a. Percent Vacant Units in the 2010 Census and 2010 USPS Data for Brooklyn

Postal Service Percent Vacant Units (Quintiles)



Census Quintile vs. Postal Service Quintile



2010 Census Percent Vacant Units (Quintiles)

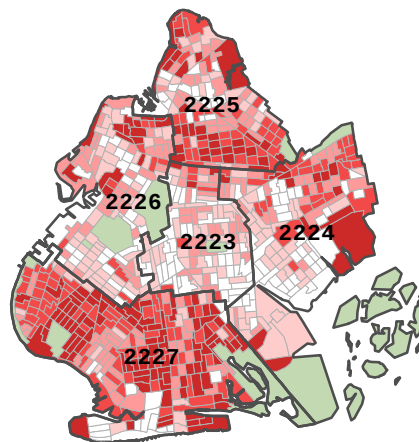
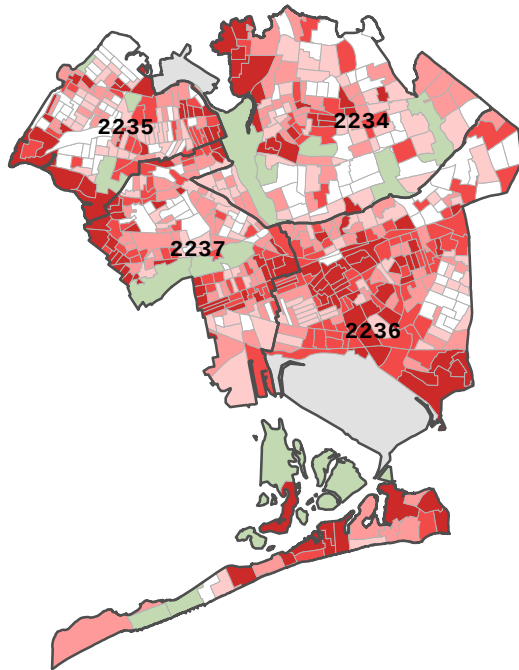
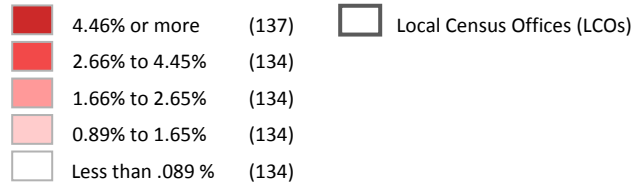
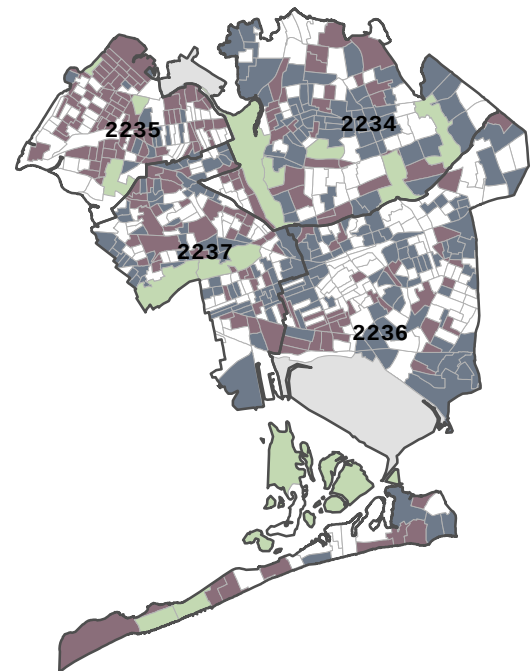
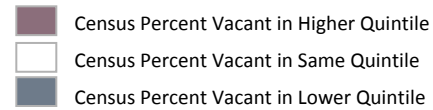


Figure 9b. Percent Vacant Units in the 2010 Census and 2010 USPS Data for Queens

Postal Service Percent Vacant Units (Quintiles)



Census Quintile vs. Postal Service Quintile



2010 Census Percent Vacant Units (Quintiles)

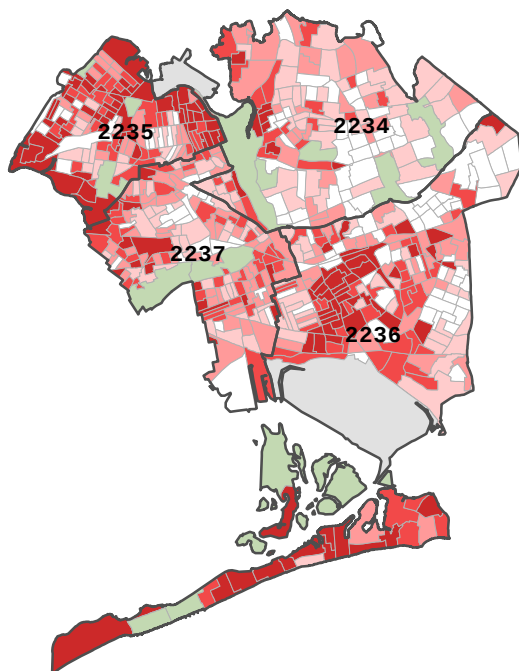
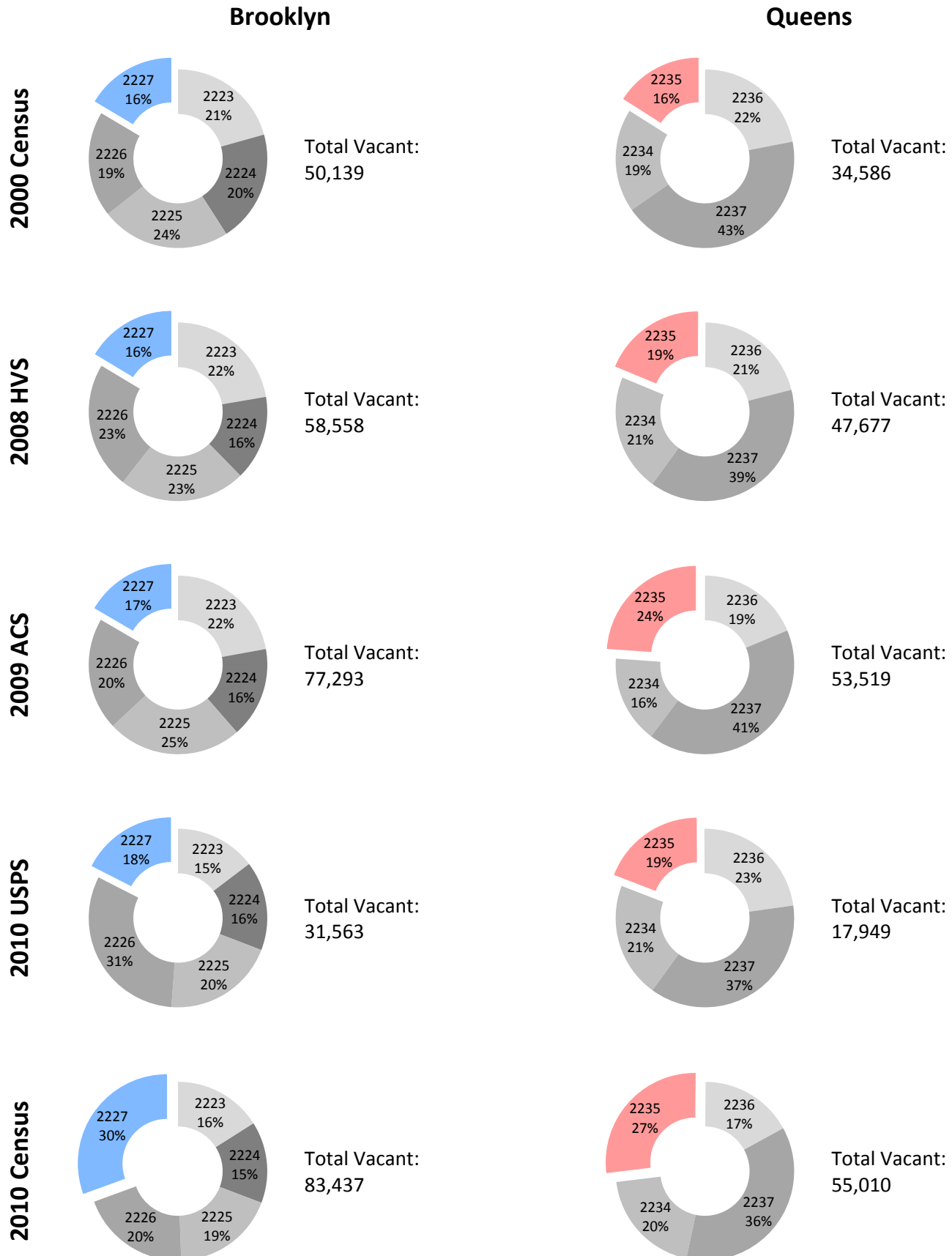


Figure 10. Distribution of Vacant Housing Units in the 2000 and 2010 Censuses, 2008 HVS, 2009 ACS, and 2010 USPS, by Psuedo-LCO



Source: U.S. Census Bureau, 2000 & 2010 Census PL 94-171 Files, 2008 HVS, 2009 ACS 1-Year Estimates, USPS Population Division – NYC Department of City Planning

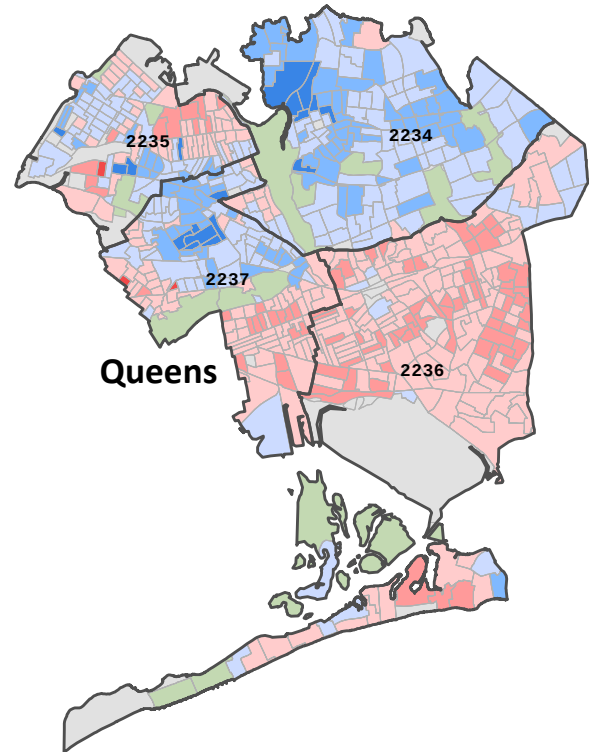
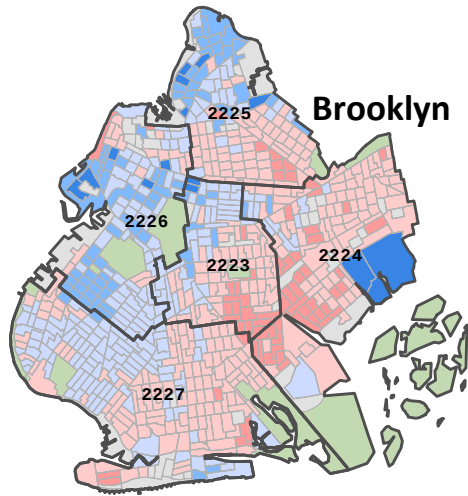
Figure 11. Change in Housing Values 2009-2010 for Residential Properties* by Census Tract for Brooklyn and Queens

Change in Market Value, Expressed as Z-score

-	+	
		0.01 to 1.00 (999)
		1.01 to 2.00 (327)
		2.01 or more (35)

BK	Mean: -1.64	STD: 4.58
QN	Mean: -3.79	STD: 3.09

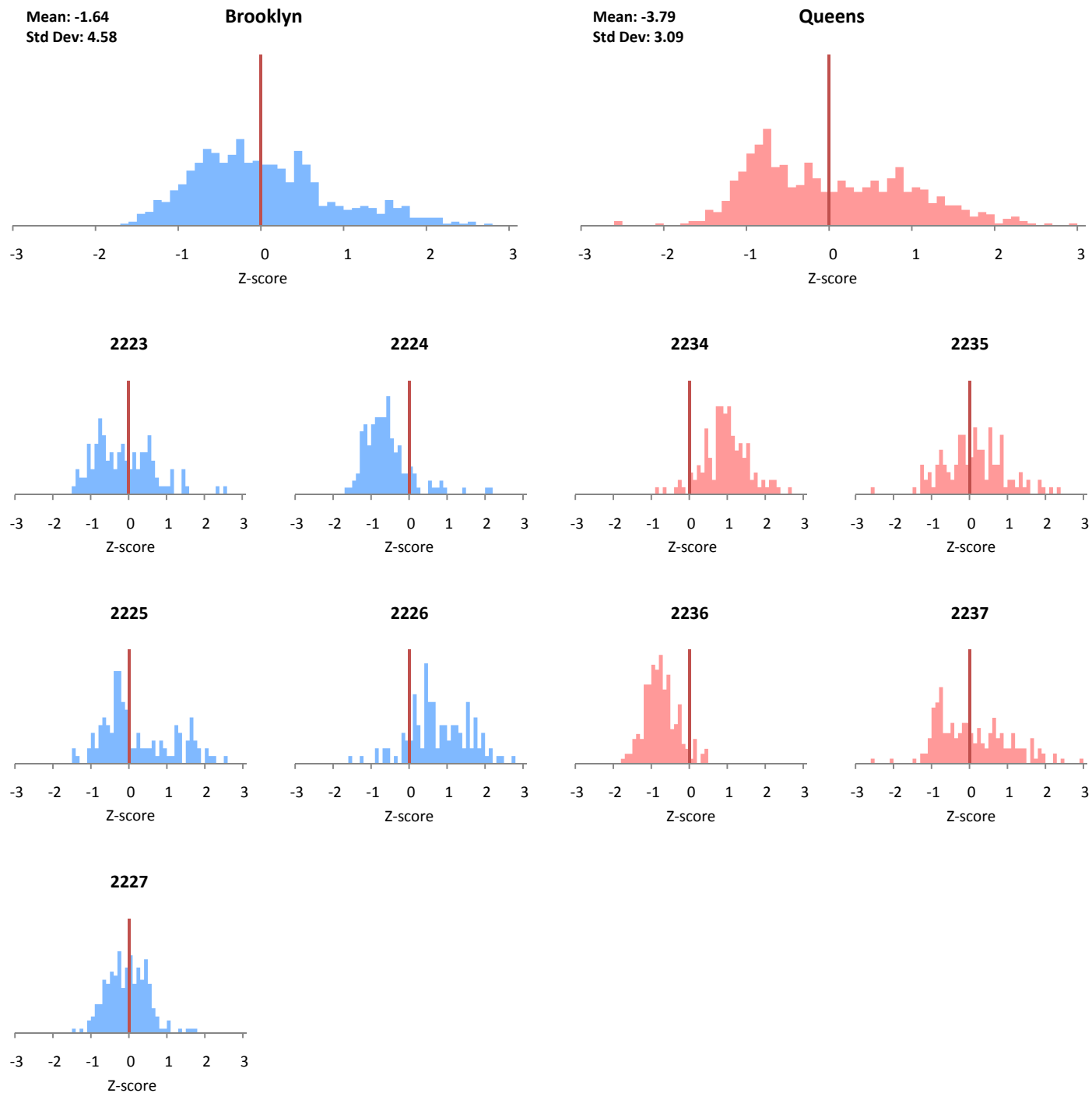
 Fewer than 25 residential buildings
 Local Census Offices (LCOs)
 * Calculated only for tracts with 25 or more residential buildings with 10 or fewer residential units. Change is from Q1 2009 to Q1 2010.



Source: NYC Department of Finance, Real Property Assessment Division

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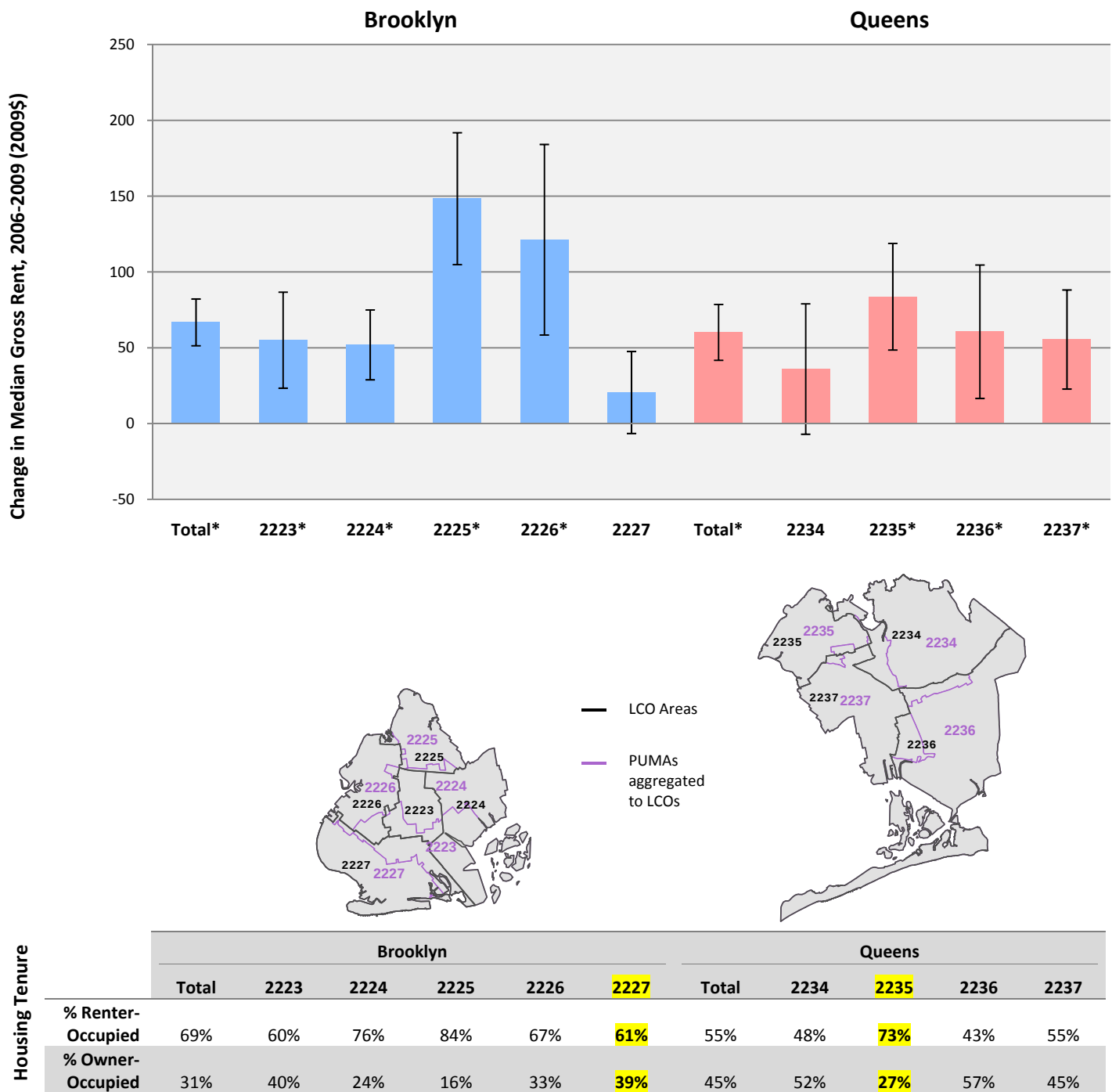
Figure 12. Change in Housing Values 2009-2010 for Residential Properties in Census Tracts within LCOs in Brooklyn and Queens



Source: NYC Department of Finance, Real Property Assessment Division

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Figure 13. Change in Median Gross Rent for Occupied Units†, 2006-2009, by PUMAs Aggregated to LCOs



Source: US Census Bureau, American Community Survey, 2006 and 2009

†In structures with one to four units

*Change is statistically significant

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