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SHAUNA NOEL and EMMANUELLA SENAT,

                         PLAINTIFFS,

        ----- against -----   **15-CV-5236 (LTS) (KHP)**

CITY OF NEW YORK,

                         DEFENDANT.

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EXPERT REPORT OF BERNARD R. SISKIN, Ph.D.

Originally filed JUNE 27, 2019

Amended Initially September 4, 2019

Amended December 13, 2019

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I.   INTRODUCTION

I am a Director of BLDS, LLC, a specialty consulting firm. Prior to joining BLDS, I did similar work at the specialty consulting firms, LECG, LLC, the Center for Forensic Economic Studies, Inc., and National Economic Research Associates (NERA). Prior to that, I was a tenured faculty member and Chairman of the Department of Statistics at Temple University in Philadelphia. I received my Ph.D. in Statistics with a minor in Econometrics from the Wharton School of the University of Pennsylvania in 1970. I have authored four books on statistical methodology, three book chapters, four research monographs, and numerous papers, including articles on the role of statistics in the analysis of statistical evidence of discrimination. Since receiving my Ph.D., I have specialized in the application of statistics as evidence in legal proceedings, particularly in assessing issues of discrimination. In this capacity, I have been retained by numerous governmental and private organizations including, but not limited to, the Third Circuit Task Force on Race and Gender, the Equal Employment Opportunity Commission (EEOC), the Civil Rights Division of the United States Justice Department, the Office of Federal Contract Compliance (OFCCP), the Federal Bureau of Investigation, and various states and municipalities as well as numerous Fortune 500 corporations. My resume, which includes a list of the cases on which I have served as an expert, as well as my publications, is attached as Appendix A.

II.   ASSIGNMENT[1]

I have been asked by Counsel for the City to review Dr. Beveridge's April 1, 2019 report

and his 2017 preliminary report and underlying data, to opine as to whether his analysis properly

supports his conclusions that the community preference ("CP") policy has a disparate impact on

one or more races and also has the effect of perpetuating segregation in the City.[2] I was also

asked to comment on any of Dr. Beveridge's other analyses or opinions that I believe are either

flawed or incorrect, and undertake any analyses I thought appropriate to demonstrate the

problems with Dr. Beveridge's analyses or opinions.

I was further asked to conduct the analyses I thought appropriate to answer the following

questions:

- Did the community preference policy have a disparate impact by race or ethnicity on the ability to compete for affordable housing opportunities?

- To what extent did the community preference policy increase or decrease the degree of segregation in the City?

III.   EXECUTIVE SUMMARY

A. Overview of Dr. Beveridge's Opinions

Dr. Beveridge states in his report dated April 1, 2019 that his task was to "determine

whether the community preference policy operates to create discriminatory effects against one or

more racial groups. [He] was also asked to determine whether these effects are reflective of a

pattern that perpetuates segregation more (and allows integration less) than would exist without

the policy. [He] was also asked to opine on the extent to which applicant households choose to

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[1] This report amends and replaces my September 4, 2019 report, which replaced my initial Expert report dated June 27, 2019.
[2] I am being paid $500 an hour for my time. My compensation is not dependent in any way on the outcome of this matter.

limit or do not choose to limit themselves to lotteries for affordable housing opportunities within their own community. Finally, [he] was asked to opine on the scope of residential segregation in New York City."[3]

Based on his analyses, Dr. Beveridge makes the following major conclusions:

(1) Having the community preference increases one's chances of being awarded a unit, on average, irrespective of whether the analysis population consists of all applicants or only those apparently eligible.[4]

(2) The community preference disproportionately aids the majority race and sometimes the plurality race of the CD typology of the community preference area of the project.[5]

(3) While the community preference disproportionately benefits the majority or plurality race, the majority or plurality race varies depending on the CD typology, so no single race is advantaged overall.[6]

(4) "[T]he result of the operation of the community preference policy is a pattern that perpetuates segregation more (and allows integration less) than what would be expected without the policy."[7]

B. <u>Professor Beveridge's Disparate Impact Analysis is Incorrect--A Properly Performed Disparate Impact Analysis Demonstrates That There is No Disparate Impact on African Americans or Hispanics</u>

Dr. Beveridge does not correctly perform a disparate impact analysis. There are three fundamental flaws with his analysis: (1) he does his analysis based upon subgroups that he calls CD typologies; he never runs his analyses Citywide; (2) he compares the incorrect groups—i.e., he compares what he calls community preference beneficiaries with non-community preference

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[3] See paragraph 15 of Dr. Beveridge's April 1, 2019 report.
[4] See Dr. Beveridge's Tables 1 and 4 of his April 1, 2019 report.
[5] The CD typology is defined by Dr. Beveridge based on the racial distribution of the community preference area of the project and the majority race is the race which exceeds 50 percent of the population in the community preference area of the project, and if no majority race exists, the plurality race is the race with the largest percent of the population. See Dr. Beveridge's Tables 2, 3, 5, and 6 of his April 1, 2019 report.
[6] See paragraph 30 of Dr. Beveridge's April 1, 2019 report.
[7] See paragraph 31 of Dr. Beveridge's April 1, 2019 report.

beneficiaries; (3) he conflates correlation with causation, never actually demonstrating the impact of the community preference policy or; measuring the impact of the community preference policy on the ability to compete for housing in the lottery.

1. Disparate Impact Analysis Should Not Be Based on Subgroups

The concept of disparate impact concerns whether a uniformly applied practice (here the community preference policy ("CP policy")) disproportionately results in adverse outcomes for one racial group compared to another. Here, the CP policy is applied Citywide, wherever an eligible project is built. Thus, the population impacted by the community preference policy is the apparently eligible applications[8] for all projects to which the CP policy applies Citywide. Dr. Beveridge's analysis never actually addresses the question of whether the CP policy operates to create a discriminatory effect against African Americans or Hispanics Citywide.[9] Instead, Dr. Beveridge's analysis is limited to its impact on racial groups within subgroups of the population impacted by the CP policy. The subgroups, called CD typologies,[10] are applications to a variable number of affordable housing projects that are grouped together based on the racial demographics of the community preference area for the project.[11] For instance, if a community

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[8] Apparently eligible applications are applications that based upon self-reported income and household data are eligible for at least one unit.

[9] In my analyses, I follow Dr. Beveridge's convention and classify each application into one of the following mutually exclusive racial/ethnicity categories (which are referred to herein simply as racial groups): Hispanic, non-Hispanic white, non-Hispanic African American, non-Hispanic Asian, refused, and all other races including multi-racial. When referring to these racial groupings in this report, I drop the non-Hispanic prefix, but the non-Hispanic prefix should always be assumed for any racial group other than Hispanic and refused. Additional information about sources and methodology is contained in the body of this report and in Appendix C.

[10] See Dr. Beveridge's Exhibit 3 of his April 1, 2019 report.

[11] Typically, the community preference area is the community district in which the project is located. However, there are circumstances where it has been expanded, and thus the community preference area references all the community districts for a project for which the CP policy will be applied.

preference area for a project has a majority white population, the project will be included in the Majority White CD typology. If there is no majority race in the community preference area, the community preference areas is categorized into a plurality CD typology, based upon the largest racial group in the community preference area. Dr. Beveridge then undertakes his analyses based upon the data from all the projects that were categorized into the various 7 CD typologies.

In Dr. Beveridge's analysis by CD typology, whites are favored in some CD typologies, and African Americans are favored in other CD typologies, while Hispanics and Asians are favored in others. The conclusion that Dr. Beveridge makes from his analysis, that the community preference policy advantages the majority/plurality race in a CD typology, does not answer the question that Dr. Beveridge was asked to answer (whether the community preference policy has a disparate impact on race) and does not establish disparate impact on the population effected by the CP policy. If anything, it proves that the CP policy does not have a disparate impact against a specific race, which Dr. Beveridge actually concedes.

Dr. Beveridge states that "[o]ne can still imagine some saying, 'what is the problem? Each racial group is helped somewhere. But the powerful pattern…has a particular sorting effect…The result of the operation of the community preference policy is a pattern that perpetuates segregation more (and allows integration less) than what would exist without the policy."[12] It appears that having recognized that the CP policy does not have a disparate impact by race Citywide, Dr. Beveridge quickly shifts his focus to perpetuation of segregation. While Dr. Beveridge labels his analyses "disparate impact" analyses, as stated in the quote above, those analyses are really a concession that disparate impact is not shown and are an attempt to demonstrate perpetuation of segregation.

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[12] See paragraphs 30 and 31 of Dr. Beveridge's April 1, 2019 report.

I have conducted and assessed disparate impact analyses for more than 40 years and have lectured and written about disparate impact and statistical evidence of discrimination, and I have never seen a disparate impact study by race which creates subgroups of the population impacted, defines the favored race (from which to determine if there is an impact on other races) differently for each subgroup, and conducts the disparate impact analysis by subgroup. Dr. Beveridge's disparate impact analysis are thus done incorrectly and do not demonstrate whether the CP policy has a disparate impact on the population impacted by the policy by race.

2. Dr. Beveridge's Comparison of CP beneficiaries with Non-CP Beneficiaries is Improper

A disparate impact analysis by race requires one to first define the outcome of interest. For example, the outcome could be passing a test or being able to compete for an apartment. Once we have defined the outcome of interest, we define the majority race to which the percent of outcomes for each race will be compared. Typically, the majority race is white, or the race that most commonly achieves the outcome. The success rate (the percentage of the race with the positive outcome) of each race is then compared to the success rate of the majority race. The most common comparison is computing the ratio of the success rate of each race to the success rate of the comparison race. This is referred to as the Adverse Impact Ratio (AIR). Then, one assesses where the differences in the rates are meaningfully different.

Dr. Beveridge never conducts a valid disparate impact analysis. In addition to his failure to apply his analysis to applications or awardees on a Citywide basis, Dr. Beveridge chooses the incorrect comparison for a disparate impact analysis. His studies compare the odds of having the community preference by race with the odds of not having the community preference by race and the odds of getting an award if you have the community preference and the odds of getting an award if you do not have the community preference. This framing improperly defines the

injury as not being a CP beneficiary (i.e. an application not being from the CP area), as opposed to what was alleged (i.e. to not being able to fairly compete for housing as a result of the CP policy). See Second Amended Complaint at paragraph 7, paragraph 102, paragraphs 177-182. This focus on whether or not an application or apparently eligible application is a CP beneficiary does not address the impact of the community preference on the ability to compete for housing in a lottery on a Citywide basis.

Nevertheless, if one were to accept that being eligible for the community preference is the outcome of interest, if Dr. Beveridge had done his analysis Citywide, as opposed to within subgroups, he would have found that there is no disparate impact against African Americans or Hispanics in being eligible for the community preference. See Appendix D, where I reproduce Dr. Beveridge's analyses of getting the community preference by race, but do the analysis Citywide and not by CD typology.

3. **Dr. Beveridge Conflates Correlation with Causation, Consequently Failing to Demonstrate that the CP Policy Has any Impact**

Further, Dr. Beveridge's analysis incorrectly assumes that any difference in the odds of obtaining a unit, or any difference in being actually awarded a unit, between CP beneficiary applications and non-CP beneficiary applications (or what I refer to as "CP status") is due to the CP policy.[13] Undertaking a comparison of results by CP status does not actually measure the impact of the CP policy because the CP policy is only one of many factors that determines who will be considered or awarded a unit.

Comparisons by CP status are only measuring the extent to which CP status is correlated with getting an award or with the increased odds of getting an award. There are many other

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[13] Under Dr. Beveridge's approach, if 20% of the awards in a CD typology go to white CP beneficiaries, and only 10% of the awards in that CD typology go to white non-CP beneficiaries, the community preference policy doubled the award rate of whites in that CD typology.

factors and policies that influence whether one will be considered awarded. For instance, the CP Policy has no impact on the determination of actual eligibility (meaning that the information in the application is complete and accurate with respect to all eligibility requirements) and interest (meaning the application does not intentionally or inadvertently drop out of the process, but rather takes the steps necessary to confirm eligibility, and accept a unit if offered), yet those with the CP are much more likely to be determined to be actually eligible (meaning their income and household eligibility has been confirmed by the marketing agent and HPD or HDC) and interested. The effects of any other factors[14] that are correlated with CP status and affect the likelihood of getting an award will be incorrectly confounded with Dr. Beveridge's measure of the effect of the CP policy. Dr. Beveridge fails to acknowledge this in his report, and does not even attempt to account for the impact of these other factors in his analysis. He did, however, admit at his deposition that causation and correlation are different concepts that measure different things. (See Dr. Beveridge's Deposition at page 87, lines 6-23.) Dr. Beveridge's conflation of causation with correlation results in studies which fail to measure the impact of the CP policy. Statisticians and social scientists are well aware that correlation and causation are different concepts and must be measured differently, yet Dr. Beveridge failed to do so, making his analyses meaningless.

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[14] Other factors, such as the type of unit for which one is eligible (which is a selection policy factor) might be correlated with CP status, and their impact would also be confounded with CP status.

C. A Proper Disparate Impact Analysis Demonstrates That the Community Preference Policy Has No Impact by Race

I have conducted my analysis in three ways, each of which demonstrate that the CP policy does not have a disparate impact on any race. First, I demonstrate that African Americans and Hispanics are overrepresented in the City's affordable housing units as compared to their representation among low income New York City residents. The second analysis compares lottery results with the CP policy and without the CP policy. The third analysis examines the stage of the Lottery Process that determines which applications will be able to compete for a unit by demonstrating their actual eligibility and interest in a unit. This stage of the Lottery Process, referred to as the Consideration Stage, is the only stage where the CP policy has an impact on who can compete for affordable housing. My analyses demonstrate that there is no meaningful disparate impact.

1. The City's Affordable Housing Overwhelmingly Serves African Americans and Hispanics

The City's affordable housing projects overwhelmingly serve people of color, even in majority white areas. African Americans and Hispanics are awarded affordable housing through the City's housing lottery in disproportionate numbers in their favor compared to their representation among New York City residents with incomes that would make them eligible for the City's affordable housing lotteries. (See Appendix G.) Dr. Beveridge ignored this obvious analysis, choosing instead to conduct unnecessarily complicated tests that fail to actually measure what he purports to measure.

2. There is No Meaningful Difference in Who Can Compete for Housing In a Lottery Run with the CP policy and Without the CP Policy

In order to best isolate the impact of the CP policy, I ran a simulation where I used all the lottery rules to select apparently eligible applications that will be able to be considered[15] by a developer or marketing agent, and thereby compete for a unit by demonstrating actual eligibility and interest. I made the simplifying assumption that those selected to be considered by a developer or marketing agent will be interested and actually eligible (and thus once selected for consideration, would be awarded a unit). This assumption allows us to remove the confounding effects of other aspects and requirements of the Lottery Process.

I simulated the lottery again using the same data and methodology, but this time excluded the CP policy. We can then isolate and measure the impact caused by the CP policy on the racial groups by comparing the race distribution when the CP policy is used versus when the CP policy is eliminated.

The result of the simulation experiment shows that there was no meaningful difference in who was considered and thus able to compete for a unit Citywide by race due to the CP policy (see Table 3).[16] That is, only 1.6% of the 10,245 awards would need to be changed to get perfect racial parity. Essentially the same number of Hispanics and Asians would be considered by a developer or marketing agent with or without the CP policy in effect. With respect to whites and African Americans the impact of the CP policy on their share of awards is slight. If the CP policy

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[15] See Section IV.A *infra* for an explanation of what I mean by "considered" by a developer or a "Considered application."

[16] The simulation assumes that those who are awarded a unit based on the simulation would be the same as those who are considered. Therefore, this simulation also demonstrates that there is no meaningful difference between those who are awarded a unit with and without the CP policy.

is eliminated, the white share of awards drops by only 1.4 percentage points and the African

American share increases by only 1.38 percentage points.

3. The Consideration Process (of which the CP Policy is Part) Does Not Have Any Impact by Race on Who is able to Compete for a Unit

As an alternative analysis, in order to determine whether the CP policy impacts the ability

to compete on equal footing, as Plaintiffs' allege, one must first determine at what stage of the

housing Lottery Process the CP policy has an impact on the ability to compete. In order to make

this determination, it is helpful to consider an analytical framework of the affordable housing

Lottery Process. As more fully explained in Section IV.A, *infra*, I have broken down the Lottery

Process in to three stages.

The first stage is identifying who is apparently eligible for a unit based upon self-reported

income and household size and family relationship submitted on the housing application. This

Stage 1 is called the "Apparently Eligible Stage." Once it is determined who is apparently

eligible, a variety of factors, including the CP policy and other preferences (collectively the

"Consideration Process"), determine who will be selected to be considered by a developer or

marketing agent and will thus be able to compete for housing by confirming[17] actual eligibility

and interest. Stage 2 is the "Consideration Stage." Applications that make it to the Consideration

Stage are called "Considered Applications." Considered Applications then confirm their actual

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[17] Although you cannot compete for the housing if you are not apparently eligible, since the community preference policy has no impact on whether an application is apparently eligible, examining whether one is apparently eligible or not says nothing about the community preference policy's impact. Thus, the true opportunity to compete occurs at the Consideration Stage. In fact, Dr. Beveridge himself emphasized that it is only apparently eligible applications that "are the ones that, if reached by a marketing agent, would be able to continue in competition by documenting their eligibility as opposed to being rejected out of hand. Whether the apparently-eligible HHs have a level playing field (equal chances) remains a function of the community preference policy." April 1, 2019 report at para 62, emphasis in original.

eligibility and continued interest in the unit. This stage, Stage 3, is called the "Confirmation Stage." Those applications that complete the Confirmation Stage are called Awardees.

While Dr. Beveridge correctly noted in his deposition (see page 92, lines 4-11) that precisely measuring the impact of the CP policy is impossible[18] (although its impact can be estimated quite well, albeit not precisely, by the simulation mentioned above), it is possible to precisely measure the impact of the Consideration Process, or Stage 2 of the Lottery Process. The Consideration Process determines which apparently eligible applications will be considered for a unit by the developer or marketing agent. The CP policy plays a role during the Consideration Process, although it is not alone dispositive of which applications will be considered by the developer/marketing agent. However, the Consideration Stage is a dispositive stage in the Lottery Process. In other words, if an application is not considered as a result of the Consideration Process (or does not pass the Consideration Stage), the application will not receive a unit.

Focusing on which apparently eligible applications, separated by race, were considered for an apartment, and therefore, had the opportunity to compete for a unit by demonstrating that they are actually eligible and interested (i.e. focusing on the results of Stage 2, the Considered Applications) I found that the lottery Consideration Process (during which the CP policy plays a role) did not have a disparate impact by race. (See Table 4, *infra*.)

In sum, not only are African Americans and Hispanics over-represented in the City's awardees of affordable housing for which lotteries are used, I have demonstrated through a

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[18] While claiming to do an analysis at the "developer review stage" and acknowledging that only apparently eligible applications that are reached can compete, Dr. Beveridge only actually studies applications, apparently eligible applications and awardees. See April 1, 2019 report at page 18 (section F heading) and para 62. Dr. Beveridge failed to properly measure the "Disparate impact at the developer stage" (Id. At page 18.)

simulation of the lottery with and without a CP policy, that the CP policy does not have a

disparate impact based on race of those considered for housing. I have further demonstrated that

the Consideration Process (during which the CP policy has a role) does not have a disparate

impact by race. In other words, the Consideration Process (and specifically the CP policy) does

not have any impact on the race of apparently eligible applications that are considered by a

developer. Therefore, the CP policy does not cause a disparate impact on the ability of African

Americans or Hispanics to compete equally with whites for housing lottery opportunities.

D. Dr. Beveridge's Perpetuation of Segregation Analysis Does Not Demonstrate that the CP Policy Perpetuates Segregation

Dr. Beveridge fails to demonstrate that the CP Policy perpetuates segregation.

1. No Actual Analysis

Dr. Beveridge opines that, since the CP policy advantages the majority or plurality race

group in each CD typology, it must perpetuate segregation or allow less integration.[19] Dr.

Beveridge bases this conclusion on the unsupported and flawed assumption that CP beneficiaries

are disproportionately the same race as the Majority or Plurality race in a CP typology and that

therefore, due to the CP policy, more of that majority or plurality race are awarded units than

they would without the CP policy in place and this perpetuates segregation. Dr. Beveridge does

not define what he means by "perpetuates segregation more (or allows integrates less)"[20] and

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[19] It is worth noting that Dr. Beveridge does not opine that the overall affordable housing lottery results perpetuate segregation, only that if the CP policy had been eliminated, the degree of segregation would be lower. This is not surprising since, according to Dr. Beveridge, the racial mix in the majority white CD typology is 60.65% white, 6.34% African American, 18.78% Hispanic and 11.67% Asian. Yet, the racial mix of the units awarded with known race in that CD typology was 36.8% Hispanic (the largest racial/ethnic group), 21.1% African American and only 24.5% white. Clearly, the overall impact of the affordable housing lottery was to diversify the majority white CD typology.

[20] See paragraph 31 of Dr. Beveridge's April 1, 2019 report.

undertakes no analysis whatsoever to support his conclusions. Furthermore, he does not attempt to measure the alleged change in the degree of segregation and without such a measure, one cannot know if the overall impact is meaningful or trivial, or even if it exists.

      2.   Technical Flaws with His Logic

      Besides the fundamental lack of analysis, Dr. Beveridge's conclusions are flawed because (i) he does not take into consideration the impact on multiple races (sometimes while there is more segregation between two specific racial groups, there is simultaneously less segregation between other racial groups), (ii) he assumes that census tracts in which the projects are located are the same demographic as the CD typology of the project (for instance, sometimes a project is located in a white majority census tract, but Dr. Beveridge's CD typology for that project is majority African American), and (iii) he does not consider the demographics of the census tract from which the awardee is moving (if an African American awardee moves from one majority white census tract to another majority white census tract, it will have no impact on the degree of segregation in the City but, if an African American moves from a majority African American census tract to a majority white census tract, it would lower the degree of segregation in the City), (iv) his definition of the majority race of a CD typology is inconsistent with the definition of a majority race of an area when measuring segregation, and (v) his basic argument with regard to perpetuating segregation (i.e., that it is a tautology that the CP policy results in more awards to the majority race in a CD typology and, thus, if the CP policy is eliminated, there will be fewer awards to the majority race, which will result in lowering the segregation index) is simply not shown by the data.

3. My Analysis Demonstrates that Lottery Process Decreases Segregation and Any Impact on the Dissimilarity Index of the CP Policy is Trivial

I undertook analyses that demonstrate that the CP policy, Consideration Process (Stage 2 of the Lottery Process), and the Lottery Process overall have *de minimis* impacts on the Dissimilarity Indices. The increase and decrease in these Indices are in the 4th decimal place, a level at which the Indices are rarely reported. In his report and his book (cited in his report), Dr. Beveridge reports only up to two decimal places, and hence, these changes in the fourth decimal place would not change any results he normally reported. First, I looked at the race of those who actually were awarded units to determine what impact, if any, it would have on the Dissimilarity Indices.[21] I find that the effect of the awards on the Dissimilarity Index[22] was to trivially decrease the Dissimilarity Index between all pairs of races.

I also calculated the impact on the Dissimilarity Indices if apparently eligible applications who were considered were all equally likely to pass the Confirmation Stage and be found eligible and interested and awarded an apartment. This allows us to isolate the extent of the impact of the Consideration Process (again, where the CP policy plays its only role) on the overall outcomes and its impact on the Dissimilarity Indices. The Dissimilarity Index based on random

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[21] In the context of perpetuation of segregation analysis, it is necessary to look at the awardees. In this context, Plaintiffs are not challenging the ability to compete, but are claiming that who is actually awarded housing perpetuates segregation. Thus, while it is necessary to look at the awardees, we also attempt to isolate the community preference policy's impact through a simulation and analysis at the Consideration Stage.

[22] Dr. Beveridge presents the Dissimilarity Index in his study of the trends in segregation in the City. I was able to replicate his 2010 calculations but could not replicate his 2013-2017 ACS calculation. Since my algorithm matched what he reported from his book for 2010, and what he provided to me through counsel, it should have matched his 2013-2017 ACS calculation, since only the data input changed. I note that he appears to have independently computed the 2013-2017 ACS calculation while he relied on his book for the other Indices values. His computation based on the 2013-2017 ACS appears to be incorrect. Appendix F contains my calculation of the Dissimilarity Indices applied to the 2013-2017 ACS data.

selection[23] from those considered compared to random selection from the apparently eligible

applicant pool would remain fundamentally unchanged (trivially increasing) for all races.

My third analysis was to isolate the impact of the CP policy on the Dissimilarity Indices

using a simulation, similar to the simulation I undertook for my disparate impact analysis. The

simulation best isolates the impact of the CP policy on the Dissimilarity Indices. I determined

that if the CP policy were not part of the lottery process the Dissimilarity Indices would remain

fundamentally unchanged for all the pairs of races.

In summary, my analysis of the data shows that the Lottery Process, as well as the CP policy

do not perpetuate segregation in any meaningful way. That is, the lottery with the CP policy in

place is integrative and if the selection polices (or Consideration Process) were eliminated and

only a random lottery from all applications were used, or specifically if the CP policy were

eliminated, the resulting Dissimilarity Indices would not decrease beyond a trivial amount.

E. Dr. Beveridge's Secondary Analyses are Not Relevant

1. Dr. Beveridge's Conclusion that the Community Preference is a Preference is Irrelevant

Dr. Beveridge's analyses set forth in his tables 1 and 4 serve only to prove the obvious

while ignoring the relevant issues. His first opinion,[24] that the community preference on average

increases the likelihood of an applicant's chances, does not require any analysis of the HPD and

HDC data. The CP policy was specifically designed to be a preference and give a boost to

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[23] Random selection means that the distribution of the type of impact of the awards on the Dissimilarity Index is the same as the distribution within the population (herein, the considered population). That is, for example, if 10% of the applications among the considered population would integrate, 5% would segregate, and 85% would have no effect, if the awards from this population were made randomly, then 10% of the awards would integrate, 5% would segregate, and 85% would have no effect.

[24] See Dr. Beveridge's Tables 1 and 4 of his April 1, 2019 report.

applications from within the community preference area. The fact that it succeeds in the

objective for which it is designed, or the extent to which it succeeds in this objective, is not what

is at issue here. It does not address the impact of the CP policy by race.

2. **Dr. Beveridge's Finding that Applicants Apply all Over the City is Meaningless**

Dr. Beveridge's finding that applicants apply to many affordable housing projects

throughout the City does not shed light on where applicants ultimately prefer to move. An

applicant's decision to apply for a unit outside the applicant's community district does not mean

that the applicant would not prefer to stay within or near his/her current residence. Dr.

Beveridge's finding reflects the attractiveness of affordable housing and the ease of applying.

Simply because applicants submit an application does not mean they will actually choose to

move if given the option, nor does it mean that they would prefer to move outside the community

in which they live.

In fact, my study of who applies for a given project based on how close they live to the

project demonstrates that the likelihood of applying for a unit in a project is higher if the project

is located close to the applicant's address. This is true for applicants that are CP beneficiaries as

well as applicants that are non-CP beneficiaries. These findings indicate that applicants tend to

prefer to find affordable housing close to where they already reside. Further, my study of the

factors correlated with being awarded a unit demonstrates that there is a strong correlation

between being a CP beneficiary application and being awarded a unit, and that correlation cannot

be explained[25] by the CP policy. Thus, while people may apply to many lotteries in many

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[25] It may be partially explained by the effect of the CP policy on the likelihood that someone would follow through, but there is clearly also a significant correlation between CP status and the likelihood that someone would follow through which is not caused by the CP policy.

locations, they tend to follow through more during the Confirmation Stage if they are from the community preference area.

IV. **DETAILED REVIEW OF ERRORS AND LIMITATIONS OF DR. BEVERIDGE'S ANALYSIS CONCERNING THE DISPARATE IMPACT OF THE COMMUNITY PREFERENCE POLICY**

A. **Dr. Beveridge's Attempt to Conduct A Disparate Impact Analysis At The Developer Review Stage Fails**

Reading Dr. Beveridge's report, one would think that having the community preference is determinative of whether or not one will be able to compete for housing. To the contrary, the CP policy does not alone determine who is able to compete for housing (or who is awarded housing). There are many policies and requirements that get implemented through a multi-stage Lottery Process. In order to determine whether the CP policy impacts the ability to compete, as Plaintiffs' allege, it is important to understand the Lottery Process, and the role the community preference policy plays in the lottery, and when it is implemented during the Lottery Process.[26] For ease, I have broken down the Lottery Process into three stages.

Stage 1 Apparent Eligibility"

The first stage is identifying from the total application pool, those who are apparently eligible for a unit based upon self-reported income and household size. Each project has unique income requirements (minimum and maximum) and combinations of various unit sizes. If an

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[26] Plaintiffs are not challenging any part of the lottery selection process except the community preference policy. They do not allege that the community preference policy has a disparate impact on African Americans and Hispanics in the awards of affordable housing units. (See Second Amended Complaint see paragraph 7, paragraph 102, and paragraphs 177-182.) Plaintiffs instead allege that the community preference policy causes a disparate impact in the ability to compete for affordable housing. See id. In other words, they are challenging the process that determines who is considered for an apartment pending confirmation of their eligibility and interest.

application's income and family size would make it eligible for at least one unit based upon the information provided in the application, the application is "apparently eligible."

Stage 2 "Consideration Stage"

Once it is determined which applications are apparently eligible, there are a variety of factors and policies (collectively the "Consideration Process") which determine who will be further considered by a developer or marketing agent. Factors in the Lottery Process that impact whether an application will pass the Consideration Process include the application's eligibility under one or more preference categories, the lottery applied to, the application's lottery number, and the type of units for which the application is apparently eligible.

More specifically, in Stage 2, applications are separated into preference lists[27] and processed in order based on their preference status. Then, applications on the lists are chosen until all the apartments that are to be filled from the lists are filled. Applications are chosen in lottery order and then, if apparently eligible for at least one of the available apartments, the application has passed the Consideration Process and is called a "Considered Application"[28] A

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[27] An application can be considered under multiple preference categories (including "NY city" or "no preference" if the applications are restricted to NY City applications only, as in Dr. Beveridge's analyses). Those with a preference must be considered for an apartment in a specific order [disability preferences first, then community preference, then municipal employees, and finally all without a preference (those who have a preference but were not reached fall to the "no preference" list)]. A fixed number of apartments are initially reserved for selection of those on a preference list and, when these are filled in lottery number order or when the list is exhausted, the developer/marketing agent processes applicants from the next list in order. If an applicant is selected from one preference list and is on a subsequent preference list (not including the "no preference" list), the number of apartments required to be filled from the subsequent list is lowered by one, and one additional apartment is added to be selected from the last list (for those with no preference or those with a preference who were not reached and considered for an apartment as a result of having a preference). See Appendix C for a more detailed explanation.

[28] I use the term "considered" rather than "reached" because, in practice, the decisions are not made application-by-application, but, for the sake of efficiency, by selecting groups of applications to proceed. This over-selects the number of applications that may be apparently

Considered Application is able to compete for the housing by moving onto Stage 3, and

confirming actual eligibility and interest. If one does not pass the Consideration Process, the

application cannot compete for a unit. Thus, the Consideration Stage is a dispositive stage in the

process. (See Appendix C for further explanation.)

Stage 3 "Confirmation Stage"

Considered Applications must confirm their actual eligibility and interest. They must

attend a meeting with the developer or marketing agent, verify their household size and income,

and complete any other required steps to confirm eligibility. By attending the meeting,

submitting the requested information, completing any of the required steps, and accepting a unit

if offered, they confirm their interest. Those applications that pass the Confirmation Stage are

called Awardees.

Given this analytical framework, it is clear that the Consideration Stage determines which

applications can compete for housing. It is also clear that the community preference policy,

along with other preferences and factors, influences whether an application will pass the

Consideration Process.

While Dr. Beveridge separates his disparate impact analysis between the "developer

review stage" and the "awarded stage" he does not actually do any analysis at the Consideration

Stage. Instead, his "developer review stage" focuses on applications and apparently eligible

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eligible for an available apartment after the review is done. Moreover, the data does not allow
the easy identification of those who were reached. However, since we know the highest lottery
number of applications selected from each preference list by apartment type, we can determine
which applications were selected for review that would have been awarded a unit if they passed
the review process and which can therefore be considered. Moreover, those which were not so
considered are delineated as "not selected for consideration," since irrespective of whether they
were reached, they are eliminated from consideration for an apartment at this stage because of
the Consideration Process.

applications. However, as explained above, the community preference policy has no influence

on which applications are apparently eligible.   Dr. Beveridge then skips the key stage, the

Consideration Stage, and examines the Awardees (comparing Stage 1 to Stage 3). This in turn,

as explained more fully *infra*, compounds the impact of the Confirmation Stage and does not

answer the question of whether the community preference policy has a disparate impact on the

ability to compete for housing.

To understand the importance of undertaking the analysis at the Consideration Stage

(looking at who was considered by a developer) as opposed to the Confirmation Stage (who was

awarded a unit), let us analogize this case with a traditional employment application disparate

impact scenario. In Stage 1, applicants apply for any production job and their applications are

assessed as to whether the applicants meet the minimum qualifications for any such job. In

Stage 2, those applicants who meet the minimum requirements are given a written test, and if

they pass the written test, they move on to Stage 3. In Stage 3, applicants are asked to come in

for an interview and background check. Those applicants who show up for the interview and

pass the interview as well as the background check get a job offer.

A claim is made that the written test has a disparate impact on African Americans being

able to compete in the hiring process. The written test has a disparate impact on African

Americans' ability to compete in the hiring process if African Americans disproportionately fail

the test and cannot proceed to the interview and background check stage. If one computes the

disparate impact between white and African American candidates by comparing the percent of

white and African American applicants who are offered a job, this measures the disparate impact

of the cumulative differences in: (1) the likelihood of meeting the minimum standards for the

jobs, (2) passing the written test, *and* (3) showing up and passing the interview and background

check. Thus, the analysis of the hiring process outcomes (Stage 1 to Stage 3) cannot show if the test has a disparate impact, because the test is just one of the necessary steps in reaching the ultimate outcome (being hired). Measuring the overall outcomes of who is hired will not tell you if the test or the interview and background check had the disparate impact. It is possible that there is no disparate impact at Stage 2, but that the disparate impact is caused by the interview and background check, or *vice versa*. Moreover, if both the written test and the interview process have a disparate impact, the overall disparate impact will measure the combined effect of both components of the process. To isolate the impact of the test, one must measure whether there is a disparate impact in the written test pass rate, and not the disparate impact of the hiring process overall.

The analytical framework for the Lottery Process is analogous to the hiring process. In our Stage 1, or apparent eligibility process, the lottery applications are equivalent to the job applicants in the traditional employment example described above and the apparently eligible applications are equivalent to the applicants who satisfy the minimum qualifications. In our Stage 2, or Consideration Process, the lottery selection rules (which include the CP policy) that determine whether an application is considered by a developer and consequently given the opportunity to verify eligibility for a unit are equivalent to the written test that determines whether an applicant proceeds to the interview and background check. Our Stage 3, the Confirmation Process, where eligibility is verified and interested applications are awarded units, is equivalent to the interview and background check in the employment example. Consequently, as in the test example, so as to avoid compounding the impact of the Confirmation Stage (Stage 3), the disparate impact analysis should be done at the Consideration Stage (Stage 2).

Like the test in the example above, the Consideration Process is a dispositive step of the

Lottery Process, if you are considered, you can proceed with the Eligibility Confirmation Stage

and decide whether you want a unit, and if you are not considered you will not get the

opportunity to compete for a unit by confirming your eligibility and interest in unit. While the

community preference policy cannot be isolated within the Consideration Process, [29] undertaking

the analysis at this dispositive stage will best estimate the impact of the community preference

policy while eliminating the compounding effect of the many factors involved in the

Confirmation Stage which influence whether an applicant is awarded a unit.

B. **Dr. Beveridge Fails to Examine Whether There Is A Disparate Impact of The Community Preference Policy on One Or More Race/Ethnicity Groups**

Normally, when conducting a disparate impact analysis by race or ethnicity, one defines

the practice which is being challenged and the population to which the practice is applied. The

question then is whether the practice results in a meaningful disparity by a protected

characteristic, such as race or ethnicity. The concept of disparate impact looks at the impact of

the challenged process on the affected population by race. This is the basic definition of a

disparate impact study. That is, the operative question in a disparate impact analysis is whether a

specific practice, uniformly applied across racial groups, disproportionately results in adverse

outcomes for one racial group compared to another.

For example, if there was a claim that a test used during a hiring process caused a

disparate impact on African Americans, you would first determine what percentage of African

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[29] It is obvious that the CP policy is only one of various factors (e.g., what types of apartment eligible for, lottery number drawn, what amount of competition there is for each unit, and what other preferences an application has) that impact the Consideration Process outcome. It is not obvious whether or not any of these other factors are correlated with CP status. But, to the extent they are correlated, their impact on the Consideration Process is confounded with the impact of the CP policy.

Americans that took the test, passed the test. You would do the same for all the other races, to determine which race had the highest pass rate. You would then compare the pass rate of the African American test takers to the pass rate of the race with the highest pass rate or the white group.

In this case, the practice being challenged is the CP policy. The policy is applied to eligible projects Citywide, irrespective of the location of the project. The population to which it is applied is the apparently eligible applications. Thus, a disparate impact analysis should look at what percentage of apparently eligible applications pass the Consideration Process, by race.

Dr. Beveridge fails to do this analysis. Instead, his analysis is done on subgroups of people affected by the community preference policy, uses the wrong comparators, and conflates causation with correlation, consequently failing to isolate the impact of the community preference policy.

1. Dr. Beveridge's CD Typologies are an Incorrect Unit of Analysis

Despite having been asked to answer the question of "whether the community preference policy creates discriminatory effects against one or more racial groups,"[30] Dr. Beveridge never answers this question. Instead, Dr. Beveridge classifies each project into one of seven categories (which he refers to as "CD typologies") based on the majority or plurality race of the population of the community preference area for the project. The community preference area, typically the community district[31], is the area in which an applicant for that project must reside in order to be

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[30] See paragraph 15 of Dr. Beveridge's Expert Report of April 1, 2019.
[31] Sometimes, multiple CDs are defined as the community preference area for a project. Fourteen of the hundred and sixty-eight projects in the community preference area are defined as more than a single CD. See Dr. Beveridge's Exhibit 3 of his April 1, 2019 report.

eligible for the community preference policy. His analysis thus focuses on whether a particular

race is impacted in a particular CD typology, and not whether they are impacted Citywide.[32]

Looking at the results by CD typology is like looking at the results of a test by the

location of the test takers. That is, it may be interesting, but it is irrelevant to the issue of any

disparate impact of the test. For example, consider the following hypothetical. Suppose a city's

population is only African American and white, and a test for a certain position is scheduled at

two locations in the city for the convenience of the test takers. One test location (Location 1) is

in the richer and predominantly white part of the city, and the other (Location 2) is in the poorer

and predominantly African American part of the city. The results of the test are as follows:

Location 1:
100 white test takers, of which 90 pass, and
10 African American test takers, of which 9 pass.

Location 2:
100 African American test takers, of which 10 pass, and
10 white test takers, of which 1 passes.

Overall test takers:
110 African American test takers, of which 19 pass, and
110 white test takers, of which 91 passed.

 If each location is examined separately, the passing rate for African Americans and whites is the

same. Does that mean that the test does not have disparate impact? Of course not. Overall

82.7% of the whites pass while only 17.3% of the African Americans pass. The African

American passing rate is only 21% that of the whites. Following Dr. Beveridge's approach, one

would only look at the locations separately and would conclude that there was no disparate

impact at each location, never addressing or even discovering what the actual disparate impact of

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[32] As Dr. Beveridge himself notes, the racial impact of the CP works to the advantage of
different races depending on the CD typology see paragraph 30 of his April 1, 2019 report.

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the test is.[33] By conducting his disparate impact analysis by CD typology but never overall (i.e.,

Citywide), Dr. Beveridge is not actually measuring the disparate impact of the community

preference policy. While studies by CD typology might be of interest to other issues, they are

not relevant to the question of whether the CP policy creates a disparate impact by race. The CP

policy applies Citywide, no matter where a project is located in the City, and irrespective of the

demographics of the community preference area, and thus the analysis should have been done

Citywide. Therefore, Dr. Beveridge's analysis fails to properly analyze or demonstrate disparate

impact because he fails to look at the Citywide results.[34]

2. Dr. Beveridge Does Not Compare the Correct Groups

Dr. Beveridge compares each race's percentage of applications, apparently eligible

applications and awardees who live in the community preference area of the project applied to

(to which he refers as CP beneficiaries) with the percentage of applications, apparently eligible

applications and awardees that do not live in the community preference area (to which he refers

as non-CP beneficiaries). In other words, Dr. Beveridge compares the CP status (CP beneficiary

or non-CP beneficiary) of applications, apparently eligible applications and awardees by race.

He presents two alternative analyses[35] each, for applications, apparently eligible applications,

and awardees.

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[33] The fact that there is no difference at the location may be of interest in trying to explain why a
disparate impact of the test exists. It may be, for instance, that people that are wealthy and well
educated will do better on this test (i.e. people taking the test in Location 1). Thus, the disparate
impact of the test may be the result of the people in Location 1 being better educated (and in
Location 1, whites were disproportionately represented).

[34] In fact, as noted above, Dr. Beveridge acknowledges that "each group is helped somewhere"
and thus concedes that there is not a Citywide disparate impact based upon race. See paragraphs
30 and 31 of Dr. Beveridge's April 1, 2019 report.

[35] Dr. Beveridge agrees that these are simply two ways of looking at the same results (see page
175, lines 7-24 of his May 30, 2019 deposition).

When studying the applications and apparently eligible applications, his logic is that since the CP increases the likelihood of getting an award, it is a benefit. He thus studies which races are more likely to receive that benefit. For example, if 1,000 whites apply for projects in a majority white CD typology, and 500 of these are CP beneficiaries, then 50% of the white applicants are benefitted by the CP policy. If there are 10,000 Hispanic applications, of which 800 have a CP, although there are numerically more Hispanics than whites with a CP, only 8% of the Hispanics are advantaged by the CP policy. Thus, Dr. Beveridge would argue, within the majority white CD typology, white applications are disproportionately more likely to be CP beneficiaries, giving them a disproportionate advantage in competing for housing. Of course, by the same analysis, in a majority African American CD typology, African American applications are disproportionately more likely to be CP beneficiaries, giving them a disproportionate advantage in competing for affordable housing opportunities through a lottery.

Both of these alternative measures at the application/apparently eligible application stage indicate that the racial group with applications that are disproportionately CP beneficiaries within a majority CD typology will always be the majority race and will more likely be the plurality race within a plurality CD typology. While this conclusion is correct, it is essentially irrelevant to the question of what impact the CP policy has on applicants being considered (or being able to compete) for a unit. Having the CP status is not the same thing as benefiting from the CP status. For instance, an application can be a CP beneficiary and still have a log number that is too high for it to be considered. Conversely, an applications' log number can be low enough that the application would have been considered even if it was not a CP beneficiary application. See Appendix B hypotheticals.

Being a CP beneficiary does not determine whether an applicant will be able to compete for housing (or be a "Considered Application"), because that also depends on income eligibility, other preferences, their lottery number, and the project and types of apartments for which they are eligible. Therefore, Dr. Beveridge's analysis comparing CP beneficiaries to non-CP beneficiaries does not measure the impact of the community preference policy and is meaningless.

3. Dr. Beveridge's Analysis Conflates Causation with Correlation

A comparison by CP status is not a measure of the actual difference in outcomes by race due to the CP policy, since it conflates correlation with causation. Reviewing Dr. Beveridge's analysis at the awardee stage highlights the problems with comparing CP status by race and conflating causation with correlation. Dr. Beveridge's analyses assume that if there were no CP policy, the award rates would be identical to the non-CP beneficiary award rates in his Table 7, and that the rates by race would be zero in Table 8, because those with and without a CP would be equally likely to be awarded a unit. This assumption is wrong, because it conflates causation with correlation.

Table 1 shows the actual passing rate at each stage of the Lottery Process. Yet as Table 1 shows, most applications are eliminated at Stage 1 and Stage 3 where the CP Policy has no impact.

TABLE 1
COUNTS AND PERCENTAGE OF APPLICATIONS
AT EACH STAGE OF THE AWARD PROCESS

	Number of Apps	Percent of All Apps	Percent Passing
Stage 1			
Apply	7,245,725	100.00%	
Found Apparently Eligible	3,118,966	43.05%	43.05%
Stage 2			
Considered	387,679	5.35%	12.43%
Stage 3			
Awarded	10,245	0.14%	2.64%

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Dr. Beveridge's analysis comparing the award rate of applications with and without the CP focuses on the overall impact of the three-stage Lottery Process (Stage 1 outcome of apparently eligible applications compared to Stage 3 outcome of awardees). However, the CP policy does not impact the probability of passing all three stages. It affects only the Stage 2 outcome, the Consideration Stage.

Dr. Beveridge makes an incorrect assumption that any difference in the average outcomes between an application with and without the community preference is due to the community preference policy. That is, he assumes that applications with and without the CP should be equally likely to pass Stages 1, 2 and 3, but for the CP policy, and the only reason applications with and without the CP are not awarded a unit at the same rate is because of the CP policy.

The data clearly shows that those residing within the community preference area (and hence benefiting from the CP) were significantly more likely to follow through and be found actually eligible and interested and be awarded a unit. This correlation between the likelihood of

follow through and the CP status does not mean that the CP policy causes any outcomes in Stage 3 (as the CP policy is implemented at Stage 2).[36] In other words, of the Considered Applications, some of which are CP beneficiaries and others are non-CP beneficiaries, the CP beneficiaries are more likely to pass the Confirmation Stage.

To measure the extent of bias in the analyses conducted by Dr. Beveridge, I studied the correlation between CP status and the outcome of Stage 3, the Confirmation Stage. I ran an analysis restricted to those apparently eligible applications that were considered (i.e., passed Stages 1 and 2), and measured the impact on the likelihood of passing Stage 3 (i.e. the likelihood of being awarded a unit)[37] for: of (i) the racial group of the applicant, (ii) the preferences for which the application is eligible (e.g., disability, CP, municipal employee), (iii) the unit types for which the application is eligible, and (iv) the project to which the application applied.[38] This analysis estimates the extent to which an application's CP status (which at Stage 3 has no causal link to the outcome), and race (which at this stage has nothing to do with the CP status) are correlated with the likelihood of the application passing the Confirmation Process.

I used logistic regression analysis to measure the average probability of getting an award if a given factor is present, compared to when it is absent, with all other factors staying the same. That is, for each variable, I estimated the increase (or decrease) in the likelihood that an application with that factor would pass the Confirmation Stage, compared to the likelihood of an application without that factor passing, keeping all the other variables in the model constant. That is, if the only factor considered that differs between two applications is that one application

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[36] See Appendix B hypothetical 3.
[37] This is an analysis from Stage 2, Consideration Stage, to Stage 3, Confirmed Stage.
[38] We do not have complete or representative data on why Considered Applications are not awarded units. Hence, I studied the data points that I did have-measuring correlation of these data points with the outcome.

has the CP and the other does not, the analysis finds the difference in the likelihood of the

applications being determined to be actually eligible and interested and hence awarded a unit.

When race is the factor to be analyzed, I estimated the difference in the likelihood of an African

American application passing Stage 3 (i.e., being confirmed to be eligible and interested and

therefore awarded a unit) to that of a white application when all other factors (e.g., preferences,

units eligible for and project applied to) considered are the same. Table 2 presents the results of

this logistic regression in the format used by Dr. Beveridge in his April 1, 2019 report in his

Tables 3 and 6. Table 2 below clearly demonstrates differences in the probability of outcomes.

TABLE 2
IMPACT ON PREDICTION THAT AN APPLICATION
CONSIDERED WILL BE FOUND INTERESTED AND QUALIFIED

Factor	Increase/Decrease in Probability of Passing Stage 3*	Change in Units of Standard Deviation	Statistically Significant?
Race (Compared to White)			
African American	-2.67%	1.79	No
Hispanic	0.75%	0.49	No
Asian	6.96%	3.08	YES
Preference			
MB	1.98%	1.25	No
HV	-1.81%	0.85	No
CP	117.56%	61.79	YES
ME	-2.40%	2.13	YES

Notes

* = Provides valid evidence that Considered Applications are eligible and interested
      in unit.
            Controls for project and type of units for which apparently eligible.

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Table 2 shows that applications from within the community preference area (which,

therefore, have the CP) are significantly more likely to follow through and be eligible and

interested (and thus awarded a unit) as compared to applications without the CP that are similarly

situated with respect to all other factors (i.e., preferences other than CP, project applied for, race,

and unit type for which apparently eligible). This significant increase in the probability of being

awarded a unit if you are a CP beneficiary cannot be explained[39] by the CP policy at the Consideration Stage. The CP policy has limited impact when measuring from the Consideration Stage to the Confirmation Stage. Thus, the increased probability is due to the applications from the community preference area being much more likely than applications from outside the community preference area to follow through and be found eligible and interested. This effect is incorrectly confounded in Dr. Beveridge's measurements which purport to measure the impact of the CP policy on getting an award.[40] The correlation between CP status and the Confirmation Stage (Stage 3) is captured in his analyses and wrongly fully attributed to the CP policy.[41] The result is that his analyses are biased and markedly overstate the impact of the CP policy on being awarded a unit. Therefore, comparing the selection rate of CP beneficiary awardees to non CP beneficiary awardees does not measure the impact of the CP policy.

In addition to confounding the correlation between CP status and the Confirmation Stage with the impact of CP policy, the "disparate impact" analysis of awardees undertaken by Dr. Beveridge does not support the central claim of the Plaintiffs in this case, which is that the CP policy disparately impacts applicants' ability to compete for an affordable unit and that disparate impact occurs along racial lines. In fact, it is irrelevant to Plaintiffs' allegation.

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[39] It may be partially explained by the effect of the CP policy on the likelihood that someone would follow through, but there is clearly also a significant correlation between CP status and the likelihood that someone would follow through which is not caused by CP policy.
[40] See Dr. Beveridge's Tables 1, 4, 7, and 8 in his April 1, 2019 report.
[41] Factors other than those at Stage 3, such as actual eligibility, are also confounded with CP status. However, by studying only apparently eligible applications, we can eliminate that confounding factor. Selection policies other than the CP policy, such as the type of units one is eligible for, may also be correlated with CP status and their effect would also be confounded with CP status.

V.   DISPARATE IMPACT ANALYSIS DONE PROPERLY[42]

A.   The City's Affordable Housing Disproportionately Serves African Americans and Hispanics as Compared to their Citywide Representation

The City's affordable housing projects overwhelmingly serve people of color, even in majority white areas. African Americans and Hispanics are awarded affordable housing in disproportionate numbers in their favor compared to their representation in New York City, among those with low income. The Tables in Appendix G show that African Americans and Hispanics are overrepresented among the awardees compared to their representation in the City among lower income residents. Dr. Beveridge ignored this obvious analysis, choosing instead to conduct unnecessarily complicated tests that fail to actually measure what he purports to measure.

B.   Isolating the Impact of the Community Preference Through a Standard Simulation

To isolate and measure the disparate impact of the CP policy, one must compare what actually occurred with what would have occurred if the CP policy were not in effect. In his deposition, Dr. Beveridge admitted that this would be necessary to properly measure the disparate impact of the CP policy, but stated that he did not do this because one cannot precisely measure what would happen if the CP policy were not in effect.[43] He is correct, because one cannot replicate what would occur if the CP policy were not in effect, because we do not know which of the applications if reached would pass Stage 3. We also do not know how many

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[42] To conduct my analyses, I relied primarily on the same data that Dr. Beveridge used for his amended October 18, 2019 Expert Report. I used his database with a few minor modifications and exceptions that were necessary to correct errors or to reflect standard practice when performing disparate impact analyses. For a more detailed discussion of my methodology and data modifications please see Appendix C.

[43] See page 106, lines 24-25 and page 107, lines 1-15 of Beveridge Deposition of May 30, 2019.

applications would need to be considered, nor the final outcomes.[44] Hence, we cannot precisely

determine what would occur if the CP policy were eliminated.

However, we can conduct a simulation experiment to isolate and estimate the impact of

the CP policy by race; while not precise, it is a very good measure of the specific impact of the

CP policy.

 Simulations are a commonly used statistical technique for attempting to isolate factors

that cannot otherwise be isolated through available data on actual outcomes. If we assume that

everyone who is apparently eligible and considered for an apartment would be interested and

actually eligible and would take the lowest cost apartment for which they are eligible, we can

simulate the Lottery Process on the actual applications under two conditions (with and without

the CP policy in effect) and look at the difference in the results. Moreover, by making these

assumptions, we eliminate the compounding impact of the Confirmation Process on the lottery

outcomes by race.[45]

To conduct the simulation experiment, I assigned all the apparently eligible applications a

new random lottery number, and then duplicated the lottery selection process using information

on actual applications for specific lotteries. I then re-ran the lottery without the CP policy. In

this experiment, I am able to identify and compare the applications awarded units with the CP

policy in effect with those awarded units when the CP policy is not in effect. Of course, the

difference is based on the specific random lottery numbers assigned and, since the lottery

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[44] Dr. Beveridge offered an experimental approach based on the awards to non-CP beneficiaries. This approach is flawed, however, in that it conflates correlation with causation.
[45] While the actual results will not be precisely the same as the actual lottery results, the assumptions make the difference in the result with and without the CP policy completely attributable to the CP policy, and should be a very good estimate of the expected impact of the CP policy on the lottery results.

numbers were randomly assigned, it should not affect the racial outcomes, on average. However, any single lottery will have some variation in the random numbers assigned and therefore may not be representative of what would be found if the lottery was run again. Therefore, to allow the racial impact of the lottery numbers drawn to average out, I simulated the Lottery Process 1,000 times, randomly assigning 1,000 different lottery numbers for each of the 168 lotteries under each condition (with and without the CP in effect). I then averaged the results of the experiment over the 1,000 lottery simulations so the impact on the difference in the results by race caused by the lottery number assignment averaged out. I then compared the awards by race using the CP policy with the awards by race without using the CP policy.[46] The results of the experiment are presented in Table 3.

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[46] This, of course, means that the actual estimate of the racial mix will not be accurate, but our interest is in the difference in the results by race with and without the CP policy in effect, which should mirror the difference in the actual results with what would occur if the CP policy were not in effect.

TABLE 3

RESULTS OF SIMULATION OF LOTTERY PROCESS WITH AND WITHOUT CP POLICY

Race of Awardee	Awards* CP Policy		Difference	Percent Increase with
	In Effect	Not in Effect	With-Without	CP in Effect
White	1,099	955	144	15.1%
African American	3,506	3,647	-141	-3.9%
Hispanic	3,642	3,650	-8	-0.2%
Asian	629	646	-17	-2.6%
Other	655	659	-3	-0.5%
Refuse	713	688	25	3.7%
Total	10,245	10,245		

Notes

Simulation mirrors actual selection policies, but assumes all considered are actually eligible and interested.

* = Average over 1000 simulations.

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Table 3 shows that there was no meaningful difference in those that are considered[47] by race with and without the CP policy in effect. The number of Hispanic and Asian Considered Applications is almost identical with and without the CP policy being in effect. Slightly more whites are considered when the CP policy is in effect. With respect to whites and African Americans, the impact of the CP policy on their share of the awards changes only slightly. If the CP policy is eliminated, the white share of the awards drops by only 1.4 percentage points, from 10.72% to 9.32%, while the African American share increases by only 1.38 percentage points, from 34.22%

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[47] In this simulation, all those that are considered pass the Confirmation Process and are awarded a unit. Thus, in this simulation, considered and awarded are the same.

to 35.60%. Overall, changing the race of 169 or 1.6% of the Considered Applications when the

CP policy is in effect would bring about perfect racial parity in the results between when the CP

policy is in effect and when it is not in effect. Thus, any differences between the lottery with and

without the CP policy are not practically significant[48] and the community preference policy does

not cause a disparate impact on any race to be able to compete for housing opportunities.

C. **Disparate Impact Analysis of the Consideration Stage Outcomes Shows There Is No Effect on One or More Race/Ethnic Groups**

Undertaking a disparate impact analysis at Stage 2 demonstrates that the Consideration

Process, of which the community preference policy is part, does not cause a disparate impact on

African Americans or Hispanics.[49] The Consideration Process determines who among the

apparently eligible applications will be able to compete for a unit through the Confirmation

Process.

To measure the impact of the Consideration Process by race, I start by restricting my

analysis to the apparently eligible applications. Using the data which indicates for each

application: (i) its eligibility for preferences,[50] (ii) the apartment types for which the application

is apparently eligible, (iii) if ultimately awarded an apartment, the preference list from which the

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[48] One can also compute the AIR for the racial difference in the impact of the CP policy. This would be computed by calculating the difference in the selection rate of minorities with the CP policy in effect relative to the selection rate of minorities that would be expected if the CP policy was not in effect, compared to the difference in the selection rate of whites with the CP policy in effect relative to the selection rate of whites that would be expected if the CP policy was not in effect. African Americans, Hispanics, and Asians all pass the 80% test for disparate impact.

[49] My specific reference to African Americans and Hispanics is based upon the Complaints' allegations of a disparate impact on African Americans and Hispanics (see paragraph 7, paragraph 102, and paragraphs 177-182). In fact, as seen in Table 3, there is no disparate impact on Asians either.

[50] An application may be eligible for multiple preferences. Furthermore, all New York City applications that are not selected from any earlier preference list are eligible for selection from the New York City list, which I refer to as the "no preference" list.

application was selected, and (iv) the application's lottery log number, I can determine which applications were considered for an apartment.[51]

The results of the analysis are presented in Table 4.

TABLE 4
RACIAL/ETHNIC DISPARATE IMPACT OF CONSIDERATION PROCESS STAGE 2
ON APPARENTLY ELIGIBLE APPLICATIONS

	Asian	African American	Hispanic	Other	White	Total Known Race
Number of Apparently Eligible Applications	181,053	1,180,915	1,132,704	194,719	241,932	2,931,323
Number Considered	20,113	148,053	139,310	24,959	30,963	363,398
Consideration Rate	11.11%	12.54%	12.30%	12.82%	12.80%	12.40%
AIR	86.80%	97.97%	96.09%	100.16%		
Difference in Actual - Expected Consideration Rate	-1.29%	0.14%	-0.10%	0.42%	0.40%	
Surplus (-Shortfall) Awards	(61)	43	(29)	22	25	

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Table 4 isolates the impact of the Consideration Process that determines which applications are considered for an apartment. As discussed above, the community preference policy is implemented at this stage and, thus, its impact is incorporated into these outcomes, although not isolated within the stage.

Table 4 lists the number of apparently eligible applications and the number that were considered and the resultant consideration rate (percentage of apparently eligible applications that were Considered Applications by race.) Looking at the consideration rates by race, we see that all the rates are very similar. The white rate is 12.80%, the African American rate is 12.54%, the Hispanic rate is 12.30%, and the Asian rate is 11.11%.

A common measure of disparate impact is the adverse impact ratio (AIR), which compares the ratio of the selection rate of the minority race group divided by the selection rate of

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[51] See Appendix C for a description of how those to be considered were determined.

the majority group (whites). Generally, if the AIR is less than 80%, the difference in selection rates is said to show a disparate impact. This is referred to as the 80% Rule and is often used in discrimination cases. If we use whites as the majority group, the adverse impact ratio shows that African Americans, and Hispanics are slightly disfavored at the Consideration Stage compared to whites, but their AIRs are both over 95%. The Asian AIR is 86.80, which is above the common 80% standard. Thus, the Consideration Process has no disparate impact for African Americans, Hispanics or Asians compared to whites.

However, while the 80% Rule is a commonly used measure to define practical significance, it is not uniformly accepted. The decision of whether a disparity is practically significant is a judgment which is ultimately up to the decision maker in a particular case. Therefore, it is useful to measure the actual size of the disparity in terms of its impact on awards by race, to aid the decision maker in making her judgment based on all the statistical and other evidence.

To measure the impact of the Consideration Stage on the racial distribution of awards, if there had been no impact whatsoever, then each race would have the same consideration rate, which would be equal to the overall consideration rate irrespective of race. Looking at the rate of considerations, we see that overall 12.40% of the apparently eligible applications were considered and, among those considered, 2.82% were awarded apartments.   If the consideration rates and selection rates from those considered were the same for all races, out of the 10,245 awards there would have been 25 less white awards, 29 more Hispanic awards, 61 more Asian awards, and 43 fewer African American awards, assuming the confirmation stage has no confounding effect.[52] Thus, the Consideration process which determines who is considered and

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[52] That is, the percent of awards by race equals the percent of applications considered by race.

thus able to compete for an award (and would be awarded a unit if eligible and interested) works

to the slight but insignificant advantage of Whites and African Americans, and to the slight,

insignificant disadvantage of Hispanics, and Asians. One would only have to change 90 (or

0.9%) of the 10,245 awards to make the award rates by race perfectly match what would occur if

the Consideration rate for each race was identical.

In sum, Dr. Beveridge undertook an improper disparate impact analysis which does not

measure the impact of the community preference policy on the ability to compete for housing

because it does the analysis by CD typology as opposed to Citywide, compares the wrong

groups, and conflates causation with correlation. In contrast, the methodologies I employed

demonstrate that African Americans and Hispanics are disproportionately represented in

affordable housing, and that the community preference policy does not have a disparate impact

based upon race in the ability to compete for housing.

VI.   **PROBLEMS WITH DR. BEVERIDGE'S PERPETUATION OF
SEGREGATION CONCLUSIONS**

A. **Dr. Beveridge Never Measures the Degree of Segregation Resulting from the CP
Policy, nor the Degree of Segregation That Would Result if the CP Policy Were
Eliminated**

Dr. Beveridge opines that the "the result of the operation of the community preference

policy is a pattern that perpetuates segregation more (and allows integration less) than what

would be expected without the policy."[53] The "pattern" Dr. Beveridge references is based upon

his analysis that he claims demonstrates that CP beneficiary applicants/awardees are advantaged

if they are the same race as the majority or plurality race in each CD typology and disadvantaged

if they are not the same race as the majority or plurality race in the CD typology (what he refers

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[53] See paragraph 31 of Dr. Beveridge's April 1, 2019 report.

to as his disparate impact analysis). Without any analysis, Dr. Beveridge concludes that this pattern perpetuates segregation or allows less integration. Dr. Beveridge argues that if the CP were eliminated, more of the non-majority races of each CD typology would be awarded units, which would result in a lower degree of segregation than would occur with the CP policy in effect. With no supporting evidence or analysis, he simply hypothesizes that the degree of segregation would be meaningfully lower if the CP policy were eliminated.[54]

It is worth noting that Dr. Beveridge does not opine as to whether or not the overall affordable housing lottery perpetuates segregation, only that if the CP policy had been eliminated, the degree of integration would be higher, or the degree of segregation would be lower.   In fact, Dr. Beveridge could not fairly make such a claim. According to Dr. Beveridge's own figures, the percentage of whites in the majority white typology is 60.65%,[55] with only 6.34% African American, and 18.78% Hispanic,[56] while the racial mix of the units actually awarded with known race in the majority white typologies was 33.9% Hispanic (the largest racial/ethnic group), 19.4% African American, 53.3% African American or Hispanic, and only 22.6% white.[57] In other words, the impact of the affordable housing lottery was to diversify the majority white CD typology.

Further, Dr. Beveridge does not define what he means by "perpetuates segregation" and does not even attempt to measure the scope of the alleged change in the degree of segregation that would occur if the CP policy were to be eliminated. Without such a measure, one does not know if the impact he hypothesizes is trivial or significant, or even exists.

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[54]   See Page 193, lines 1-13 of Dr. Beveridge's Deposition of May 30, 2019.
[55]   See Exhibit 4 of Dr. Beveridge's April 1, 2019 report.
[56]   See Tables 5, 6, 7, and 8 of Dr. Beveridge's April 1, 2019 report.
[57] See Exhibit 7 to Dr. Beveridge's April 1, 2019 report.

B. Problems with Dr. Beveridge's Logic and Analysis Concerning Perpetuating Segregation

Additionally, there are five significant problems with Dr. Beveridge's analysis. First, Dr. Beveridge's analysis fails to take into consideration the impact on segregation between all the races. Second, Dr. Beveridge's analysis fails to take into consideration the inconsistencies between the race typology of the census tract in which a project is located and his race typology based on the community preference area of the project. Third, Dr. Beveridge fails to consider the race typology of the census tract from which an awardee comes. Fourth, Dr. Beverage's definition of a majority race is inappropriate for computing the degree of segregation. Fifth, the basic logic underlying his theory (i.e., that it is a tautology that if fewer of the majority race of the CD typology are awarded a unit and thus more of the non-majority races of the CD typology are awarded a unit it will reduce the degree of segregation) is simply not true.

1. Dr. Beveridge Does not Take into Consideration Multiple Races

Dr. Beveridge's race typology is based on all four races, but the segregation indices that Dr. Beveridge uses to delineate his CD typologies are based on pairs of races. The Dissimilarity Index considers only pairs of races so, if we are concerned with the four most populous races in New York City (whites, African Americans, Hispanics, and Asians), there are actually six Dissimilarity Indices that measure segregation. Thus, there can be differences in the race typology of a CP area depending on which two races you are studying when measuring segregation. That is, under Dr. Beveridge's logic, eliminating the CP policy could simultaneously increase and decrease the degree of segregation, depending on what races you are comparing. Dr. Beveridge's CD typology definitions are inadequate to assess the degree of segregation between all the six different measures or even among the three white comparisons (white vs African American, white vs Hispanic, and white vs Asian).

To illustrate this, consider the following hypothetical case where we have a project with the following racial composition:

ILLUSTRATION 1
HYPOTHETICAL MAJORITY
HISPANIC CD TYPOLOGY

Hispanic	African American	White	Asian	Other
70	5	15	3	2

Dr. Beveridge would deem the project majority Hispanic, and he would argue that the CP policy results in awarding more units to Hispanics than would be awarded if the CP policy were eliminated. Let us accept Dr. Beveridge's argument and assume that the census tract where the project is located is also majority Hispanic and a unit that would have gone to a white application absent the CP policy was awarded to a Hispanic application as the result of the CP policy. Dr. Beveridge would argue that the Dissimilarity Index would be lower if the CP policy were eliminated. This argument might be true when comparing Hispanics and whites, but what about the segregation between African Americans and whites? That depends on the race of the awardee chosen instead of the Hispanic if the CP policy is eliminated. Awarding units to a Hispanic application would have no impact on the measure of segregation between African Americans and whites, since it only looks at African Americans and whites. So, under Dr. Beveridge's logic, the CP policy result of awarding a unit to a Hispanic application has no impact on the degree of segregation between whites and African Americans. But, what would be the effect of awarding the unit to the white application if the CP policy is eliminated? If we look at the race distribution of the project only with respect to whites and African Americans, then the project will be defined as in a majority white CD typology (since Hispanics do not enter into the

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equation), and under Dr. Beveridge's logic, the degree of segregation would become greater if more of the white majority race were awarded units, as would be expected if the CP policy were eliminated.

This illustrates two critical flaws with Dr. Beveridge's logic. First, his CD typologies and his logic only work for the impact of the CP policy on the degree of segregation between the majority race and other races, which says nothing about the impact of the degree of segregation between any set of races not including the majority race. Second, his methodology creates cases where eliminating the CP policy would result in conflicting conclusions concerning its impact on the degree of segregation, depending upon which races are being compared. That is, in a majority African American typology, Dr. Beveridge's logic cannot tell us anything about what effect the elimination of the CP policy would have on the degree of segregation between whites and Hispanics, whites and Asians, or Hispanics and Asians. Thus, eliminating the CP policy might increase the segregation index for one pair of races, while decreasing it for another.

2. Dr. Beveridge's Comparison between CP Areas and Census Tracts Fails

Dr. Beveridge cannot properly compare CP areas to census tracts. Dr. Beveridge's analysis hinges on the CD typologies in which projects are analyzed, which in turn are based upon the racial demographics of the community preference area for a project. However, Dr. Beveridge measures racial residential segregation using the Dissimilarity Index at the census tract level (as it is typically measured).

Dr. Beveridge's hypothesis is predicated on the theory that if the CP policy is eliminated, the number of awards to the majority/plurality race will be reduced, and more apartments will be awarded to applications of non-dominant races, which will result in a lower level of segregation in the City. This theory hinges on the assumption that the majority/plurality race in the CD

typology defined by the racial distribution of the CP area is the same as the racial distribution of the census tract(s) in which the project is located. However, in a significant number of cases, this is not true.

Appendix E presents a list of projects with the following information for each project: (i) for each address associated with the project (a project may have one or more addresses), the community district ("CD"), census tract and Neighborhood Tabulation Area ("NTA") [58] with which the address is associated, and (ii) the racial typology assigned the project by Dr. Beveridge, the racial typology of the CD of the project's address, the racial typology of the census tract of project's address, and the NTA of the project's address.[59] Appendix E shows that there is often an inconsistency between Dr. Beveridge's race typology and the typology of the census tract of at least one of the addresses of the project.[60] The data in Appendix E shows that 30 out of the 168 projects (i.e., more than 15% of the projects) have a disconnect problem in

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[58] I also calculated the NTA of the area of the project which is larger than a census tract, because the ACS population is a small sample at the census tract level and the reliability of the race estimate at the tract level is questionable. To get a more reliable estimate, one frequently uses the NTA a larger area rather than the census tract, or one uses the latest decennial census.

[59] The population is derived from the five-year ACS for the year preceding the lottery year, so as not to confound the effect of the project on the counts. For one project (project 141) the census tract had a zero population. In that case, I inserted the NTA racial distribution. It is interesting to note (but not significant) that Dr. Beveridge's race typologies would change in one case if he had used the ACS preceding the lottery year rather than the 2013-2017 ACS for all projects.

[60] It is a technical problem if the project has multiple addresses with different race typologies, since the data does not allow one to determine which address corresponds to the apartment awarded and, hence, under Dr. Beveridge's logic, one cannot determine the effect of the CP policy on segregation, since it would depend on which address the award was for. For example, if the CP area is majority white, and the CP policy were to result in more whites being awardees, if there are two locations, one of which is in a majority white census tract and one of which is in a majority Hispanic census tract, then following Dr. Beveridge's logic, more white awards would increase the degree of segregation if the award is for an apartment in the majority/plurality white census tract, but more white awards would lower the degree of segregation if the award is for a unit in the majority/plurality Hispanic census tract. In the former case, according to Dr. Beveridge's logic, eliminating the CP policy would lower the degree of segregation while, in the latter case, removing the CP policy would increase the degree of segregation.

which the CD typology of the CP area is not necessarily the same as the typology of the census tract in which the apartments are located.

Different racial distributions between the CP area and the project's census tract(s) can occur when the CP area is based on a combination of CDs with different typologies, or when the CP area is a single CD but the location of the project is in a census tract with a different race typology. Whether a project is in one CD or multiple CDs, it may have multiple addresses in multiple census tracts and, unless they are all in census tracts with the same race typology as Dr. Beveridge's designation of the CD typology designation, there will be a disconnect between Dr. Beveridge's race typology and the race typology of the census tract being impacted (i.e., the area where the project is located). If there is an inconsistency between the race typology of the project location and the race typology of the CP area, then Dr. Beveridge's assumption is invalid. Consequently, his opinion that providing more units to the majority/plurality race (which he claims is a result of the CP policy) perpetuates segregation is undermined. That is, if the dominant race of the CD typology in which a project is grouped is not the dominant race of the census tract in which the project is actually located, then Dr. Beveridge's theory is up-ended entirely. In such cases, Dr. Beveridge's logic leads to the conclusion that if the CP policy is eliminated, the degree of segregation will increase rather than decrease.

3. Dr. Beveridge's Measure of Majority/Plurality Does Not Match the Measure of Segregation, which is Based on Proportionality

Dr. Beveridge's concept of majority/plurality race of the CD typology is inconsistent with the measurement of segregation, which measures distribution of races as compared to their proportional representation Citywide. That is, if the percentage of whites in the City is 60%, then each census tract would be 60% white under no segregation. Thus, a majority white CD typology which is 55% white is actually under-representative of whites. Therefore, adding

whites to the area in sufficient number to raise the white percentage to 60%, would bring the area in line with the City population and decrease segregation in the City.[61] This is inconsistent with Dr. Beveridge's theory that adding whites to a white majority CD typology perpetuates segregation.

4. Dr. Beveridge Fails to Consider the Race Typology of the Area from Which an Awardee Moves

Putting aside the more technical problems described above (his definition of a race typology, and the limitation of using his theory and typology to apply to cases where the majority/plurality race is not part of the Dissimilarity Index), Dr. Beveridge's core theory that if the majority/plurality race of the CD typology and race of the awardee are the same, then there is a perpetuation of segregation, is simply not true.[62]

Dr. Beveridge fails to consider the demographics of the census tract from which the awardee is moving. Because the Dissimilarity Index measures how many people of a particular race would need to be redistributed among census tracts to match proportional representation Citywide, determining whether a move increases or decreases the Index requires knowing the racial distribution of the census tracts from which and to which someone moves. The Dissimilarity Index changes only when someone residing in an area in which their race is proportionately overrepresented moves to an area in which their race is underrepresented (lowers the degree of segregation) or when someone residing in an area in which their race is

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[61] Assuming the white applications come from an area that is at least 60% white as discussed *infra*.

[62] Dr. Beveridge's theory holds for the concept of diversity in the area of the project, not segregation. Diversity means the races are all evenly represented in an area. In order for a CD to be diverse, it would need to have each race equally represented. Hence, if an area is majority/plurality a given race, decreasing the representation will increase the diversity in that area.

proportionately underrepresented moves to an area in which their race is overrepresented (increases the Index). In order to measure the impact on the Dissimilarity Index of awarding a unit when the CP policy is in effect, we need to consider not only the race of the awardee and the race of the area in which the awarded apartment is located, but also the racial composition of the area from which the application came. Furthermore, for those who would have been awarded the unit if the CP were not in effect, we need to consider not only their race, but also the racial composition of the area from which they applied. Dr. Beveridge simply ignores these factors.

For instance, moving a white applicant from an area which is disproportionately white to another area that is disproportionately white will have no effect on the Dissimilarity Index of segregation. But, now let us consider that if the CP policy is eliminated, instead of the unit going to a white awardee, the unit would have gone to an African American application. If the African American awardee moves into a disproportionately white area from another disproportionately white area, the move will have no impact on the Dissimilarity Index. However, if the African American moves from a disproportionately African American area to a disproportionately white area, then awarding the unit to that African American would decrease the Dissimilarity Index. The point, clearly, is that the CP policy's impact on segregation cannot be measured without taking into consideration the demographics of the census tract from which an awardee moved in addition to the demographics of the census tract to which that awardee moves.

VII. PROPERLY MEASURING THE IMPACT OF THE CP POLICY AND THE LOTTERY PROCESS OVERALL ON SEGREGATION

I have conducted analyses which measure the impact on the Dissimilarity Indices as a result of the Lottery Process overall, of the Consideration Stage, and also an estimate of the impact of eliminating the CP policy. My analyses take into consideration the above-discussed

important factors (that Dr. Beveridge ignored) when measuring change in the Dissimilarity Index and, as set forth below, demonstrate that the Lottery Process, the Consideration Stage and the community preference policy do not perpetuate segregation in any meaningful way.

A. **Overview of Methodology**

In order to properly measure any change in the Dissimilarity Indices, we need to determine who was awarded the unit with the CP policy in place, the racial composition of the area in which the awarded unit is located, and the racial composition of the area from which the applicant moved. Using this data, we can determine the impact of the housing Lottery Process, overall, and at each stage of the lottery process on the Dissimilarity Indices. Thus, we measure the impact of awards (i) if only Stage 1 was conducted, and then a random selection of applications to be considered followed (the Stage 1 measure); (ii) if Stage 1 and Stage 2 were conducted, and then a random selection of awardees followed (the impact of Stages 1 and 2); and (iii) if all the stages were conducted (the impact of Stages 1, 2 and 3). Then, if we want to measure the result of the Confirmation Stage (Stage 3) on segregation, we compare the difference in the impact on the Dissimilarity Indices of the actual awards with the impact of Stages 1 and 2 only (i.e., the impact of Stages 1, 2, and 3 minus the impact of Stage 1 and 2 leaves the impact of Stage 3). To measure the impact of Stage 2 (Consideration Process), we compare the impact of the combined effect of Stage 1 and Stage 2 with the impact of Stage 1.

The key to being able to do these studies is that the amount of change in the Dissimilarity Index is mathematically determined by examining the racial composition of the census tract from which the application originates, and the racial composition of the census tract of the apartment to be awarded, the race of the applicant who is moving, and the number of people of each race in the Citywide population. This is illustrated in the following simple hypothetical.

Consider a situation in which we are studying segregation only between whites and African Americans, so selecting any non-white or non-African American has no impact whatsoever. If we are using the race of the households[63] as our unit of observation, and the City population consists of white households (W) and African American households (AA), then the effect of awarding a unit to a particular household will impact the Dissimilarity Index as follows:

ILLUSTRATION 2
IMPACT ON THE DISSIMILARITY INDEX
OF AN AWARDEE

From Area	To Area	Effect	Size of Effect
Maj Afr. Amer.	Maj Afr. Amer.	No Effect	0
Min Afr. Amer.	Min Afr. Amer.	No Effect	0
Maj Afr. Amer.	Min Afr. Amer.	Lower the Index	-1/AA
Min Afr. Amer.	Maj Afr. Amer.	Increase the Index	+1/AA

From Area	To Area	Effect	Size of Effect
Maj White	Maj White	No Effect	0
Min White	Min White	No Effect	0
Maj White	Min White	Lower the Index	-1/W
Min White	Maj White	Increase the Index	+1/W

The impact of awarding 1,000 units located in a majority white area to African Americans who all applied from majority African American areas would lower the Dissimilarity Index by 1000/AA. Awarding 1,000 units located in a majority white area to whites who all applied from majority white areas would have no impact on the Dissimilarity Index.

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[63] The race of the household is defined as the race of the primary applicant. I use the race of the household as the unit because we do not know the race of all members of the household.

The definition of majority and minority racial area here is not Dr. Beveridge's CD typology definition. Instead, for example, if we are measuring the African American-white Dissimilarity Index, the determination of the majority/minority races is based on the population of only whites and African Americans (the two races that are being measured for segregation) in the City and the relevant census tracts. In this example, a census tract is defined as majority white if the percentage of whites (among whites and African Americans) in the census tract is equal to or greater than the percentage of whites (among whites and African Americans) in the City; otherwise it is defined as majority African American. Using the 5-year ACS preceding the year the lottery closed, for each application I compute whether the project that was applied for is in a majority white or African American census tract, and whether the census tract from which the application came is majority white or African American.[64] This is done for all applications for the projects that are located in a single census tract and for which the application's address can be geocoded. This allows us to study 145 of the 168 projects and 5,983,820 or 94.3% of the 6,345,462 applications that were race identified.[65]

If we assume an initial benchmark population, we can compute the actual numerical impact on the Dissimilarity Index of segregation. To do that, I assumed the population by race in the City to be that reported by households in the 2012-2016 ACS. The impact on the Dissimilarity Index can be computed for all pairs of the four races of interest.

Preliminarily, it is interesting to note that, if one were to choose the awards so as to minimize (or maximize) the Dissimilarity Index between African Americans and whites, it would result in decreasing (or increasing) the Dissimilarity Index by 0.0148. In other words,

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[64] I repeat this assessment comparing each of the races to each other.
[65] See Appendix E, which identifies the projects.

even if one were to select awardees with the goal of increasing the Dissimilarity Index (or decreasing the Index), the result would have a small impact on the Dissimilarity Index between African Americans and whites. This is primarily due to the fact that the housing lottery units make up only a very small portion of the housing stock in New York City.

At the simplest level, I compared the demographics of the census tract from which each apparently eligible application came with the demographics of the census tract of the project to which the application applied to determine what the effect on the Dissimilarity Indices would be if each apparently eligible application were awarded a unit. Per Table 5 below, the percent of apparently eligible applications which, if awarded an apartment, would have no impact on each of the six Dissimilarity Indices is extremely high. In other words, due to the demographics of the census tract of the application address as compared to the demographics of the census tract of the project and the choice of where applicants choose to apply and where they live, if 79.6% of apparently eligible applications were awarded a unit, those awards would not change the Dissimilarity Index between African Americans and whites (93.0% would not change the Dissimilarity Index measuring segregation between Whites and Asians, etc.).

TABLE 5
PERCENT OF APPARENTLY ELIGIBLE
APPLICATIONS WHOSE AWARD WOULD HAVE
NO IMPACT ON DISSIMILARITY
SEGREGATION INDEX

Races	Index
White vs. African American	79.6%
White vs. Asian	93.0%
White vs. Hispanic	78.8%
African American vs. Hispanic	64.1%
African American vs. Asian	80.9%
Hispanic vs. Asian	81.3%

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The results set forth in Table 5 demonstrate that unless one specifically chooses to award units based on the impact of the award on segregation, the method of awarding units will have only a minimal impact on the degree of segregation in the City, no matter what policies are in effect. This is further demonstrated in Table 6, in which I explored the impact of stages 2 and 3 on the Dissimilarity Index of segregation.

Table 6 below presents the results delineating the count of the actual awards by whether the award decreases the Dissimilarity Index, increases the Index or had no impact on the Dissimilarity Index. It also presents the impact on each of the six Dissimilarity Indices for each pair of races for Stage 1, for Stages 1 and 2, and for Stages 1, 2, and 3. It also indicates the direction of the impact on the value of the Dissimilarity Index. Finally, it compares the

differences between the stages in order to isolate the impact of the consideration and

Confirmation Stages.[66]

TABLE 6
ANALYSIS OF LOTTERY AWARDS OVERALL AND THE IMPACT OF THE CONFIRMATION AND SELECTION POLICIES ON SEGREGATION IN CITY

| | | Impact of Actual Awards (Stage 1, Stage 2, and Stage 3) | | | | | | | |
| | | Awards by Effect on Segregation | | | | | | | |
Races	Total	Segregate	No Effect	Integrate	Net Effect Seg-Int	Numerical Change in DIS Index	Direction of Effect DIS	Direction of Effect of Stage on DIS	Numerical Change in DIS Due to Stage
W vs. AA	8,224	203	7,435	586	-383	-0.00055	Lowers		
W vs. A	8,224	227	7,599	398	-171	-0.00015	Lowers		
W vs. H	8,224	312	7,136	776	-464	-0.00063	Lowers		
AA vs. H	8,224	697	6,389	1,138	-441	-0.00060	Lowers		
AA vs. A	8,224	176	7,493	555	-379	-0.00055	Lowers		
H vs. A	8,224	237	7,339	648	-411	-0.00048	Lowers		
Impact of Awards if No Impact of Confirmation Process (Stage 1 and Stage 2)								Impact of Stage 3	
W vs. AA	8,224	242	6,896	1,086	-844	-0.00114	Lowers	Increases	0.00060
W vs. A	8,224	170	7,694	360	-190	-0.00034	Lowers	Increases	0.00019
W vs. H	8,224	359	6,811	1,054	-695	-0.00086	Lowers	Increases	0.00023
AA vs. H	8,224	823	5,566	1,835	-1,012	-0.00142	Lowers	Increases	0.00082
AA vs. A	8,224	214	6,978	1,032	-818	-0.00133	Lowers	Increases	0.00078
H vs. A	8,224	323	7,027	874	-551	-0.00083	Lowers	Increases	0.00035
Impact of Awards if no Impact of Selection Process and Confirmation Process								Impact of Stage 2	
W vs. AA	8,224	243	6,547	1,434	-1,191	-0.00167	Lowers	Increases	0.00053
W vs. A	8,224	180	7,652	392	-212	-0.00058	Lowers	Increases	0.00024
W vs. H	8,224	364	6,482	1,377	-1,013	-0.00129	Lowers	Increases	0.00043
AA vs. H	8,224	886	5,272	2,066	-1,180	-0.00166	Lowers	Increases	0.00023
AA vs. A	8,224	211	6,650	1,363	-1,152	-0.00182	Lowers	Increases	0.00049
H vs. A	8,224	335	6,683	1,206	-871	-0.00122	Lowers	Increases	0.00040

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Table 6 shows that the effect of the actual awards was to lower the Dissimilarity Index (increase integration) with respect to all pairs of races. But, the effects on the Dissimilarity Index are trivial in all cases and would not show up in most reporting of the Index (which typically is not reported to four decimals).

The impact of Stage 3 (the Confirmation Process, which is principally determined by the applicants' cooperation and documentation) compared to random selection from those

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[66] The change in the indices is based on the household counts in the City based on the 2012-2016 ACS. The numbers change trivially if we use the 2010 census counts or the 2008-2012 ACS as the benchmark.

considered was to increase the Dissimilarity Index for all pairs of races. In all cases the impact is *de minimis*.

Table 6 shows that random selection from those passing Stage 2 Consideration Process (which is when the community preference policy is implemented) compared to random selection from the pool of apparently eligible applications had the effect of trivially increasing the Dissimilarity Index (reducing the degree of integration) for all pair of races.

B. Simulation Experiment Estimate of the Impact of the CP Policy on Perpetuating Segregation

One cannot precisely isolate and measure the impact of the CP policy on the Dissimilarity Index because one cannot determine who would have actually been selected if the CP policy were not in effect. However, one can run a simulation to get a good estimate of the impact of the CP policy on the Dissimilarity Index. To do this, I re-ran the experiment where I simulate the Lottery Process with and without the CP policy, using apparently eligible applications and assuming that all those considered would be found actually eligible and interested and, if given a choice of units, the household would choose the cheapest unit for which it was eligible. This simulation is similar to the earlier simulation I used to estimate the disparate impact of the CP policy by race. In this case however, unlike the prior simulation, which was concerned with measuring disparate impact by race, the population was restricted to the 145 projects located in a single census tract and only to apparently eligible applications with addresses that could be geocoded. Also, unlike the earlier simulation, in this simulation the outcome is not the race of the awardee, but rather the effect of the awardee on the Dissimilarity Index.[67]

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[67] Applications with unknown race (on average, 639 awards) have no impact on the index.

Table 7 presents the results focusing on the difference in the awards with and without the impact of the CP policy. It looks at the awards classified by their impact on the Dissimilarity Index for each of the six pairs of races, and also measures the degree of impact on the Dissimilarity Index using the 2012-2016 ACS population counts as the benchmark.

TABLE 7
SIMULATION OF LOTTERY PROCESS WITH AND WITHOUT CP POLICY
AND RESULTANT AWARDS BY IMPACT OF SEGREGATION

Race Comparison	Total	Segregates	No Effect	Integrates	Seg-Integ	Change in DIS	Effect on DIS	Effect of CP Policy Direction	Change in DIS
			Results* with CP Policy						
W vs. AA	9,157	182	8,243	733	-551	-0.00075	Lowers		
W vs. A	9,157	194	8,522	441	-248	-0.00032	Lowers		
W vs. H	9,157	325	7,941	890	-565	-0.00074	Lowers		
AA vs. H	9,157	686	7,186	1,285	-599	-0.00083	Lowers		
AA vs. A	9,157	156	8,308	692	-536	-0.00086	Lowers		
H vs. A	9,157	234	8,168	755	-521	-0.00070	Lowers		
			Result* with No CP Policy						
W vs. AA	9,157	250	7,783	1,124	-874	-0.00119	Lowers	Increases	0.00044
W vs. A	9,157	198	8,438	521	-323	-0.00048	Lowers	Increases	0.00016
W vs. H	9,157	391	7,643	1,123	-733	-0.00093	Lowers	Increases	0.00019
AA vs. H	9,157	888	6,337	1,931	-1,043	-0.00145	Lowers	Increases	0.00063
AA vs. A	9,157	220	7,823	1,114	-894	-0.00146	Lowers	Increases	0.00060
H vs. A	9,157	333	7,824	1,000	-667	-0.00097	Lowers	Increases	0.00027

Notes

DIS = Dissimilarity Index
* = Average over 1000 simulations rounded to whole number
Simulation replicates actual lottery process with exception of CP policy when noted and uses actual applications, but assumes all considered are actually eligible and interested.

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Table 7 shows that, with respect to the Dissimilarity Index, the CP policy has a trivial and insignificant effect of increasing the Dissimilarity Index (reducing the level of integration) for all pairs of races. In all cases the results were *de minimis*.

In summary, Dr. Beveridge undertakes no analysis as to what extent the community preference policy perpetuates segregation. He simply draws a conclusion based upon his disparate impact analysis and several assumptions that are flawed. An actual analysis of the impact on the Dissimilarity Indices demonstrates that the estimated effect of the CP policy on the Dissimilarity Indices for all pairs of races results in only a trivial, non-meaningful increase in the Dissimilarity Index.

VIII. DR. BEVERIDGE'S SECONDARY OPINIONS ARE MEANINGLESS WITH RESPECT TO THE ISSUES IN THIS CASE

A. Whether You Can Update Information or Appeal is Irrelevant

Dr. Beveridge opines that those not reached by a developer in the Lottery Process cannot update their application or appeal a decision, and that because CP beneficiaries are more likely to be "reached by a developer" they will be more likely to get the opportunity to update their information and appeal any rejection of their applications[68] Even if true, the only question that is relevant is whether there is a disparate impact by race of those that are not reached or considered. Dr. Beveridge never concludes that this "consequence" of the CP Policy falls more heavily on a particular race. In fact, to the contrary, I have demonstrated that the likelihood of an apparently eligible household being considered was not different by race (see Table 4, *infra*). Thus, there is no reason to believe that there would be a difference by race in apparently eligible households that are not considered.

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[68] See paragraph 86 and 87 of the Beveridge Expert Report of April 1, 2019.

B. **The Fact That Some Applications Without Any Preference Cannot Compete for Any Unit Because All the Units for Which They are Eligible are Awarded Before the No- Preference Applications are Considered is Irrelevant to the Issue of Disparate Impact by Race**

Dr. Beveridge's opinion that some applicants with no community preference will be unable to compete for any apartment because all the apartments for which they were eligible were filled before the "no preference" list was processed[69] is obviously true, but this statement has nothing to do with a disparate impact by race. The likelihood of an apparently eligible application being considered for a unit Citywide is essentially the same by race. (See Table 4). Moreover, the fact that all the apartment types for which an application is eligible are filled before the application would be considered is not unique to those without the CP. Households with the CP are considered in lottery number order and, consequently, when their lottery number is reached, all the apartments for which they are apparently eligible may already have been filled, so they are also denied the opportunity to compete.

C. **Dr. Beveridge's Statement That Any Hypothesis that New Yorkers are Always or Mostly Interested in Remaining in Their Existing Community District is Belied by the Evidence of Lottery Participation for those Seeking Affordable Housing is Misleading**

Dr. Beveridge's statement that any hypothesis that New Yorkers are always or mostly interested in remaining in their existing Community District is belied by the evidence of lottery participation for those seeking affordable housing is misleading. It is easy to apply for many projects and there is no cost or penalty to applying for multiple projects. Clearly, many applicants do apply for multiple projects, and many apply for projects in which they are not in the community preference area. The data does show that affordable housing units are difficult to

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[69] See Beveridge's Exhibit 8 and paragraphs 88 to 93 of the Beveridge Expert Report of April 1, 2019.

obtain and are highly desirable, and many applicants are willing to move out of their

communities to obtain affordable housing. However, applying for affordable housing does not

mean that an application will choose to move to a unit in a project applied to if given the

opportunity (see Table 2 where applications considered which did not reside in the CP area were

much more likely to successfully complete the Confirmation Process). It also does not mean that

applicants would not typically prefer to stay within their community, if they had a choice.

As to the first point, the data shows that applications who live in the CP area compared to

those who do not, but are similarly situated with respect to the project applied for, apartment

types eligible for, other preferences, and race , (i.e., differ only on CP status) are much more

likely to follow thorough in the Confirmation Stage (i.e., successfully complete) and be awarded

an apartment (see Table 2, *supra*).

To determine if the distance of a project from the applicant's residence influences the

likelihood an applicant would apply for that project, (that is, does the applicant have a preference

for projects nearer to where they live) I conducted the following study. For each project and

each applicant who applied for any project, I computed the distance between the geocoded

address of the applicant and the geocoded address of the project.[70] Thus, for each project and

each applicant for any project in the data, I have two data points, the distance between where the

applicant lives and where the project is, and an indicator as to whether or not the applicant

applied for that project. Then, for each project, I split the applicants into those living within the

community preference area of the project and those living outside the area. My analysis is

designed to determine if the proximity of the applicant's current residence to the project impacts

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[70] I compute the straight line distance between the latitude and longitude of the project and
applicants. If the project had multiple addresses, I used the project address closest to the
applicant's address.

the likelihood that they would apply. That is, the analysis assesses whether there is statistical

evidence that applicants would prefer to live close to their current residence. However, to the

extent living in the community preference area of the project is an incentive to apply, these two

factors would be confounded. Hence, I ran the analysis studying only applicants who did not

live in the community preference area of the project and then studying only applicants who lived

within the community preference area. Then, for each project I correlated the likelihood that

someone would apply for the project and how far they lived from the project. Thus, I ran 168

regressions (one for each project) restricted to applicants living outside the community

preference area of the project and 168 regressions restricted to applicants living within the

community preference area. The results are set forth in Table 8 below.

TABLE 8

RELATIONSHIP BETWEEN THE LIKELIHOOD OF AN APPLICANT* ENTERING THE LOTTERY FOR EACH PROJECT AND HOW FAR THE APPLICANT LIVES FROM THAT PROJECT

Applicants Who Do Not Live in the CP Area of the Project

Likelihood of Applicant Applying for Specific Project	Number of Projects	Percent of Projects
Statistically significantly more likely to apply	163	97.0%
Statistically significantly less likely to apply	3	1.8%
No significant impact	2	1.2%

Applicants Who Live Within the CP Area of the Project

Likelihood of Applicant Applying for Specific Project	Number of Projects	Percent of Projects
Statistically significantly more likely to apply	112	66.7%
Statistically significantly less likely to apply	1	0.6%
No significant impact	55	32.7%

* = "Applicant" represents any applicant who bid for any affordable housing project.

The results (see Table 8) show that while applicants apply to many projects and frequently to projects outside their community preference area, the further a project is from their current residence, the less likely that an applicant looking for affordable housing will apply to a project. Moreover, the closer a project within their community preference area is to their current residence, the more likely that an applicant looking for affordable housing will apply to a project. For 97.0% of the projects, applicants who did not live in the CP area were more likely to apply for that project the closer the project was to where they currently resided. Thus, while it is true that applicants will frequently seek affordable housing outside their community district, it also is

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true that the data shows they tend to prefer to remain close to the area in which they currently

reside.[71]

IX. SUMMARY OF FINDINGS AND OPINIONS

In summary, my analysis demonstrates that:

(i)   Dr. Beveridge's analysis of disparate impact is flawed and biased, fails to isolate the impact of the CP Policy on the opportunity to compete and cannot be relied upon;

(ii)   Dr. Beveridge fails to do any perpetuation of segregation analysis, and his unsupported conclusions are based upon improper assumptions;

(iii)   There is a strong correlation between CP status and race in being awarded a unit, which results in a bias in Dr. Beveridge's analysis;

(iv)   African Americans and Hispanics are disproportionately overrepresented in the City's affordable housing as compared to their representation in the low-income New York City population;

(v)   the Consideration Process of the Affordable Housing lottery (in which the community preference policy is implemented) does not have a disparate impact Citywide;

(vi)   the impact of the Community Preference policy which is part of the Consideration Process cannot be directly measured, but a simulation study of the Lottery Process with and without the CP policy shows that it does not have disparate impact Citywide;

(vii)   for the majority of apparently eligible applications, if they were awarded an apartment, their move would have no impact on the Dissimilarity Index of Segregation. Hence, the impact of any of the Affordable Housing lottery policies other than specifically selecting applications based on their impact on segregation or integration will be minimal;

(viii) the overall effect of the Lottery Process on segregation in the City measured by the Dissimilarity Index was to trivially reduce the Dissimilarity Index for all race pairs;

(ix)   the Consideration Process had a trivial or minimal impact on the measures of segregation compared to random selection, trivially increasing the Dissimilarity Index for all race pairs (although the lottery still had a net integrative effect);

(x)   the impact of the Confirmation Process, which is distinct from the Consideration Process and is primarily a function of the applicant's interest and ability or willingness to verify their eligibility, was to trivially increase the Dissimilarity Index between all races compared to random

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[71] Of course, as stated above, due to the appeal of affordable housing, applicants apply to many projects, many of which may not be near their current area.

selection from those considered although the lottery still had a net integrative effect;

(xi)   while the actual impact of the community preference policy on the Dissimilarity Index cannot be measured, a simulation which estimates the isolated effect of the CP policy under the assumption that all those initially selected for a unit would be actually eligible and interested shows the impact of the CP policy on the Dissimilarity Index in the City, trivially increasing the Index between all race pairs, although the net effect of the lottery is still integrative;

(xii)   there is a statistically significant increase in the likelihood that an applicant who lives within or outside the community preference area will apply for a project the closer the project is to the applicant's address.

Bernard R. Siskin

_____
Bernard R. Siskin, Ph.D.
Dated December 13, 2019

A P P E N D I X   A

Bernard R. Siskin, Ph.D.

CV and Rule 26

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SUMMARY

Bernard Siskin received his B.S. degree in Mathematics from the University of Pittsburgh and a Ph.D. in Statistics from the University of Pennsylvania. For many years, he taught statistics at Temple University and served as Chairman of the Department of Statistics.

Dr. Siskin has specialized in the application of statistics in law, particularly in the area of analyzing data for statistical evidence of discrimination. He has testified for both plaintiffs and defendants in more than 200 cases, many of which were large employment class actions. In addition to discrimination studies, he has conducted statistical studies and has testified in commercial and environmental cases involving statistical issues.

Dr. Siskin has frequently been appointed by federal judges as a neutral expert to aid the court in statistical issues and he was the statistical consultant to the Third Circuit Court of Appeals Task Force on Equal Treatment in the Courts. I was also appointed by the Court as an Expert to measure the accuracy of the CCC vehicle valuation methodology and I suggested possible modifications to the methodology.

Dr. Siskin is the author of many articles and textbooks on statistics and quantitative techniques including *Elementary Business Statistics, Encyclopedia of Management* and *Quantitative Techniques for Business Decisions.* He has also written and lectured extensively on the use of statistics in litigation.

He has served as a statistical consultant to the U.S. Department of Justice, the Equal Employment Opportunity Commission, the U.S. Department of Labor, the Federal Bureau of Investigation, the Central Intelligence Agency, the Environmental Protection Agency, the National Aeronautics and Space Administration, Consumer Financial Protection Bureau (CFPB), OFCCP and Fannie Mae (the Federal National Mortgage Association) and Freddie Mac (the Federal Home Loan Mortgage Corporation), as well as numerous other federal, state and city agencies and Fortune Five Hundred corporations.

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Ph.D., Statistics (Minor, Econometrics), 1970

University of North Carolina
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PRESENT POSITION
BLDS, LLC, Director, 2011

TEACHING EXPERIENCE
Temple University, Adjunct Professor of Law School, 1992 to 2005
Temple University, Tenured Associate Professor of Statistics, 1973 to 1984
Temple University, Chairman-Department of Statistics, 1973 to 1978
Temple University, Assistant Professor of Statistics, 1970 to 1973
Temple University, Instructor of Statistics, 1968 to 1970

OTHER POSITIONS HELD
LECG, Director, 2003 to 2011
Center for Forensic Economic Studies, Senior Vice President, 1991 to 2003
National Economic Research Associates, Inc., Senior Vice President, 1989 to 1991
National Economic Research Associates, Inc., Vice President, 1986 to 1989
Center for Forensic Economic Studies, Ltd., President, 1984 to 1986
Center for Forensic Economic Studies, Ltd., Consultant, 1980 to 1984

PUBLICATIONS
Books
1. B. Siskin and N. Schmidt, "Proper Methods for Statistical Analysis of Promotions," *Adverse Impact Analysis: Understanding Data, Statistics, and Risk*, Psychology Press, 2017, S. Morris and E. Dunleavy, eds.
2. B. Siskin, "Employment Discrimination Litigation: Behavioral, Quantitative, and Legal Perspectives" John Wiley & Sons, Inc. 2005, Chapter 5 *Statistical Issues in Litigation* (with Joseph Trippi).
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5. B. Siskin and R. Johnson, *Elementary Statistics: A First Course*, Duxbury Press, 1982.
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   2nd Edition, 1985
7. B. Siskin, *Encyclopedia of Management*, McGraw Hill, 1979. (Ed. Les Bechtel).
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   Hall, 1976.

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1. B. Siskin and D. Griffin, "Litigating Employment Discrimination & Sexual Harassment
   Claims," *Litigation Handbook Series*, 2002.
2. B. Siskin, H. Carter, V. Lee, G. Page, M. Parker, R.G. Ford, G. Swartzman, S. Kress,
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    Lending Analysis: A Compendium of Essays on the Use of Statistics*, American
    Bankers Association, 1995.
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    Vol. 8, No. 3, July 1995.
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    Federal Publications, 1993.
13. B. Siskin, "Use of Statistical Models to Provide Statistical Evidence of Discrimination
    in the Treatment of Mortgage Loan Applicants: A Study of One Lending
    Institution," *Discrimination and Mortgage Lending Research and Enforcement
    Conference* Department of Housing and Urban Development, May 1993.

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SPEECHES (Partial List)
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3. American Financial Services Association
4. American Statistical Association
5. Defense Research Institute
6. Federal Bar Association
6. Harvard University
7. Institute of Industrial Research
8. International Organization of Human Rights Association
9. Law Education Institute
10. Law Enforcement Assistance Administration
11. Michigan Bar Association
12. National Center on Aging
13. Ohio Bar Association
14. Penn State University
15. Pennsylvania Human Relations Commission
16. Practising Law Institute
17. Security Industry Association
18. Women's Law Caucus: National Conference

STATISTICAL CONSULTANT (Partial List)
1. Attorney General's Office of the Commonwealth of Pennsylvania, and states of California, Oregon, Massachusetts, Connecticut, Mississippi, Louisiana and New Jersey
2. Board of Higher Education for Massachusetts and Oregon
3. Central Intelligence Agency (CIA)
4. Environmental Protection Agency (EPA)
5. Equal Employment Opportunity Commission (EEOC)
6. Federal Bureau of Investigation (FBI)
7. Freddie Mac (Federal Home Loan Mortgage Corporation)
7. Fannie Mae (Federal National Mortgage Association)
8. Homeland Security
9. International Organization of Human Rights Associations
10. Municipal Court of Philadelphia
11. National Aeronautics and Space Administration (NASA)
12. Office of Federal Contract Compliance, Department of Labor (OFCCP)
13. Pennsylvania Human Relations Commission
14. Security Exchange Commission
15. Third Circuit Court of Appeals Task Force on Equal Treatment in the Courts
16. U.S. Department of Agriculture
17. U.S. Department of Commerce
18. U.S. Department of Labor
19. U. S. Justice Department
20. Numerous Fortune 500 and other private corporations

Testimony Listing for Bernard R. Siskin, Ph.D.

Date	Case Name	Location	Activity	On Behalf Of
2019	Robertson, et al. v. Valley Communications Center	Philadelphia, PA	Deposition	Plaintiff
2019	Shauna Noel & Emmanuella Senat v. City of New York	New York City, NY	Deposition	Defendant
2019	Tillman Industrial Properties, et al. v. Mercantile Bank	Philadelphia, PA	Deposition	Plaintiff
2019	USA ex rel. Jose R. Valdez v. Aveta, Inc.; et al.	Washington, DC	Deposition	Defendant
2018	Health New, Inc. v. American International	Philadelphia, PA	Deposition	Plaintiff
2018	Kleinsasser v Progressive	Seattle, WA	Trial	Plaintiff
2017	Greater Birmingham Ministries, et al. v. Honorable Joh	Washington, DC	Deposition	Plaintiff
2017	Independent Living Center of Southern CA, et al v City	Washington DC	Deposition	Plaintiff
2017	Marc Daniel Vigna v. Allstate Insurance Company	Philadelphia, PA	Deposition	Plaintiff
2017	Mark Kleinsasser, et al v Progressive Direct Insurance	Philadelphia PA	Declaration	Plaintiff
2016	Brenda Koehler, et al v Infosys Technologies, et al	Washington DC	Deposition	Defendant
2016	City of Miami Gardens v. Wells Fargo & Co, et al.	Philadelphia PA	Declaration	Defendant
2016	David Turk, et al v USAA	Philadelphia PA	Deposition	Plaintiff
2016	US v Jacksonville Brotherhood of Firefighters, NAACP,	Washington, DC	Deposition	Plaintiff
2016	US v State of Rhode Island, Rhode Island Department	Washington DC	Deposition	Plaintiff
2016	US v Wells Fargo Bank N.A.	Atlanta GA	Deposition	Defendant
2016	Yolanda McGraw, et al v GEICO	Philadelphia PA	Deposition	Plaintiff

OVERVIEW OF ANALYTICAL FRAMEWORK AND
COMMUNITYPREFERENCE POLICY IMPACT

PART I: <u>Overview of the Lottery Process</u>

The Community Preference Policy ("CP Policy") is implemented, along with other

preferences during the lease up of certain affordable housing units. Applications for affordable

housing at a certain project are filed through Housing Connect,[1] an online application database.[2]

Once the application deadline has passed, a random log number is generated for each application,

and a log in numerical order is created.

Subject to preferences, and a confirmation of apparent eligibility for at least one unit in

the project (based upon self-reported income and household size as set forth in the application)

the log numbers are used to determine the order in which applications will be invited to verify

their eligibility and interest in a unit. Thus, without preferences, the apparently eligible

application with the lowest log number would be considered first. As explained more fully in

Section IV.A of the report, and Appendix C, a "Considered application" is an apparently eligible

application that, based upon its log number, available apartment units that the application is

eligible for, and the implementation of preferences, is given the opportunity to compete for

housing by confirming eligibility and interest.

There are three primary preferences implemented during the lottery process, and more

specifically, during the process in which Considered applications are determined (the

"Consideration process"). Each preference category has a percentage of units intended to be

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[1] Paper applications may also be submitted and the data is entered into Housing Connect.
[2] This summary is not intended to discuss each component of the lease up process in detail, but
is intended to simply give a broad overview. To the extent this explanation varies from the
actual practice or expected practice of developers, it has no impact on my analysis.

allocated for that preference. The percentage for these preferences varies, but together they are roughly 62% percent of the units subject to the housing lottery for each project. The preferences are ranked, so that the mobility and hearing/vision preference applications are processed first to meet the intended number of units to be awarded, followed by the community district preference ("CP"), and then the municipal employee preference.[3] The remaining units are open for any application from the City which was not yet processed.[4] Applications can have more than one preference, and granting someone with multiple preferences a unit counts against each preference's goal. The community preference policy sets a goal of 50% of the available units.

PART II: <u>Understanding How the CP Policy Works</u>

To understand how the CP policy works and who and how many community preference applications actually benefit from the policy, let us first consider a very simple hypothetical example. We have only one project and only one type of apartment, and no preferences other than the CP. There are 60 applications from people who live in the CP area[5] ("CP applications") and 60 applications from people who live outside of the CP area ("non-CP applications),[6] each of whom have been given a random lottery number. Hence, we expect that among any percentage of the applications receiving the best (lowest ranked) lottery number, half will be from the

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[3] The community district preference and municipal employee preference percentages are goals and, if there are not enough eligible applications to meet those preferences, the units can be offered to other lottery applications.

[4] These are the major preferences found in all projects, but there are a few special circumstance preferences. For example, there is a preference in one project for artists. In other projects there is a preference for veterans, and in others a preference for Hurricane Sandy victims.

[5] The CP area is typically the community district ("CD") in which the project is located and, if an application is from someone that resides in the CD area, the application will have the CP. However, there are circumstances where the CP area is expanded to additional CDs.

[6] Dr. Beveridge would call these "CP beneficiary applications" and "non-CP beneficiary applications." In my report, I often adopt Dr. Beveridge's language.

community preference area, corresponding to the proportion of all applications who reside in the community preference area. Let us further assume that among those apparently eligible, two out of every three applications that have the CP and two out of every three applications that do not have the CP will be found to be ineligible or will withdraw.[7] Let us further assume that we have 20 apartments to fill.

If we were to fill the 20 apartments independently of the CP, we would expect to award half the apartments to applications from the community preference area and half to applications from outside the community preference area. Now, if we implement the community preference, we would fill 10 apartments from CP applications, and then fill the remaining 10 apartments from the non-CP applications and those CP-applications that were already offered an apartment or would have been offered an apartment but for their actually being ineligible or withdrawing at the confirmation stage.[8] If we follow the community preference selection process, to satisfy the community preference we would first offer the 10 apartments to CP applications. Then, we would fill the remaining 10 apartments from non-CP applications or from those CP applications who were not considered in the CP selection process, selecting applications in lottery number order. One would expect all 10 apartments would go to non-CP applications because, after we eliminate the 30 CP candidates who would have been considered (10 awarded and 20 considered but not eligible nor interested), we would expect that of the 30 remaining CP applications not considered and the 60 non-CP applications, those with the lowest lottery numbers to be considered would all be non- CP applications. In this example, the CP policy did not result in

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[7] By withdraw, I mean that they expressed that they no longer had an interest in the apartment, or they failed to show for an interview, or they failed to supply documents necessary to verify eligibility.

[8] CP applications can be awarded units for other reasons than as a result of the community preference policy.

any difference in outcomes, whether or not the CP policy was in effect (see Hypothetical 1 below

for a graphic illustration).
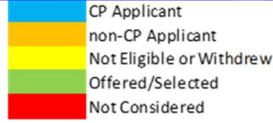
Legend:
- CP Applicant
- non-CP Applicant
- Not Eligible or Withdrew
- Offered/Selected
- Not Considered

	NO CP PREFERENCE Select 20 10 CP : 10 non-CP ALL LIST		CP PREFERENCE Select 10 10 CP CP LIST	REMAINING CP+non-CP Select 10 10 non-CP All CP Not Reached + non-CP
NUMBER	LOTTERY	non-CP/CP	LOTTERY / Selected	LOTTERY
1	1			1
2	2		2	
3	3			3
4	4		4	
5	5	1		5 → 1
6	6	2	6 → 1	6
7	7			7
8	8		8	
9	9			9
10	10		10	
11	11	3		11 → 2
12	12	4	12 → 2	
13	13			13
14	14		14	
15	15			15
16	16		16	
17	17	5		17 → 3
18	18	6	18 → 3	
19	19			19
20	20		20	
21	21			21
22	22		22	
23	23	7		23 → 4
24	24	8	24 → 4	
25	25			25
26	26		26	
27	27			27
28	28		28	
29	29	9		29 → 5
30	30	10	30 → 5	
31	31			31
32	32		32	
33	33			33
34	34		34	
35	35	11		35 → 6
36	36	12	36 → 6	
37	37			37
38	38		38	
39	39			39
40	40		40	
41	41	13		41 → 7
42	42	14	42 → 7	
43	43			43
44	44		44	
45	45			45
46	46		46	
47	47	15		47 → 8
48	48	16	48 → 8	
49	49			49
50	50		50	
51	51			51
52	52		52	
53	53	17		53 → 9
54	54	18	54 → 9	
55	55			55
56	56		56	
57	57			57
58	58		58	
59	59	19		59 → 10
60	60	20	60 → 10	60 (Not Considered)

5

Legend:
- CP Applicant
- non-CP Applicant
- Not Eligible or Withdrew
- Offered/Selected
- Not Considered

NUMBER LOTTERY	NO CP PREFERENCE Select 20 10 CP : 10 non-CP ALL LIST non-CP/CP	CP PREFERENCE Select 10 10 CP CP LIST LOTTERY Selected	REMAINING CP+non-CP Select 10 10 non-CP All CP Not LOTTERY
61			61
62		62	62
63			63
64		64	64
65			65
66		66	66
67			67
68		68	68
69			69
70		70	70
71			71
72		72	72
73			73
74		74	74
75			75
76		76	76
77			77
78		78	78
79			79
80		80	80
81			81
82		82	82
83			83
84		84	84
85			85
86		86	86
87			87
88		88	88
89			89
90		90	90
91			91
92		92	92
93			93
94		94	94
95			95
96		96	96
97			97
98		98	98
99			99
100		100	100
101			101
102		102	102
103			103
104		104	104
105			105
106		106	106
107			107
108		108	108
109			109
110		110	110
111			111
112		112	112
113			113
114		114	114
115			115
116		116	116
117			117
118		118	118
119			119
120		120	120

6

Now, let us alter the hypothetical such that instead of having the same number of CP and non-CP applications, we have more non-CP applications. Let us assume that there are 50 apparently eligible applicants from the community and 100 from outside the community. In this case, if we select without taking community preference into account, 14 from outside the community preference area would be expected to be awarded a unit and 6 from within the community preference area would be expected to be awarded a unit. However, if we follow the community preference selection process, to satisfy the community preference we would first award 10 apartments to those with the CP and then we would award the remaining 10 apartments in lottery order to those without the CP or those with the CP who were not selected for consideration in the CP selection process. One would expect all 10 apartments would go to non-CP applications because, after we eliminate the 30 CP candidates who would have been considered (10 awarded and 20 considered but not eligible nor interested), we would expect that of the 20 remaining CP applications not considered and the 100 non-CP applications, those with the lowest lottery numbers to be considered would all be non- CP applications. In this hypothetical illustration, 10 awards would go to CP applications instead of the 6 which would have been awarded if there were no CP policy. Hence, four applications with the CP actually benefitted because of the CP policy, and four applications without the CP were negatively impacted by the CP policy. This refers to the expected outcomes assuming that the lottery numbers are actually distributed equally by CP status. This is graphically illustrated *infra* (see Hypothetical 2).

Legend:
- CP Appliacnt
- non-CP Applicant
- Not Eligible or Withdrew
- Offered/Selected
- Not Considered

	NO CP PREFERENCE			CP PREFERENCE		REMAINING CP+non-CP	
	Select 20			Select 10		Select 10	
	6 CP : 14 non-CP			10 CP		10 non-CP	
Count	ALL LIST		14 ncp	CP LIST		All Ex CP Sel/Outs	
Apps	Lottery	non-CP/CP	Outcome	Lottery	non-CP/CP Outcome	Lottery	non-CP
1	1					1	
2	2					2	
3	3			3		3	
4	4		1			4	1
5	5					5	
6	6			6		6	
7	7					7	
8	8		2			8	2
9	9		3	9	1	9	
10	10					10	
11	11					11	
12	12			12		12	
13	13		4			13	3
14	14					14	
15	15			15		15	
16	16					16	
17	17		5			17	4
18	18		6	18	2	18	
19	19					19	
20	20					20	
21	21			21		21	
22	22		7			22	5
23	23					23	
24	24			24		24	
25	25					25	
26	26		8			26	6
27	27		9	27	3	27	
28	28					28	
29	29					29	
30	30			30		30	
31	31		10			31	7
32	32					32	
33	33			33		33	
34	34					34	
35	35		11			35	8
36	36		12	36	4	36	
37	37					37	
38	38					38	
39	39			39		39	
40	40		13			40	9
41	41					41	
42	42			42		42	
43	43					43	
44	44		14			44	10
45	45		15	45	5	45	
46	46					46	(Not Considered)
47	47					47	
48	48			48		48	
49	49		16			49	(Not Considered)
50	50					50	
51	51			51		51	
52	52					52	(Not Considered)
53	53		17			53	
54	54		18	54	6	54	
55	55					55	(Not Considered)
56	56					56	
57	57			57		57	
58	58		19			58	(Not Considered)
59	59					59	
60	60			60		60	

8

Legend:
- CP Appliacnt
- non-CP Applicant
- Not Eligible or Withdrew
- Offered/Selected
- Not Considered

NO CP PREFERENCE				CP PREFERENCE			REMAINING CP+non-CP	
Select 20				Select 10			Select 10	
6 CP : 14 non-CP				10 CP			10 non-CP	
Count	ALL LIST		14 ncp		CP LIST		All Ex CP Sel/Outs	
Apps	Lottery	non-CP/CP	Outcome	Lottery	non-CP/CP	Outcome	Lottery	non-CP
	61						61	
	62		20				62	
	63			63		7	63	
	64						64	
	65						65	
	66			66			66	
	67						67	
	68						68	
	69			69			69	
	70						70	
	71						71	
	72			72		8	72	
	73						73	
	74						74	
	75			75			75	
	76						76	
	77						77	
	78			78			78	
	79						79	
	80						80	
	81			81		9	81	
	82						82	
	83						83	
	84			84			84	
	85						85	
	86						86	
	87			87			87	
	88						88	
	89						89	
	90			90		10	90	
	91						91	
	92						92	
	93			93			93	
	94						94	
	95						95	
	96			96			96	
	97						97	
	98						98	
	99			99			99	
	100						100	
	101						101	
	102			102			102	
	103						103	
	104						104	
	105			105			105	
	106						106	
	107						107	
	108			108			108	
	109						109	
	110						110	
	111			111			111	
	112						112	
	113						113	
	114			114			114	
	115						115	
	116						116	
	117			117			117	
	118						118	
	119						119	
	120			120			120	
	121						121	

9

Legend:
- CP Appliacnt
- non-CP Applicant
- Not Eligible or Withdrew
- Offered/Selected
- Not Considered

	NO CP PREFERENCE			CP PREFERENCE			REMAINING CP+non-CP		
	Select 20			Select 10			Select 10		
	6 CP : 14 non-CP			10 CP			10 non-CP		
Count	ALL LIST		14 ncp	CP LIST			All Ex CP Sel/Outs		
Apps	Lottery	non-CP/CP	Outcome	Lottery	non-CP/CP	Outcome	Lottery	non-CP	
122							122		
123				123			123		
124							124		
125							125		
126				126			126		
127							127		
128							128		
129				129			129		
130							130		
131							131		
132				132			132		
133							133		
134							134		
135				135			135		
136							136		
137							137		
138				138			138		
139							139		
140							140		
141				141			141		
142							142		
143							143		
144				144			144		
145							145		
146							146		
147				147			147		
148							148		
149							149		
150				150			150		

PART III: CP Status as Correlation and Not Causation

The results above seem to indicate that we can compare the selection rates of those with the CP and those without the CP to determine the extent to which we would expect the CP to actually be of benefit. This is what Dr. Beveridge does. However, this is true only under the simple assumption that no factor impacting selection is correlated or different by CP status. If CP status is correlated with factors that impact the awarding of units, then these factors must be

independent of race of the awardee, or studies of CP status and race would also not properly

measure the impact of the CP policy by race.

There are several types of factors other than the CP policy which would obviously impact

the likelihood of being awarded a unit. One factor is the luck of the lottery (i.e., what log

number an application receives). On average, we would not expect this to be correlated with CP

status and, therefore, we would not expect it to cause a difference in selections between those in

the community preference area and outside the community preference area. That is, since the

lottery is equally likely to help or hurt any application for any actual project, it is not expected to

favor or disfavor those in the community preference area but, of course, in a single lottery, it

might. A second factor that would impact the likelihood of selection is the project which the

application is requesting since the attractiveness of the project may impact the number and type

of applications seeking a unit. A third factor is the types of apartments available at the project.

That is, there are a variety of types of apartments available, and the mix of applicants for each

apartment type varies, which could impact selection. These second and third factors are not

random, and the extent to which they will vary by CP status or race is unknown, but they may

well be correlated with CP status or race. The fourth factor that would impact the likelihood of

selection is the likelihood that someone who was apparently eligible would actually be ineligible

because they would withdraw or fail to follow through in supplying the necessary information to

establish their eligibility, or would be found ineligible (or not accept a unit). This fourth factor

does differ by CP status since CP applicants are significantly less likely to be ineligible or to

withdraw from the process. The data presented in the report clearly shows that this is the case.

(See Table 2.)

Let us revisit our initial hypothetical, in which we assumed that the number of CP and non-CP applications was the same, and the likelihood that an applicant would actually be ineligible or withdraw was the same for those with and without the CP. In that case, the CP policy is expected to have no impact on which applications get an award. Now, if we change the assumptions such that the likelihood that an application would be ineligible or withdraw was *not* the same for CP applications as for non-CP applications, but was instead 2 out of 3 (66.6%) for non-CP applications but only 1 out of 2 (50%) for CP applications, what would our analysis show? When we redo the analysis, we find that the award rate without the CP policy now favors CP applications, with 12 of the 20 offers going to CP applications. This is graphically illustrated *infra* (see Hypothetical 3). More significantly, if the CP policy is used, the exact same results occur. Thus, the advantage in awards for CP applications is not the result of the community preference policy, but actually results from factors other than the community preference policy that are correlated with CP status.[9]

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[9] It should be noted that factors associated with race which impact getting an award given CP status would also make any estimate of the racial impact of the CP policy biased and inaccurate.

Legend:
- CP Applicant
- non-CP Applicant
- Not Eligible or Withdrew
- Offered/Selected
- Not Considered

NO CP PREFERENCE	CP PREFERENCE	REMAINING CP+non-CP
Select 20	Select 10	Select 10
12 CP : 8 non-CP	10 CP	2 CP: 8 non-CP
		All CP Not Reached
ALL LIST	CP LIST	+ non-CP

Number	LOTTERY	Non-CP/CP		LOTTERY	Selected	Lottery		
1	1					1		
2	2			2				
3	3					3		
4	4		1	4	1			
5	5		2			5	1	
6	6			6				
7	7					7		
8	8		3	8	2			
9	9					9		
10	10			10				
11	11		4			11	2	
12	12		5	12	3			
13	13					13		
14	14			14				
15	15					15		
16	16		6	16	4			
17	17		7			17	3	
18	18			18				
19	19					19		
20	20		8	20	5			
21	21					21		
22	22			22				
23	23		9			23	4	
24	24		10	24	6			
25	25					25		
26	26			26				
27	27					27		
28	28		11	28	7			
29	29		12			29	5	
30	30			30				
31	31					31		
32	32		13	32	8			
33	33					33		
34	34			34				
35	35		14			35	6	
36	36		15	36	9			
37	37					37		
38	38			38				
39	39					39		
40	40		16	40	10			
41	41		17			41	7	
42	42			42				
43	43					43		
44	44		18	44			8	
45	45					45		
46	46			46				
47	47		19			47	9	
48	48		20	48			10	
49	49					49		
50	50			50				
51	51					51		

13

	CP Applicant
	non-CP Applicant
	Not Eligible or Withdrew
	Offered/Selected
	Not Considered

NO CP PREFERENCE	CP PREFERENCE	REMAINING CP+non-CP
Select 20	Select 10	Select 10
12 CP : 8 non-CP	10 CP	2 CP: 8 non-CP
ALL LIST		All CP Not Reached
CP LIST		

Number	LOTTERY	Non-CP/CP	LOTTERY	Selected	Lottery
52	52		52		
53	53				53
54	54		54		
55	55				55
56	56		56		
57	57				57
58	58		58		
59	59				59
60	60		60		60
	61				61
	62		62		62
	63				63
	64		64		64
	65				65
	66		66		66
	67				67
	68		68		68
	69				69
	70		70		70
	71				71
	72		72		72
	73				73
	74		74		74
	75				75
	76		76		76
	77				77
	78		78		78
	79				79
	80		80		80
	81				81
	82		82		82
	83				83
	84		84		84
	85				85
	86		86		86
	87				87
	88		88		88
	89				89
	90		90		90
	91				91
	92		92		92
	93				93
	94		94		94
	95				95
	96		96		96
	97				97
	98		98		98
	99				99
	100		100		100
	101				101
	102		102		102
	103				103

14

	CP Applicant
	non-CP Applicant
	Not Eligible or Withdrew
	Offered/Selected
	Not Considered

NO CP PREFERENCE	CP PREFERENCE	REMAINING CP+non-CP
Select 20	Select 10	Select 10
12 CP : 8 non-CP	10 CP	2 CP: 8 non-CP
ALL LIST	CP LIST	All CP Not Reached

Number	LOTTERY	Non-CP/CP		LOTTERY	Selected		Lottery	
104				104			104	
105							105	
106				106			106	
107							107	
108				108			108	
109							109	
110				110			110	
111							111	
112				112			112	
113							113	
114				114			114	
115							115	
116				116			116	
117							117	
118				118			118	
119							119	
120				120			120	

15

Analysis Methodology

Overview

     To conduct my analyses[1], I relied on the same data that Dr. Beveridge used.[2] I used his database with a few minor modifications and exceptions that were necessary to correct errors or to reflect standard practices in when performing disparate impact analyses. My modifications and exceptions are detailed below.

     Dr. Beveridge appears to have made a trivial error by designating 1,179 applications (consisting primarily of applications to Projects 1 and 2) as multi-racial, although only one race was noted in the data. I reclassified these applications to the single race. Also, when an application identified the household race as a single race and "other" race, Dr. Beveridge classified the application as multi-racial. I reclassified the application as the single race, based on the 2003 Parker study[3] which concluded that, in such cases, the "other" race is usually an ethnicity rather than actually another race.[4] Finally, I recoded those applications that were classified as not apparently eligible but were awarded a unit as apparently eligible applications.[5]

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[1] A list of the documents that I reviewed and informed my analysis and opinions is listed at the end of this Appendix.

[2] Dr. Beveridge amended his database to correct his eligibility flag. However, since I had calculated eligibility from his raw data and did not rely upon his flag, my report relies on his original database. However, where I do use his published data from his Exhibit 6, I rely upon the Amended Exhibit 6.

[3] Schenke, N., Parker, J.D. From single-race reporting to multiple-race reporting: using imputation methods to bridge the transition. Stat. Med. 22(9), 1571- 1587(2003) DOI:10.1002/sim.1512.

[4] The impact of this was slight, adding 67,347 more single race applications (6,520 Asian, 45,435 African American, 13,421 white, and 1,971 other race).

[5] There were 844 such applications.

In my analyses, I follow Dr. Beveridge's convention and classify each application into one of the following mutually exclusive racial/ethnicity categories (which are referred to herein simply as racial groups): Hispanic, non-Hispanic white, non-Hispanic African American, non-Hispanic Asian, and all other races including multi-racial[6]. When referring to these racial groupings in this report, I drop the non-Hispanic prefix, but the non-Hispanic prefix should always be assumed for any racial group other than Hispanic and refused.

For my segregation studies for which I need to know the Census tract in which an applicant resided when they applied and the Census tract in which the project to which they applied was located, I geocoded the address of the application and the project location to which the application was directed. For 23 of the projects in Dr. Beveridge's sample, the project unit addresses were in multiple Census tracts and, since I could not determine which project location address corresponded to which award, those projects were eliminated from my simulation study of the impact of the CP policy on segregation. The 23 projects are noted in Appendix E.

Finally, I note that while the City has taken the position that the City's community preference did not apply to standalone RPTL 421a projects, Dr. Beveridge did not exclude those projects from his analysis. So as to keep my analyses on the same dataset, I also did not exclude the standalone 421-a projects.

Lottery Simulation

In my efforts to understand the effect community preference (CP) had on the Lottery Process, a simulation program was created which replicates the Lottery Process with and without

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[6] Not all applicants identified their race or ethnicity; these applications are treated as unknown race.

use of the community preference. In the lottery simulation program, the population of applicants from each of the 168 housing lotteries is redrawn and randomly reordered to create a new processing order. For each lottery, the various preferences were then implemented in the order that they are typically implemented. That is, first the apparently eligible applications with the mobility preference (5%), and hearing/vision preference (2%) were selected, followed by the CD preference (50%), and then the municipal employee preference (5%) and the "no preference" (38%) applications.[7]

For each preference, applicants who qualified for the preference group from which the selection was occurring were evaluated under the new random ordering. If the applicant was apparently eligible for an available unit, it was assumed that the applicant would take the unit. If an applicant was eligible for more than one type of unit, the applicant was placed into the smallest number of bedrooms available, favoring a lower rent if eligible for multiple units of the same size. This processing was repeated until the desired number of units for each preference had been reached or the pool of eligible applicants was exhausted.

At each preference processing stage, awarded applicants were evaluated to determine if they satisfied other preference categories that had not yet been processed. For example, if a mobility unit placement also qualified for the CP, they would be counted as satisfying one unit in both preferences. The result of this nested preference was that the number of available units in both preferences would be decreased, and the units available in the no preference or open stage would be increased. The exception to the nested preference process was that a unit could not

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[7] There were exceptions in both the percentage of units and the inclusion/exclusion of these and other preference types based on the specifications of the housing advertisements. In those circumstances, I followed the advertisements and not the typical breakdown of preferences to the extent the data allowed.

satisfy both a mobility and hearing/vision placement. Atypical preferences like veterans'

preference and Hurricane Sandy relief were implemented to the extent to which data was

available within Housing Connect. NYCHA preferences were not implemented in the simulation

due to a lack of information in Housing Connect, but they appear to be relatively few and should

not have a meaningful impact on the analysis.

This process of implementing the preferences in order was performed for all lotteries,

tracking the number of available units of each type, and filling the units until the lottery was

completed. The lotteries were processed in lottery close date order and any applicant who was

selected to receive a unit in any lottery was excluded from all subsequent lotteries within that

simulation. The simulation was repeated one thousand times, each with new random ordering of

applicants. Once the simulation was run with the CP Policy, it was repeated without the CP

Policy.

An alternative variant of the lottery simulation was performed to measure the effects of

households moving from their home census tract to the housing project census tract on the

Dissimilarity Index. In order to perform this analysis, both the source and destination census

tract were required. Because of this restriction, the simulation procedure was identical but was

limited to applicants who could be precisely geocoded, and to the 145 lotteries which had either

a single project address or had multiple addresses within the same census tract. The 145 projects

are noted in Appendix E.

Determining Preference for Awarded Applicants

I relied upon the awarded applicants listing provided in Dr. Beveridge's report. Although

that data contained preference data, it did not specify which preference was used to in the

Consideration Process (explained *supra*, Section IV.A of the report, and Appendix B). It is possible for an awardee to qualify for multiple preferences. For example, a mobility awardee might also live in the project community preference area. Although that award is eligible for community preference, they did not receive their unit as a result of the community preference. So, the existence of preference eligibility alone is insufficient to determine which preference resulted in the award.

To determined which awards were granted due to a NYCHA preference I manually reviewed the status reports.[8] Within the 168 studied lotteries, there were 8 lotteries[9] which had a NYCHA preference. The status sheets for each of the NYCHA lotteries were reviewed to determine which awardees were eligible for the NYCHA preference. The NYCHA preference was used to determine awardees who qualified as a result of NYCHA preference. However, we did not attempt to determine which type of NYCHA sub-preference[10] the preference corresponded to.

In order to determine the qualifying preference, the award preferences were assigned to applicants in the same order the awards should have been selected. During the processing of preference order, we treated NYCHA awards as being processed first before other preferences.[11]

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[8] This was previously included in Appendix H of my Sur-Reply report amended November 12, 2019.

[9] Lotteries numbers 22, 108, 120, 141, 201, 206, 237 and 279 had advertisements specifying a NYCHA preference and had status sheet awardees with NYCHA preference.

[10] There are multiple layers of NYCHA preferences. For instance, there is a preference for NYCHA applicants from certain buildings, the CB, the borough and waitlist.

[11] Initial NYCHA selection was confirmed in all other NYCHA lotteries, except for lottery 22, by confirming that the earliest unit confirmation date for the lottery was for a NYCHA unit. Based on confirmation dates Lottery 22 appears to have processed NYCHA after the disability awards. However, because none of the NYCHA awardees had any nested preferences nor did the NYCHA awards close out any unit type, there was no effect to the order of awards, and they were also processed first.

For example, if a lottery was supposed to place two mobility units[12], the awards would be

searched for any applicant with mobility eligibility. Then the two lowest lottery numbers with a

mobility preference were marked as receiving the mobility preference. The procedure was then

repeated for each subsequent processing stage. If at any point an awarded applicant qualified for

a subsequent preference stage, that award also counted as satisfying one of the subsequent

preference units (e.g. a hearing/vision award who also qualified as a municipal employee). If an

award had nested preferences, an adjustment was made to debit units from subsequent preference

and add them to the open awards. The exception to the nested preference rule was that a unit

could not qualify as satisfying both mobility and hearing/vision.

Determining Whether an Application was Considered for a Unit ("Consideration Process")

To determine who I treated as a "Considered Application" (i.e., who had passed the Stage

2 Consideration Process), I first created lists of apparently eligible applications that were not

awarded a unit with each preference[13]. An application with multiple preferences was on multiple

lists. A distinction was made between apparently eligible applicants who did not receive a unit

because they were excluded for some reason and those who never considered due to a high

lottery number. I assumed that people with lottery numbers lower than highest lottery number of

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[12] Applicants for which their preference was listed as Disability Unspecified (DUNS) we
reviewed the final logs to provide data to determine the specific type of disability preference. We
were able to determine the specific disability preference for all but one case. The one case the
disabled applicant was selected of the municipal employee preference so for our analysis we did
not need to know the specific disability preference for which they were eligible. This was
previously discussed in in Appendix H of my Sur-Reply report amended November 12, 2019.
[13] Although we can potentially identify NYCHA eligible applicants who were not awardees from
the Housing Connect data, we did not have enough data to replicate the sub-preferences process
within the NYCHA preference. To be conservative, no additional applications were designated
considered during the NYCHA preferences.

the awarded application from that preference list had been considered and moved onto Stage 3, the Confirmation stage, with one exception. For instance, if the highest application to have been awarded a unit on the list of CP beneficiary applications was log number 5,000, under my first basic assumption, every apparently eligible application on the list with a lower number than 5,000 would have been considered and moved to Stage 3.

This was done with one significant exception. If the only unit(s) which an apparently eligible application had been eligible were already awarded to applications with a lower lottery number, then that application would not be treated as a Considered Application. Taking the example above, if the highest log number on the CP list was 5,000, and the log number of the application at issue was 1,000, but that application was only eligible for a 3 bedroom unit and all the 3-bedroom units had been filled, and the highest log number that resulted in an award to any 3-bedroom unit was 900, then the application at issue with log number 1,000 would not be a Considered Application, because any eligible units were filled before that log number was reached.[14] However, if a 3-bedroom unit was awarded to log number 2,000 (rather than 900), log number 1,000 would be a Considered Application, as it was considered for a unit and was not awarded a unit for a reason other than lack of availability, as evidenced by the fact that a higher log number was awarded a 3-bedroom unit.

This processing was performed for each applicable preference in a lottery, however there were occasions where a preference did not result in the award of any units. If the failure to award a unit in a preference stage was due to the preference being satisfied by prior selections due to nested preferences, then none of the eligible preference holders where designated as

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[14] If all the units for which the application was eligible were filled prior to processing the preference list in question, the application would not be noted as a Considered Application.

considered. However, if a preference was not exhausted due to nested preferences and no selections were made, it was assumed that all eligible preference holders were considered and did not receive an award. An application which is awarded a unit or was a Considered Application from any preference list was denoted as a Considered Application in my analyses.

DOCUMENTS

1. Beveridge Report dated 04-01-19, Exhibits and Production Documents
2. Beveridge Declaration dated 02-20-2018
3. Beveridge Declaration dated 06-01-17 and Exhibits
4. Beveridge Deposition Transcript dated 05-30-19
5. Data Reconciliation Letter and Exhibits A through D
6. First Amended Complaint on 09-08-15
7. Second Amended Complaint on 06-14-18
8. Protective Order
9. Amended Answer to First Amended Complaint
10. City Data and Lottery Process: NYC_0050656, NYC_0071465, NYC_0071466, NYC_0071477, NYC_0085435, InclusionExclusionDiagram 100217 (PDF), DataSources 100217 (PDF), ProjectUnitSummary 100217 (PDF), SelectHousingConnnectTables 100217(PDF), and The HPD Marketing Handbook http://www1.nyc.gov/assets/hpd/downloads/pdf/developers/marketing-handbook.pdf..
11. LINC V Rental Assistance Program Face Sheet for DHS Clients
12. Data Bates Number Guide for Experts
13. Reconciliation Results
14. Lottery Document Coverage Survey
15. Deposition Transcript dated 06-19-18 and Errata Sheet dated 07-25-18 for Paulina Marek
16. Deposition Transcript dated 11-07-18 and Errata Sheet dated 12-18-18 for Josephine Logozzo
17. Deposition Transcript dated 06-05-18 for Thomas Boman and Victor Hernandez
18. Errata Sheets for Victor Hernandez dated 05-29-18 and 07-27-18
19. Errata Sheet for Thomas Boman dated 07-27-18
20. Deposition Transcript dated 11-07-2018 and Errata Sheet dated 12-18-18 for Vincent Anthony Guglietta
21. Deposition (Day 1 04-12-18) of Gilmore Jones, Srinivas Vallury, Sukhwinder Singh, and Jose De Jesus
22. Deposition (Day 2 04-13-18) of Gilmore Jones, Srinivas Vallury, Sukhwinder Singh, Jose De Jesus and Victor M. Hernandez
23. Errata Sheet for Gilmore Johns dated 06-13-18
24. Error in Awarded Units letter dated 08-08-18
25. Data Question from Plaintiffs letter dated 12-21-18
26. Response to Questions 1-29 from Plaintiffs' Data Questions letter dated 01-07-19
27. Production of Beveridge Program Files for Amended 10-18-19 Expert Report.
28. Beveridge Reported Amended October 27, 2019
29. Deposition Transcript dated 10-04-19 of Professor Andrew A. Beveridge and errata

TABLE D1

Beveridge Table 2-Comparing Each Race's CP Beneficiary Applications as a Percentage of that Race's Total Applications Against the Highest Such Percentage for any Race Citywide

	White	African American	Hispanic	Asian
Percent of Applications with CP Beneficiary	5.399%	5.316%	4.998%	3.414%
Relative Percent by which Highest Race's Rate Exceeds Others	Highest	101.57%	108.03%	158.13%
80% Rule		98.46%	92.56%	63.24%

Source: Beveridge's Exhibit 5

TABLE D2

Beveridge Table 3-Comparing Relative Percentage Change for Each Race from Share of Non-Beneficiary Entrants to Share of CP Beneficiary Entrants Citywide

	White	African American	Hispanic	Asian
Percent among CP Beneficiaries	7.63%	39.70%	36.50%	3.62%
Percent among Non- CP Beneficiaries	7.13%	37.73%	37.02%	5.47%
Difference (among Beneficiaries - among Non-Beneficiaries)	0.5%	2.0%	-0.5%	-1.8%
Relative Change from Non-Beneficiary Rate	6.98%	5.24%	-1.39%	-33.74%

Source: Beveridge's Exhibit 5

TABLE D3

Beveridge Table 5-Comparing Each Race's CP Beneficiary
Apparently Eligible Applications as a Percentage of that Race's Total Applications
Against the Highest Such Percentage for any Race Citywide

	White	African American	Hispanic	Asian
Percent of Apparently Eligible Applications with CP Beneficiary	6.161%	5.786%	5.340%	3.809%
Relative Percent by which Highest Race's Rate Exceeds Others	Highest	106.47%	115.37%	161.75%
80% Rule		93.93%	86.68%	61.82%

Source: Beveridge's Amended Exhibit 6

Amended December 12, 2019

Note: Amended due to Beveridge amending his Exhibit 6.

TABLE D4

Beveridge Table 6-Comparing Relative Percentage Change for Each Race
from Share of Non-Beneficiary Apparently Eligible Applications
to Share of CP Beneficiary Entrants Citywide

	White	African American	Hispanic	Asian
Percent among CP Beneficiaries	9.07%	41.86%	37.71%	4.23%
Percent among Non-CP Beneficiaries	8.00%	39.46%	38.70%	6.19%
Difference (among Beneficiaries - among Non-Beneficiaries)	1.1%	2.4%	-1.0%	-2.0%
Relative Change from Non-Beneficiary Rate	13.39%	6.08%	-2.57%	-31.61%

Source: Beveridge's Amended Exhibit 6

Amended December 12, 2019

Note: Amended due to Beveridge amending his Exhibit 6.

CD Census Tract Disconnect	Projects Used in Segregation Study	Proj No	Project Name	Boro Code	CB 1	CB 2	CB 3	CB 4	Lottery End	Address(es)	Boro	CB	County	Tract	NTA	Beveridge Race Typology	ACS Project CP Area	ACS Address CB	ACS NTA	ACS Tract
	yes	1	Richmond Place	4	9				8/6/2012	129-11 Jamaica Avenue, Jamaica, NY 11418	4	9	081	014201	QN54	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Maj hispanic
yes	yes	2	Westwind Houses	1	11				8/6/2012	45 E 131st St, New York, NY 10037	1	11	061	020600	MN03	Plur hispanic	Plur hispanic	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	4	11 Broadway Residential LLC	3	1				10/11/2012	15 Dunham Pl, Brooklyn, NY 11249	3	1	047	054900	BK73	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	5	Prospect Court LLC	2	2				12/5/2012	1224 Prospect Ave, Bronx, NY 10459	2	2	005	013100	BX33	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	7	26th Street Affordable	1	4				2/9/2013	260 W 26th St, New York, NY 10001	1	4	061	009100	MN13	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	8	COURTLANDT CRESCENT	2	3				2/14/2013	927 Courtlandt Ave, Bronx, NY 10451	2	3	005	014300	BX14	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	9	Coney Island Commons	3	13				4/2/2013	2960 W 29th St, Brooklyn, NY 11224; 2961 W 29th St, Brooklyn, NY 11224	3	13	047	034200	BK21	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_Black	Plur nh_Black
	yes	10	LINDENGUILD HALL	2	3				5/16/2013	3859 3rd Ave, Bronx, NY 10457	2	3	005	016700	BX01	Maj nh_black	Maj hispanic	Maj hispanic	Maj hispanic	Maj nh_Black
	yes	11	East Clarke Place Court	2	4				5/27/2013	12 E Clarke Pl, Bronx, NY 10452; 27 E 169th St, Bronx, NY 10452	2	4	005	022101	BX63	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	12	St. Nicholas Park	1	10				6/2/2013	306 W 128th St, New York, NY 10027	1	10	061	021500	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
yes	yes	13	Harlem River Point North	1	11				7/1/2013	121 E 131st St, New York, NY 10037; 1951 Park Ave, New York, NY 10037	1	11	061	024200	MN34	Plur hispanic	Plur hispanic	Plur hispanic	Maj hispanic	Plur nh_Black
	yes	14	50 North Fifth Street	3	1				7/1/2013	50 N 5th St, Brooklyn, NY 11249	3	1	047	055500	BK73	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	16	Macedonia Plaza	4	7				9/30/2013	36-08 Union St, Flushing, NY 11354	4	7	081	086900	QN22	Maj nh_asian	Plur nh_Asian	Plur nh_Asian	Maj nh_Asian	Maj nh_Asian
	yes	17	500 West 30th Street	1	4				9/30/2013	500 W 30th St, New York, NY 10001	1	4	061	009900	MN13	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	no	18	Maple Mesa	2	3	4			10/7/2013	232 E 169th St, Bronx, NY 10456	2	4	005	017901	BX14	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										601 E 163rd St, Bronx, NY 10456	2	3	005	018500	BX35	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	19	525 W 28th Street Apts	1	4				10/10/2013	282 11th Ave, New York, NY 10001; 525 W 28th Street, New York, NY 10001	1	4	061	009900	MN13	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	no	20	Lebanon West Farms	2	6				10/17/2013	1172 E Tremont Ave, Bronx NY 10460	2	6	005	006000	BX75	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										1160 Lebanon St, Bronx NY 10460; 1175 E Tremont Ave, Bronx NY 10460	2	6	005	022000	BX17	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	21	Harlem River Point South	1	11				8/24/2013	200 E 131st St, New York, NY 10037	1	11	061	024200	MN34	Plur hispanic	Plur hispanic	Plur hispanic	Maj hispanic	Plur nh_Black
	yes	22	Highbridge Overlook	2	4				9/24/2013	240 W 167th St, Bronx, NY 10452	2	4	005	019300	BX26	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	23	Bethany Place	1	10				8/29/2013	301 W 153rd St, New York, NY 10039	1	10	061	023502	MN03	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	no	24	Cypress Village	3	5				9/7/2013	315 Jerome St, Brooklyn NY 11207	3	5	047	115000	BK82	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										371 Van Siclen Ave, Brooklyn NY 11207	3	5	047	116000	BK82	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										525 Linwood St, Brooklyn NY 11208	3	5	047	116400	BK82	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
yes	yes	25	Q41	4	1				9/15/2013	23-10 41st Ave, Long Island City NY 11101	4	1	081	003300	QN68	Plur nh_White	Plur nh_White	Plur nh_White	Plur hispanic	Plur nh_Asian
	yes	27	Belmont Commons	2	6				12/2/2013	499 East 188th Street, Bronx NY 10458	2	6	005	038700	BX06	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	28	Mennonite United Revival Apartments	3	4				11/25/2013	424 Melrose Street, Brooklyn NY 11237	3	4	047	042700	BK77	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	29	Sugar Hill Apartments	1	9				1/3/2014	404 West 155th Street, New York, NY 10032	1	9	061	023501	MN04	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Plur nh_Black
yes	no	75	Dougert Realty Round II LLC	2	6	12			1/21/2014	2076 Belmont Ave, Bronx NY 10457; 2121 Belmont Ave, Bronx NY 10457	2	6	005	037300	BX17	Plur nh_black	Maj nh_Black	Maj hispanic	Maj hispanic	Maj hispanic
										755 East 224th St, Bronx NY 10466; 812 East 226th St, Bronx NY 10466	2	12	005	040600	BX44	Plur nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	80	Alphabet Plaza	1	3				2/18/2014	310 East 2nd St, New York, NY 10009	1	3	061	002202	MN28	Plur nh_White	Plur nh_White	Plur nh_White	Plur hispanic	Maj nh_White
yes	yes	82	Rufus King Apartments	4	12				3/6/2014	148-19 90th Ave, Jamaica NY 11435	4	12	081	024000	QN61	Maj nh_black	Maj nh_Black	Maj nh_Black	Plur hispanic	Maj hispanic
yes	yes	83	Norman Towers	4	12				3/24/2014	90-11 161st St, Jamaica NY 11432; 90-14 161st St, Jamaica NY 11432	4	12	081	044601	QN61	Maj nh_black	Maj nh_Black	Maj nh_Black	Plur hispanic	Plur hispanic
	yes	84	2017 Morris Avenue	2	5				2/20/2014	2017 Morris Ave, Bronx NY 10453	2	5	005	024100	BX41	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	85	Morris Court Apartments	2	1				4/7/2014	250 E. 144th St, Bronx NY 10451; 253 E. 142nd St, Bronx NY 10451	2	1	005	005100	BX39	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	86	The Roosevelt	4	4				2/25/2014	40-07 73rd St, Woodside NY 11377	4	4	081	026500	QN50	Maj hispanic	Maj hispanic	Maj hispanic	Maj nh_Asian	Maj nh_Asian
	yes	87	57 and 59 Orient Avenue	3	1				3/21/2014	57 Orient Ave, Brooklyn NY 11211	3	1	047	047700	BK90	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_White	Maj nh_White
	yes	88	Utica Place Residential	3	8				5/13/2014	1339 Lincoln Pl, Brooklyn NY 11213	3	8	047	035100	BK61	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	89	Harlem West 117	1	10				5/5/2014	24 West 117th St, New York, NY 10035	1	10	061	019000	MN11	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	90	Knickerbocker Commons	3	4				3/31/2014	803 Knickerbocker Ave, Brooklyn NY 11207	3	4	047	043700	BK77	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	91	Crossroads Plaza III	2	1				5/16/2014	535 Union Ave, Bronx, NY 10455	2	1	005	003100	BX39	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	92	The Stack	1	12				4/4/2014	4857 Broadway, New York NY 10034	1	12	061	029500	MN01	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	93	1070 Washington Avenue	2	3				4/28/2014	1070 Washington Ave, Bronx NY 10456	2	3	005	018500	BX35	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	94	1133 Manhattan Avenue	3	1				7/16/2014	1133 Manhattan Ave, Brooklyn NY 11222	3	1	047	056300	BK76	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	95	Elliot J Hobbs Gardens	3	3				7/25/2014	482 Franklin Ave, Brooklyn NY 11238	3	3	047	022700	BK69	Maj nh_black	Maj nh_Black	Maj nh_Black	Plur nh_White	Maj nh_Black
	yes	96	El Barrio Artspace PS109	1	11				7/14/2014	215 E 99th St, New York NY 10029	1	11	061	016400	MN33	Artspace	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic
yes	no	98	FAC Advance	3	2	6	7		6/13/2014	258 51st St, Brooklyn NY 11220	3	7	047	002000	BK32	Plur nh_White	Plur nh_White	Plur hispanic	Plur hispanic	Plur hispanic
yes										31 St Mark's Place, Brooklyn NY 11217	3	2	047	012700	BK38	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_Black
										237 5th Ave, Brooklyn NY 11215	3	6	047	013300	BK37	Plur nh_White	Plur nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	no	99	Pass Properties BK LLC	3	3	8			6/26/2014	186 Stuyvesant Ave, Brooklyn NY 11221	3	3	047	029300	BK35	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										752 Putnam Ave, Brooklyn NY 11221	3	3	047	029500	BK35	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										108 Albany Ave, Brooklyn NY 11213	3	8	047	031100	BK61	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										1429 Sterling Pl, Brooklyn NY 11213	3	8	047	034500	BK61	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	100	WFHA East 147th Street	2	1				7/25/2014	539 East 147th St, Bronx NY 10455	2	1	005	004300	BX39	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	102	1690 Nelson Ave	2	5				9/3/2014	1690 Nelson Ave, Bronx NY 10453	2	5	005	021502	BX36	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic

CD Census Tract Disconnect	Projects Used in Segregation Study	Proj No	Project Name	Boro Code	CB 1	CB 2	CB 3	CB 4	Lottery End	Address(es)	Boro	CB	County	Tract	NTA	Beveridge Race Typology	ACS Year Race Typology Project CP Area	Address CB	NTA	Tract
	no	105	WHGA Schomburg Place	1	9	10			9/16/2014	8 St Nicholas Terrace, New York, NY 10027	1	9	061	021303	MN06	Plur nh_black	Plur nh_Black	Plur hispanic	Maj hispanic	Plur nh_Black
										110 W 114th St, New York, NY 10026	1	10	061	021600	MN11	Plur nh_black	Plur nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										241 W 137th St, New York, NY 10030	1	10	061	022800	MN03	Plur nh_black	Plur nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										271 W 150th St, New York, NY 10039	1	10	061	023600	MN03	Plur nh_black	Plur nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	106	287 West 150th Street	1	10				10/27/2014	287 W 150th St, New York, NY 10039	1	10	061	023600	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	107	2311 Tiebout Avenue	2	5				11/10/2014	2311 Tiebout Avenue, Bronx, NY 10468	2	5	005	038301	BX40	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	108	Yomo Toro Apartments	1	11				11/17/2014	222 E 104th St, New York, NY 10029	1	11	061	016400	MN33	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic
	no	109	BRADHURST CORNERSTONE PHASE II		10				11/10/2014	312 W 112th St, New York, NY 10026	1	10	061	019702	MN11	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Plur nh_Black
										215 W 115th St, New York, NY 10026	1	10	061	021800	MN11	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										228 W 116th St, New York, NY 10026										
										274 W 117th St, New York, NY 10026										
yes	yes	110	552 Academy Street	1	12				11/24/2014	552 Academy St, New York, NY 10034	1	12	061	029100	MN01	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	111	Hunters Point South Living	4	2				12/15/2014	1-50 50th Ave, Long Island City, NY 11101	4	2	081	000100	QN31	Plur hispanic	Plur hispanic	Plur hispanic	Plur nh_White	Maj nh_White
										1-55 Borden Ave, Long Island City, NY 11101										
	yes	114	2999 Webster Ave	2	7				11/5/2014	2999 Webster Ave, Bronx NY 10458	2	7	005	041500	BX05	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	115	59 Frost Street	3	1				12/22/2014	59 Frost St, Brooklyn NY 11211	3	1	047	051500	BK73	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	116	2985 and 2987 Webster Ave	2	7				11/14/2014	2985 Webster Ave, Bronx NY 10458	2	7	005	041500	BX05	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	117	338 and 340 Eldert Street	3	4				11/14/2014	338 Eldert St, Brooklyn NY 11237	3	4	047	043700	BK77	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	118	Park West Apartments	2	9				1/20/2015	2026 Westchester Ave, Bronx, NY 10462	2	9	005	009200	BX59	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	120	Mother Arnetta Crawford Apartments	2	3				1/21/2015	1500 Hoe Ave, Bronx, NY 10460	2	3	005	015700	BX75	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	no	121	TPT Homes in Harlem Phase 1	1	10	11			12/19/2014	2353 2nd Ave, New York, NY 10035	1	11	061	019400	MN34	Plur nh_black	Plur nh_Black	Plur hispanic	Plur hispanic	Maj hispanic
										158 W 122nd St, New York, NY 10027	1	10	061	022000	MN11	Plur nh_black	Plur nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										152 W 124th St, New York, NY 10027	1	10	061	022200	MN11	Plur nh_black	Plur nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	124	Webster Commons A B	2	12				2/20/2015	3560 Webster Ave, Bronx, NY 10467	2	12	005	043500	BX99	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	125	Gateway Elton II	3	5				2/19/2015	516 Vandalia Avenue, Brooklyn NY 11239	3	5	047	107000	BK82	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										524 Vandalia Avenue, Brooklyn NY 11239										
										526 Schroeders Avenue, Brooklyn NY 11239										
	yes	126	Westchester Point	2	2				2/25/2015	899 Westchester Ave, Bronx NY 10459	2	2	005	012901	BX33	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	no	131	Davidson Avenue Cluster	2	5				1/5/2015	1664 Davidson Ave, Bronx, NY 10453	2	5	005	021700	BX36	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										1702 Davidson Ave, Bronx, NY 10453										
										1770 Davidson Ave, Bronx, NY 10453										
										1780 Davidson Ave, Bronx, NY 10453										
										1750 Monroe Ave, Bronx, NY 10457	2	5	005	022901	BX41	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	132	1238 Decatur Street	3	4				1/7/2015	1238 Decatur St, Brooklyn, NY 11207	3	4	047	041100	BK78	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	133	200 East 39th Street	1	6				3/16/2015	200 East 39th Street, New York, NY 10016	1	6	061	007800	MN20	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	135	88 Jefferson Street	3	4				3/3/2015	88 Jefferson Street, Brooklyn, NY 11206	3	4	047	039100	BK78	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	136	40 Riverside Boulevard	1	7				4/20/2015	470 West 62nd Street, New York, NY 10023	1	7	061	015100	MN14	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_White
	no	137	133 Equities	1	10				4/20/2015	63 West 137th Street, New York, NY 10037	1	10	061	021200	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										229 West 121st Street, New York, NY 10027	1	10	061	022000	MN11	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										119 West 133rd Street, New York, NY 10030	1	10	061	022600	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	138	Prospero Hall	1	11				5/5/2015	100 East 118th St, New York, NY 10035	1	11	061	018200	MN34	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Maj hispanic
	yes	140	Atlantic Commons Phase II	3	16				5/27/2015	1459 St Marks Ave, Brooklyn, NY 11233	3	16	047	030300	BK79	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										1969 Bergen St, Brooklyn, NY 11233										
										404 Howard Ave, Brooklyn, NY 11233										
										414 Howard Ave, Brooklyn, NY 11233										
	yes	141	Soundview Family Housing	2	9				6/1/2015	401 Bronx River Ave, Bronx, NY 10473	2	9	005	002400	BX99	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	142	160 Madison Ave	1	5				6/1/2015	160 Madison Ave, New York, NY 10016	1	5	061	007400	MN17	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	145	1802 Crotona Avenue	2	6				4/23/2015	1802 Crotona Ave, Bronx, NY 10457	2	6	005	036902	BX17	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	146	207 West 115th Street	1	10				4/28/2015	207 West 115th St, New York, NY 10026	1	10	061	021800	MN11	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	147	1016 Washington Avenue	2	3				6/8/2015	1016 Washington Avenue, Bronx, NY 10456	2	3	005	018500	BX35	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	148	570 Willoughby Avenue	3	3				5/1/2015	570 Willoughby Ave, Brooklyn, NY 11206	3	3	047	026100	BK75	Maj nh_black	Maj nh_Black	Maj nh_Black	Plur nh_Black	Maj nh_Black
yes	yes	149	490 Myrtle Avenue	3	2				6/11/2015	490 Myrtle Ave, Brooklyn, NY 11205	3	2	047	019300	BK69	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_Black
	no	150	NIA JV LLC	3	3	8			5/13/2015	96 Brooklyn Ave, Brooklyn, NY 11216	3	8	047	031300	BK61	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										177 Rogers Ave, Brooklyn, NY 11216	3	8	047	031702	BK61	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										233 Ralph Ave, Brooklyn, NY 11233	3	3	047	037900	BK35	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										295A Bainbridge St, Brooklyn, NY 11233	3	3	047	038100	BK61	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	no	170	Livonia Commons	3	5				7/1/2015	491 Sheffield Ave, Brooklyn, NY 11207	3	5	047	112600	BK85	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										494 Sheffield Ave, Brooklyn, NY 11207										
										481 Williams Ave, Brooklyn, NY 11207	3	5	047	113000	BK85	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										494 Georgia Ave, Brooklyn, NY 11207										
	yes	171	West Tremont Residences	2	5				6/30/2015	92 West Tremont Ave, Bronx, NY 10453	2	5	005	021700	BX36	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	172	605 West 42nd Street	1	4				7/13/2015	605 W 42nd St, New York, NY 10036	1	4	061	012900	MN15	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	173	169-30 Baisley Boulevard	4	12				7/15/2015	169-30 Baisley Blvd, Jamaica, NY 11436	4	12	081	033401	QN08	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
yes	yes	175	331 East Houston Street	1	3				6/29/2015	331 E Houston St, New York, NY 10002	1	3	061	002201	MN28	Plur nh_White	Plur nh_White	Plur nh_White	Plur hispanic	Plur hispanic

CD Census Tract Disconnect	Projects Used in Segregation Study	Proj No	Project Name	Boro Code	CB 1	CB 2	CB 3	CB 4	Lottery End	Address(es)	Boro	CB	County	Tract	NTA	Beveridge Race Typology	ACS Project CP Area	ACS Address CB	ACS NTA	ACS Tract
	yes	176	Bridge 145 LLC	1	10				8/3/2015	151 W 145th St, New York, NY 10039	1	10	061	023200	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										2468 Adam Clayton Powell Jr Blvd, New York, NY 10030										
	no	179	Heights 150th Street	1	9				8/12/2015	1772 Amsterdam Ave, New York, NY 10031	1	9	061	023300	MN04	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic
yes										801 St Nicholas Ave, New York, NY 10031	1	9	061	023501	MN04	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic
	yes	180	184 Monroe Street	3	3				7/13/2015	184 Monroe St, Brooklyn, NY 11216	3	3	047	024500	BK75	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	181	Arthur Avenue Apartments	2	6				9/3/2015	600 E 181st St, Bronx, NY 10457	2	6	005	037300	BX17	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	182	382 Lefferts Avenue	3	9				9/22/2015	382 Lefferts Ave, Brooklyn, NY 11225	3	9	047	080400	BK60	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	183	City Point Tower I	3	2				9/24/2015	7 Dekalb Ave, Brooklyn, NY 11201	3	2	047	001500	BK38	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White
yes	no	185	Park Monroe II Apartments	3	2	3	8	16	10/5/2015	342 Lafayette Ave, Brooklyn, NY 11238	3	2	047	023100	BK69	Maj nh_black	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White
										495 Putnam Ave, Brooklyn, NY 11221	3	3	047	026700	BK75	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										1169 E New York Ave, Brooklyn, NY 11212	3	8	047	035900	BK61	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										1920 Union St, Brooklyn, NY 11233										
										1933 Union St, Brooklyn, NY 11233										
										1939 Park Pl, Brooklyn, NY 11233	3	16	047	036300	BK79	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										862 Macon St, Brooklyn, NY 11233	3	16	047	037300	BK79	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										864 Macon St, Brooklyn, NY 11233										
										868 Macon St, Brooklyn, NY 11233										
	yes	186	331 Saratoga Avenue	3	16				10/5/2015	331 Saratoga Ave, Brooklyn, NY 11233	3	16	047	030300	BK79	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	188	65 Park Place	3	6				10/13/2015	65 PARK PLACE, BROOKLYN, NY 11217	3	6	047	012902	BK37	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	189	My Micro NY	1	6				11/2/2015	335 E 27th St, New York, NY 10016	1	6	061	006600	MN20	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	no	192	S-Five Properties LLC	3	3	4	16		11/9/2015	25 Madison St, Brooklyn, NY 11238	3	3	047	022900	BK69	Plur nh_black	Maj nh_Black	Maj nh_Black	Plur nh_Black	Maj nh_Black
										354 Saratoga Ave, Brooklyn, NY 11233	3	16	047	030300	BK79	Plur nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										1752 Sterling Pl, Brooklyn, NY 11233	3	16	047	036100	BK79	Plur nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										1719 Sterling Pl, Brooklyn, NY 11233	3	16	047	036300	BK79	Plur nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										1725 Sterling Pl, Brooklyn, NY 11233										
yes										163 Suydam St, Brooklyn, NY 11221	3	4	047	042300	BK78	Plur nh_black	Maj nh_Black	Maj hispanic	Maj hispanic	Maj hispanic
	yes	193	535W43	1	4				11/10/2015	535 W 43rd St, New York, NY 10036	1	4	061	012900	MN15	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	194	21 West End Avenue APTS	1	7				11/12/2015	21 West End Ave, New York, NY 10023	1	7	061	015100	MN14	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_White
	yes	195	223 N 8th Street	3	1				10/9/2015	223 N 8th St, Brooklyn, NY 11211	3	1	047	051900	BK73	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	196	COMPASS RESIDENCES 1A AND 1B	2	3				11/20/2015	1490 Boone Ave, Bronx, NY 10460	2	3	005	015700	BX75	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										1500 Boone Ave, Bronx, NY 10460										
	yes	198	RUBIN WOLF RESIDENCES	2	12				11/30/2015	3629 White Plains Rd, Bronx, NY 10467	2	12	005	037800	BX44	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	199	Norwood Terrace Apartments	2	7				11/30/2015	3349 Webster Ave, Bronx, NY 10467	2	7	005	042902	BX43	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	201	Randolph Houses	1	10				12/11/2015	202 W 114th St, New York, NY 10026	1	10	061	021600	MN11	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	202	Bridge Land West	1	1				12/14/2015	456 Washington St, New York, NY 10013	1	1	061	003900	MN24	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	206	1743-1765 Prospect Place	3	16				1/19/2016	1743 Prospect Pl, Brooklyn, NY 11233	3	16	047	036300	BK79	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	208	205 East 92nd Street	1	8				2/1/2016	205 East 92nd Street, New York, NY 10128	1	8	061	015400	MN32	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	no	210	Kings Villas	3	1	3	4	5	2/4/2016	663 Willoughby Ave, Brooklyn, NY 11206	3	3	047	028300	BK35	Plur nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										178 Rockaway Ave, Brooklyn, NY 11233	3	16	047	030100	BK79	Plur nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
yes										76 Grove St, Brooklyn, NY 11221	3	4	047	039900	BK78	Plur nh_black	Maj nh_Black	Maj hispanic	Maj hispanic	Maj hispanic
yes										275 Menahan St, Brooklyn, NY 11237	3	4	047	043300	BK77	Plur nh_black	Maj nh_Black	Maj hispanic	Maj hispanic	Maj hispanic
yes										717 Flushing Ave, Brooklyn, NY 11206	3	1	047	050700	BK75	Plur nh_black	Maj nh_White	Maj nh_White	Plur nh_Black	Maj nh_Black
										160 Glenmore Ave, Brooklyn, NY 11212	3	16	047	090800	BK81	Plur nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										877 Dumont Ave, Brooklyn, NY 11207	3	5	047	116200	BK82	Plur nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	211	21 Commercial Street	3	1				2/3/2016	21 Commercial St, Brooklyn, NY 11222	3	1	047	056300	BK76	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	212	640 Broadway HDFC	3	1				1/11/2016	640 Broadway, Brooklyn, NY 11206	3	1	047	050700	BK75	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_Black	Maj nh_White
	yes	215	1770 Madison Avenue LLC	1	11				1/26/2016	1770 Madison Ave, New York, NY 10035	1	11	061	018400	MN34	Plur hispanic	Plur hispanic	Plur hispanic	Maj hispanic	Maj hispanic
	yes	216	West 170th Street Ogden LP	2	4				1/27/2016	127 West 170th Street, Bronx, NY 10452	2	4	005	021100	BX26	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	218	Bronx Living LLC	2	4				2/1/2016	1138 TELLER AVENUE, BRONX, NY 10456	2	4	005	017500	BX14	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	219	1035 Anderson Avenue	2	4				2/3/2016	1035 ANDERSON AVENUE, BRONX, NY 10457	2	4	005	018900	BX26	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	220	Ashland Lottery- 250 Ashland Place	3	2				4/11/2016	250 Ashland Pl, Brooklyn, NY 11217	3	2	047	003300	BK68	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White
yes	yes	222	WHGA Schomburg Place LP	1	11				2/16/2016	2049 5th Ave, New York, NY 10035	1	11	061	020600	MN03	Plur hispanic	Plur hispanic	Plur hispanic	Maj nh_Black	Maj nh_Black
	yes	223	THE RESIDENCES AT PS 186	1	9				4/8/2016	526 W 146th St, New York, NY 10031	1	9	061	022900	MN04	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Maj hispanic
	yes	224	EOS 855 Avenue of the Americas	1	5				4/11/2016	855 6th Ave, New York, NY 10001	1	5	061	010100	MN17	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	225	149 Kent Apartments	3	1				4/11/2016	149 Kent Ave, Brooklyn, NY 11249	3	1	047	055500	BK73	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	226	West 153 Owner LLC	1	10				4/12/2016	260 W 153rd St, New York, NY 10039	1	10	061	023600	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
yes	yes	229	ENCLAVE AT THE CATHEDRAL	1	9				4/12/2016	400 W 113th St, New York, NY 10025	1	9	061	019701	MN09	Plur hispanic	Plur hispanic	Plur hispanic	Plur nh_White	Plur nh_White
	no	230	WILLIAMSBURG APARTMENTS	3	1				4/29/2016	37 Maujer St, Brooklyn, NY 11206	3	1	047	051300	BK73	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
										37 Ten Eyck St, Brooklyn, NY 11206										
yes										356 Bedford Ave, Brooklyn, NY 11211	3	1	047	055100	BK73	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj hispanic
	yes	231	Harlem Dowling Alembic LLC	1	10				5/10/2016	2139 Adam Clayton Powell Jr Blvd, New York, NY 10027	1	10	061	022400	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	232	33 Eagle Street	3	1				5/16/2016	33 Eagle St, Brooklyn, NY 11222	3	1	047	056300	BK76	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	no	234	TPT Homes in Harlem Phase ll	1	10	11			4/19/2016	70 E 127th St, New York, NY 10035	1	11	061	020600	MN03	Plur nh_black	Plur nh_Black	Plur hispanic	Maj nh_Black	Maj nh_Black

CD Census Tract Disconnect	Projects Used in Segregation Study	Proj No	Project Name	Boro Code	CB 1	CB 2	CB 3	CB 4	Lottery End	Address(es)	Boro	CB	County	Tract	NTA	Beveridge Race Typology	Project CP Area	Address CB	NTA	Tract
										152 W 124th St, New York, NY 10027	1	10	061	022200	MN11	Plur nh_black	Plur nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
yes	yes	236	71 East 110th Street	1	11				4/25/2016	71 EAST 110 STREET, NEW YORK NY 10029	1	11	061	017402	MN33	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Plur nh_Black
	yes	237	Oceanhill II	3	16				6/15/2016	1740 Prospect Pl, Brooklyn, NY 11233	3	16	047	036300	BK79	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										396 Saratoga Ave, Brooklyn, NY 11233										
	no	247	MGM APARTMENTS	2	4	9			6/24/2016	1585 E 172nd St, Bronx, NY 10472	2	9	005	005600	BX08	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										1589 E 172nd St, Bronx, NY 10472										
										1265 Morrison Ave, Bronx, NY 10472	2	9	005	006200	BX08	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										1268 Stratford Ave, Bronx, NY 10472										
										1350 University Ave, Bronx, NY 10452	2	4	005	020100	BX26	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										1479 Macombs Rd, Bronx, NY 10452	2	4	005	021302	BX26	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	248	1674 Park Avenue Apartments	1	11				5/17/2016	1674 PARK AVENUE, NEW YORK, NY 10035	1	11	061	018400	MN34	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic	Plur hispanic
	yes	250	CROTONA TERRACE BUILDING A	2	3				7/1/2016	950 E 176th St, Bronx, NY 10460	2	3	005	016100	BX75	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	251	555TEN	1	4				7/6/2016	555 10th Ave, New York, NY 10036	1	4	061	011700	MN13	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	253	Morris Avenue Apartments	2	1				7/8/2016	655 Morris Ave, Bronx, NY 10451	2	1	005	006500	BX34	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	255	70 Charlton	1	2				7/20/2016	70 Charlton St, New York, NY 10014	1	2	061	003700	MN24	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	256	30 AND 40 ORIENT AVENUE APARTMENTS	3	1				6/15/2016	30 Orient Ave, Brooklyn, NY 11211	3	1	047	048100	BK90	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_White	Plur nh_White
										42 Orient Ave, Brooklyn, NY 11211										
	yes	257	Crossroads II Plaza	2	1				7/25/2016	500 Union Ave, Bronx, NY 10455	2	1	005	003100	BX39	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	258	505 St Marks Avenue	3	8				7/26/2016	505 ST. MARKS AVENUE, BROOKLYN, NY 11238	3	8	047	030500	BK61	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Plur nh_White
	no	260	133 Equities Phase II	1	10				7/29/2016	63 West 137th Street, New York, NY 10037	1	10	061	021200	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										235 West 116th Street, New York, NY 10026	1	10	061	021800	MN11	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										119 West 133rd Street, New York, NY 10030	1	10	061	022600	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										123 West 133rd Street, New York, NY 10030										
										132 West 133rd Street, New York, NY 10030										
	yes	261	Brook Avenue Apartments	2	1				8/1/2016	463 East 147th Street, BRONX, NY 10455	2	1	005	004300	BX39	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										469 East 147th Street, BRONX, NY 10455										
	yes	262	West of Ninth	1	4				6/27/2016	424 WEST 55TH STREET, NEW YORK, NY 10019	1	4	061	013900	MN15	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	263	Webster Commons E	2	12				8/5/2016	3556 Webster Ave, Bronx, NY 10467	2	12	005	043500	BX99	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	267	Bushwick Place Venture LLC	3	1				7/12/2016	83 Bushwick Place, Brooklyn, NY 11206	3	1	047	048500	BK78	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_White
	yes	268	Jackson Estate ll LLC	3	1				7/13/2016	11 Jackson Street, Brooklyn, NY 11211	3	1	047	051500	BK73	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	269	7 West 21 Street	1	5				8/23/2016	7 West 21st Street, New York, NY 10010	1	5	061	005800	MN13	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	270	Bridge Land Hudson LLC	1	2				8/31/2016	261 Hudson St, New York, NY 10013	1	2	061	003700	MN24	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
yes	yes	271	11-07 Welling Court	4	1				7/22/2016	11-07 Welling Ct, Astoria, NY 11102	4	1	081	008100	QN71	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White	Plur hispanic
	yes	272	GATEWAY ELTON III	3	5				9/2/2016	1062 Elton St, Brooklyn, NY 11207	3	5	047	107000	BK82	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										475 Locke Street, Brooklyn, NY 11239										
	yes	275	3160 Park Avenue	2	3				9/9/2016	3160 Park Ave, Bronx, NY 10451	2	3	005	014100	BX35	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	276	535 Carlton Pacific Park Brooklyn	3	2	3	6	8	9/15/2016	535 Carlton Ave, Brooklyn, NY 11238	3	8	047	016300	BK64	Plur nh_White	Plur nh_Black	Maj nh_Black	Plur nh_White	Maj nh_White
	no	277	GM Properties II	2	5	9			9/16/2016	1167 Stratford Ave, Bronx, NY 10472	2	9	005	004800	BX55	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										100 W 174th St, Bronx, NY 10453	2	5	005	021502	BX36	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
										1636 University Ave, Bronx, NY 10453										
	yes	278	Strivers Plaza	1	10				9/23/2016	275 W 140th St, New York, NY 10030	1	10	061	023000	MN03	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	no	279	STANLEY COMMONS	3	5				9/27/2016	910 Hendrix St, Brooklyn, NY 11207	3	5	047	110400	BK82	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										271 Wortman Ave, Brooklyn, NY 11207	3	5	047	110600	BK82	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
										656 Stanley Ave, Brooklyn, NY 11207										
										869 Van Siclen Ave, Brooklyn, NY 11207										
										879 Van Siclen Ave, Brooklyn, NY 11207										
										924 Hendrix St, Brooklyn, NY 11207										
	yes	281	The Brooklyn Grand	3	1				8/17/2016	774 Grand Street, Brooklyn, NY 11211	3	1	047	049500	BK90	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_White	Maj nh_White
	yes	284	Summit Ridge	2	4				10/7/2016	950 Summit Ave, Bronx, NY 10452	2	4	005	018900	BX26	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	285	West 38th Street Apartments	1	4				10/4/2016	509 West 38th Street, New York NY 10018	1	4	061	011700	MN13	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
	yes	286	3677 White Plains RD	2	12				10/7/2016	3677 WHITE PLAINS RD, BRONX, NY 10467	2	12	005	037800	BX44	Maj nh_black	Maj nh_Black	Maj nh_Black	Maj nh_Black	Maj nh_Black
	yes	287	525 W 52nd Street APTS	1	4				10/8/2016	525 W. 52nd STREET, NEW YORK, NY 10019	1	4	061	013500	MN15	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_White	Maj nh_White
	yes	289	1907 SOUTHERN BOULEVARD	2	3				9/1/2016	1907 SOUTHERN BLVD, BRONX, NY 10460	2	6	005	036502	BX17	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	290	6155 Broadway	2	8				9/2/2016	6155 BROADWAY, BRONX, NY 10471	2	8	005	035100	BX22	Plur hispanic	Plur hispanic	Plur hispanic	Maj nh_White	Maj nh_White
		298	435 West 31 Apartments	1	4				11/7/2016	435 West 31st Street, New York, NY 10001	1	4	061	010300	MN13	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
yes	yes	299	2222 JACKSON AVENUE APARTMENTS	4	2				11/9/2016	46-10 Crane Street, Long Island City, NY 11101	4	2	081	001900	QN31	Plur hispanic	Plur hispanic	Plur hispanic	Plur nh_White	Plur nh_White
	yes	300	28-22 ASTORIA BOULEVARD APARTMENTS	4	1				10/3/2016	28-22 ASTORIA BOULEVARD, ASTORIA, NEW YORK 11102	4	1	081	006900	QN71	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White
	yes	301	44-46 Stanhope Street LLC	3	4				10/5/2016	44 Stanhope Street, Brooklyn, NY 11221	3	4	047	042100	BK78	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	304	THE MEEKERMAN	3	1				12/8/2016	410 Manhattan Ave, Brooklyn, NY 11211	3	1	047	049700	BK90	Maj nh_White	Maj nh_White	Maj nh_White	Plur nh_White	Maj nh_White
	yes	310	Five Blue Slip	3	1				12/29/2016	5 Blue Slip, Brooklyn, NY 11222	3	1	047	056300	BK76	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White	Maj nh_White
yes	yes	311	9306 Shore Front	4	14				12/27/2016	9306 Shore Front Pkwy, Far Rockaway, NY 11693	4	14	081	094203	QN12	Plur nh_black	Plur nh_Black	Plur nh_Black	Plur nh_Black	Maj nh_White
	yes	313	2346 Prospect Avenue	2	6				12/14/2016	2346 PROSPECT AVENUE, BRONX, NY 10458	2	6	005	039300	BX06	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
yes	yes	315	504 Myrtle Avenue	3	2				2/1/2017	504 Myrtle Avenue, Brooklyn, NY 11205	3	2	047	019300	BK69	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_White	Plur nh_Black

CD Census Tract Disconnect	Projects Used in Segregation Study	Proj No	Project Name	Boro Code	CB 1	CB 2	CB 3	CB 4	Lottery End	Address(es)	Boro	CB	County	Tract	NTA	Beveridge Race Typology	ACS Year Race Typology Project CP Area	Address CB	NTA	Tract
	yes	316	Compass Residences 2B	2	3				2/7/2017	1544 Boone Ave, Bronx, NY 10460	2	3	005	015700	BX75	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic
	yes	317	Beach Green Dunes	4	14				2/6/2017	44-19 Rockaway Beach Blvd, Far Rockaway, NY 11691	4	14	081	097204	QN12	Plur nh_black	Plur nh_Black	Plur nh_Black	Plur nh_Black	Maj nh_Black
	yes	320	74 West Tremont Avenue	2	5				1/26/2017	74 WEST TREMONT AVENUE BRONX, NY 10453	2	5	005	021700	BX36	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic	Maj hispanic

APPENDIX F
DISSIMILARITY INDICES
2103-2017 ACS

Races	Index
NH-White/NH-African American	0.80
NH-White/Hispanic	0.64
NH-White/NH-Asian	0.52
NH-African American/Hispanic	0.56
NH-African American/NH-Asian	0.79
NH-Asian/Hispanic	0.58

Table G1
NEW YORK CITY - PERCENT OF HOUSEHOLDS WITHIN INCOME RANGES
OF PERCENT OF MEDIAN HOUSEHOLD INCOME ($57,782) BY RACE, ETHNICITY
COMPARED TO PERCENT OF AWARDS BY RACE, ETHNICITY

Non-Hispanic:	Percent of Households within Range of Percent of Median Household Income						Percent of Awardees with Known Race
	40-60%	60-80%	80-100%	40-80%	60-100%	40-100%	
White	28.5%	29.0%	32.8%	28.7%	30.7%	29.9%	11.8%
African American	24.7%	25.9%	23.6%	25.3%	24.8%	24.8%	35.7%
Asian	13.3%	11.6%	12.1%	12.5%	11.8%	12.4%	7.1%
Hispanic	31.4%	31.1%	29.1%	31.3%	30.2%	30.6%	38.8%
Other or mutli-racial	2.1%	2.4%	2.6%	2.2%	2.5%	2.3%	6.5%
Total Households	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

Income adjusted to 2017 dollars.
Total households based on housing unit weights.
Races are those identifying as only that race.
Source: 2013-2017 ACS data

Table G2
NEW YORK CITY - NUMBER OF HOUSEHOLDS WITHIN INCOME RANGES
OF PERCENT OF MEDIAN HOUSEHOLD INCOME ($57,782) BY RACE, ETHNICITY
AND NUMBER OF AWARDS BY RACE, ETHNICITY

Non-Hispanic:	Number of Households within Range of Percent of Median Household Income						Number of Awardees with Known Race
	40-60%	60-80%	80-100%	40-80%	60-100%	40-100%	
White	88,436	79,555	79,312	167,991	158,867	247,303	1,119
African American	76,641	71,209	57,022	147,850	128,231	204,872	3,382
Asian	41,205	31,887	29,175	73,092	61,062	102,267	676
Hispanic	97,529	85,447	70,362	182,976	155,809	253,338	3,675
Other or mutli-racial	6,439	6,509	6,217	12,948	12,726	19,165	616
Total Households	310,250	274,607	242,088	584,857	516,695	826,945	9,468

Notes

Income adjusted to 2017 dollars.
Total households based on housing unit weights.
Races are those identifying as only that race.
Source: 2013-2017 ACS data