

## **Introduction**

This report provides a projection of the racial and ethnic composition for various income strata in Community Boards two, three, six and eight in Brooklyn New York (hereafter referred to as Northwest Brooklyn). Projections were made for several periods up to 2035. The results of the projections show that should present trends continue the racial composition of Northwest Brooklyn will change dramatically in coming years. More specifically, the most substantial changes are; that across virtually all income strata including those with low and very low incomes Northwest Brooklyn is projected to become substantially less black and substantially whiter. The Asian population will also grow significantly but this group is projected to remain a relatively smaller share of the population in Northwest Brooklyn. The size of the Hispanic population is projected to change relatively modestly. Finally, Other race and Native American population sizes and shares fluctuate, around a very small base. Taken together these projections allow us to infer that the population of Northwest Brooklyn eligible for subsidized housing is projected to become substantially less black and substantially more white, along with other compositional changes mirroring the projected changes described above.

In the next section we describe the methodological approaches used to make the projections. In the subsequent section we present the results of the projections. The final section summarizes the results of this analysis.

## **Methodology**

I was asked to construct population projection for one, two, three and four person families for racial and ethnic groups in Northwest Brooklyn in the following income strata; 40% of Area Median Income (AMI) or below, 40-50% of AMI, 60-100% of AMI, 100-140% of AMI,

140-160% of AMI. Projections were made to 2019, 2024, 2030, and 2035 using linear regression and 2020 and 2030 using the shift share approach. The racial/ethnic groups considered for the projections were non-Hispanic blacks (hereafter referred to as blacks), non-Hispanic whites (hereafter referred to as whites), Hispanics, Asians, Native Americans and Others including multi-race individuals.

To make projections for the income and racial/ethnic strata the Public Use Microdata Samples (PUMS) from the 1990 and 2000 census and the 2006, 2007, 2008, 2009, 2010, and 2011 American Community Survey were utilized. The PUMS are the individual level records from the decennial census and American Community Survey, respectively.

To protect the respondent's confidentiality the smallest geographic scale for which PUMS data are released is the Public Area Microdata Area (PUMA). PUMAs contain at least 100,000 persons and in New York City the PUMA boundaries are roughly coterminous with Community Board boundaries. Figure one in the appendix illustrates the boundaries of the PUMAs used for this study in relation to the boundaries of the community boards that comprise Northwest Brooklyn.

We made use of two projection methods to projection the population for the various racial/ethnic composition and income strata. These two approaches, linear regression and shift share are described below.

### Linear Regression

Linear regression is a method of fitting a line to summarize the relationship between an independent variable and a dependent variable. When using regression for population projections the dependent variable is the population and the independent variable is time. The linear

regression method is a common approach used for small (i.e. sub state) geographic areas (Smith, Tayman, and Swanson 2001; Wang and Hofe 2007). We tabulated the population for each racial/ethnic and income category combination, respectively, for the years 1990, 2000, 2006, 2007, 2008, 2009, 2010, and 2011. We then estimated a regression model with these respective population tabulations as the dependent variable and time in years (i.e. 1990, 2000, 2006, 2007, 2008, 2009, 2010, and 2011) as the independent variable. The formula for the projection is given below:

**Equation 1:**

$$\text{projected population}_{\text{year}_t} = a + b * \text{year of projection}$$

Where *projected population<sub>year<sub>t</sub></sub>* is the population projection for a given year, a is the intercept, b is the slope and *year of projection* is the year being projected (e.g. 2035).

To tabulate the population for each racial/ethnic and income category combination, respectively, for the years 1990, 2000, 2006, 2007, 2008, 2009, 2010, and 2011 we used the U.S. Department of Housing and Urban Development Income Limits website (Development 2013) which list income limits dating back to 1990. To determine if a family fell into one of the income strata above their income and family size was compared to the HUD income limit for that year. For example, for a family that was included in the 2000 census their income was compared to the income limits on HUD's website. The family was then assigned to one of the income categories 40-50% of AMI, 60-100% of AMI, 100-140% of AMI, 140-160% of AMI if their income fell within one of those ranges.

A separate regression model was estimated for each racial/ethnic and income category combination. The respective regression models were then used to project the population for each racial/ethnic and income category combination. This was done by inserting the year of the projection into equation one above.

### Shift Share Approach

The second projection method presented here is the shift share approach. The shift share approach is also a commonly used projection method for small geographic areas (Smith, Tayman, and Swanson 2001). The Shift Share approach compares changes in Northwest Brooklyn to the entire borough of Brooklyn between 2000 (the base year) and 2011 (the launch year). The Shift Share approach then makes use of projections made by the New York City Department of City Planning ([http://www.nyc.gov/html/dcp/pdf/census/projections\\_briefing\\_booklet.pdf](http://www.nyc.gov/html/dcp/pdf/census/projections_briefing_booklet.pdf)) and assumes that the ratio of change between Northwest Brooklyn and Brooklyn will continue into the future.

The Department of City Planning only made projections for 2020 and 2030 and therefore we will only make shift share projections for those years. The formula for the shift share projection along with the corresponding definitions is given below

Brooklyn<sub>t</sub> = Actual or projected Brooklyn population in year t

Race\_income\_group<sub>t</sub> = Actual or projected population for race/income combination in study area

Base year = 2000

Launch year = 2011

Projected year = 2020, 2030, respectively

### **Equation 2**

*Projected population*

$$\begin{aligned} &= Brooklyn_{2020} \left[ \left( \frac{Race_{income\_group\ 2011}}{Brooklyn_{2011}} \right) \right. \\ &+ \frac{Projected\ year - Launch\ year}{Launch\ year - Base\ year} \left( \left( \frac{Race_{income\_group\ 2011}}{Brooklyn_{2011}} \right) \right. \\ &\left. \left. - \left( \left( \frac{Race_{income\_group\ 2000}}{Brooklyn_{2000}} \right) \right) \right) \right] \end{aligned}$$

Separate shift share projections were made for each racial/ethnic and income category combination.

The use of two different approaches for our projections will enhance the robustness of our results. Research on accuracy of various projection methods have failed to identify a “best” approach (Wang and Hofe 2007). For this reason, the use of multiple projection methods is recommended by demographers (Smith, Tayman, and Swanson 2001; Wang and Hofe 2007).

### **Caveats**

The population data on which the projections are based are drawn from samples. Consequently, there is sampling error associated with these estimates. The sampling error will not bias out projections in a particular direction. But for the smaller subgroups such as Other race individuals and Native Americans, the sampling error will be large and these results should be interpreted cautiously.

### **Results**

#### Regression Projections

The results of the regression projections are listed in Table one. We first discuss the projected trends for the different income strata in turn and the various racial/ethnic groups within each income strata. We then describe trends in the racial/ethnic composition of the entire Northwest Brooklyn region.

The first panel in table one highlights the projected population estimates for those with incomes below 40% of AMI. The black population with incomes at or below 40% of AMI is expected to decline substantially both absolutely and relatively. In both absolute and relative terms the white population is projected to increase dramatically over the projection period. The Hispanic population is projected to decline modestly in both absolute terms and as a proportion of the entire population. The Asian population, the fourth largest among those with incomes at or below 40% of AMI is projected to become the second largest racial/ethnic category by 2035. This growth reflects substantial increases in both the absolute and relative size of the Asian population. The Other population is projected to be relatively stable over the projection period. The Native American population is projected to nearly double, but the launch year population was so small that Native Americans remain an insignificant proportion of the entire population throughout the projection period. Overall the biggest projected changes are that the population in this stratum is projected to become markedly whiter and substantially less black.

The second panel in table one illustrates the population projections for those with incomes greater than 40% of AMI but less or equal to 50% of AMI. The black population in this income stratum is projected to decline significantly in both absolute and relative terms. In contrast, the white population in this stratum is projected to more than double in both absolute terms and relative terms. The Hispanic population for those with incomes greater than 40% of AMI but less than 50% of AMI is projected to change very little both absolutely and relatively.

The Asian population made up a relatively small proportion of the population at the launch year and even after doubling in size still only made up a small proportion of the projected population at the end of the projection period. The Other population is projected to decline to zero but their population was relatively small in the launch year. The Native American population is projected to fluctuate slightly over the entire projection period. Over the course of the projection period the population of those with incomes greater than 40% of AMI but less than 50% of AMI is expected to become substantially less black, substantially whiter, with only modest changes among the other groups.

Panel three in Table one lists the projected population estimates for those with incomes between 60% of AMI and 100% of AMI. After initially being projected to increase between the launch year and 2016, the projected population in absolute terms is then projected to steadily decrease after 2016. The apparent projected increase between 2011 and 2016 is due to our regression model *underestimating* the decline of the black population in recent years. Consequently, the black population in the launch year is lower than what our regression model would predict it to be and the projected population appears to be an increase from the 2011 levels. The black population declines steadily in relative terms over the entire projection period. The white population for those with incomes between 60% of AMI and 100% of AMI is projected to steadily increase in both absolute and relative terms over the entire projection period. Moreover these increases are substantial with the absolute population more than doubling and the relative population increasing by two thirds. The Hispanic population is also projected to steadily grow over the projection period such that in absolute terms this population nearly doubles and in proportional terms grows by about a third. The Asian population is projected to witness a substantial increase in both absolute terms, trebling, and in proportional terms, more

than doubling. The other population, which was very small at the launch year, is projected to decline to zero. The Native American population, also very small at the launch year, is also projected to decline to zero. Over the course of the projection period the most substantial projected changes are declines in the black population along with substantial increases in the white, Hispanic and Asian populations.

The fourth panel of table one lists the projected population estimates for those with incomes greater than 100% of AMI but less than or equal to 140% of AMI. The black population is projected increase modestly between the launch year and 2016 and then to decline modestly over the projection period. As before, the apparent projected increase between 2011 and 2016 is due to our regression model *underestimating* the decline of the black population in recent years. Consequently, the black population in the launch year is lower than what our regression model would predict it to be and the projected population appears to be an increase from the 2011 levels. The white population grows consistently and substantially in both absolute and relative terms over the projection period. The absolute size of the Hispanic population increases modestly and steadily over the projection period. The relative size of the Hispanic population, changes very little over the projection period. The Asian population with incomes greater than 100% of AMI but less than or equal to 140% of AMI almost doubles. As a proportion of the population the Asian population with incomes greater than 100% of AMI but less than or equal to 140% of AMI almost doubles. The Other population declines by nearly half both absolutely and as a proportion of the population. The Native American population declines steadily over the projection period and the Native American population comes to represent a smaller share of the population by the end of the projection period. Taken together the biggest change among those



with incomes greater than 100% of AMI but less than or equal to 140% of AMI is the increase in the white population both absolutely and proportionally.

The final income stratum for which projections were made was for families with incomes greater than 140% of AMI but less than or equal to 160% of AMI. The fifth panel in table one depicts the population projections for this stratum. The black population in this stratum is projected to steadily decrease so that by 2030 the projected black population is zero. In contrast, the white population in this income stratum is projected to witness a major increase with their proportion share of the population rising from approximately 50% to 71%. The absolute size of the white population is projected to increase substantially as well over the course of the projection period. The Hispanic population is projected to increase modestly over the projection period. The apparent projected decline between 2011 and 2016 is due to our regression model *underestimating* the growth of the Hispanic population in recent years. Consequently, the Hispanic population in the launch year is higher than what our regression model would predict it to be and the projected population appears to be a decline from the 2011 levels. The Asian population families with incomes greater than 140% of AMI but less than or equal to 160% of AMI is projected to increase substantially over the projection period. Both absolutely and relative terms the Asian population more than doubles. The Other population is projected to decline by roughly 50% absolutely. This translates into a proportional decrease of a little under 50%. The Native American population with incomes greater than 140% of AMI but less than or equal to 160% of AMI is projected to more than double both in absolute and proportional terms. Overall, the projections suggest a population that will become substantially whiter over the projection period. The Asian, Other and Native American populations will also grow significantly over the projection period. But the respective populations of Asians, Others and

Native Americans in the launch year are fairly small so that these groups remain a small segment of the population throughout the projection period.

The final set of projections made using regression was for the population of Northwest Brooklyn as a whole irrespective of income. The last panel in table one provides projections for the population of Northwest Brooklyn as a whole irrespective of income.

The black population is projected to decline precipitously during the projection period. Both absolutely and relative terms the black population decreases by more than 50% over the course of the projection period. The white population is projected to increase sharply over the projection period. The Hispanic population is projected to remain relatively stable over the course of the projection period. The Asian population grows rapidly more than doubling absolutely and almost doubling relatively. The Other population is expected to decrease dramatically over the projection period both in absolute size and as a share of the population. Finally, the Native American population is projected to grow substantially. But the Native American population in the launch year is so small that this group still comprises a relatively small share of the population at the end of the projection period.

In sum, the results of our population projections using linear regression can be described as follows; with one exception, the black population is projected to decline substantially both absolutely and proportionally as a whole and across the various income strata. The white population is projected to increase substantially both absolutely and proportionally as a whole and across the various income strata. Projected changes in the Hispanic population are variegated with some income strata projected to decline, some income strata projected to increase, and some income strata projected to be relatively stable over the projection period. The Hispanic

population as a whole is projected to change modestly over the projection period. The Asian population is projected to increase dramatically both absolutely and in proportional terms across all income strata and for their entire population. Depending on the income stratum being considered, the Other population is projected to either remain stable or decline over the projection period. Finally, the Native American population is for the most part relatively stable remaining small in absolute and proportional terms across the projection period.

Table One. Population Projections Based on Linear Regression

Population projections for those with incomes at or below 40% of AMI

	2011		2016		2019		2024		2030		2035	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Black	63,727	34.8%	52,311	25.7%	46,200	22.2%	36,014	16.7%	23,791	10.6%	13,606	5.9%
White	72,755	39.7%	105,338	51.7%	114,191	54.9%	129,747	60.2%	148,054	65.9%	163,310	70.4%
Hispanic	29,414	16.1%	25,398	12.5%	24,853	12.0%	23,945	11.1%	22,854	10.2%	21,946	9.5%
Asian	11,438	6.2%	14,569	7.1%	16,327	7.9%	19,257	8.9%	22,772	10.1%	25,702	11.1%
Other	5,257	2.9%	5,487	2.7%	5,610	2.7%	5,816	2.7%	6,063	2.7%	6,269	2.7%
Native American	633	0.3%	719	0.4%	791	0.4%	910	0.4%	1,054	0.5%	1,174	0.5%
Total	183,224	100.0%	203,822	100.0%	207,972	100.0%	215,689	100.0%	224,588	100.0%	232,007	100.0%

Population projections for those with incomes between 40% and 50% of AMI

	2011		2016		2019		2024		2030		2035	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Black	62,479	51.6%	56,289	46.8%	53,653	44.2%	49,260	39.8%	43,988	34.6%	39,595	30.5%
White	21,261	17.6%	27,606	22.9%	30,815	25.4%	36,165	29.2%	42,584	33.5%	47,933	36.9%
Hispanic	30,924	25.6%	30,673	25.5%	31,390	25.9%	32,586	26.3%	34,021	26.8%	35,217	27.1%
Asian	3,854	3.2%	4,436	3.7%	4,761	3.9%	5,304	4.3%	5,954	4.7%	6,496	5.0%
Other	1,975	1.6%	938	0.8%	272	0.2%	0	0.0%	0	0.0%	0	0.0%
Native American	531	.4%	394	0.3%	429	0.4%	488	0.4%	559	0.4%	617	0.5%
Total	121,024	100%	120,336	100.0%	121,320	100.0%	123,803	100.0%	127,106	100.0%	129,858	100.0%

Population projections for those with incomes between 60% and 100% of AMI

	2011		2016		2019		2024		2030		2035	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Black	19,192	46.6%	19,679	40.9%	18,168	36.7%	15,651	30.2%	12,630	23.1%	10,113	17.7%
White	12,418	30.1%	15,394	32.0%	17,466	35.3%	20,920	40.4%	25,065	45.9%	28,519	50.0%
Hispanic	7,403	18.0%	10,459	21.8%	11,035	22.3%	11,994	23.2%	13,146	24.1%	14,105	24.8%
Asian	1,378	3.3%	2,490	5.2%	2,768	5.6%	3,232	6.2%	3,789	6.9%	4,253	7.5%
Other	722	1.8%	28	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Native American	88	0.2%	19	0.0%	15	0.0%	7	0.0%	0	0.0%	-8	0.0%
Total	41,201	100.0%	48,069	100.0%	49,452	100.0%	51,804	100.0%	54,630	100.0%	56,982	100.0%

Population projections for those with incomes between 100% and 140% of AMI

	2011		2016		2019		2024		2030		2035	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Black	31,655	38.8%	32,717	40.0%	31,860	37.5%	30,432	33.9%	28,721	30.0%	27,294	27.1%
White	31,960	39.2%	31,069	37.9%	34,297	40.4%	39,678	44.2%	46,134	48.1%	51,515	51.1%
Hispanic	13,087	16.0%	13,162	16.1%	13,604	16.0%	14,341	16.0%	15,224	15.9%	15,961	15.8%
Asian	2,311	2.8%	2,852	3.5%	3,049	3.6%	3,377	3.8%	3,771	3.9%	4,100	4.1%
Other	2,470	3.0%	1,977	2.4%	1,962	2.3%	1,936	2.2%	1,905	2.0%	1,879	1.9%
Native American	140	0.2%	107	0.1%	100	0.1%	89	0.1%	76	0.1%	64	0.1%
Total	81,623	100.0%	81,884	100.0%	84,872	100.0%	89,853	100.0%	95,831	100.0%	100,813	100.0%

Population projections for those with incomes between 140% and 160% of AMI

	2011		2016		2019		2024		2030		2035	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Black	11,236	23.2%	10,360	24.0%	7,293	17.3%	2,180	5.4%	0	0.0%	0	0.0%
White	24,133	49.8%	22,579	52.3%	24,180	57.2%	26,848	65.9%	30,050	70.2%	32,718	70.5%
Hispanic	8,941	18.4%	5,992	13.9%	6,261	14.8%	6,709	16.5%	7,247	16.9%	7,695	16.6%
Asian	2,043	4.2%	2,808	6.5%	3,113	7.4%	3,621	8.9%	4,232	9.9%	4,740	10.2%
Other	2,030	4.2%	1,359	3.1%	1,305	3.1%	1,215	3.0%	1,107	2.6%	1,018	2.2%
Native American	108	0.2%	97	0.2%	119	0.3%	154	0.4%	197	0.5%	232	0.5%
Total	48,491	100.0%	43,195	100.0%	42,271	100.0%	40,727	100.0%	42,833	100.0%	46,403	100.0%

Population projections for those with incomes above 160% of AMI

	2011		2016		2019		2024		2030		2035	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Black	4,959	34.4%	5,343	33.5%	5,056	31.8%	4,580	28.8%	4,007	25.2%	3,531	22.1%
White	6,478	44.9%	7,259	45.5%	7,351	46.3%	7,503	47.3%	7,686	48.3%	7,838	49.2%

Hispanic	2,016	14.0%	2,484	15.6%	2,698	17.0%	3,055	19.2%	3,484	21.9%	3,841	24.1%
Asian	800	5.5%	653	4.1%	652	4.1%	650	4.1%	648	4.1%	647	4.1%
Other	178	1.2%	122	0.8%	41	0.3%	0	0.0%	0	0.0%	0	0.0%
Native American	0	0.0%	90	0.6%	90	0.6%	90	0.6%	90	0.6%	90	0.6%
Total	14,431	100.0%	15,951	100.0%	15,888	100.0%	15,878	100.0%	15,915	100.0%	15,947	100.0%

Population projections for Entire Northwest Brooklyn

	2011		2016		2019		2024		2030		2035	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Black	193,608	39.5%	176,701	33.6%	162,233	31.1%	138,120	25.8%	114,007	20.7%	85,071	15.0%
White	169,005	34.5%	209,249	39.8%	228,604	43.8%	260,864	48.7%	293,124	53.3%	331,853	58.5%
Hispanic	91,875	18.7%	88,170	16.8%	89,843	17.2%	92,632	17.3%	95,420	17.3%	98,767	17.4%
Asian	21,824	4.4%	27,811	5.3%	30,673	5.9%	35,444	6.6%	40,215	7.3%	45,939	8.1%
Other	12,632	2.6%	9,914	1.9%	8,877	1.7%	7,150	1.3%	5,422	1.0%	3,349	.6%
Native American	1,500	.3%	1,4230	2.7%	1,546	.3%	1,742	.3%	1,938	.4%	2,173	.4%
Total	490,444	100%	526,075	100.0%	521,766	100.0%	535,952	100.0%	550,126	100.0%	567,152	100.0

## Shift Share Projections

Table Two illustrates the results of our projections made using the shift share approach. Recall these projections were made only to 2020 and 2030, the years for which DCP has made population projections for Brooklyn. As the shift share is based, in part, on data from the base year (2000) and presenting this data is not too unwieldy we present data from that year in the table as well.

The first income strata we discuss are for those with incomes at or below 40% of AMI, which is illustrated in the first panel of table two. In both absolute and proportional terms, the black population is projected to decline substantially to 2020 and again to 2030. The white population is projected to grow substantially over the projection period both absolutely and in proportional terms. The absolute size of the Hispanic population declines modestly over the projection period. As a proportion of the entire population the Hispanic population declines modestly as well. The Asian population is projected to increase dramatically, nearly doubling in absolute size and as a proportion of the population. The Other population is projected to experience a marked decrease with its proportional representation declining more than 50%. Finally, the Native American population declines dramatically and remains a small share of the entire population with incomes at or below 40% of AMI.

The second panel of table two depicts the population projections for those with incomes greater than 40% of AMI but less or equal to 50% of AMI. The black population in this income stratum is projected to decline modestly over the projection period both absolutely and as a proportion of the entire population. The white population in this income stratum is projected to increase substantially over the projection period. In absolute terms the white population is projected to nearly double. The proportional increase is substantial as well with a proportional

increase of nearly 50%. The Hispanic population is expected to change by a relatively small amount. In proportional terms the increase is small as well, increasing by less than two percentage points. The Asian population in this stratum is projected to witness a very large increase, more than doubling in absolute size and more than doubling as a proportion of the population. The Other population is projected to decline rapidly over the projection period. Indeed, the projections show a population of zero by year 2020. The Native American population in this stratum is projected to increase dramatically over the study period more than doubling by 2030. Even with such a dramatic increase Native Americans will comprise less than one percent of the population in this stratum by 2030 according to the projections.

The next income stratum we consider is for those with incomes of 60% AMI to 100% of AMI. The projections for this stratum are in the third panel of table two. The black population is projected to experience a marked decline over the projection period in both absolute and proportional terms. The white population, in contrast, is expected to more than double over the projection period in both absolute and relative terms. Projected changes for the Hispanic population are relatively modest in both absolute terms and proportional terms. The Asian population in this stratum is projected to increase significantly, growing by more than 50% absolutely and as a proportion of the entire population in this stratum. The Other population is projected to decline to zero by the year 2020. Finally the Native American population, which was very small at the launch year, changes hardly at all over the period according to the projections.

We turn next to the income stratum defined by those earning more than 100% of AMI but less than or equal to 140% of AMI. The black population is projected to decline by roughly 50% both absolutely and as a share of this stratum. The white population is projected to experience a



dramatic increase nearly doubling in absolute size. This will translate into a substantial increase in the proportional representation of whites as well. The Hispanic population is projected to grow significantly. The Hispanic growth in absolute terms, however, is not projected to translate into significant increases in their proportional representation. The Asian population is projected to grow substantially over the projection period nearly doubling in absolute size and increasing substantially as a share of the population as well. In absolute terms the Other population increases only modestly over the projection period. This modest increase actually translates into a decrease in Others' proportion of the population. Finally, the Native American population changes very little at all in both absolute and proportional terms.

The last income strata presented in table two is for those with incomes greater than 140% of AMI but less than on equal to 160% of AMI. The black population is projected to experience a stark decrease so that by 2020 this population is projected to be zero. The white population is projected to grow in substantial numbers both absolutely and as a proportion of the population. The Hispanic population is projected to almost double and will increase in proportional terms as well. The Asian population is projected to increase significantly absolutely and proportional terms as well. Those classified as Other will experience only a modest increase in their absolute numbers and a slight increase and then decrease in their proportional representation, according to the projections. The Native American population in the income stratum defined by those with incomes greater than 140% of AMI but less than on equal to 160% of AMI is projected to nearly treble. But the small size of the Native American population in the launch year means this group will still comprise a very small share of the entire population in this strata.

The last panel in table two lists projections for the entire Northwest Brooklyn population. The black population is projected to experience a dramatic decline in both absolute and

proportional terms. Conversely, the white population is expected to experience a dramatic increase in absolute and proportional terms. The Hispanic population is projected to increase significantly absolutely but this increase translates into a modest increase in proportional terms. The Asian population is projected to increase substantially, nearly doubling absolutely and increasing by more than 50% in proportional representation. The Other population steadily and dramatically declines both in absolute numbers and as a proportion of the population according to the projections. The Native American population is projected to increase significantly but given their small numbers in the launch year this group remains a miniscule proportion of the population over the entire projection period.

Taken together the projections depicted in table two foretell a Northwest Brooklyn that is projected to become; an area with a much smaller black population in absolute and relative terms across all income strata; an area with a white population that is projected to increase sharply without exception; home to a Hispanic population that will change in multifarious ways depending on the income strata being considered, but one where Hispanics as a whole will comprise a similar portion of the entire population over the course of projection period; an area with an Asian population that increases substantially both in absolute and relative terms; an area where the Other population decreases across most income strata and as a whole, and; an area with an increasing but very small Native American population

Population projections for those with incomes at or below 40% of AMI

	2000		2011		2020		2030	
Black	81,200	44.5%	63,727	34.8%	49,414	26.5%	31,903	16.9%
White	55,300	30.3%	72,755	39.7%	89,038	47.7%	107,675	57.0%
Hispanic	32,500	17.8%	29,414	16.1%	27,150	14.5%	24,210	12.8%
Asian	5,900	3.2%	11,438	6.2%	16,435	8.8%	22,250	11.8%
Other	6,700	3.7%	5,257	2.9%	4,075	2.2%	2,629	1.4%
Native American	800	0.4%	633	0.3%	497	0.3%	329	0.2%
Total	182,400	100.0%	183,224	100.0%	186,608	100.0%	188,996	100.0%

Population projections for those with incomes between 40% and 50% of AMI

	2000		2011		2020		2030	
Black	68,700	59.8%	62,749	51.7%	58,471	45.3%	52,851	37.9%
White	11,100	9.7%	21,261	17.5%	30,433	23.6%	41,105	29.4%
Hispanic	27,700	24.1%	30,924	25.5%	34,186	26.5%	37,775	27.1%
Asian	2,400	2.1%	3,854	3.2%	5,178	4.0%	6,712	4.8%
Other	4,700	4.1%	1,975	1.6%	0	0.0%	0	0.0%
Native American	200	0.2%	531	0.4%	827	0.6%	1,174	0.8%
Total	114,800	100.0%	121,294	100.0%	129,096	100.0%	139,617	100.0%

Population projections for those with incomes between 60% and 100% of AMI

	2000		2011		2020		2030	
Black	26,300	63.4%	19,192	46.6%	13,271	31.5%	6,092	14.0%
White	5,300	12.8%	12,418	30.1%	18,807	44.7%	26,262	60.2%
Hispanic	6,600	15.9%	7,403	18.0%	8,211	19.5%	9,102	20.9%

Asian	1,000	2.4%	1,378	3.3%	1,728	4.1%	2,130	4.9%
Other	2,200	5.3%	722	1.8%	0	0.0%	0	0.0%
Native American	100	0.2%	88	0.2%	79	0.2%	67	0.2%
<b>Total</b>	<b>41,500</b>	<b>100.0%</b>	<b>41,201</b>	<b>100.0%</b>	<b>42,096</b>	<b>100.0%</b>	<b>43,653</b>	<b>100.0%</b>

Population projections for those with incomes between 100% and 140% of AMI

	2000		2011		2020		2030	
Black	36,300	55.3%	31,655	38.8%	28,064	29.0%	23,532	20.7%
White	16,300	24.8%	31,960	39.2%	46,084	47.7%	62,525	54.9%
Hispanic	9,500	14.5%	13,087	16.0%	16,406	17.0%	20,220	17.8%
Asian	1,300	2.0%	2,311	2.8%	3,226	3.3%	4,290	3.8%
Other	2,200	3.3%	2,470	3.0%	2,741	2.8%	3,041	2.7%
Native American	100	0.2%	140	0.2%	177	0.2%	219	0.2%
<b>Total</b>	<b>65,700</b>	<b>100.0%</b>	<b>81,623</b>	<b>100.0%</b>	<b>96,699</b>	<b>100.0%</b>	<b>113,828</b>	<b>100.0%</b>

Population projections for those with incomes between 140% and 160% of AMI

	2000		2011		2020		2030	
Black	24,600	51.8%	11,236	23.2%	0	0.0%	0	0.0%
White	14,600	30.7%	24,133	49.8%	32,799	65.2%	42,847	65.5%
Hispanic	5,300	11.2%	8,941	18.4%	12,247	24.3%	16,082	24.6%
Asian	1,200	2.5%	2,043	4.2%	2,808	5.6%	3,696	5.6%
Other	1,800	3.8%	2,030	4.2%	2,260	4.5%	2,515	3.8%
Native American	0	0.0%	108	0.2%	204	0.4%	316	0.5%
<b>Total</b>	<b>47,500</b>	<b>100.0%</b>	<b>48,491</b>	<b>100.0%</b>	<b>50,318</b>	<b>100.0%</b>	<b>65,455</b>	<b>100.0%</b>

Population projections for all income groups

	2000		2011		2020		2030
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Black	242,800	52.2%	193,608	39.5%	153,518	29.6%	104,338	19.0%
White	107,700	23.2%	169,005	34.5%	224,937	43.3%	289,666	52.7%
Hispanic	82,400	17.7%	91,785	18.7%	101,306	19.5%	111,768	20.3%
Asian	12,700	2.7%	21,824	4.5%	30,100	5.8%	39,706	7.2%
Other	18,300	3.9%	12,632	2.6%	7,872	1.5%	2,124	0.4%
Native American	1,200	0.3%	1,500	0.3%	1,783	0.3%	2,106	0.4%
<u>Total</u>	<u>465,100</u>	<u>100.0%</u>	<u>490,354</u>	<u>100.0%</u>	<u>519,516</u>	<u>100.0%</u>	<u>549,708</u>	<u>100.0%</u>

## **Conclusion**

The population projections made for the entire Northwest Brooklyn and for 1, 2, 3, and 4 person families with incomes of 40% of AMI or below, 40-50% of AMI, 60-100% of AMI, 100-140% of AMI, 140-160% of AMI can be summarized as follows: The Black population is projected to decline markedly across virtually all the income strata listed above. The white population is projected to increase dramatically over all income strata. As these two groups are by far the biggest in Northwest Brooklyn as of this writing, the projected changes for these groups are the most significant.<sup>1</sup> The third largest group, Hispanics, is projected experience modest changes depending on the income strata being considered. The Asian population is projected to grow rapidly as a whole and across all income strata. But the Asian population is starting from a relatively small base and thus is projected to remain a small portion of the population. The projected populations for Others and Native Americans fluctuate depending on the income strata being considered and both groups are projected to remain relatively small segments of the entire population.

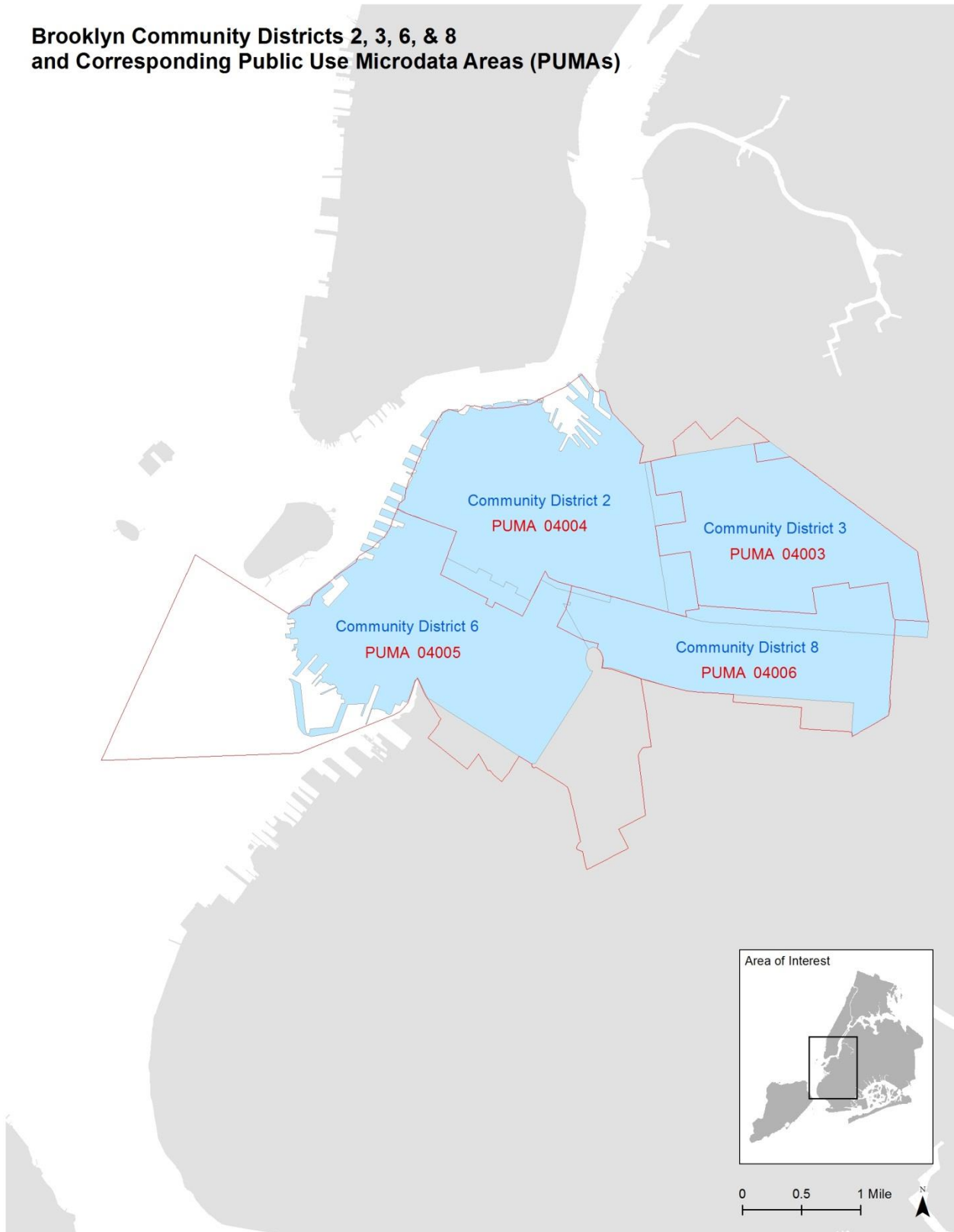
The projections described above are robust across two commonly used projection techniques for small geographic areas: the linear regression approach and the shift share approach.

## **Appendix**

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<sup>1</sup> Because the black and white populations are the largest groups in Northwest Brooklyn the population estimates for these groups have smaller amounts of sampling error and are more reliable as well. Thus, the greatest weight should be attached to the projected changes in these populations.

**Brooklyn Community Districts 2, 3, 6, & 8  
and Corresponding Public Use Microdata Areas (PUMAs)**



- Development, U.S. Department of Housing and Urban. 2013. *Income Limits*. Author 2013 [cited October 1, 2013 2013]. Available from <http://www.huduser.org/portal/datasets/il.html>.
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Population projections for those with incomes at or below 40% of AMI

	2011		2016		2019		2024		2030		2035
	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Black	63,727	34.8%	52,311	25.7%	46,200	22.2%	36,014	16.7%	23,791	10.6%	13,606
White	72,755	39.7%	105,338	51.7%	114,191	54.9%	129,747	60.2%	148,054	65.9%	163,310
Hispanic	29,414	16.1%	25,398	12.5%	24,853	12.0%	23,945	11.1%	22,854	10.2%	21,946
Asian	11,438	6.2%	14,569	7.1%	16,327	7.9%	19,257	8.9%	22,772	10.1%	25,702
Other	5,257	2.9%	5,487	2.7%	5,610	2.7%	5,816	2.7%	6,063	2.7%	6,269
Native American	633	0.3%	719	0.4%	791	0.4%	910	0.4%	1,054	0.5%	1,174
Total	183,224	100.0%	203,822	100.0%	207,972	100.0%	215,689	100.0%	224,588	100.0%	232,007

Population projections for those with incomes between 40% and 50% of AMI

	2011		2016		2019		2024		2030		2035
	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Black			56,289	46.8%	53,653	44.2%	49,260	39.8%	43,988	34.6%	39,595
White			27,606	22.9%	30,815	25.4%	36,165	29.2%	42,584	33.5%	47,933
Hispanic			30,673	25.5%	31,390	25.9%	32,586	26.3%	34,021	26.8%	35,217
Asian			4,436	3.7%	4,761	3.9%	5,304	4.3%	5,954	4.7%	6,496
Other			938	0.8%	272	0.2%	0	0.0%	0	0.0%	0
Native American			394	0.3%	429	0.4%	488	0.4%	559	0.4%	617
Total			120,336	100.0%	121,320	100.0%	123,803	100.0%	127,106	100.0%	129,858

Population projections for those with incomes between 40% and 60% of AMI

	2011		2016		2019		2024		2030		2035
	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Black	62,749	51.7%	56,289	47.2%	53,653	44.2%	49,260	39.8%	43,988	34.6%	39,595
White	21,261	17.5%	27,606	23.2%	30,815	25.4%	36,165	29.2%	42,584	33.5%	47,933
Hispanic	30,924	25.5%	30,673	25.7%	31,390	25.9%	32,586	26.3%	34,021	26.8%	35,217
Asian	3,854	3.2%	3,346	2.8%	4,761	3.9%	5,304	4.3%	5,954	4.7%	6,496

Other	1,975	1.6%	938	0.8%	272	0.2%	0	0.0%	0	0.0%	0
Native American	531	0.4%	394	0.3%	429	0.4%	488	0.4%	559	0.4%	617
Total	121,294	100.0%	119,246	100.0%	121,320	100.0%	123,803	100.0%	127,106	100.0%	129,858

Population projections for those with incomes between 60% and 100% of AMI

	2011		2016		2019		2024		2030		2035
	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Black	19,192	46.6%	19,679	40.9%	18,168	36.7%	15,651	30.2%	12,630	23.1%	10,113
White	12,418	30.1%	15,394	32.0%	17,466	35.3%	20,920	40.4%	25,065	45.9%	28,519
Hispanic	7,403	18.0%	10,459	21.8%	11,035	22.3%	11,994	23.2%	13,146	24.1%	14,105
Asian	1,378	3.3%	2,490	5.2%	2,768	5.6%	3,232	6.2%	3,789	6.9%	4,253
Other	722	1.8%	28	0.1%	0	0.0%	0	0.0%	0	0.0%	0
Native American	88	0.2%	19	0.0%	15	0.0%	7	0.0%	0	0.0%	-8
Total	41,201	100.0%	48,069	100.0%	49,452	100.0%	51,804	100.0%	54,630	100.0%	56,982

Population projections for those with incomes between 100% and 140% of AMI

	2011		2016		2019		2024		2030		2035
	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Black	31,655	38.8%	32,717	40.0%	31,860	37.5%	30,432	33.9%	28,721	30.0%	27,294
White	31,960	39.2%	31,069	37.9%	34,297	40.4%	39,678	44.2%	46,134	48.1%	51,515
Hispanic	13,087	16.0%	13,162	16.1%	13,604	16.0%	14,341	16.0%	15,224	15.9%	15,961
Asian	2,311	2.8%	2,852	3.5%	3,049	3.6%	3,377	3.8%	3,771	3.9%	4,100
Other	2,470	3.0%	1,977	2.4%	1,962	2.3%	1,936	2.2%	1,905	2.0%	1,879
Native American	140	0.2%	107	0.1%	100	0.1%	89	0.1%	76	0.1%	64
Total	81,623	100.0%	81,884	100.0%	84,872	100.0%	89,853	100.0%	95,831	100.0%	100,813

Population projections for those with incomes between 140% and 160% of AMI

	2011		2016		2019		2024		2030		2035
	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Black	11,236	23.2%	10,360	24.0%	7,293	17.3%	2,180	5.4%	0	0.0%	0

White	24,133	49.8%	22,579	52.3%	24,180	57.2%	26,848	65.9%	30,050	70.2%	32,718
Hispanic	8,941	18.4%	5,992	13.9%	6,261	14.8%	6,709	16.5%	7,247	16.9%	7,695
Asian	2,043	4.2%	2,808	6.5%	3,113	7.4%	3,621	8.9%	4,232	9.9%	4,740
Other	2,030	4.2%	1,359	3.1%	1,305	3.1%	1,215	3.0%	1,107	2.6%	1,018
Native American	108	0.2%	97	0.2%	119	0.3%	154	0.4%	197	0.5%	232
Total	48,491	100.0%	43,195	100.0%	42,271	100.0%	40,727	100.0%	42,833	100.0%	46,403

Population projections for those with incomes above 160% of AMI

	2011		2016		2019		2024		2030		2035
	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Black	4,959	34.4%	5,343	33.5%	5,056	31.8%	4,580	28.8%	4,007	25.2%	3,531
White	6,478	44.9%	7,259	45.5%	7,351	46.3%	7,503	47.3%	7,686	48.3%	7,838
Hispanic	2,016	14.0%	2,484	15.6%	2,698	17.0%	3,055	19.2%	3,484	21.9%	3,841
Asian	800	5.5%	653	4.1%	652	4.1%	650	4.1%	648	4.1%	647
Other	178	1.2%	122	0.8%	41	0.3%	0	0.0%	0	0.0%	0
Native American	0	0.0%	90	0.6%	90	0.6%	90	0.6%	90	0.6%	90
Total	14,431	100.0%	15,951	100.0%	15,888	100.0%	15,878	100.0%	15,915	100.0%	15,947