3.0 INTRODUCTION

This chapter describes the Proposed Actions' potential impacts on the socioeconomic character of the area within and surrounding the project area. As described in the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, the socioeconomic character of an area includes its population, housing, and economic activity. Changes to an area's socioeconomic character may occur directly or indirectly as a result of a project.

Existing conditions are presented for an approximately ½-mile study area, and compared with those conditions in Richmond County and New York City. In accordance with *CEQR Technical Manual* guidelines, the analysis considers whether the Proposed Actions could result in significant adverse impacts due to: (1) direct residential displacement; (2) direct business displacement; (3) indirect residential displacement; (4) indirect business displacement; and (5) adverse effects on specific industries.

This chapter also presents for each project alternative the estimated construction costs and construction-related benefits to New York City and New York State, including construction jobs, wages and salaries, and the total economic output generated by construction activities.

3.1 PRINCIPAL CONCLUSIONS

Under the No Action Alternative, no new comprehensive resiliency systems would be implemented in the project area. The study area would continue to experience adverse effects from wave action and erosion. Economic costs associated with the No Action Alternative would include the direct physical damages associated with wave action and erosion; potential displacement and other human impacts; and loss of service. In addition, the community amenities associated with Alternatives 2 and 3 would not be implemented in the project area.

Alternative 2—The Layered Tottenville Shoreline Resiliency Strategy: Living Breakwaters and Tottenville Shoreline Protection Project—would not result in significant adverse socioeconomic impacts. Under Alternative 2, by 2020 two layers of coastal risk reduction would be implemented and study area residents would be less susceptible to damage by wave action and erosion. The alternative's wave attenuation and social resiliency measures could lead to an increase in residential property values over time due to the following influences: 1) the project's improved open spaces and amenities could make the area more desirable as a residential neighborhood; and 2) the reduced risk of property damage from wave action and erosion could increase the desirability of the neighborhood, and could reduce costs associated with investing in resiliency measures at individual properties. However, for the following reasons potential increases in property value attributable to this alternative are not expected to result in significant residential displacement pressures within the study area. First, market conditions already reflect the close proximity of the waterfront as a valuable residential amenity; the Proposed Actions would improve the area's amenities, but would not introduce a substantial new use that would alter market conditions. In addition, study area property values and rents historically have not

discounted value based on the risk posed by major storm events. In this respect, rather than leading to substantial increases in property value and rent, Alternative 2 would be expected to maintain pre-Sandy levels of interest, investment, and property values in the study area. Second, approximately 80 percent of the study area's households reside in owner-occupied units, and homeowners are not vulnerable to displacement due to rent increases. Of the 20 percent of study area households who rent, most have incomes that suggest they could afford modest rent increases, and study area rents are low relative to other areas in the borough and City, suggesting a small number of residents who would be vulnerable to displacement if rents were to increase. Even if all study area renters vulnerable to displacement from rent increases were to be displaced (which is not expected), the displaced population would represent a very small portion of the overall study area population, and therefore Alternative 2 would not result in displacement that could substantially alter the socioeconomic character of the neighborhood.

With respect to potential indirect business displacement, a vast majority of existing businesses are located outside of the area that would benefit from reduced risk of damage caused by wave action and erosion. Similarly, retail businesses in the study area not located within close proximity to the project area, and would not experience a substantial increase in consumer visits that in turn, could lead to increased rents. Therefore, Alternative 2 does not have the potential to increase commercial rents in a manner that could lead to significant indirect commercial displacement.

Alternative 3 would not result in significant adverse socioeconomic impacts. Under Alternative 3, the Breakwaters Project would be implemented without the Shoreline Project. The socioeconomic study area would receive the resiliency benefits of the proposed breakwaters, Water Hub, and landscaping elements, but would not receive the additional resiliency benefits of the Shoreline Project. Residents would benefit from reduced susceptibility to property damage from wave action and erosion, although to a lesser extent than with Alternative 2. As with Alternative 2, residents would benefit from access to an improved public amenity. These benefits could lead to an increase in residential property values over time due to an increase in desirability of the neighborhood, reduction of risk of property damage, and potential reduction of costs associated with investing in resiliency measures. However, similar to the findings for Alternative 2, potential increases in property values would not result in significant adverse impacts due to indirect residential displacement. Residential rents already reflect the proximity to the waterfront as a residential amenity, and therefore rents would not be expected to substantially increase due to the alternative's improvements. In addition, study area property values and rents historically have not discounted value based on the risk posed by major storm events, and therefore property values did not fully incorporate the risks of personal injury and property damage. In addition, approximately 80 percent of study area residents are homeowners, who are not vulnerable to increases in market rent. Of the 20 percent of study area households who rent, most have incomes that suggest they could afford modest rent increases, and study area rents are low relative to other areas in the borough and City, suggesting a small number of residents who would be vulnerable to displacement if rents were to increase. Even if all study area renters vulnerable to displacement from rent increases were to be displaced (which is not expected), the displaced population would represent a very small portion of the overall study area population, and therefore Alternative 3 would not result in displacement that could substantially alter the socioeconomic character of the neighborhood. In terms of commercial rents, study area commercial businesses are located away from the waterfront where they are at a lower risk of damage or closure due to wave action and erosion. In addition, the commercial

businesses are not in a location where they would experience increases in consumer base due to new and improved public amenities.

Alternative 4 would not result in significant adverse socioeconomic impacts. Alternative 4 would implement the Shoreline Project without the Breakwaters Project. The study area would not receive the resiliency benefits from the proposed breakwaters, Water Hub, and landscaping elements. However, by 2020, the study area residents would still be less susceptible to damage by wave action and erosion, which could lead to increases in residential property values over time. Similar to Alternatives 2 and 3, potential increases in property value would not result in significant adverse impacts due to indirect residential displacement. Study area rental rates already include the beach as a neighborhood amenity but do not incorporate the risks of personal injury and property damage; in this respect Alternative 4 would not introduce a substantial new use that could affect market rents and would be expected to maintain pre-Sandy levels of interest, investment, and property values in the study area, rather than leading to substantial increases in property value and rent. In addition, approximately 80 percent of the study area population is not vulnerable to rental rate increases because they are homeowners and not renters, and the potentially displaced renter population would represent a very small portion of the overall study area population such that their displacement, were it to occur, would not substantially alter the socioeconomic character of the neighborhood. In terms of indirect commercial displacement, rents would not increase substantially because the study area's commercial properties are located outside of an area most susceptible to damage caused by wave action and erosion. Secondly, retail businesses are over ½-mile inland from the beach, and would not be expected to see an increase in consumer base from increased beach visitors.

ECONOMIC BENEFITS OF CONSTRUCTION

The economic benefits of constructing Alternatives 2 through 4 were estimated using the IMPLAN economic input-output modeling system. Total direct, indirect, and induced employment resulting in New York City from construction is estimated to range between 176 and 570 person-years of employment, depending on the alternative. Total direct, indirect, and induced employee compensation resulting in New York City from construction is estimated to range from between $15.95 million and $51.80 million, depending on the alternative. Total economic activity that would result from construction is estimated to range between $41.84 million and $136.24 million in New York City, depending on the alternative. Each alternative would generate additional employment, employee compensation, and economic activity within the broader New York State and National economies.

3.2 REGULATORY CONTEXT

3.2.1 SOCIOECONOMIC IMPACT ASSESSMENT REQUIREMENTS

In 1978, the Council on Environmental Quality (CEQ) issued regulations (40 CFR Parts 1500-1508) to implement the National Environmental Policy Act (NEPA). These regulations are binding on all federal agencies. CEQ includes economic and social impacts in its definition of effects. Many federal agencies have also developed their own NEPA procedures that supplement the CEQ NEPA regulations, as the U.S. Department of Housing and Urban Development (HUD) has done. According to HUD's regulation for implementing NEPA (24 CFR Part 50), environmental impact statements (EIS) will be prepared and considered in program determinations pursuant to the general environmental policy stated in § 50.3 and 40 CFR 1505.2 (b) and (c). According to 40 CFR 1505.2 (b) and (c), in making a decision in cases requiring an

EIS, an agency may discuss preferences among alternatives based on relevant factors including economic and technical considerations and agency statutory missions.

Moreover, New York State Environmental Quality Review Act (SEQRA) considerations include social and economic factors as they relate to community character, such as changes in demographics or access to businesses.

The assessment of potential significant adverse socioeconomic impacts also follows the methodology in the *CEQR Technical Manual*. Under CEQR, the socioeconomic character of an area includes its population, housing, and economic activity. Although socioeconomic changes may not result in impacts under CEQR, they are disclosed if they would at all affect land use patterns, low-income populations, the availability of goods and services, or economic investment in a way that changes the socioeconomic character of an area. In some cases, these changes may be substantial but not adverse. In other cases, these changes may be good for some groups but bad for others. The objective of the CEQR socioeconomic analysis is to disclose whether any changes resulting from a project would have a significant adverse impact on the study area compared to what would happen in the future if the project was not completed (the "No Action Alternative").

A socioeconomic assessment addresses possible changes to direct and indirect displacement of residents and businesses, and adverse impacts on specific industries. Direct (or primary) displacement is defined by CEQR as the involuntary displacement of residents or businesses from a site or sites directly affected by a proposed project. Examples of direct displacement include a proposed redevelopment of a currently occupied parcel for a new use or structure, or a proposed easement or right-of-way that would take a portion of a parcel, rendering it unfit for its current use.

Indirect (or secondary) displacement is defined by CEQR as the involuntary displacement of residents, businesses, or employees that results from a change in socioeconomic conditions created by the Proposed Actions. Examples of indirect displacement include lower-income residents forced out due to rising rents caused by a new concentration of higher-income housing introduced by a proposed project, or a similar turnover of industrial uses being forced out in favor of higher-paying commercial tenants attracted to an area because of a successful office project.

If a project does not affect an area's socioeconomic characteristics directly or indirectly, it may still affect the operation of a major industry or commercial operation in the city. An example would be of new regulations that restrict a certain process that is vital to a particular industry. In these cases, the effect of a Proposed Actions on a particular industry will be analyzed.

3.2.2 BENEFIT-COST ANALYSIS

Pursuant to the CEQ's *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508), if a cost-benefit analysis relevant to the choice among environmentally different alternatives is being considered for the proposed action, it shall be incorporated by reference or appended to the EIS as an aid in evaluating the environmental consequences. **Appendix D** provides a benefit-cost analysis prepared for the Breakwaters Project as part of the Rebuild by Design process.

3.2.3 ECONOMIC BENEFITS OF CONSTRUCTION

In accordance with NEPA and SEQRA and their implementing regulations, economic benefits are provided to allow the agencies to make a determination that balances environmental impacts

with economic and social considerations. According to the New York State Department of Environmental Conservation's (NYSDEC) *The SEQR Handbook 3rd edition—2010*, "Social and economic benefits of, and need for, an action must be included in an EIS" (p. 89).

3.3 METHODOLOGY

3.3.1 SOCIOECONOMIC IMPACT ASSESSMENT

DETERMINING WHETHER A SOCIOECNOMIC ASSESSMENT IS APPROPRIATE

According to the *CEQR Technical Manual*, a socioeconomic assessment should be conducted if a project may be reasonably expected to spur socioeconomic changes within an area that would not have experienced such changes if the project did not occur. This section presents the threshold circumstances described by the *CEQR Technical Manual* that can lead to socioeconomic changes warranting further analysis.

1. Direct Residential Displacement: Would the project directly displace population to the extent that the socioeconomic character of the neighborhood would be substantially altered? Displacement of less than 500 residents would not typically be expected to alter the socioeconomic character of a neighborhood.

There are no residential uses within the footprint of any of the proposed project elements. Therefore, the Proposed Actions would not directly displace any residents, and an assessment of direct residential displacement is not warranted.

2. Direct Business Displacement: Would the project directly displace more than 100 employees, or a business that is unusually important because its products or services are uniquely dependent on its location, are the subject of policies or plans aimed at its preservation, or that serves a population uniquely dependent on its services in its present location?

There are no existing businesses within the footprint of any of the proposed project elements. Therefore, the Proposed Actions would not directly displace any businesses, and an assessment of direct business displacement is not warranted.

3. Indirect Residential and/or Business Displacement due to increased rents: Would the project result in substantial new development that is markedly different from existing uses, development, and activities within the neighborhood? Residential development of 200 units or less or commercial development of 200,000 square feet or less would typically not result in significant socioeconomic impacts.

While the Proposed Actions would not introduce any new residential uses or commercial uses greater than 200,000 square feet, the project alternatives would introduce new uses that could influence residential and/or commercial rents. An indirect residential and business displacement assessment of the Proposed Actions is warranted in order to determine whether and under what conditions the alternatives could stimulate changes that would raise rents and, if so, whether such conditions could make existing residents vulnerable to displacement. Rents could potentially be influenced by the improved waterfront open space and new public amenities, which would make the area a more attractive place to live; the reduced risk of property damage due to wave action and beach erosion; and the potential reduction of costs associated with investing in resiliency measures for individual properties.

4. Indirect Business Displacement due to market saturation: Would the project add to, or create, a retail concentration that may draw a substantial amount of sales from existing businesses

within the study area to the extent that certain categories of business close and vacancies in the area increase, thus resulting in a potential for disinvestment on local retail streets? Projects resulting in less than 200,000 square feet of retail on a single development site would not typically result in socioeconomic impacts.

The Proposed Actions will not introduce a retail component as part of the project. An assessment of potential indirect business displacement due to retail market saturation is not warranted.

5. Adverse Effects on Specific Industries: Is the project expected to affect conditions within a specific industry? An analysis is warranted if a substantial number of residents or workers depend on the goods or services provided by the affected businesses or if it would result in the loss or substantial diminishment of a particularly important product or service within the City.

The Proposed Actions are not predicted to result in direct or indirect business displacement, and therefore would not affect conditions in any specific industries.

Based on the above screening assessment, the Proposed Actions warrant preliminary assessments of potential indirect residential displacement due to increased rents, and indirect business displacement due to increased rents.

STUDY AREA DEFINITION

According to the *CEQR Technical Manual*, the socioeconomic study area typically mirrors that of the land use study area, and should be reflective of the scale of the project relative to the area's population. Study areas typically include the project area and adjacent areas within 400 feet, ¼-mile, or ½-mile, depending on the project size and area characteristics.

As shown in **Figure 3-1,** the socioeconomic study area runs approximately ½-mile inland from the southern coast of Tottenville. The study area represents the area that could be directly affected by wave action and erosion, as well as a more distant area within a reasonable walking distance of the Proposed Actions' improved waterfront amenities. Per CEQR methodology, the above-described inland study area boundary has been adjusted to align with census tracts to form the socioeconomic study area. The socioeconomic study area is bounded by the coastline to the west and south, Amboy Road to the north, and runs approximately three hundred feet east of Richard Avenue.

The analysis includes trend data on the socioeconomic study area spanning from 2000 to 2015, as well as comparative data from Richmond County and New York City.

ANALYSIS FORMAT

The analysis begins with a summary of existing conditions, then looks at the future without the Proposed Actions (Alternative 1—the "No Action Alternative"), and the future with the Proposed Actions by the project build year of 2020. In conjunction with the Land Use Chapter, this Socioeconomic chapter identifies specific development projects that are expected to occur in the study area in the future without the Proposed Actions, and identifies the possible changes to population, income, residential developments, rent sale prices, commercial uses. The analysis then considers for each project alternative the potential for significant adverse socioeconomic impacts.

DATA SOURCES

A variety of sources were used to collect demographic, real estate, and business data. Demographic data was obtained from the U.S. Census Bureau's 2000 Decennial Census and

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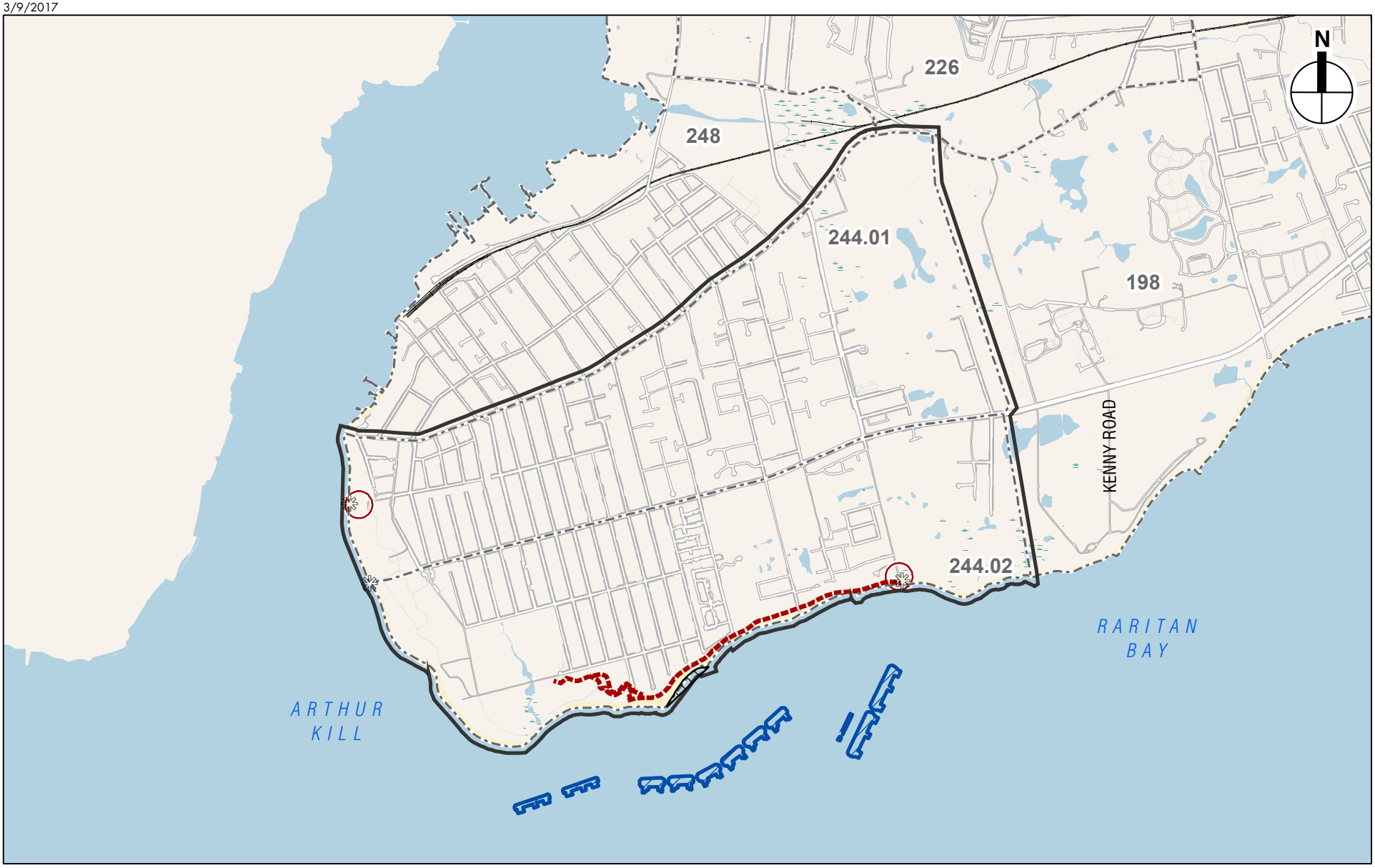


FOR ILLUSTRATIVE PURPOSES ONLY

Proposed Breakwater Features

Proposed Shoreline Restoration Area

Proposed Shoreline Project Elements

Potential Location of Proposed Water Hub (exact location to be determined)

Potential Water Access

Proposed Floating Dock and Oyster Nursery

Socioeconomic Study Area

Census Tracts

0 2,000 FEET

Socioeconomic Study Area

Figure 3-1

Coastal and Social Resiliency Initiatives for Tottenville Shoreline

2011-2015 American Community Survey (ACS) and were accessed through American FactFinder and Social Explorer. Census data from 2000, which are one-hundred percent survey data, are used to present population counts. ACS data from 2011-2015, which are 5-year estimates from a sample population, are used for population characteristics where noted. Demographic and housing trends are analyzed by comparing data from 2000 Census to the 2011-2015 ACS. Except where specifically noted, values such as median household income are presented in this chapter are in constant 2016 dollars using the U.S. Department of Labor's Annual 2016 Consumer Price Index for the "New York-New Jersey-Long Island" area. See Chapter 4, "Environmental Justice," for race, ethnicity, and poverty data for the study area, Staten Island, and New York City.

Residential rental rates and sales trends were obtained through online property databases, such as Zillow.com. Finally, business data on the number of firms and employees in the study area and comparative areas were obtained through Environmental Systems Research Institute's (Esri) online data analysis tool Business Analyst Online, Business Summary report in July 2016.

3.3.2 ECONOMIC BENEFITS OF CONSTRUCTION

Economic benefits—including construction-related jobs, wages and salaries, and the total economic output of construction activities—were estimated using IMPLAN (Impact Analysis for PLANning), an economic input-output modeling system[1]. The IMPLAN model was developed by the U.S. Department of Agriculture Forest Service in 1979 and was subsequently privatized by the Minnesota IMPLAN Group (MIG). The model uses the most recent economic data from sources such as the U.S. Bureau of Economic Analysis, the U.S. Bureau of Labor Statistics, and the U.S. Census Bureau to predict effects on the local economy from direct changes in spending. The model contains data for New York City on 536 economic sectors, showing how each sector affects every other sector as a result of a change in the quantity of its product or service. A similar IMPLAN model for New York State was used to trace the effects on the state economy.

MEASURES OF ECONOMIC EFFECT

Using IMPLAN terminology, the economic benefits of construction are broken into three components: direct, indirect, and induced:

- *Direct effects* represent the initial benefits to the economy of a specific new investment; e.g., a construction project or changes in employment.
- *Indirect effects* represent the benefits generated by industries purchasing from other industries as a result of the direct investment; e.g., indirect employment resulting from construction expenditures would include jobs in industries that provide goods and services to the contractors. A direct investment triggers changes in other industries as businesses alter their production to meet the needs of the industry in which the direct effect has occurred. These businesses in turn purchase goods and services from other businesses, causing a ripple effect through the economy. The ripple effect continues until leakages from the region (caused, for example, by imported goods) stop the cycle. The sum of these iterative inter-industry purchases is called the indirect effect.

[1] Estimated construction costs, which serve as inputs to the IMPLAN model, were provided by MFS Consulting Engineers and Surveyor, DPC (MFS) for the Breakwaters Project, and Stantec for the Shoreline Project.

- *Induced effects* represent the effects caused by increased income in a region. Direct and indirect effects generate more worker income by increasing employment and/or salaries in certain industries. Households spend some of this additional income on local goods and services, such as food and drink, recreation, and medical services. Benefits generated by these household expenditures are quantified as induced effects.

3.4 EXISTING CONDITIONS

3.4.1 DEMOGRAPHIC PROFILE

As of the most recent ACS, there were an estimated 10,649 residents in the study area (see **Table 3-1**). This represents a 26.8 percent increase from the 2000 population of 8,401 residents. Since 2000, the socioeconomic study area's population has grown at a more rapid pace than Richmond County (6.5 percent increase) and New York City (5.2 percent increase).

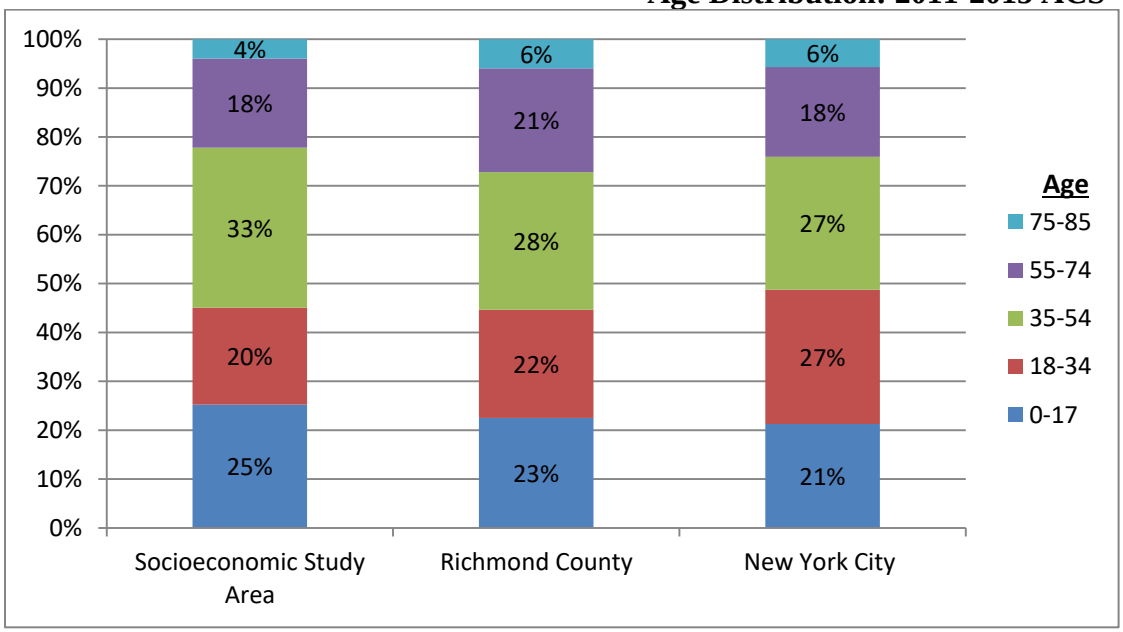
Table 3-1
Residential Population: 2000 and 2011-2015 ACS

Area	Population		Percent Change
	2000	2011-2015 Estimates	
Socioeconomic Study Area	8,401	10,649	26.8
Richmond County	443,728	472,481	6.5
New York City	8,008,278	8,426,743	5.2

Sources: U.S. Census Bureau, 2000 Decennial Census and 2011-2015 ACS. Data Downloaded through Social explorer (accessed July 2016 and March 2017)

Figure 3-2 shows the distribution of age groups within the socioeconomic study area. The largest cohort in the socioeconomic study area is 35- to 54-year-olds, who make up 33 percent of the total population. Those between the ages of 0 and 17 make up 25 percent of the population. The 18-34 cohort represents 20 percent of the study area population, and 55-74 cohort represents 18 percent of the study area population. The remaining 4 percent of the socioeconomic study area's population are between the ages of 75 and 85. The age distribution within Richmond County and New York City are similar, with the largest cohort being 35- to 54-year-olds in both geographies.

Figure 3-2
Age Distribution: 2011-2015 ACS



Source: U.S. Census Bureau, 2011-2015 ACS. Accessed through Social Explorer in July 2016 and March 2017.

3.4.2 HOUSEHOLD AND INCOME PROFILE

According to 2011-2015 ACS data there are an estimated 3,623 households in the socioeconomic study area (see **Table 3-2)**. This represents a 25.4 percent increase since 2000, when there were 2,890 study area households. The growth in number of study area households is over four times greater than in Richmond County, which saw 6.0 percent growth in the number of households over the same period. The number of households in New York City grew by 3.0 percent. Also shown in **Table 3-2**, the average household size within the socioeconomic study area is larger than the two comparison geographies.

Table 3-2
Household Characteristics: 2000 and 2011-2015 ACS

Area	Total Households			Average Household Size		
	2000	2011-2015	Percent Change	2000	2011-2015	Percent Change
Socioeconomic Study Area	2,890	3,623	25.4	2.9	2.9	0.0
Richmond County	156,341	165,784	6.0	2.8	2.8	0.0
New York City	3,021,588	3,113,535	3.0	2.6	2.7	0.04

Sources: U.S. Census Bureau, 2000 Decennial Census and 2011-2015 ACS. Data Downloaded through Social explorer (accessed July 2016 and March 2017)

As shown in **Table 3-3**, the average household income for the study area is approximately 9 percent higher than in Richmond County as a whole, and 15 percent higher than that of New York City. The average household income for households in the socioeconomic study area according to the 2011-2015 ACS was $98,598, which represents a 16 percent decline from the

2000 average household income of $118,052. Richmond County saw a similar rate of decline (7.5 percent), whereas New York City experienced a 0.6 percent rate of growth over the same time period.

Table 3-3
Household Income Characteristics: 2000 and 2011-2015 ACS

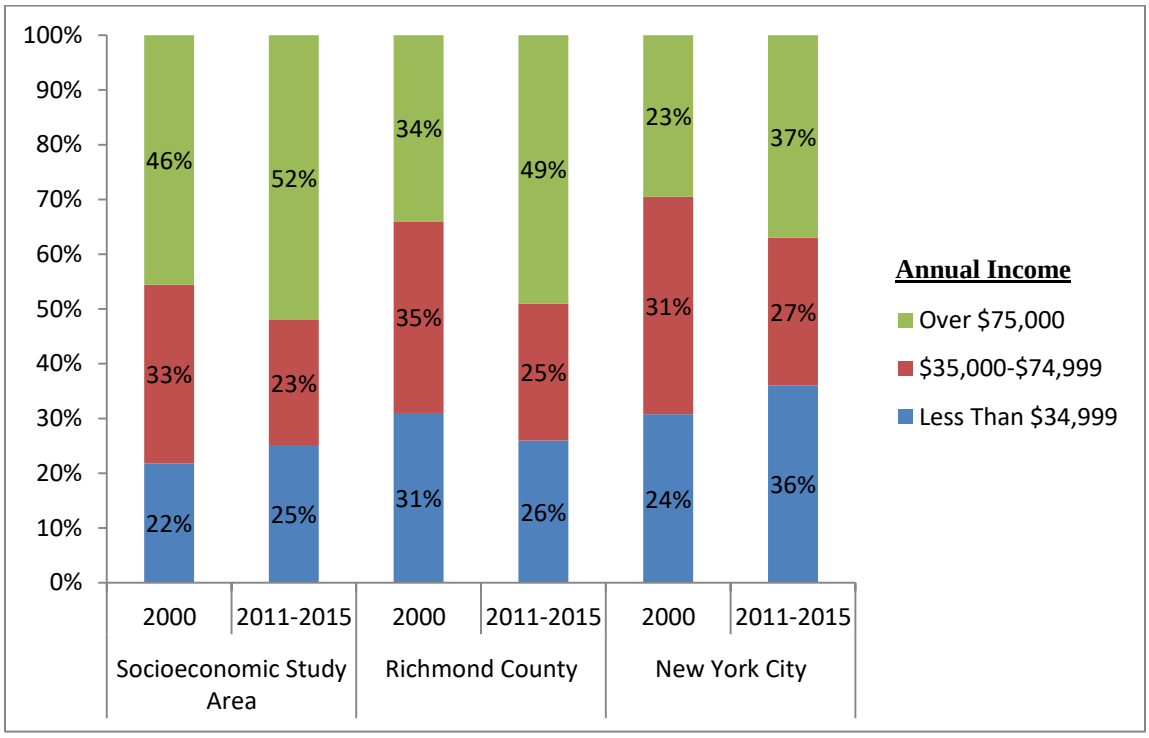
Area	Average Household Income[1]			Median Household Income[1]			Poverty Status (Percent)	
	2000	2011-2015	Percent Change	2000	2011-2015	Percent Change	2000	2011-2015
Socioeconomic Study Area	$118,052	$ 98,598	-16.5%	$99,141	$ 78,683	-20.6%	1.8	3.3
Richmond County	$97,501	$ 90,236	-7.5%	$80,158	$ 73,197	-8.7%	7.9	10.1
New York City	$85,206	$ 85,704	0.6%	$55,769	$ 53,654	-3.8%	18.5	17.5

Note: [1]The average household income and median household income for both time periods is presented in 2016 dollars using the U.S. Department of Labor's Annual 2016 Consumer Price Index for the "New York-Northern New Jersey-Long Island Area."
Sources: U.S. Census Bureau, 2000 Decennial Census and 2011-2015 ACS. Data Downloaded through Social explorer (accessed July 2016 and March 2017)

As shown in **Table 3-3**, the median household income declined by 20.6 percent within the socioeconomic study area, from $99,141 in 2000 to $78,683 in 2011-2015. Richmond County and New York City declined at slower rates of 8.7 percent and 3.8 percent, respectively.

Figure 3-3 illustrates the distribution of household incomes, and the changes in distribution over time. In the most recent years for which ACS data is available, those households making over $75,000 per year in the socioeconomic study area (52 percent) represent a greater proportion of households than those making less than $34,999 and between $35,000 and $74,999 combined (48 percent). The same cannot be said for the comparative geographies of Richmond County and New York City, which have lower proportions of households making over $75,000 and higher proportions of households making less than $34,999 and between $35,000 and $74,999 combined.

Figure 3-3
Household Income Distribution: 2000 and 2011-2015 ACS

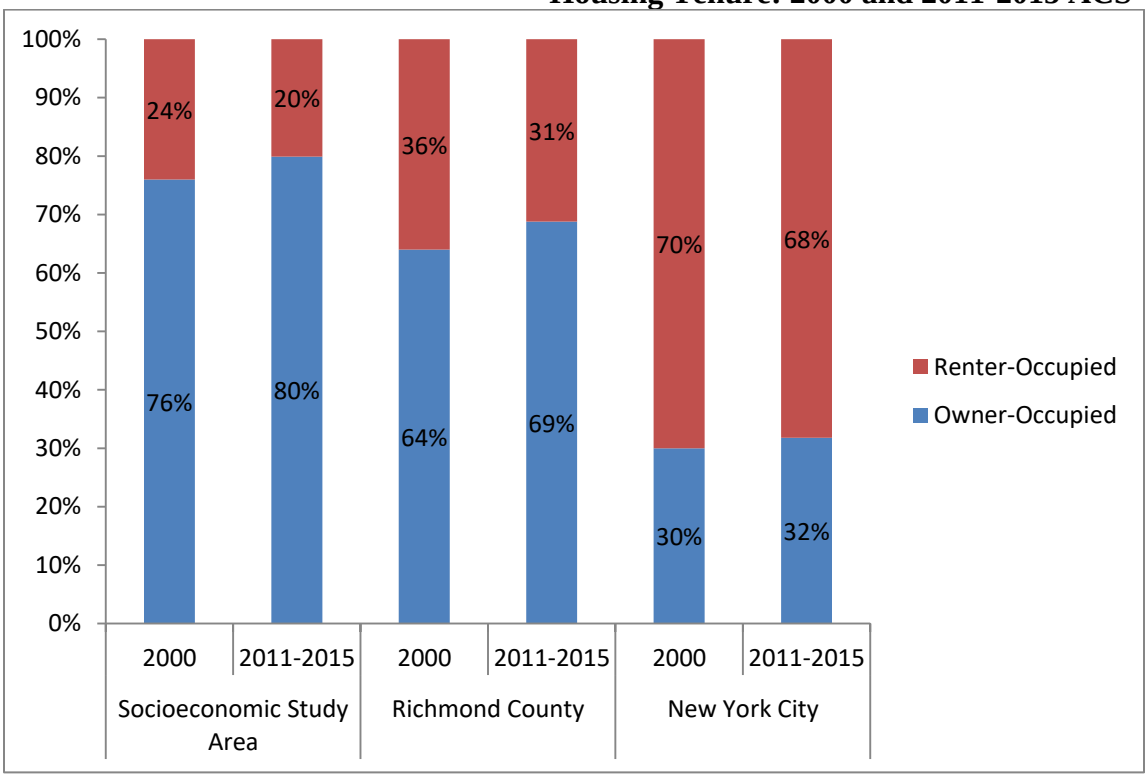


Source: U.S. Census Bureau, 2000 Decennial Census and 2011-2015 ACS. Accessed through Social Explorer in July 2016 and March 2017.

3.4.3 HOUSING PROFILE

The socioeconomic study area contains predominantly single-family housing, but also includes several duplexes and garden style apartment buildings. In 2000, the socioeconomic study area had 2,890 housing units (see **Figure 3-4**). By 2011-2015, the number of dwelling units grew to 3,623. A majority of the units in the socioeconomic study area are owner-occupied. In 2000, 76 percent of the occupied units were owner-occupied, while in 2011-2015, 80 percent of the occupied units were owner-occupied. In the most recent year, the rate of home ownership for the socioeconomic study area was greater than that of Richmond County (69 percent) and New York City (32 percent).

Figure 3-4
Housing Tenure: 2000 and 2011-2015 ACS



Source: U.S. Census Bureau, 2000 Decennial Census and 2011-2015 ACS. Accessed through Social Explorer in July 2016 and March 2017.

As compared to study area homeowners, the median household income of study area renters ($51,475 based on 2011-2015 ACS data) is substantially lower than the median income of study area homeowners ($90,945, shown in **Table 3-3**), and household income distribution for study area renters is skewed more toward the low- to middle-income brackets. As shown in **Table 3-4**, approximately 30 percent of study area renters had household incomes of $75,000 or greater, as compared to 40 percent of homeowners (see **Figure 3-3**). Approximately 20 percent of study area renters had household incomes between $35,000 and $74,999, as compared to 15 percent for study area homeowners. As compared to all renters in the borough, the income distribution for study area renters is similar, if not more slightly skewed to upper-income brackets.

Table 3-4
Distribution of Household Income in the Past 12 Months for Renters

Household Income in the Past 12 Months	Socioeconomic Study Area		Richmond County		New York City	
	2000	2011-2015	2000	2011-2015	2000	2011-2015
Total Renters	701	728	56,609	51,784	2,109,455	2,122,185
Less than $9,999	19%	12%	18%	17%	21%	14%
$10,000 to $19,999	7%	14%	16%	15%	15%	14%
$20,000 to $34,999	17%	17%	19%	15%	19%	16%
$35,000 to $74,999	30%	20%	33 %	30%	39%	28%
$75,000 to $149,999	17%	30%	13%	20%	12%	19%
$150,000 or more	4%	1%	2%	1%	4%	9%

Notes: [1]Data on the distribution of household income in the past 12 months for renters is not available in the 2000 Census dataset.
[2]Represents the percent of total renters that made less than $9,999 in the Past 12 Months.
See Chapter 4, "Environmental Justice," for poverty data for the study area, Staten Island, and New York City.
Sources: U.S. Census Bureau, 2000 Decennial Census and 2011-2015 ACS. Data Downloaded through American FactFinder (accessed August 2016 and March 2017)

3.4.4 RECENT RESIDENTIAL TRENDS

Based on a survey of current rental listings collected from Zillow.com during July 2016, the median monthly rent for a studio in the socioeconomic study area ranged from $900 to $1,000, one-bedroom units ranged from $950 to $1,300, and three-bedroom units ranged from $1,900 to $2,325. The survey showed that there were no two-bedroom units available for rent at the time of the survey. As shown in **Table 3-5**, the overall median rent in the socioeconomic study area ranges from $950 to $2,200. The overall median rent for the socioeconomic study area was 50 percent lower than that of the county and 247 percent lower than that of New York City. Given that Study Area rents are relatively low, while Study Area renters' incomes are skewed toward higher income brackets, a relatively low percentage of Study Area renters are expected to be vulnerable to displacement from potential rent increases.

Table 3-5
Current Rental Rates

	Median Monthly Rent[1]	Average Monthly Rent[1]	Average Annual Price per Square Foot (PSF)
Socioeconomic Study Area			
Studio	$950	$950	$19
1 BR	$1,050	$1,075	$16
2 BR[2]	N/A	N/A	N/A
3 BR	$2,200	$2,142	$12
Total	$1,050	$1,389	$12
Richmond County	$1,571	$1,611	$10
New York City	$3,639	$3,692	$58

Notes: [1]Median and Average rents are presented in 2016 dollars.
[2]Research on several real estate listing sites showed no two-bedroom listings located in the socioeconomic study area.
Sources: Zillow.com, accessed July 2016.

In terms of owner-occupied residential sales trends, the median sales prices in the socioeconomic study area are $271,000 for a condominium, $349,000 for a townhome, and $804,000 for a single-family, detached home (see **Table 3-6**). The median sales prices for condos and townhomes in the socioeconomic study area are, on average, 17 percent lower than the county and 74 percent lower than New York City. In contrast, the median sales price for a single-family, detached home in the study area is approximately 55 percent higher than that of Richmond County ($519,944) and 39 percent higher than that of New York City ($577,000).

Table 3-6
Current Sales Prices

	Socioeconomic Study Area	Richmond County	New York City[2]
Condominiums			
Median Sales Price[1]	$271,000	$309,999	$899,000
Average Sales Price[1]	$271,000	$306,690	$849,429
Average Annual PSF	$2,600	$3,274	$6,815
Townhomes			
Median Sales Price[1]	$349,000	$439,000	$1,600,000
Average Sales Price[1]	$799,000	$461,500	$3,798,000
Average Annual PSF	$3,602	$3,791	$5,268
Houses			
Median Sales Price[1]	$804,000	$519,944	$577,000
Average Sales Price[1]	$987,333	$604,315	$1,037,250
Average Annual PSF	$2,297	$3,736	$5,936

Notes: Research on several real estate listing sites showed no for sale apartment listings located in the socioeconomic study area. As such, apartment listings were not included in this real estate sales analysis.
[1]Median and Average sales prices are presented in 2016 dollars.
[2] Single-family detached houses in the New York City geography were primarily located in Queens, the Bronx, and Upper Manhattan.
Sources: Zillow.com, accessed July 2016.

3.4.5 BUSINESS PROFILE

PROJECT AREA

There are no businesses within the project area; the closest institutional use to the project area is the Staten Island Early Learning Center, located along the Tottenville waterfront, west of Joline Avenue and South of Joline Lane. The Learning Center is run by Volunteers of America Greater New York, a non-profit, faith-based community organization, and prepares 3-5 year olds, many of which have significant developmental delays, for success in kindergarten. According to the organization's website, approximately 20 children graduate from the program every year. The property is located in a residential zoning district (R1-2) and, according to the New York City Department of Finance tax records, the Volunteers of America, Greater New York is the owner of the property. Therefore, this business would not be vulnerable to potential displacement due to rent increases.

SOCIOECONOMIC STUDY AREA

The socioeconomic study area shown in **Figure 3-1** is the area within which the Proposed Actions could have the greatest potential to affect business conditions. The study area consists primarily of residential and open space uses, with very few commercial concentrations that define neighborhood character. The largest concentration of businesses in the socioeconomic

study area is on Amboy Road. There are approximately 14 neighborhood-oriented commercial businesses concentrated along Amboy Road, between Main Street to the west and Brehaut Avenue to the east. Moving south in the study area, at the intersection of Page Avenue and Hylan Boulevard are 2 businesses, including a 7-Eleven and BP gas station.

3.4.6 ECONOMIC PROFILE OF THE SOCIOECONOMIC STUDY AREA

As of January 2016, there were a total of 172 businesses within the socioeconomic study area. These businesses represent 1.3 percent of Richmond County businesses and 0.05 percent of New York City businesses (see **Table 3-7**).

Table 3-7
Estimated Businesses 2016

Industry (by NAICS code)	Socioeconomic Study Area		Richmond County		New York City	
	Number	Percent	Number	Percent	Number	Percent
Agriculture, Forestry, Fishing & Hunting	0	0.0	13	0.1	202	0.1
Mining	1	0.6	6	0.0	109	0.0
Utilities	0	0.0	14	0.1	225	0.1
Construction	39	22.7	1,388	10.6	16,189	5.0
Manufacturing	2	1.2	282	2.1	9,115	2.8
Wholesale Trade	3	1.7	390	3.0	11,431	3.5
Retail Trade	13	7.6	1,763	13.4	51,833	16.2
Transportation & Warehousing	2	1.2	240	1.8	6,564	2.0
Information	3	1.7	223	1.7	9,719	3.0
Finance & Insurance	10	5.8	962	7.3	20,949	6.4
Real Estate, Rental & Leasing	9	5.2	616	4.7	20,278	6.2
Professional, Scientific & Tech Services	17	9.9	1,279	9.7	34,241	10.5
Management of Companies & Enterprises	0	0.0	15	0.1	551	0.2
Administrative & Support & Waste Management & Remediation Services	18	10.5	585	4.4	12,761	3.9
Educational Services	7	4.1	421	3.2	9,200	2.8
Health Care & Social Assistance	9	5.2	1,218	9.3	25,255	7.7
Arts, Entertainment & Recreation	8	4.7	238	1.8	6,079	1.9
Accommodation & Food Services	6	3.5	1,074	8.2	28,863	8.8
Other Services (except Public Administration)	14	8.1	1,640	12.5	38,542	11.8
Public Administration	1	0.6	201	1.5	3,009	0.9
Unclassified Establishments	10	5.8	584	4.4	20,758	6.4
Total	**172**	**100.00**	**13,152**	**100**	**326,873**	**100**

Note: Detailed amounts may not add to total due to rounding.
Source: Esri Business Analyst Online, Business Summary Report, 2016 data.

Within the socioeconomic study area, the Construction sector is the most prevalent industry, representing 23 percent of all businesses in the socioeconomic study area (see **Table 3-7**). There are 39 construction businesses. The next most prevalent industries are Administrative and Support and Waste Management and Remediation Services (18 businesses), Professional, Scientific and Tech Services (17 businesses), Other Services (14 businesses), and Retail Trade (13 businesses). Construction accounts for a greater proportion of businesses in the study area than compared to Richmond County (10.6 percent) or New York City (5 percent).

There are 1,059 employees in the socioeconomic study area as shown in **Table 3-8**. The employees in the socioeconomic study area represent 0.71 percent of Richmond County

employees and 0.02 percent of New York City employees. Over one-third of these jobs are in the Educational Services industry, which represents 36.6 percent of jobs in the socioeconomic study area or 388 jobs. The next most prevalent industries are Construction (132 employees), Health Care & Social Assistance (124 employees), and Administrative and Support and Waste Management and Remediation Services (68 employees).

Table 3-8
Estimated Employees 2016

Industry (by NAICS code)	Socioeconomic Study Area		Richmond County		New York City	
	Number	Percent	Number	Percent	Number	Percent
Agriculture, Forestry, Fishing & Hunting	0	0.0	72	0.0	1,125	0.0
Mining	5	0.5	23	0.0	675	0.0
Utilities	0	0.0	492	0.3	10,296	0.2
Construction	132	12.5	9,100	6.1	135,160	.32
Manufacturing	15	1.4	2,534	1.7	143,989	3.4
Wholesale Trade	9	0.8	2,625	1.7	113,385	2.7
Retail Trade	47	4.4	17,961	12.0	467,288	10.9
Transportation & Warehousing	11	1.0	4,845	3.2	133,445	3.1
Information	23	2.3	3,153	2.1	215,369	5.0
Finance & Insurance	41	3.9	9,339	6.2	371,753	8.7
Real Estate, Rental & Leasing	51	4.8	5,221	3.5	191,472	4.5
Professional, scientific & Tech Services	42	4.0	19,546	13.0	512,769	12.0
Management of Companies & Enterprises	0	0.0	205	0.1	22,173	0.5
Administrative & Support & Waste Management & Remediation Services	68	6.4	4,546	3.0	147,680	3.5
Educational Services	388	36.6	14,290	9.5	344,354	8.0
Health Care & Social Assistance	124	11.7	24,517	16.3	605,316	14.1
Arts, Entertainment & Recreation	36	3.4	2,924	1.9	89,805	2.1
Accommodation & Food Services	17	1.6	10,980	7.3	340,687	8.0
Other Services (except Public Administration)	44	4.2	9,517	6.3	251,548	5.9
Public Administration	5	0.5	7,927	5.3	166,416	3.9
Unclassified Establishments	1	0.1	299	0.2	13,479	0.3
Total	**1,059**	**100**	**150,116**	**100**	**4,278,195**	**100**

Note: Detailed amounts may not add to total due to rounding.
Source: Esri Business Analyst Online, Business Summary Report, 2016 data.

3.5 EFFECTS ASSESSMENT

3.5.1 ALTERNATIVE 1—NO ACTION ALTERNATIVE

Under the No Action Alternative, no new resiliency systems, structural risk reduction projects, public amenities, or open space improvements would be introduced to the project area. The No Action Alternative assumes that current trends with respect to coastal conditions at Tottenville's shoreline–i.e., relating to coastal erosion, ecosystems, and water quality–will continue. The No Action Alternative also presumes that existing strategies to educate New Yorkers and the general public on the risks posed by climate change would remain the same in the study area.

As noted in Chapter 2, "Land Use, Zoning, and Public Policy," the NYC Department of Buildings (NYCDOB) has several records on file for infill housing in the study area. The developments are consistent with the surrounding single-family, detached housing in the study

area. By 2020, no major residential developments or development proposals are planned or proposed. In terms of commercial uses, there are no proposals for new commercial zoning districts within the study area. By 2020, no major commercial developments or development proposals are planned or proposed.

Under the No Action Alternative, study area beaches would continue to erode, and residential and commercial buildings and infrastructure would continue to be more susceptible to damage from major storm events. Further, certain amenities such as the coastal portion of Conference House Park, which currently contribute to neighborhood character and desirability, would continue to suffer the effects of significant coastal erosion. In terms of potential socioeconomic effects, as compared to the Alternatives 2, 3, and 4, under the No Action Alternative there would be greater potential for residential and commercial disinvestment in portions of the study area that would continue to be susceptible to damage from major storm events.

3.5.2 ALTERNATIVE 2—THE LAYERED TOTTENVILLE SHORELINE RESILIENCY STRATEGY: LIVING BREAKWATERS AND TOTTENVILLE SHORELINE PROTECTION PROJECT (LAYERED STRATEGY)

As described in Chapter 1, "Purpose and Need and Alternatives," Alternative 2 would provide two layers of coastal risk reduction intended to improve current shoreline erosion conditions, serve to further reduce wave action, and provide for ecological enhancement and promote social resiliency. The two layers consist of (1) the Breakwaters Project (a breakwater system, area of shoreline restoration and community Water Hub), and (2) the Tottenville Shoreline Protection Project (an earthen berm, hybrid dune system, eco-revetment, and raised edge).

BREAKWATERS PROJECT

The primary components of the Breakwaters Project include an ecologically enhanced in-water breakwater system, an area of shoreline restoration, and an on-shore community Water Hub with landscaping elements. The in-water breakwaters would provide coastal risk reduction by reducing wave energy at the shoreline and reducing or reversing shoreline erosion. Reduced wave energy would assist in ongoing efforts to replenish beaches that protect homes and infrastructure from destructive wave action. The complementary on-shore Water Hub and landscaping elements would provide a community gathering place and other amenities, improve access to the waterfront, and provide educational opportunities for residents and visitors. An improved shoreline condition and a new public amenity would have the potential to increase residential and commercial property values over time.

SHORELINE PROJECT

The second element of Alternative 2 would act as an additional buffer to wave action, and would provide a level of risk reduction to the natural and built land uses along the Tottenville shoreline. Increasing risk reduction from destructive wave action would help to avoid or reduce cost of property damage repairs for homes and businesses, as well as repairs to public infrastructure.

By 2020, existing residents and businesses in the study area would be less susceptible to damage by wave action and erosion. The addition of the alternative's wave attenuation and social resiliency measures could lead to an increase in residential property values over time due to a number of influences. These influences include the increased desirability of the area as a residential neighborhood, the reduction of risk of property damage from wave action, and the potential reduction of costs associated with investing in resiliency measures for individual properties. These influences could result in increases in property values within the study area.

POTENTIAL SOCIOECONOMIC EFFECTS

Potential increases in residential property value attributable to this alternative would not result in significant indirect residential displacement due to increased rents. The rents and sales prices of the study area already reflect the availability of the beach as an amenity in the neighborhood, as well as other amenities within Conference House Park. Considering that the park and beach would not be a substantial new use, but rather improvements would be made to the existing park and beach, the potential increase in rents would be marginal. In addition, study area property values and rents historically have not discounted value based on the risk posed by major storm events. Prior to Superstorm Sandy, property owners and renters could not fully appreciate the extent of damage generated by a storm event of that magnitude, and therefore property values did not fully incorporate the risks of personal injury and property damage. In this respect, Alternative 2 would be expected to maintain pre-Sandy levels of interest, investment, and property values in the study area, rather than leading to substantial increases in property value and rent. Finally, approximately 80 percent of the study area households own their homes; according to the CEQR guidelines, the population of concern is renters who are potentially vulnerable to displacement because they are unable to afford potential rent increase. Of the 20 percent of study area households who rent, most have incomes that suggest they could afford modest rent increases, and study area rents are low relative to other areas in the borough and City, suggesting a small number of residents who would be vulnerable to displacement if rents were to increase. Even if all study area renters vulnerable to displacement from rent increases were to be displaced (which is not expected), the displaced population would represent a very small portion of the overall study area population, and therefore the alternative would not result in displacement that could substantially alter the socioeconomic character of the neighborhood.

Existing retail concentrations in the socioeconomic study area are not located where their property values and rents would be influenced by benefits from a reduced risk of damage caused by wave action and business closures from major storm events. In addition, a vast majority of retail business are located along Amboy Road, which is over ½-mile inland from the project area. This is outside of an area likely to experience increases in visitation to the new and improved amenities provided by this alternative, and therefore these businesses are unlikely to experience rent increases due to a growth in consumer base. Finally, while the Water Hub would be a valuable new amenity in the study area, it would not draw a high volume of new visitors that could substantially alter the consumer base and market conditions in the study area. Therefore, this alternative would not have the potential for significant adverse impacts due to indirect business displacement.

Overall, this alternative is not expected to result in any significant adverse socioeconomic impacts and would have positive social and economic benefits. As stated above, reduced wave energy would assist in ongoing efforts to replenish beaches that protect homes and infrastructure from destructive wave action, thereby contributing to community cohesion. The complementary on-shore Water Hub and landscaping elements would also improve community character by providing a community gathering place and other amenities, improved access to the waterfront, and educational opportunities for residents and visitors. The reduction of risk of property damage from wave action would also contribute positively to community cohesion and character and would preserve access to businesses.

3.5.3 ALTERNATIVE 3—BREAKWATERS WITHOUT SHORELINE PROTECTION SYSTEM

Alternative 3, the Breakwaters Project without the Shoreline Project would have all the resiliency benefits of the breakwater system, proposed Water Hub, and landscaping elements but none of the additional resiliency benefits provided by the Shoreline Project.

As with Alternative 2, the Breakwaters Project would provide coastal risk reduction by reducing wave energy at the shoreline and reducing or reversing shoreline erosion. The complementary on-shore Water Hub and landscaping elements would provide a community gathering place and other amenities, improve access to the waterfront, and provide educational opportunities for residents and visitors.

By 2020, existing residents and businesses in the study area would be less susceptible to damage by wave action and erosion (although to a lesser extent than with Alternative 2), and would have access to a new public amenity, the Water Hub. As with Alternative 2, the addition of the alternative's wave attenuation effects and social resiliency measures could lead to an increase in residential and property values over time due to a number of influences including increased desirability of the neighborhood, the reduction of risk of property damage from wave action, and the potential reduction of costs associated with investing in resiliency measures. These influences could result in increases in market-rate residential rents within the study area.

POTENTIAL SOCIOECONOMIC EFFECTS

Under this alternative, potential increases in residential property value attributable to this alternative would not result in significant indirect residential displacement due to increased rents. As detailed in the discussion of Alternative 2 above, the beach and other shoreline amenities are not new amenities, and already influence market rent in the study area. In addition, study area property values and rents historically have not discounted value based on the risk posed by major storm events. Similar to Alternative 2 although to a lesser extent, Alternative 3 would be expected to maintain pre-Sandy levels of interest, investment, and property values in the study area, rather than leading to substantial increases in property value and rent. Finally, approximately 80 percent of the population own their home and would not be susceptible to displacement due to increased rent. Of the 20 percent of study area households who rent, most have incomes that suggest they could afford modest rent increases, and study area rents are low relative to other areas in the borough and City, suggesting a small number of residents who would be vulnerable to displacement if rents were to increase. Even if all study area renters vulnerable to displacement from rent increases were to be displaced (which is not expected), the displaced population would represent a very small portion of the overall study area population, and therefore the alternative would not result in displacement that could substantially alter the socioeconomic character of the neighborhood.

Potential increases in commercial property values attributable to this alternative would not result in significant indirect commercial displacement pressures. A majority of the retail businesses are located where they would be at marginally less of a risk of damage due to wave action. In addition, the businesses are not in a location that would experience a growth in consumer base due to new beach improvements. Finally, while the Water Hub would be a valuable new amenity in the study area, it would not draw a high volume of new visitors that could substantially alter the consumer base and market conditions in the study area. Alternative 3, the Breakwaters Project without the Shoreline Project, would have less upward influence on residential and commercial rents than anticipated with Alternative 2. It would have all the positive social and

economic benefits of the breakwater system, proposed Water Hub, and landscaping elements, including enhanced community cohesion and character from reduced wave energy and protection from destructive wave action. However, as compared to Alternative 2, Alternative 3 would not have the additional buffer to wave action and increased risk reduction provided by the shoreline project to the natural and built land uses along the Tottenville shoreline. Therefore, this alternative would not result in any adverse socioeconomic impacts.

3.5.4 ALTERNATIVE 4—SHORELINE PROTECTION SYSTEM WITHOUT BREAKWATERS

Alternative 4, the Shoreline Project without the Breakwaters Project, would have the resiliency benefits of the shoreline elements, but none of the additional resiliency benefits provided by the breakwaters system, Water Hub, or landscaping elements. Of note, under this alternative, the Shoreline Project elements themselves would not have the added protection provided by the Breakwaters Project with respect to wave action.

Acting as a buffer to the natural and built environment along the Tottenville shoreline, the Shoreline Project would increase protection from destructive wave action to help avoid or reduce cost of property damage repairs for homes and businesses, as well as repairs to public infrastructure.

By 2020, existing residents closest to the shoreline in the study area would be less susceptible to damage by wave action and erosion (although to a lesser extent than with Alternative 2). As with Alternatives 2 and 3, the addition of the alternative's wave attenuation effects could lead to an increase in residential property values over time due to increased residential desirability, the reduction of risk of property damage from wave action, and the potential reduction of costs associated with investing in resiliency measures. These influences could result in increases in market-rate residential and commercial rents within the study area.

POTENTIAL SOCIOECONOMIC EFFECTS

For the following reasons, potential increases in residential property value attributable to this alternative would not result in significant indirect residential displacement pressures due to increased rents. First, the beach and amenities such as Conference House Park are not new amenities and are already influencing market rent in the study area. Considering that the beach would not be a substantial new use, but rather improvements would be made to the existing beach, the potential increase in rents would be marginal. In addition, study area property values and rents historically have not discounted value based on the risk posed by major storm events, and therefore property values did not fully incorporate the risks of personal injury and property damage. In this respect, Alternative 2 would be expected to maintain pre-Sandy levels of interest, investment, and property values in the study area, rather than leading to substantial increases in property value and rent. Finally, 80 percent of study area residents own their homes and would not vulnerable to displacement due to increased rents. Of the 20 percent of study area households who rent, most have incomes that suggest they could afford modest rent increases, and study area rents are low relative to other areas in the borough and City, suggesting a small number of residents who would be vulnerable to displacement if rents were to increase. Even if all study area renters vulnerable to displacement from rent increases were to be displaced (which is not expected), the displaced population would represent a very small portion of the overall study area population, and therefore the alternative would not result in displacement that could substantially alter the socioeconomic character of the neighborhood.

For the following reasons potential increases in commercial property value attributable to this alternative would not result in significant indirect commercial displacement pressures due to increased rents. First, the reduction in risk of damage or closure due to wave action is marginal for the commercial businesses because they are located in an inland area along Amboy Road that is not at the greatest risk of damage. Second, the commercial properties are over ½-mile from the waterfront and would not experience an increase in rent due to a larger consumer base visiting the improved beach. Furthermore, without the breakwaters, the upward influences on residential and commercial rents would be less than anticipated with the Preferred Alternative.

Alternative 4, the Shoreline Project without the Breakwaters Project, would have the resiliency benefits of the shoreline elements, including the reduction of risk of property damage from wave action, which would contribute positively to community cohesion and character and preserve access to businesses. However, Alternative 4 would not have the added benefits of the in-water breakwater system, an area of shoreline restoration, or an on-shore community Water Hub with landscaping elements. Therefore, this alternative would not result in any adverse socioeconomic impacts.

3.6 ECONOMIC BENEFITS OF CONSTRUCTION

3.6.1 ALTERNATIVE 1—NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be none of the economic benefits from construction activities associated with the other alternatives.

3.6.2 ALTERNATIVE 2—THE LAYERED TOTTENVILLE SHORELINE RESILIENCY STRATEGY: LIVING BREAKWATERS AND TOTTENVILLE SHORELINE PROTECTION PROJECT (LAYERED STRATEGY)

Construction of the Layered Tottenville Shoreline Resiliency Strategy Alternative (Alternative 2) is estimated to cost approximately $89.37 million in 2016 dollars (see **Table 3-9**). This amount includes all hard costs for the Breakwaters Project with the exception of the Water Hub[2], and all hard costs for the Shoreline Project, but excludes contingency costs for both projects.

[2] There are two potential locations under consideration for siting the Water Hub. Potential Location 1 would involve construction of a new structure, with an estimated cost of $5.00 million. Potential Location 2 would involve the rehabilitation and adaptive reuse of an existing NYC Parks building; the cost of rehabilitation and adaptive reuse has not been estimated, but is expected to be less than $5.00 million cost associated with new construction Potential Location 2. Given that the cost of constructing the Water Hub at Potential Location 2 is not yet known, the economic benefits associated with the development of the Water Hub are excluded from this analysis. However, as it is expected to have less construction costs than the Water Hub at Potential Location 2, it can qualitatively be surmised that Potential Location 1 would have slightly less economic benefit in terms of construction.

Table 3-9
Construction Costs by IMPLAN Sector
Layered Tottenville Shoreline Resiliency Strategy Alternative

IMPLAN Sector	Description of IMPLAN Industry Sector	Construction Costs (in millions of dollars)
58	Construction of other new nonresidential structures	$89.37
	Total	**$89.37**

Notes: Construction costs are reported in 2016 dollars; in future years dollar amounts would be expected to increase with inflation. Detailed amounts may not add to total due to rounding.
Sources: Construction cost estimates provided by MFS and Stantec in October 2016; AKRF, Inc. distributed costs to appropriate IMPLAN sector categories.

EMPLOYMENT AND ECONOMIC EFFECTS

Employment

As a result of the $89.37 million in direct expenditures associated with this alternative's construction, direct employment from construction is estimated at 394 person-years of employment (see **Table 3-10**). A person-year is the equivalent of one person working full-time for one year. Assuming a two-year construction schedule for this alternative, the 394 person-years estimate equates to 197 people working full-time over that two-year period.

Table 3-10
Economic Benefits from Construction—Alternative 2

	Portion in New York City	Total New York City And State
Employment (Person-Years)[1]		
Direct (jobs from construction)	394	394
Indirect (jobs in support industries)	86	95
Induced (jobs from household spending)	90	93
Total	**570**	**581**
Employee Compensation (Millions of Constant 2016 dollars)		
Direct (earnings from construction)	$35.60	$35.60
Indirect (earnings from support industries)	$8.11	$8.68
Induced (earnings from household spending)	$8.09	$8.29
Total	**$51.80**	**$52.57**
Total Economic Output or Demand[2] (Millions of Constant 2016 dollars)		
Direct (output from construction)	$90.88	$90.88
Indirect (output from support industries)	$22.09	$24.93
Induced (output from household spending)	$23.27	$24.18
Total	**$136.24**	**$139.98**

Notes:
[1] A person-year is the equivalent of one person working full-time for a year.
[2] The total effect on the local economy, including the sum of the cost of goods and services used to produce a product and the associated payments to workers, taxes, and profits.
Detailed amounts may not add to total due to rounding.
Sources:
The characteristics of construction and estimated construction costs were provided by MFS for the Living Breakwaters, and Stantec for the Tottenville Shoreline Protection Project. AKRF, Inc. performed the input-output modeling using the IMPLAN economic modeling system.

When new direct jobs are introduced to an area, those jobs lead to the creation of additional *indirect* and *induced* jobs, as defined in Section D. Based on the IMPLAN model's economic multipliers for New York City sectors, the construction of Alternative 2 would generate in New York City an additional 86 person-years of indirect employment and 90 person-years of induced employment, bringing the total number of New York City-based jobs from construction to 570 person-years of employment (see **Table 3-10**). In the larger New York State economy, the construction of this alternative would generate an estimated additional 11 person-years of indirect and induced employment, bringing the total direct and generated jobs from construction to 581 person-years of employment.

Employee Compensation

The direct employee compensation during construction is estimated at $35.60 million (see **Table 3-10**). Total direct, indirect, and induced employee compensation resulting in New York City from the construction is estimated at $51.80 million. In the broader New York State economy, total direct, indirect, and induced employee compensation from the construction is estimated at $52.57 million.

Total Effects on the Local Community

Based on the IMPLAN models for New York City and State, the total economic activity that would result from construction is estimated at $139.98 million in New York State, of which $136.24 million would occur in New York City.

3.6.3 ALTERNATIVE 3—BREAKWATERS WITHOUT SHORELINE PROTECTION SYSTEM

Alternative 3 is estimated to cost approximately $61.50 million in 2016 dollars (see **Table 3-11**). This amount includes all hard costs for the breakwaters, with the exception of the Water Hub.[3] The $61.50 million amount excludes contingency costs.

Table 3-11
Construction Costs by IMPLAN Sector
Baseline Flood Protection System Alternative

IMPLAN Sector	Description of IMPLAN Industry Sector	Construction Costs (in millions of dollars)
58	Construction of other new nonresidential structures	$61.50
	Total	**$61.50**

Notes: Construction costs are reported in 2016 dollars; in future years dollar amounts would be expected to increase with inflation. Detailed amounts may not add to total due to rounding.
Sources: Construction cost estimates provided by MFS in October 2016; AKRF, Inc. distributed costs to appropriate IMPLAN sector categories.

[3] There are two potential locations under consideration for siting the Water Hub. Potential Location 1 would involve construction of a new structure, with an estimated cost of $5.00 million. Potential Location 2 would involve the rehabilitation and adaptive reuse of an existing NYC Parks building; the cost of rehabilitation and adaptive reuse has not been estimated, but is expected to be less than $5.00 million cost associated with new construction Potential Location 2. Given that the cost of constructing the Water Hub at Potential Location 2 is not yet known, the economic benefits associated with the development of the Water Hub are excluded from this analysis. However, as it is expected to have less construction costs than the Water Hub at Potential Location 2, it can qualitatively be surmised that Potential Location 1 would have slightly less economic benefit in terms of construction.

EMPLOYMENT AND ECONOMIC EFFECTS

Employment

As a result of the $61.50 million in direct construction expenditures, direct employment from construction is estimated at 273 person-years of employment (see **Table 3-12**). Assuming a two-year construction schedule for this alternative, the 273 person-years estimate equates to approximately 136 people working full-time over that two-year period.

Table 3-12
Economic Benefits from Construction—Alternative 3

	Portion in New York City	Total New York City And State
Employment (Person-Years)[1]		
Direct (jobs from construction)	273	273
Indirect (jobs in support industries)	60	65
Induced (jobs from household spending)	62	64
Total	**395**	**402**
Employee Compensation (Millions of Constant 2016 dollars)		
Direct (earnings from construction)	$24.64	$24.64
Indirect (earnings from support industries)	$5.62	$5.98
Induced (earnings from household spending)	$5.60	$5.73
Total	**$35.86**	**$36.35**
Total Economic Output or Demand[2] (Millions of Constant 2016 dollars)		
Direct (output from construction)	$63.01	$63.01
Indirect (output from support industries)	$15.28	$17.30
Induced (output from household spending)	$16.12	$16.76
Total	**$94.41**	**$97.08**

Notes:
[1] A person-year is the equivalent of one person working full-time for a year.
[2] The total effect on the local economy, including the sum of the cost of goods and services used to produce a product and the associated payments to workers, taxes, and profits.
Detailed amounts may not add to total due to rounding.
Sources:
The characteristics of construction and estimated construction costs were provided by MFS. AKRF, Inc. performed the input-output modeling using the IMPLAN economic modeling system..

When new direct jobs are introduced to an area, those jobs lead to the creation of additional *indirect* and *induced* jobs, as defined in Section D. Based on the IMPLAN model's economic multipliers for New York City sectors, the construction of Alternative 3 would generate an additional 60 person-years of indirect employment and 62 person-years of induced employment in New York City, bringing the total number of jobs from construction to 395 person-years of employment (see **Table 3-12**). In the larger New York State economy, the construction of this alternative would generate an estimated additional 8 person-years of indirect and induced employment, bringing the total direct and generated jobs from construction to 402 person-years of employment.

Employee Compensation

The direct employee compensation during construction is estimated at $24.64 million (see **Table 3-12**). Total direct, indirect, and induced employee compensation resulting in New York City

from the construction is estimated at $35.86 million. In the broader New York State economy, total direct, indirect, and induced employee compensation from the construction is estimated at $36.35 million.

Total Effects on the Local Community

Based on the IMPLAN models for New York City and State, the total economic activity that would result from construction is estimated at $97.08 million in New York State, of which $94.41 million would occur in New York City.

3.6.4 ALTERNATIVE 4—SHORELINE PROTECTION SYSTEM WITHOUT BREAKWATERS

Alternative 4 is estimated to cost approximately $27.87 million in 2016 dollars (see **Table 3-13**). This amount includes all hard costs for the Shoreline Project. The $27.87 million amount excludes contingency costs.

Table 3-13
Construction Costs by IMPLAN Sector
Shoreline Protection System Alternative

IMPLAN Sector	Description of IMPLAN Industry Sector	Construction Costs (in millions of dollars)
58	Construction of other new nonresidential structures	$27.87
	Total	**$27.87**

Notes: Construction costs are reported in 2016 dollars; in future years dollar amounts would be expected to increase with inflation. Detailed amounts may not add to total due to rounding.
Sources: Construction cost estimates provided by Stantec; AKRF, Inc. distributed costs to appropriate IMPLAN sector categories.

EMPLOYMENT AND ECONOMIC EFFECTS

Employment

The direct expenditures for the construction of this alternative are estimated at $27.87 million. As a result of the direct expenditures, direct employment from construction is estimated at 121 person-years of employment (see **Table 3-14**). Assuming a two-year construction schedule for this alternative, the 121 person-years estimate equates to 61 people working full-time over that two-year period.

When new direct jobs are introduced to an area, those jobs lead to the creation of additional *indirect* and *induced* jobs, as defined in Section D. Based on the IMPLAN model's economic multipliers for New York City sectors, the construction of Alternative 4 would generate an additional 27 person-years of indirect employment and 28 person-years of induced employment in New York City, bringing the total number of jobs from construction to 176 person-years of employment (see **Table 3-14**). In the larger New York State economy, the construction of this alternative would generate an estimated additional 3 person-years of indirect and induced employment, bringing the total direct and generated jobs from construction to 179 person-years of employment.

Table 3-14
Economic Benefits from Construction—Alternative 4

	Portion in New York City	Total New York City And State
Employment (Person-Years)[1]		
Direct (jobs from construction)	121	121
Indirect (jobs in support industries)	27	29
Induced (jobs from household spending)	28	29
Total	**176**	**179**
Employee Compensation (Millions of Constant 2016 dollars)		
Direct (earnings from construction)	$10.96	$10.96
Indirect (earnings from support industries)	$2.50	$2.70
Induced (earnings from household spending)	$2.49	$2.56
Total	**$15.95**	**$16.21**
Total Economic Output or Demand[2] (Millions of Constant 2016 dollars)		
Direct (output from construction)	$27.87	$27.87
Indirect (output from support industries)	$6.81	$7.62
Induced (output from household spending)	$7.15	$7.41
Total	**$41.84**	**$42.91**

Notes:
[1] A person-year is the equivalent of one person working full-time for a year.
[2] The total effect on the local economy, including the sum of the cost of goods and services used to produce a product and the associated payments to workers, taxes, and profits.
Detailed amounts may not add to total due to rounding.
Sources:
Construction cost estimates provided by Stantec; AKRF, Inc. performed the modeling using the IMPLAN economic modeling system.

Employee Compensation

The direct employee compensation during construction is estimated at $10.96 million (see **Table 3-14**). Total direct, indirect, and induced employee compensation resulting in New York City from the construction is estimated at $15.95 million. In the broader New York State economy, total direct, indirect, and induced employee compensation from the construction is estimated at $16.21 million.

Total Effects on the Local Community

Based on the IMPLAN models for New York City and State, the total economic activity that would result from construction is estimated at $42.91 million in New York State, of which $41.84 million would occur in New York City.

3.7 MINIMIZATION AND MITIGATION OF IMPACTS

As described above, the Proposed Actions would not result in significant adverse socioeconomic effects. Therefore, no mitigation for socioeconomic effects is warranted. ✷