4.8 Socioeconomics and Land Use

4.8.1 Methodology

The general Study Area includes the City of Hoboken and portions of the City of Weehawken and the City of Jersey City. Census information was obtained to conduct demographic analyses. Since census boundaries do not necessarily conform to the Study Area boundary, a Demographic Analysis Area was used that includes the Study Area and extends farther to the north and south to include the entirety of census tracts located within the Study Area. The Demographic Analysis Area was also extended along the western portion of the Study Area to encompass Census Tract 78 in the City of Jersey City and Census Tract 179 in the Township of Weehawken (see **Figure 4.68**).

Environmental Justice Populations

President Clinton signed Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, on February 11, 1994. EO 12898 requires federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. The goal of EO 12898 is as follows: "Each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States." The purpose of the environmental justice review is to determine whether a disproportionate share of the Project's adverse impacts may be borne by a minority and/or low-income population (households below the poverty level).

The methodology to identify communities of concern follows the guidance established by Together North Jersey (TNJ), developed for its Regional Fair Housing and Equity Assessment portion of its Regional Plan for Sustainable Development. TNJ has developed a regional threshold, or average, to assess whether each census area meets or exceeds this average. If a census area meets or exceeds these thresholds, it is considered a community of concern. This includes thresholds for minority, Hispanic or Latino, households below the poverty level, families with related children under the age of 18 below the poverty level, and population age 75 and older. The TNJ thresholds are as follows:

- Minority population: 42.6 percent
- Hispanic or Latino: 19.5 percent
- Households below the poverty level: 8.9 percent
- Families with related children under the age of 18 below the poverty level: 5 percent
- Population age 75 and older: 6.6 percent

To identify and assess potential impacts on the socioeconomic environment, land use, zoning, and minority and low-income populations, a two-phase analysis was conducted. The first phase consisted of documenting the existing character and significant features of the Demographic Analysis Area by reviewing pertinent planning and zoning documents and identifying redevelopment proposals within the Demographic Analysis Area. A combination of secondary sources and field surveys were used to determine land uses, development patterns, and zoning within the Demographic Analysis Area. For the socioeconomic analysis and analysis of minority and low-income populations, data sources included the 2010 United States Census and the 2010-2014 American Community Survey (ACS). Data from the 2010 United States Census provides demographic information such as population and race. It should be noted that the full census is conducted every 10 years. As a result, changes that have occurred since April 2010 are not reflected in the census data. The ACS data is an estimate compiled from data collected over a five-year period. ACS data was used to compile income and poverty data. This is the best data available and meets the standards for conducting a socioeconomic analysis.

The U.S. Census Bureau compiles data based on three statistical areas. The largest area is the census tract, which is a statistical subdivision of a county. Census tracts are then divided into census block groups (the second largest census area), which are then broken down to the block level (the smallest census area). Data on race, Hispanic origin, and age were analyzed at the block group level, per the guidance from TNJ. To determine the demographic profile (the racial composition and income level) of the Demographic Analysis Area, census tract and block groups were identified and then baseline demographic data was compiled.

Each census block or block group was evaluated to identify the presence of five population categories (minority, Hispanic or Latino, households below the poverty level, families with related children under 18 below the poverty level, and population age 75 and older) and the potential impacts that the proposed improvements may have on these population groups.

As part of the analysis, census blocks and census block groups with populations above the TNJ regional thresholds were examined to determine whether they contained the proposed improvements and, if so, to identify the location of the proposed improvements in relation to the existing populations.

Figures 4.69 through 4.83 summarize population information for census block groups and census blocks in which the proposed Build Alternatives are located. Census block group data for Hoboken, Jersey City, and Weehawken are found in Appendices A, B, and C of the Socioeconomic TES (Dewberry 2016).

Land Use

To determine the existing land use and zoning conditions for the Demographic Analysis Area, the municipal master plans and zoning maps for the City of Hoboken, City of Jersey City, and Township of Weehawken were reviewed. Information on the

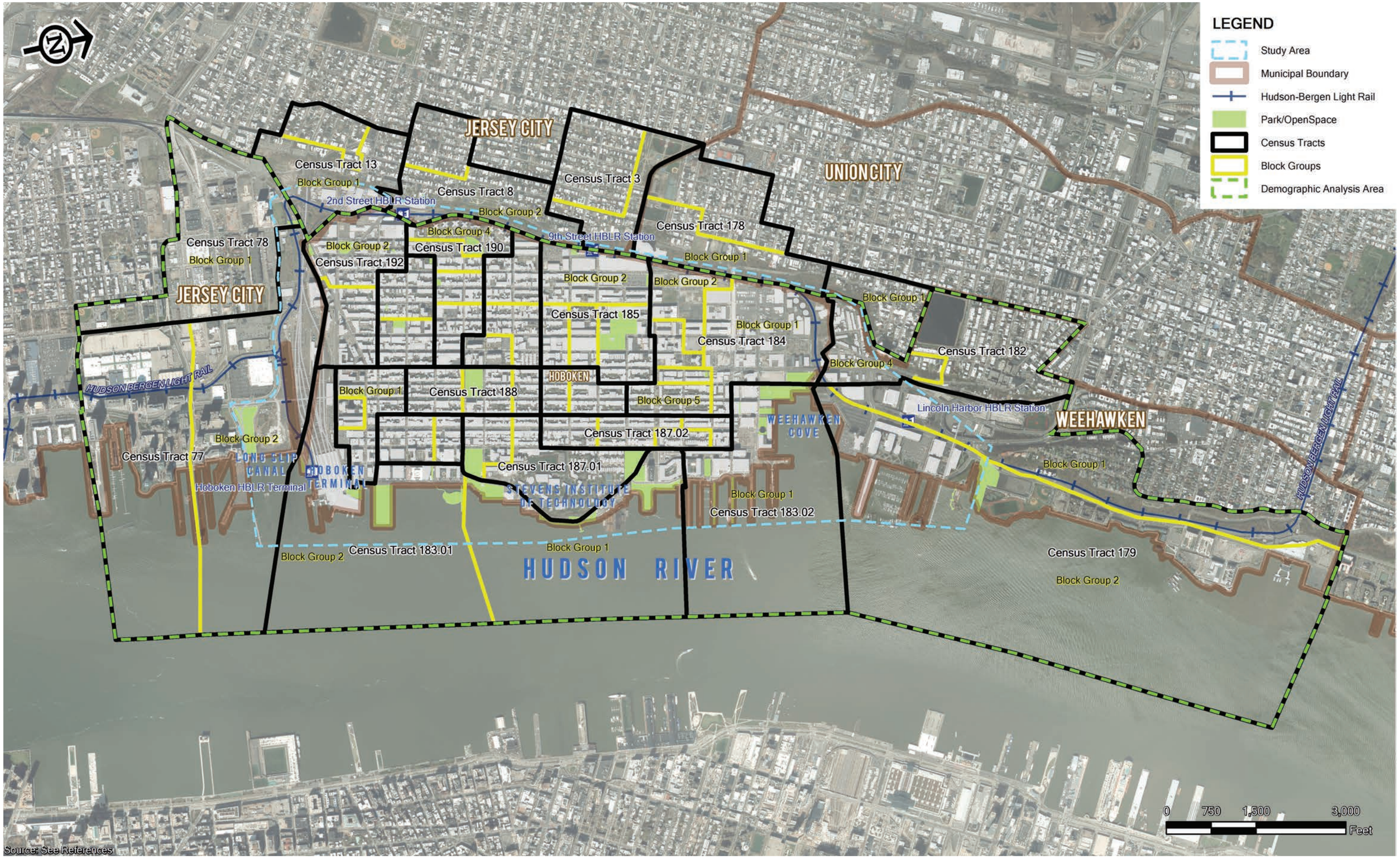

Figure 4.68 Demographic Analysis Area

location of parks, open space, and recreational facilities within the Demographic Analysis Area was obtained by reviewing the Recreational and Open Space Inventory (ROSI) GIS database provided by the NJDEP, as well as land use data. The ROSI database provides a list of municipal, county, and nonprofit parkland that is encumbered by the NJDEP's Green Acres program. The locations of open space and recreational facilities within the Demographic Analysis Area were verified in the field on September 8, 2016. To confirm the number and type of businesses in the vicinity of the Build Alternatives, a land use survey was conducted for all areas within 50 feet of the limits of disturbance for all of the three Build Alternatives. The land use survey was conducted on October 28 and November 1, 2016. Businesses observed were categorized as retail (e.g., restaurants, stores, banks, hotels, gyms, parking); offices (e.g., law offices, public relations firms, publishing); or industrial (e.g., bus garages, shipping, construction, metal works, warehouse).

The second phase of analysis included a comparison of data, which identified the specific impacts from the three Build Alternatives and the No Action Alternative. The land use impact analysis considered the Project's consistency with local and regional plans, its effects on current development proposals within the Study Area, its consistency with the existing land use pattern of the Study Area, and potential changes to development opportunities within the Study Area.

4.8.2 Affected Environment

This section presents an overview of existing conditions within the Demographic Analysis Area, which includes a summary of the demographic character, existing land use and zoning, open space, and recreational facilities within the City of Hoboken and portions of the City of Jersey City and the Township of Weehawken. The demographic characteristics are presented at the county, municipal, and Demographic Analysis Area level. The county and municipal data provide a community profile with which to compare and contrast the Demographic Analysis Area's characteristics.

4.8.2.1 Population and Demographics

As shown in **Figure 4.51**, the Demographic Analysis Area includes 18 census tracts and 37 block groups. The western boundary of the Study Area follows the HBLR Line to the west and the Hudson River to the east. The northern and southern boundaries for the Demographic Analysis Area extend beyond the Study Area boundary to include Census Tracts 77 and 78 in Jersey City and Census Tracts 179 and 182 in Weehawken. In Hoboken, the Census Tracts include 183.01, 183.02, 184, 185, 186, 187.01, 187.02, 188, 189, 190, 191, 192, 193, and 194.

According to the 2010 United States Census, 66,722 people lived in the Demographic Analysis Area; 50,005 people lived in the City of Hoboken, 10,978 lived in the City of Jersey City, and 5,739 lived in the Township of Weehawken. A summary of the Population Characteristics of the Demographic Analysis Area can be found in **Table 4.39**. The per capita income in Hoboken was $70,477, which includes all adults and children. The median household income was $108,998. According to Sperling's Best Places website, the unemployment rate in Hoboken is 3.00 percent, with job growth of 1.04 percent. Future job growth over the next 10 years is predicted to be 39.10 percent.

Minority Population – City of Hoboken

The U.S. Census Bureau defines minority populations to include persons who identify themselves as African American, American Indian, Alaskan Native, Asian alone, Native Hawaiian, Other Pacific Islander, and some other race alone or two or more races. People who identify themselves as Hispanic may be of any race.

Table 4.39 Population Characteristics in the Demographic Analysis Area

	TOTAL STUDY AREA	%	HOBOKEN	%	JERSEY CITY	%	WEEHAWKEN	%	HUDSON COUNTY	%
Total Population in the Analysis Area	56,918	100	50,005	100	4,752	100	2,161	100	634,266	100
White Alone	44,101	77	41,124	82	1,428	30	1,549	72	342,792	55
Black or African American Alone	2,383	4	1,767	4	504	11	112	5	83,925	13
American Indian and Alaska Native Alone	93	0	73	0	20	0	0	0	4,081	1
Asian Alone	6,370	12	3,558	7	2,443	51	369	17	84,924	13
Native Hawaiin and Other Pacific Islander Alone	15	0	15	0	0	0	0	0	344	0
Some Other Race Alone	2,427	4	2,144	4	215	5	68	3	90,373	14
Two or More Races	1,529	3	1,324	3	142	3	63	3	27,827	4
Hispanic (May be of any Race)	10,025	14	7,602	15	782	7	1,641	29	267,853	42

Source: U.S. Census Bureau, 2010 Census, STF1

Within the City of Hoboken, the 2010 United States Census data indicated that 8,526 people, or 18 percent of the population, identified themselves as minority. An analysis of the 38 census block groups located within the Demographic Analysis Area in Hoboken indicates that one block group had a minority population above the threshold of 42.6 percent, as determined by the TNJ guidance. Therefore, this block group was classified as a community of concern. This block group, Block Group 4, Census Tract 190, had a minority percentage of 70.6 percent (see **Figures 4.69-4.71**).

As shown in **Figures 4.72 through 4.74**, of the 38 census block groups in the City of Hoboken, 10 had a Hispanic or Latino population above the TNJ threshold of 19.5 percent.

Minority Population - City of Jersey City

Within the census block groups located in the City of Jersey City portion of the Demographic Analysis Area, 3,324 people classified themselves as minority. This figure represents 70 percent of the total population living within these block groups. Both census block groups within the Demographic Analysis Area within Jersey City exceed the TNJ threshold for minority populations, which is 42.6 percent. As shown in **Figures 4.72 through 4.74**, of the two census block groups within the Demographic Analysis Area in the City of Jersey City, one had a Hispanic or Latino population above the NJT threshold of 19.5 percent.

Minority Population - Township of Weehawken

In 2010, 612 residents living within the block groups located in the Weehawken portion of the Demographic Analysis Area considered themselves minority. This figure represents 28 percent of the total population living in these block groups. None of the three block groups exceeded the TNJ threshold of 42.6 percent. As shown on **Figures 4.72 through 4.74**, of the three census block groups within the Demographic Analysis Area in the Township of Weehawken, two had a Hispanic or Latino population above the NJT threshold of 19.5 percent.

4.8.2.1.1 *Income Level*

In 2010-2014, seven census tracts in the Hoboken portion of the Demographic Analysis Area, both census tracts in the Jersey City portion, and neither of the two census tracts in the Weehawken portion exceeded the TNJ threshold of 8.9 percent for households below the poverty line (**see Figures 4.75 through 4.77**). As per the TNJ guidance, another indicator of poverty is the percentage of families with related children under 18 (**see Figures 4.78 through 4.80**). Four census tracts in Hoboken, one census tract in the Jersey City portion of the Demographic Analysis Area, and neither of the census tracts in the Weehawken portion of the Demographic Analysis Area exceeded the TNJ threshold of five percent.

4.8.2.1.2 *Population Age 75 and Over*

TNJ uses age 75 and above as the basis for identifying communities with senior citizens that may be of special concern. TNJ's threshold is 6.6 percent of the population within a given area being 75 years of age or older. For the census block groups within the Demographic Analysis Area, five block groups in Hoboken are above this threshold; one block group in Jersey City is above this threshold (Block Group 1, Census Tract 78); and no block groups in Weehawken are above this threshold (**see Figures 4.81 through 4.83**).

4.8.2.2 Land Use and Zoning

Land use refers to the activity that is occurring on land and within the structures that occupy it and can include categories such as commercial, residential, open space, etc. Zoning controls the use, density, and bulk of development. The purpose of a zoning ordinance is to regulate the location, extent, and intensity of land use. Land use in the Study Area is illustrated in **Figure 4.84** and zoning is illustrated in **Figure 4.85**.

Land Use – City of Hoboken

Hoboken was originally incorporated as a city in 1855. It was based on a grid system designed by Colonel John Stevens. The grid system features east/west numbered streets and north/south named streets that run roughly parallel to the Hudson River. Currently, the city contains a mix of land uses including residential, commercial, industrial, public, and institutional uses. The municipality is largely fully developed. As required in the Farmland Protection Policy Act of 1981, the Study Area was reviewed and no prime or unique farmland was identified within the Study Area.

At the southern end of the city is the NJ TRANSIT Hoboken Terminal, a major transportation hub that includes connections to the PATH system, the HBLR, and ferries operated by NY Waterway. The terminal is also a hub for bus, taxi, and bicycle use. Adjacent to the terminal and along First Street is a mix of commercial and mixed-use properties. The area surrounding the terminal has been the subject of several redevelopment plans, both completed and planned (see **Figure 4.86**).

Washington Street is Hoboken's major commercial corridor, extending 16 blocks from Observer Highway to 15th Street. The southern portion of the corridor, south of 7th Street, is largely commercial on the ground floor with residential units on the upper floors. North of 7th Street, Washington Avenue is largely residential, interspersed with commercial uses on the ground floor. Other commercial and mixed-use areas include First Street, 14th Street from Sinatra Drive North to Willow Avenue, and the blocks surrounding the intersection of Hudson Street and Hudson Place.

Along the Hudson River are several parks including Warrington Plaza and Clock Tower, Pier A, and Pier C (see Section 4.8.2.3 for a discussion of Open Space). Located overlooking the Hudson River at 8th Street and Hudson Street is the Stevens Institute of Technology, a four-year, private research university that is located at Castle Point, the highest point in Hoboken. In the northeast section, along the waterfront of the city, are the Maxwell House, Shipyard, and Hudson Tea Building apartment buildings.

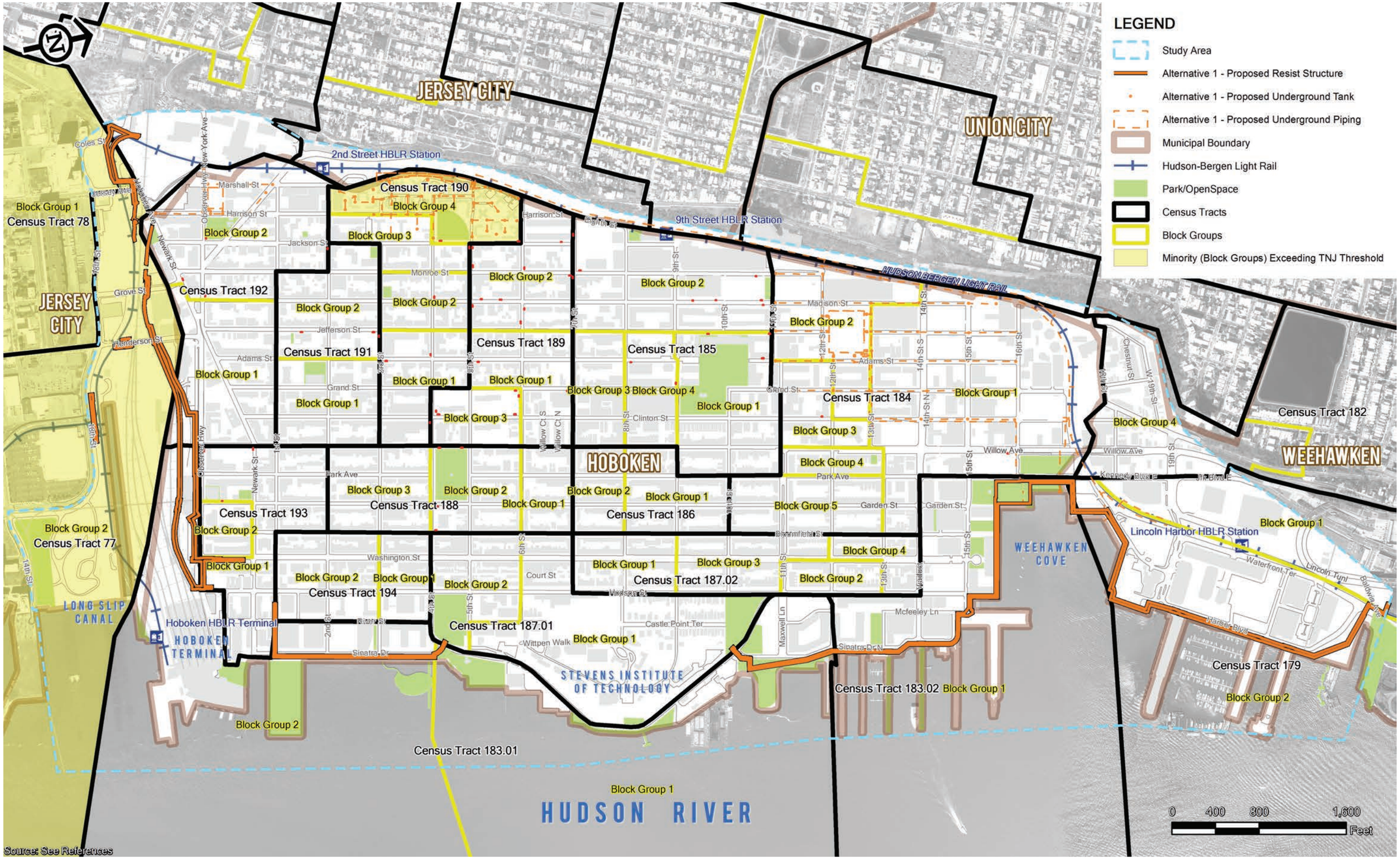

Figure 4.69 Minority (Block Groups) - Alternative 1

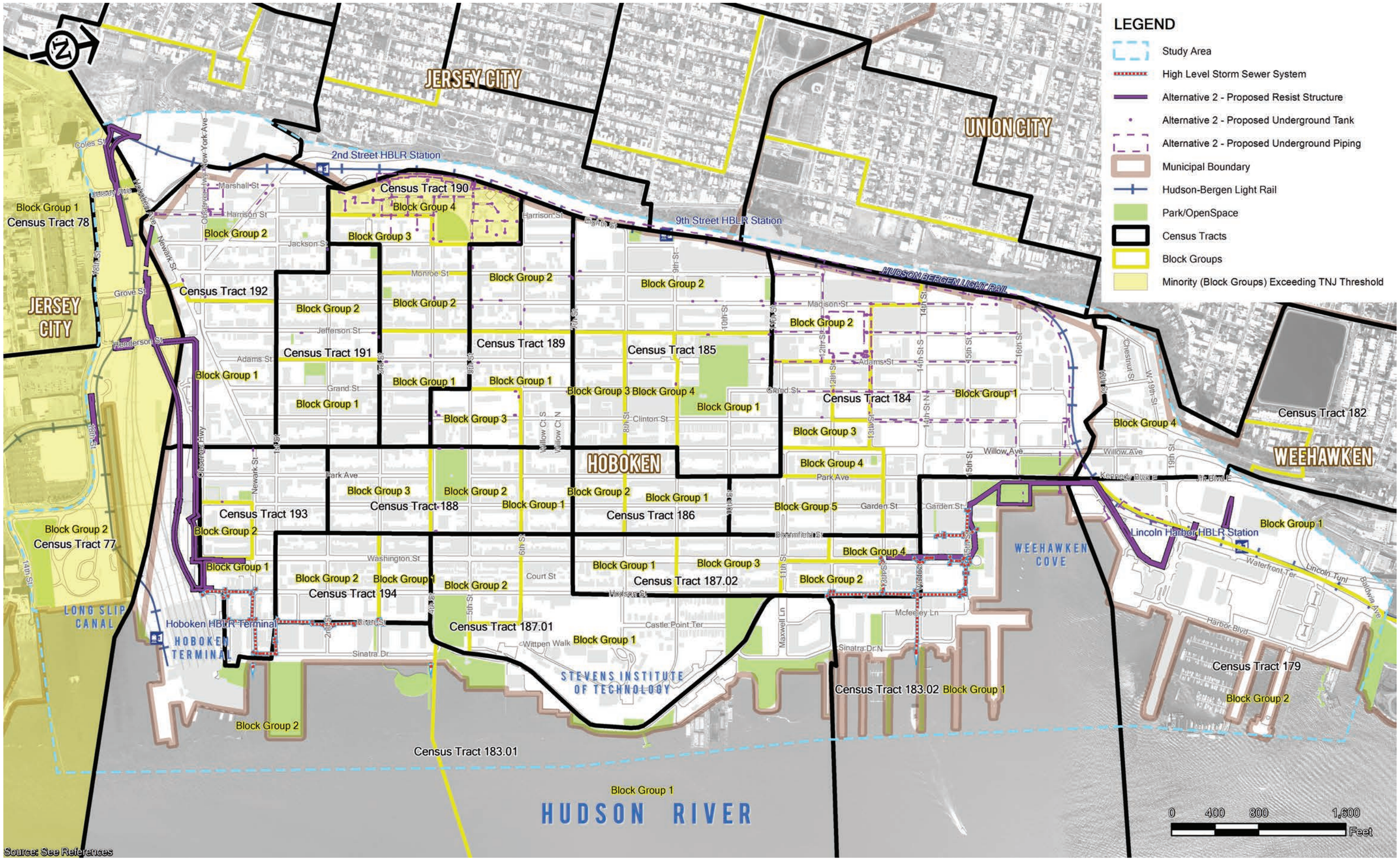

Figure 4.70 Minority (Block Groups) - Alternative 2

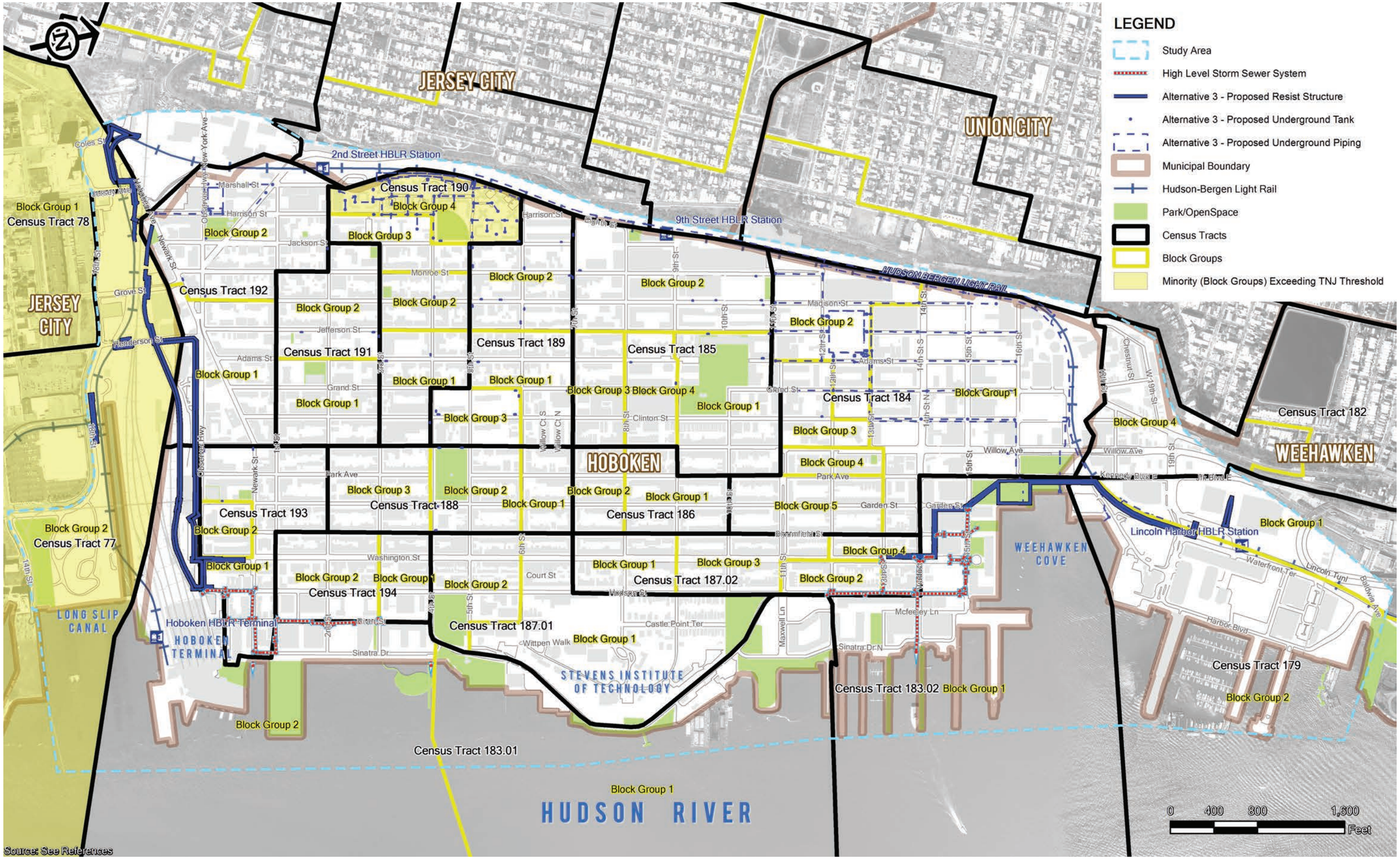

Figure 4.71 Minority (Block Groups) - Alternative 3

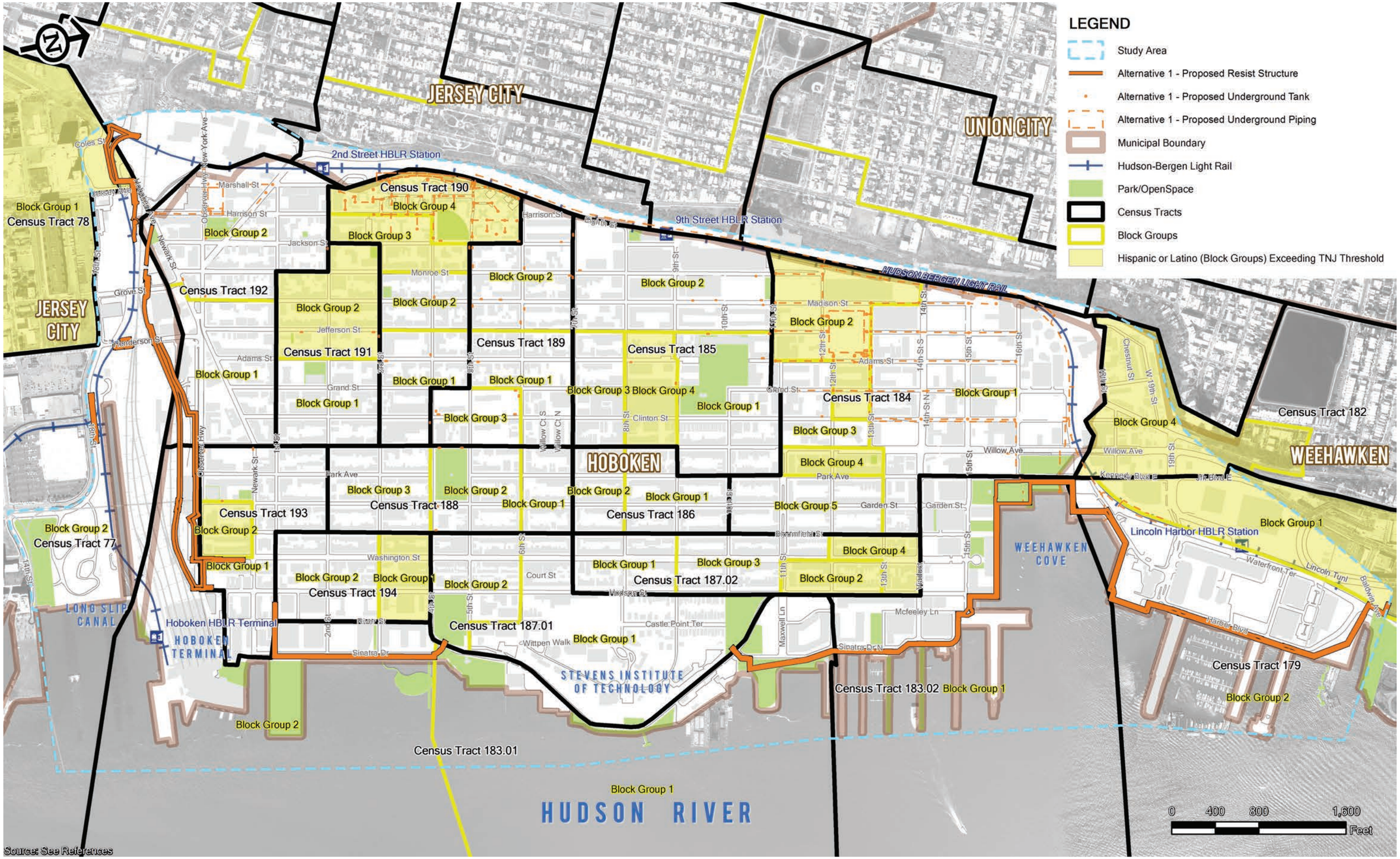

Figure 4.72 Hispanic or Latino (Block Groups) - Alternative 1

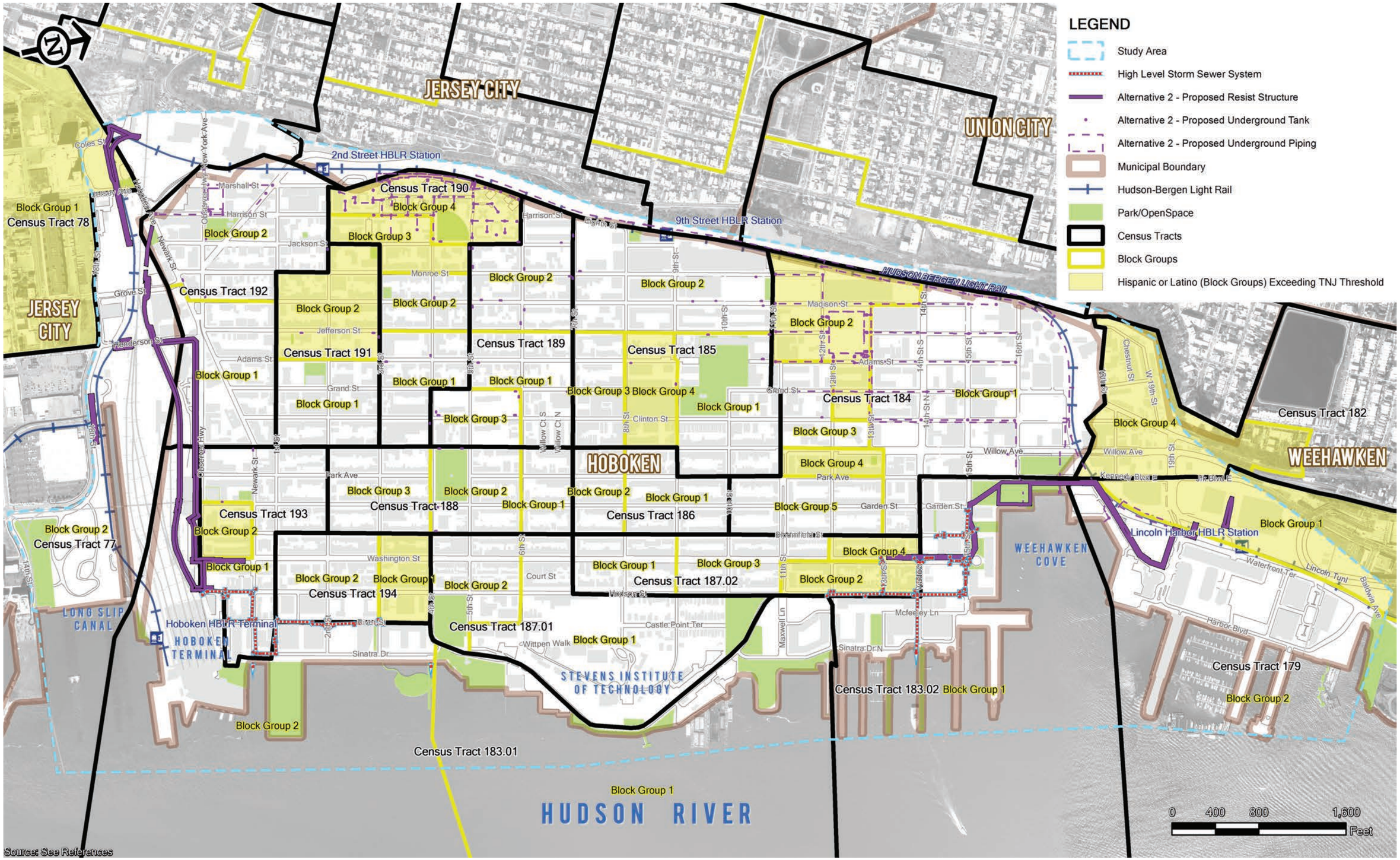

Figure 4.73 Hispanic or Latino (Block Groups) - Alternative 2

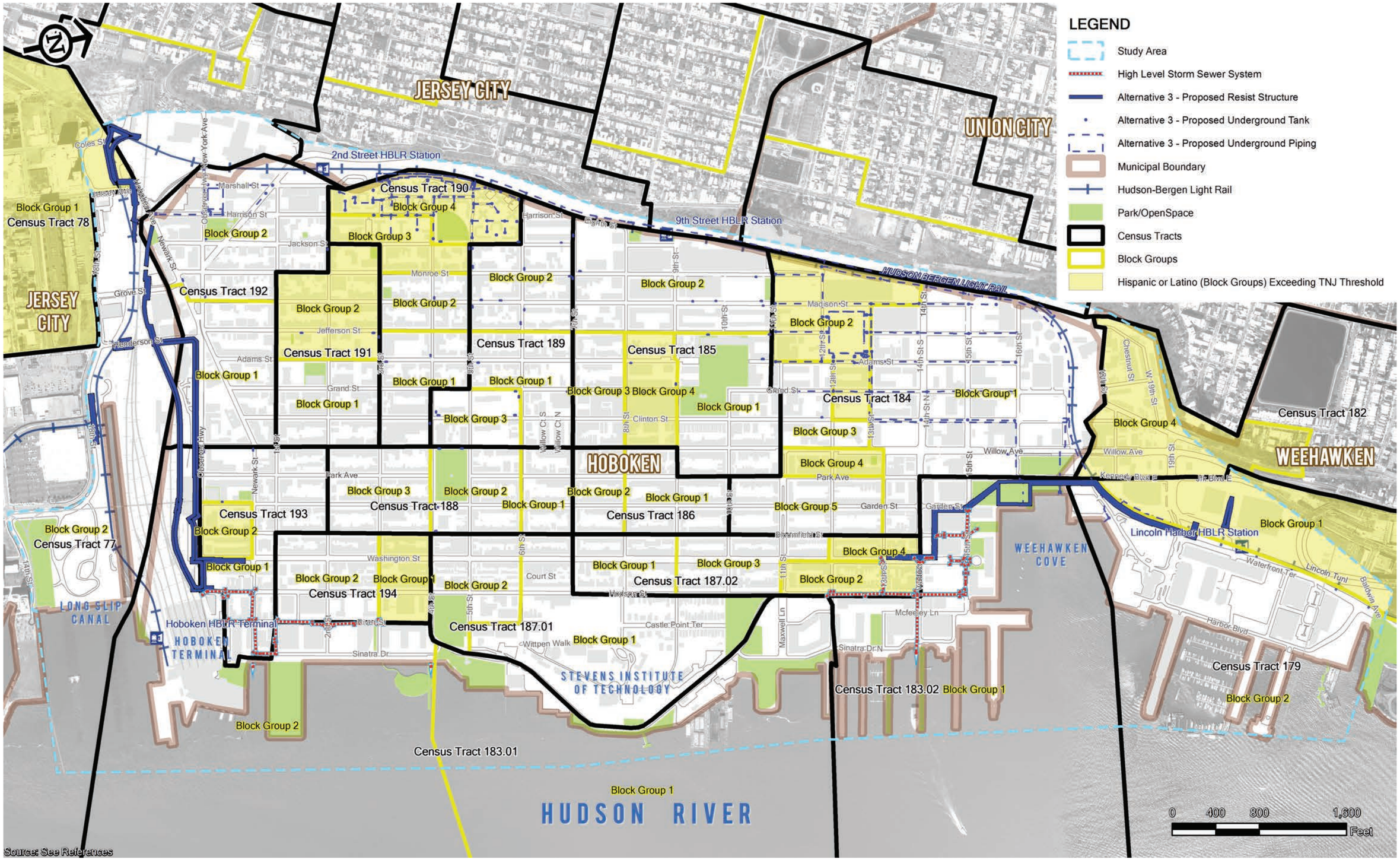

Figure 4.74 Hispanic or Latino (Block Groups) - Alternative 3

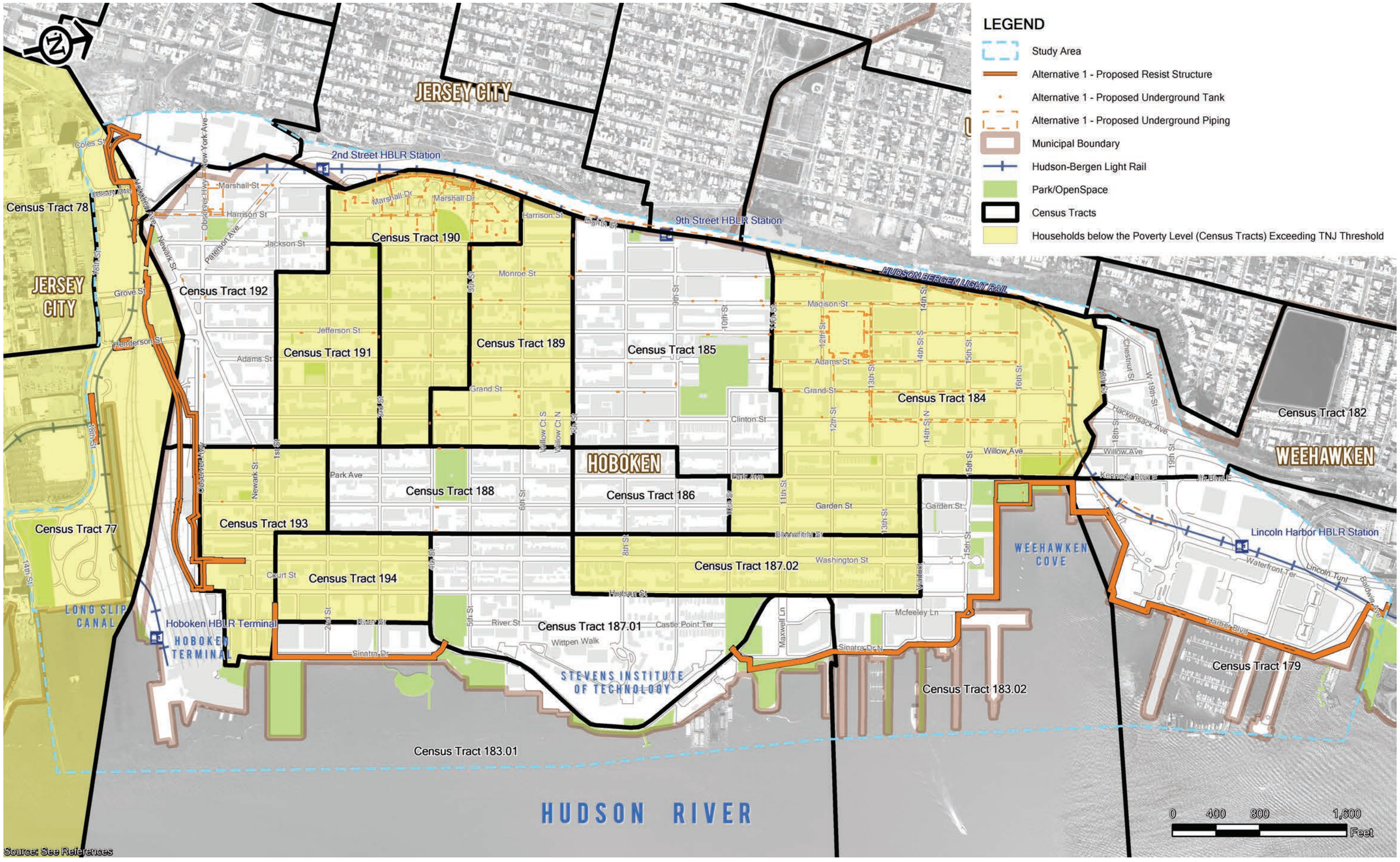

Figure 4.75 Households below the Poverty Level (Census Tracts) - Alternative 1

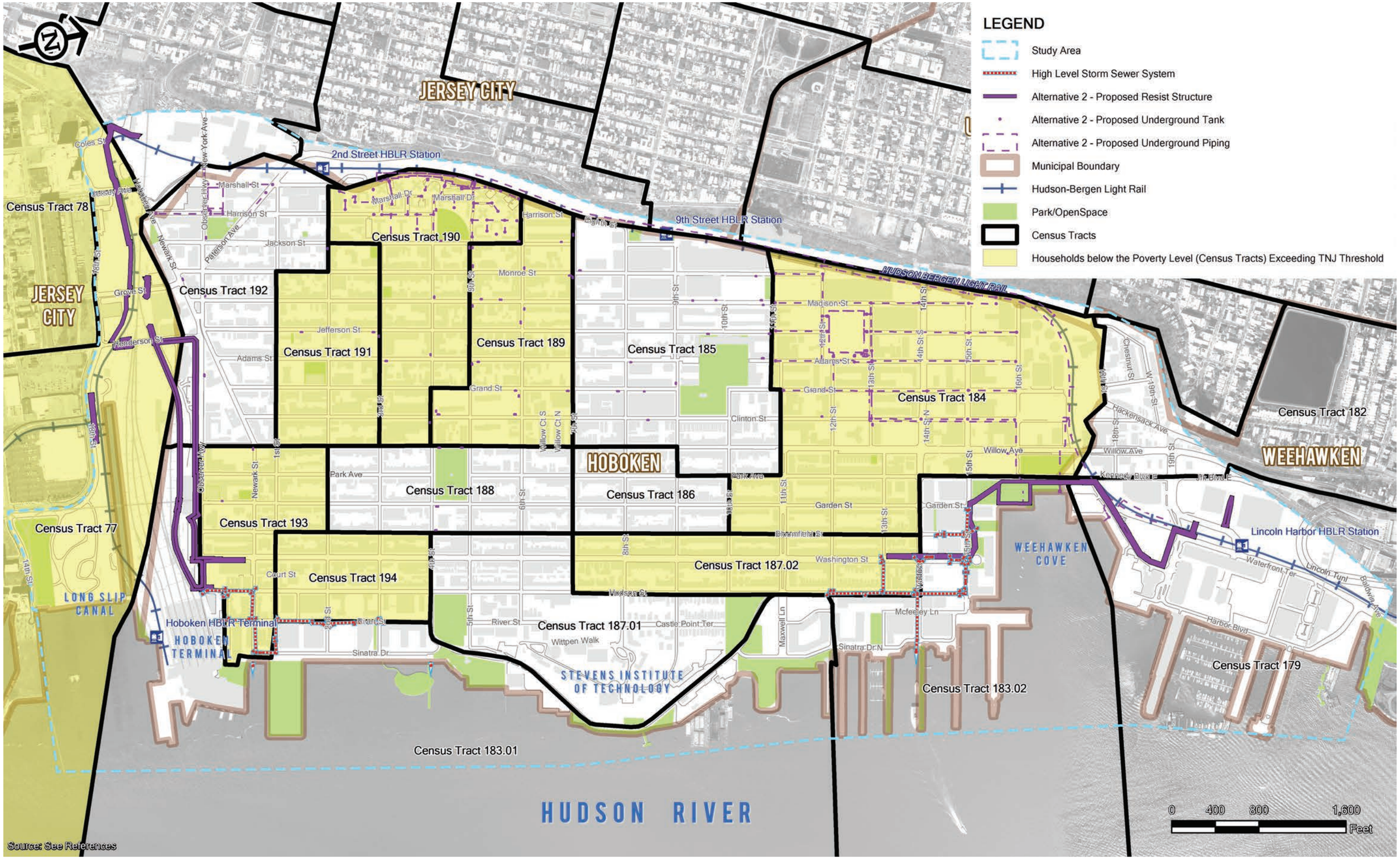

Figure 4.76 Households below the Poverty Level (Census Tracts) - Alternative 2

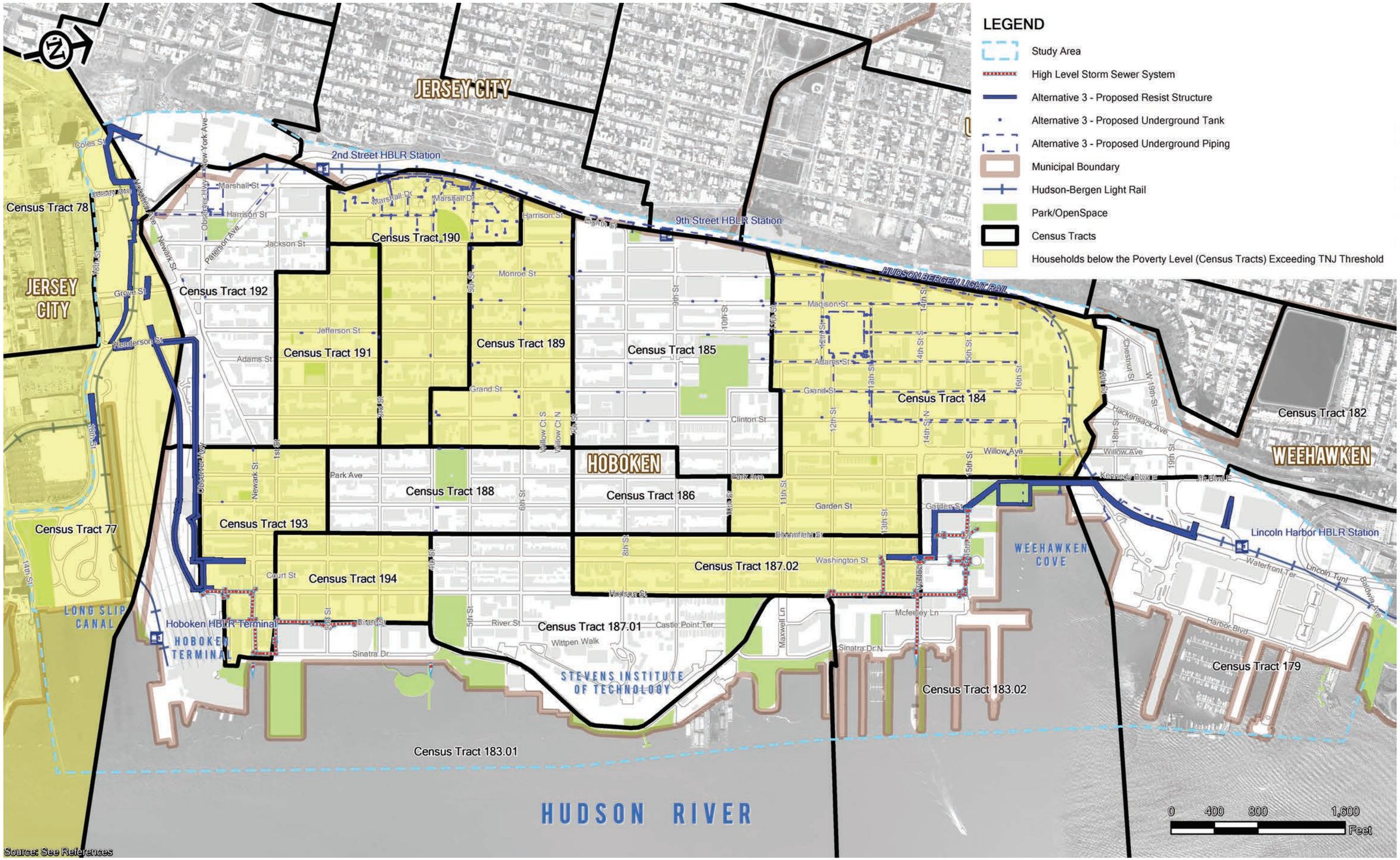

Figure 4.77 Households below the Poverty Level (Census Tracts) - Alternative 3

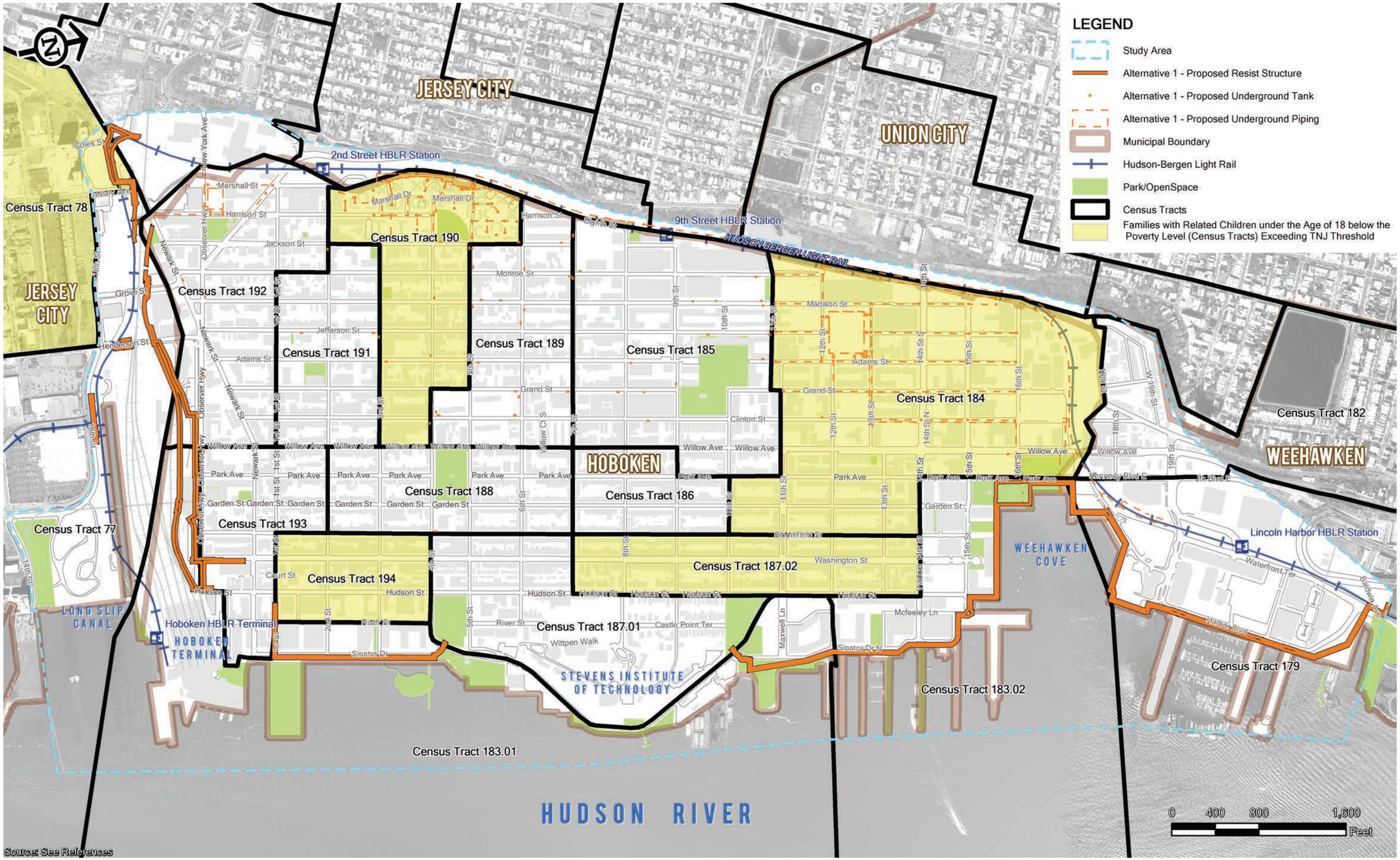

Figure 4.78 Families with Related Children under the Age of 18 below the Poverty Level (Census Tracts) - Alternative 1

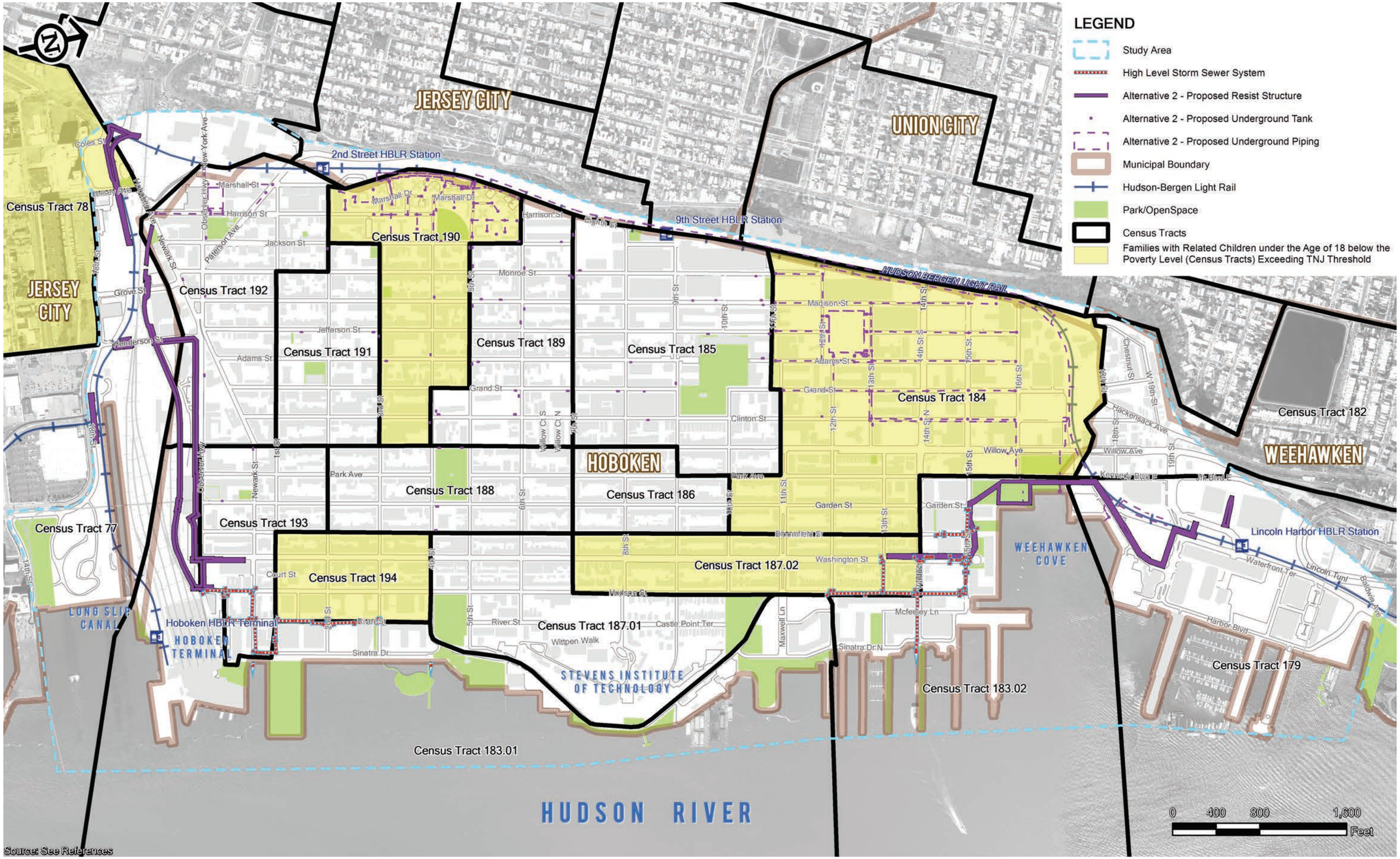

Figure 4.79 Families with Related Children under the Age of 18 below the Poverty Level (Census Tracts) - Alternative 2

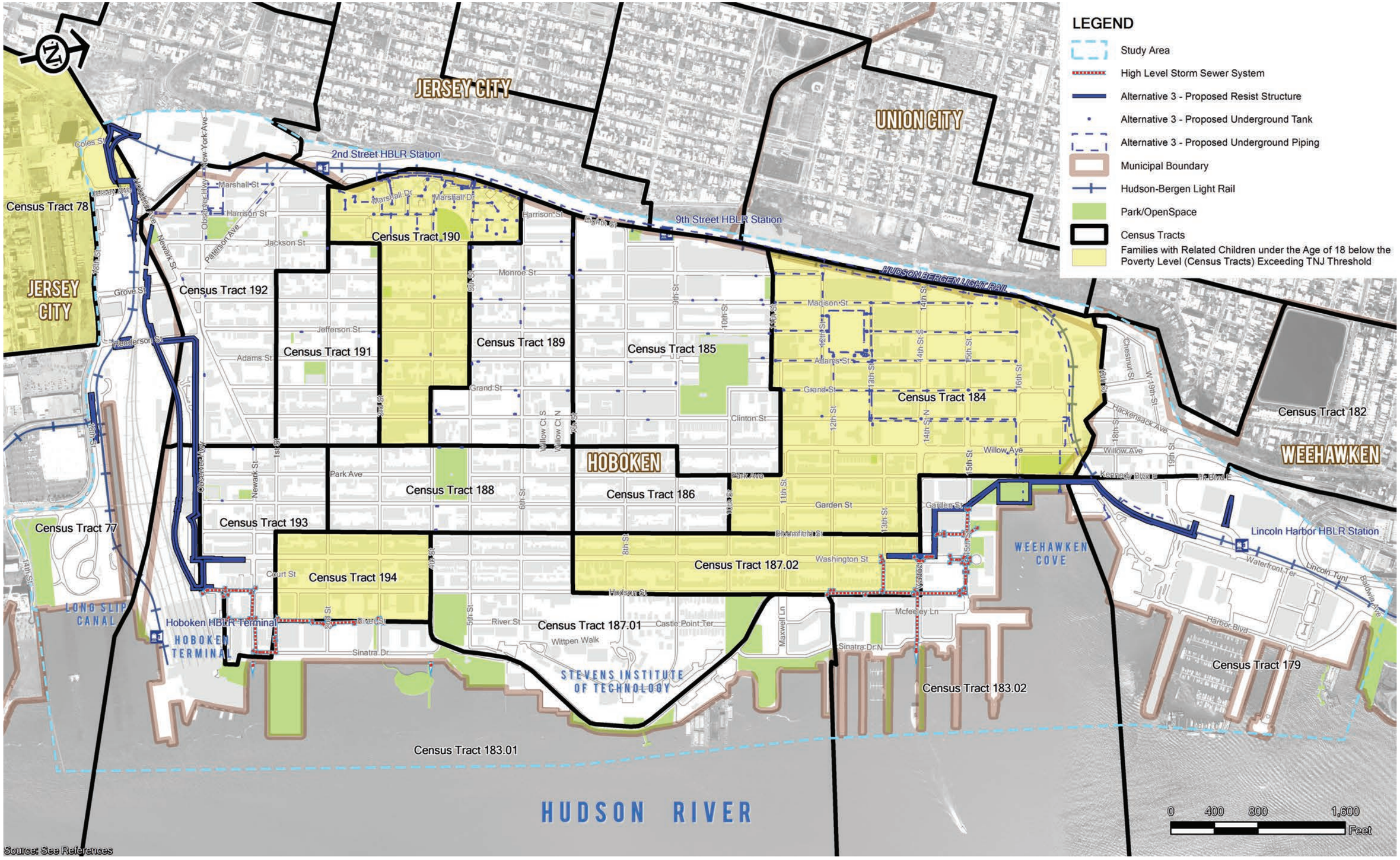

Figure 4.80 Families with Related Children under the Age of 18 below the Poverty Level (Census Tracts) - Alternative 3

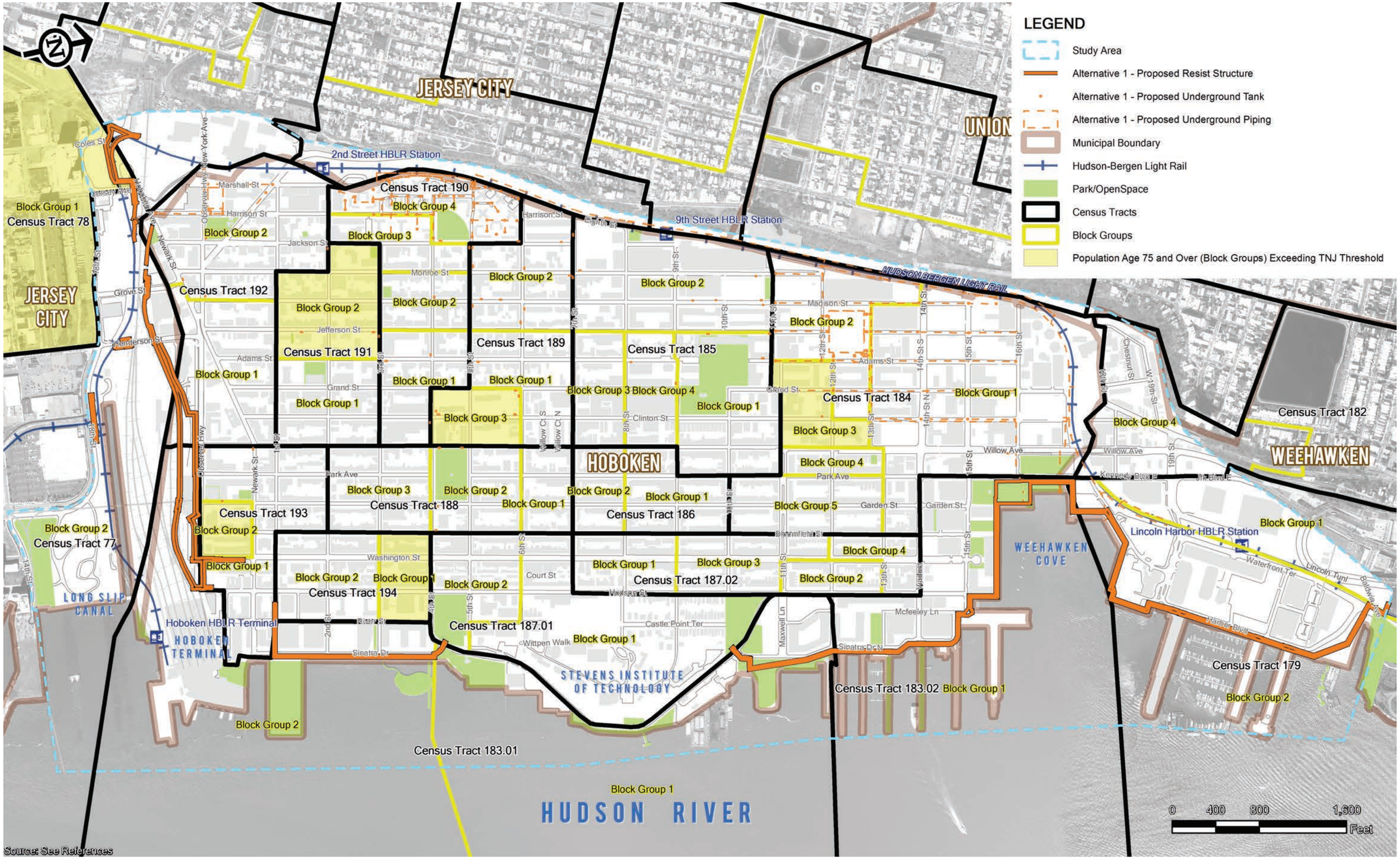

Figure 4.81 Population Age 75 and Over (Block Groups) - Alternative 1

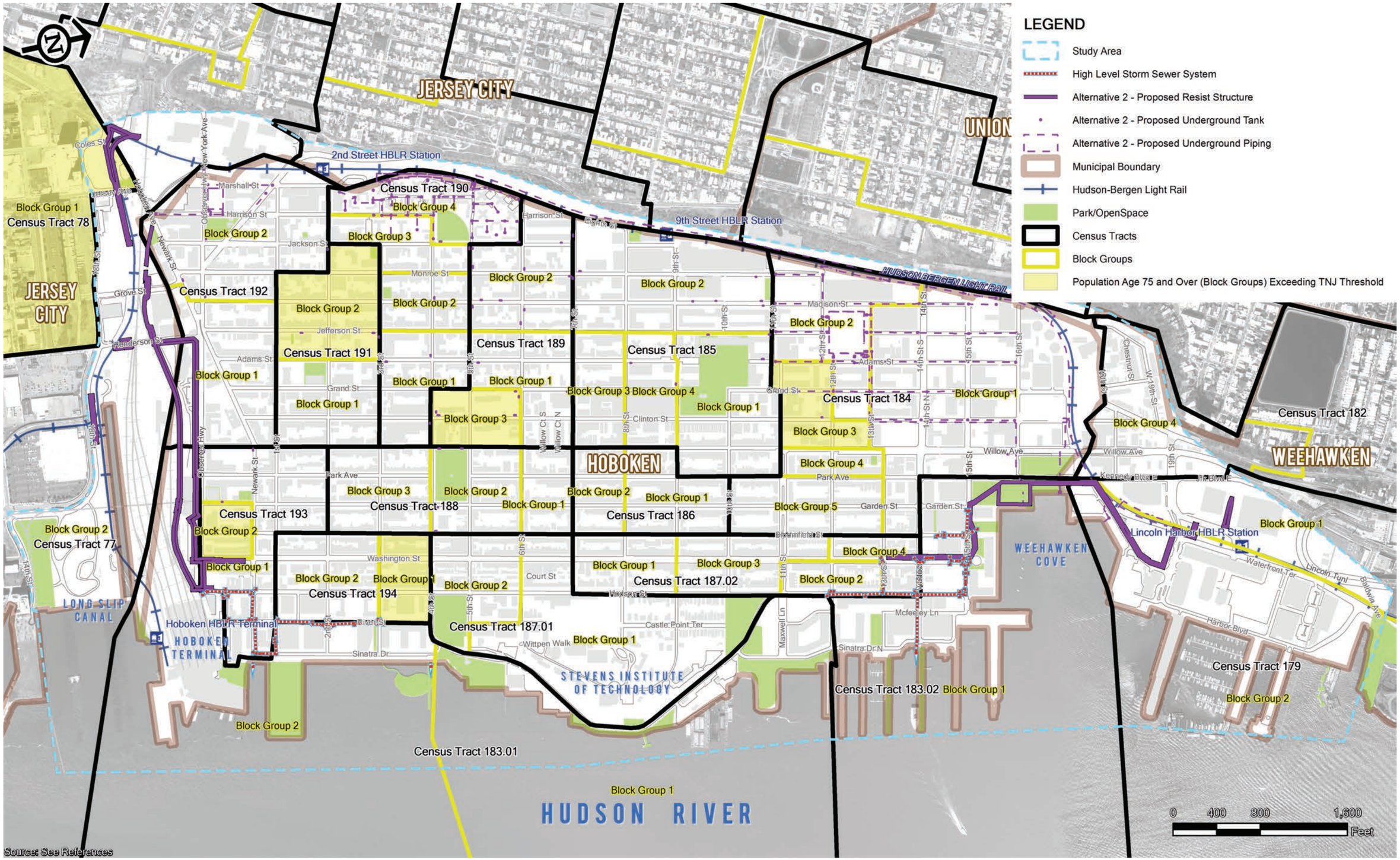

Figure 4.82 Population Age 75 and Over (Block Groups) - Alternative 2

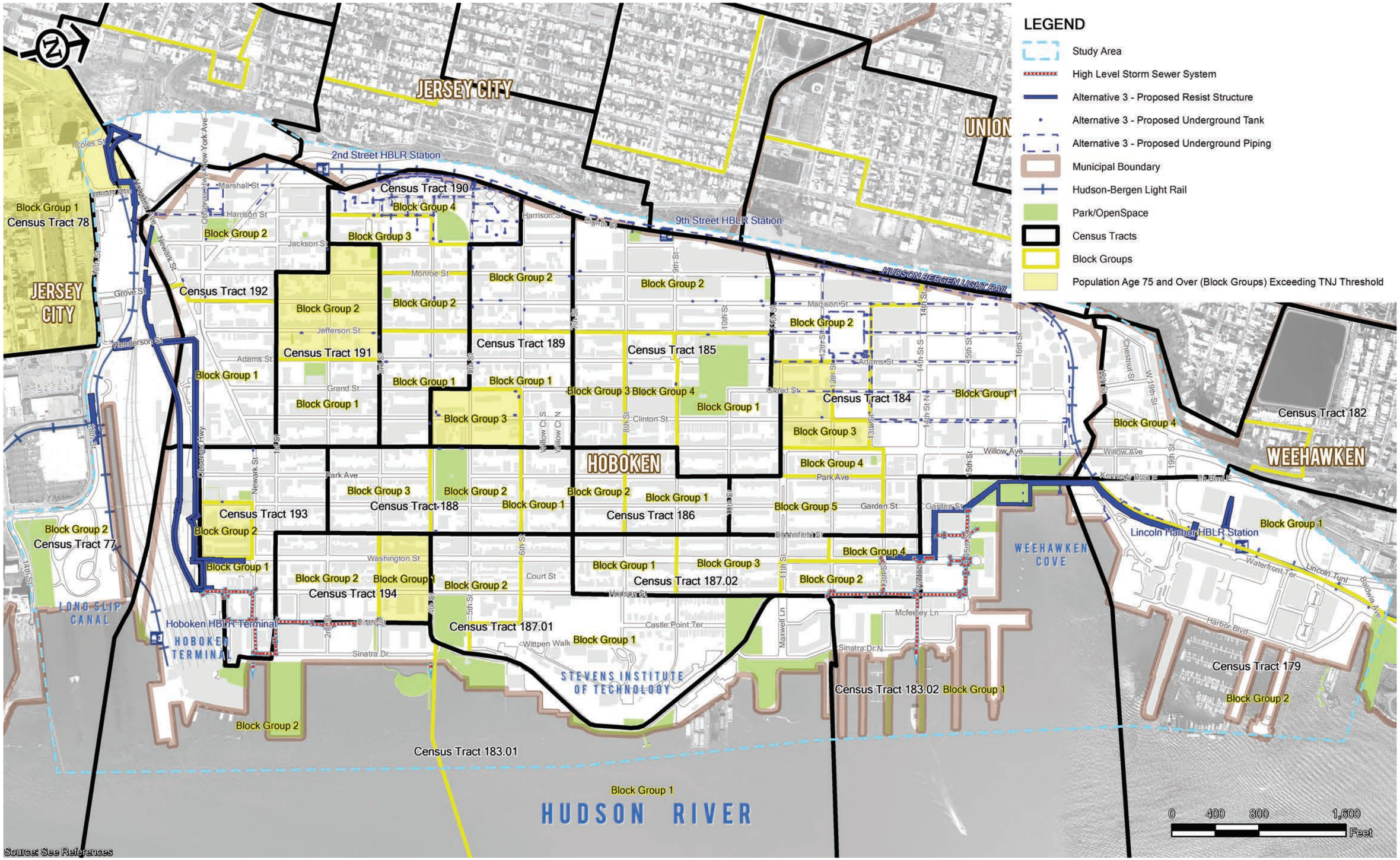

Figure 4.83 Population Age 75 and Over (Block Groups) - Alternative 3

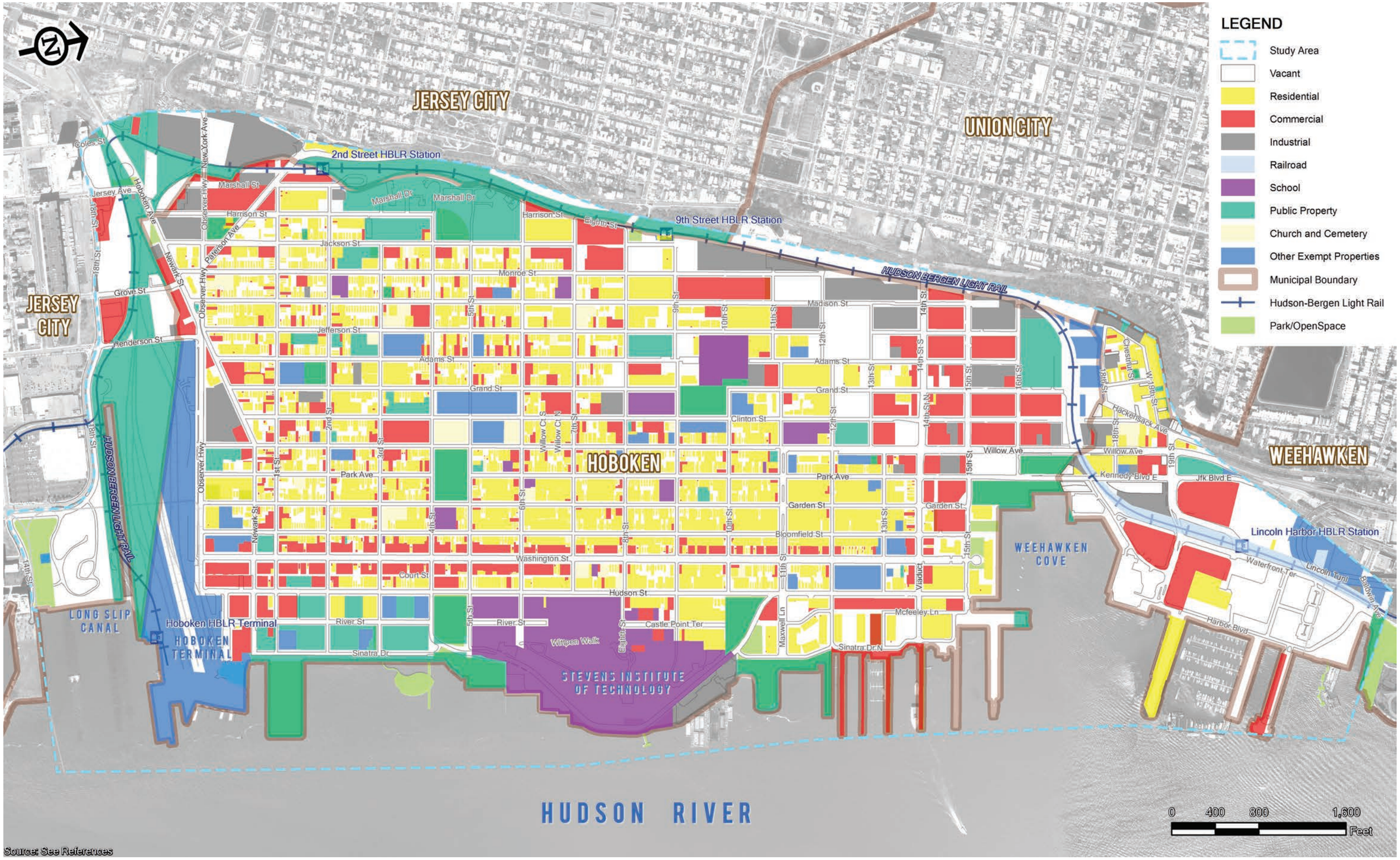

Figure 4.84 Land Use

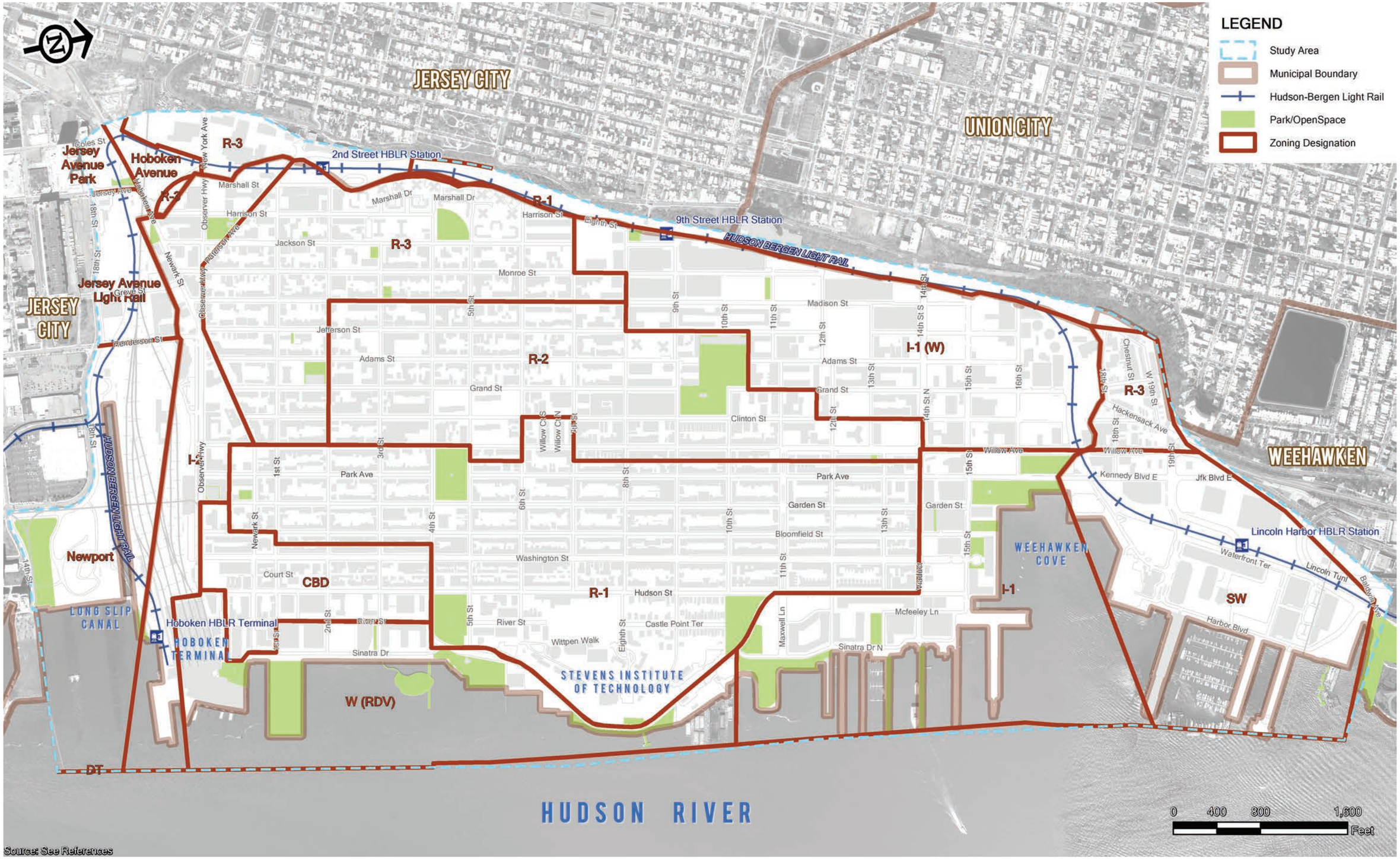

Figure 4.85 Zoning Map

Zoning – City of Hoboken

The City of Hoboken's current zoning ordinance was adopted in 2002. The city has three residential districts, two industrial districts, and an industrial waterfront sub-district. It also has two review districts and numerous redevelopment areas. These districts are shown on **Figure 4.85**.

Residential Districts

The city has three residential districts: R-1, R-2, and R-3. Within R-1, there are three sub-districts including the education sub-district R-1(E), the Court Street sub-district R-1(CS), and the Castle Point Historic sub-district (R-1(H)(CPT).

The purpose of the residential zones is to "conserve the architecture, scale and grain of the residential blocks and street blocks," according to the City of Hoboken Zoning Code. Residential buildings, retail businesses, and services are permitted principle uses in all three residential zones. Additional permitted uses include schools and restaurants, which are permitted as an accessory or conditional use.

The three overlay sub-districts, also referred to as an overlay zone, include additional development regulations that regulate the historic district, Castle Point, and Court Street areas. The R1-E Sub-district acknowledges the building requirements of the Stevens Institute of Technology in relation to adjacent residential districts.

Industrial Districts

The I-1 Zone covers most of the northwest corner of Hoboken. Permitted uses include industrial uses, office buildings, research laboratories, warehouses, related office buildings, accessory uses, and other conditionally permitted uses.

The I-1 zoning includes an I-1(W) waterfront sub-district. This district includes the entire northeast waterfront area of Hoboken. This zone permits manufacturing, office buildings, and research laboratories. It also permits planned unit developments, which may include a mix of residential, commercial, industrial, public, or quasi-public uses.

The I-2 Zone is located along southern border of Hoboken, adjacent to the NJ TRANSIT Hoboken Terminal. Permitted uses in the I-2 Zone include food processing and related storage and distribution, manufacturing, retail businesses and services, and public buildings with other conditionally permitted land uses.

Review Districts

The purpose of a review district is to encourage the location of regional and citywide services and commercial activities; to facilitate the development of buildings for permanent and transient residents appropriate to the proximity of the City's transportation terminal; and to support the objectives of the City's historic district. The city's two review districts include the Central Business District (CBD) Zone and the Waterfront Zone. The CBD Zone includes the boundaries of Hoboken's central business district and generally covers the area south of Fourth Street to River Street and the west side of Washington Street. Two sub-districts of the CBD Zone are the CBD (H) Sub-district, which covers the southern and western areas of the zone, and the CBD (H)(CS) Sub-district, which encompasses the southern stretch of Court Street. A wide variety of commercial and residential uses are permitted in the CBD Zone and the two sub-districts.

The second review district, the Waterfront District, includes three sub-districts: W (RDV), W (H), and W (N). The W (H) Sub-district includes the Hoboken Terminal. The W (N) Sub-district covers the area on the east side of Sinatra Drive below Castle Point. The W (RDV) Sub-district covers the South Waterfront Redevelopment Area. Development in the W (RDV) Sub-district is regulated by the South Waterfront Redevelopment Plan.

Redevelopment and Rehabilitation Areas – City of Hoboken

The New Jersey Local Redevelopment and Housing Law (NJSA 40A:12A) provides the opportunity for municipalities to designate areas in need of redevelopment and rehabilitation. The regulation provides requirements for the identification of redevelopment and rehabilitation areas, as well as for the adoption of redevelopment plans. A redevelopment plan takes the place of the applicable zoning or master plan provisions for the area within its boundary. Hoboken has seven designated redevelopment areas and four designated rehabilitation areas. Three redevelopment plans have been adopted and completed and five redevelopment plans have been adopted. An additional three redevelopment plans are under preparation. The active redevelopment and rehabilitation areas are identified in **Figure 4.86** and described below:

Northwest Redevelopment Area

The two-acre Northwest Redevelopment Area includes all or part of 22 tax blocks located west of Clinton Street between 7th and 14th Streets. This redevelopment area borders the BASF site on the north, east, and south sides and includes mixed-use residential and retail along the western edge of the City, adjacent to the HBLR

Western Edge Redevelopment Area

The Western Edge Redevelopment Area includes the area surrounding the Ninth Street light rail station and is 11.15 acres in size. It borders the Palisades and the HBLR right-of-way (ROW) to the west; 9th Street to the south; Monroe, Madison, and Jefferson Streets to the east; and 14th Street and the 14th Street viaduct to the north. This redevelopment area requires the provision for affordable housing, with a variety of unit sizes including three-bedroom units and large commercial and/or office-use components. Other permitted uses include retail and business services, offices, restaurants and cafes, banking and financial institutions, and health clubs open to the public.

Hoboken Yards Redevelopment Area

The NJ TRANSIT/Hoboken Yards area was declared an Area in Need of Redevelopment in February 2007.

Figure 4.86 Redevelopment and Rehabilitation Areas

In 2011, the City of Hoboken prepared a redevelopment plan for this 64-acre area. The plan was completed in September 2012, just before Superstorm Sandy hit. As a result of the extensive flooding at the terminal, additional measures were incorporated into the plan to address flood damage prevention. These flood mitigation measures include the separation of the sanitary sewer and storm sewer, sewer pumps to serve the property, compliance with the City's Flood Damage Prevention ordinance, and encouragement of the construction of storm surge protection at Warrington Plaza. The Redevelopment Plan was amended and adopted in December 2014.

Neumann Leathers Rehabilitation Area

The 2015 Neumann Leathers Redevelopment Plan covers an 11.59-acre area that includes the Observer Highway ROW from Jefferson Street to Hudson Street and includes the block bounded by Observer Highway, Newark Street, and Willow Avenue. This block includes 11 industrial buildings that formerly housed R. Neumann and Co, which produced fine leather and leather goods. The buildings are currently occupied, primarily by small businesses and art galleries. The redevelopment plan proposes to preserve both the historic industrial architecture, as well as the current art and artisan-oriented uses of the buildings, while promoting the addition of public open space.

Southwest Rehabilitation Area

The Southwest Rehabilitation Area (Southwest) is located north of Newark Street and extends along Paterson Avenue, totaling 23 acres. The Hoboken City Council adopted the Southwest as an Area in Need of Rehabilitation on June 20, 2012. A redevelopment plan for this area is currently being prepared. This area includes the proposed Southwest Park.

North End Rehabilitation Area

The North End Redevelopment Area is located in the northwestern corner of Hoboken adjacent to Union City and Weehawken. The redevelopment area consists of approximately 30.17 acres and is bounded, generally by 14th Street to the south, Union City to the west, Weehawken to the north, and Park Avenue to the east. In December 2013, the City Council declared the North End Area an Area in Need of Rehabilitation. A redevelopment plan for this area is currently being prepared.

The Post Office Rehabilitation Area

The Hoboken City Council designated the post office as an Area in Need of Rehabilitation in October 2012. The proposed redevelopment would move the post office and construct a hotel in the parking lot behind the post office. The original post office building would be preserved. However, according to the re-examination report, no discussions with the United States Postal Service have occurred to determine if a move is feasible. The acreage of this proposed redevelopment area is not known. A redevelopment plan for this area is currently being prepared.

Public Works Garage Site Redevelopment Area

In 2006, the City of Hoboken determined that the Public Works Garage should be relocated and the site should be sold and redeveloped under a redevelopment plan. On May 3, 2006, the City Council adopted a redevelopment plan for the 1.14-acre site. The plan is valid for 40 years. However, a new location for the Public Works Garage was not found and the city continues to search for a new location to store the Department of Public Works vehicles.

Master Plan – City of Hoboken

The City of Hoboken prepared and adopted its most recent master plan in 2004 and a re-examination of the master plan was prepared in 2010. The 2004 master plan is a comprehensive document containing background information on development patterns, physical features, socioeconomic indices, housing, and utility services.

The overall goal of the master plan re-examination is to guide future development in a manner designed to promote the health, safety, and quality of life for the present and future residents of the city. The 2010 re-examination plan cites a growing concern in the community regarding environmental issues related to climate change. The re-examination plan noted that "These climate issues have particularly ominous implications for Hoboken, a riverfront community that is built primarily on marshes and has the bulk of its boundaries within the 100-year floodplain." Furthermore, "The City has struggled to address the interrelated issues of flooding, aging infrastructure, and a combined stormwater and sewer system, not to mention their exacerbation with increasing storm frequency, storm surges, and rising sea levels."

Green Infrastructure Strategic Plan – City of Hoboken

This 2013 plan is a place-based approach to green infrastructure, which seeks to maximize the potential for future stormwater management investments across the community. The plan provides a conceptual framework, which considers both existing sewersheds and hydrogeology of the city in relation to stormwater storage.

Land Use – City of Jersey City

The boundary between Jersey City and Hoboken roughly follows the HBLR. The NJ TRANSIT HBLR extends from the Jersey City/Weehawken/Union City border south along the Jersey City and Hoboken border to the New Jersey TRANSIT Rail Station. The primary land use within this portion of the Study Area within Jersey City is railroad right-of-way, which also includes the HBLR railroad tracks near the 2nd Street stop. A portion of the NJ TRANSIT Hoboken Rail yard as well as the NJ TRANSIT Long Slip Canal are also located in the Jersey City portion of the Study Area. Other land uses within the portion of the Study Area within Jersey City include industrial, commercial, and open space.

Zoning – City of Jersey City

Most of the Study Area located in Jersey City is within one of four designated Redevelopment Areas. The permitted uses within these Redevelopment Areas varies, but generally include multi-family and high rise residential, community commercial, mixed use, open space, and transit/railroad. Additionally, the section of

the Study Area in Jersey City west of the light rail is zoned R-3 residential.

Redevelopment Areas – City of Jersey City

Four redevelopment areas are located in portions of the Study Area within Jersey City, just south of the Hoboken border (see **Figure 4.86**). The redevelopment areas are The Newport Redevelopment Area, the Jersey Avenue Light Rail Redevelopment, the Jersey Avenue Park Redevelopment Area, and the Hoboken Avenue Redevelopment Area. All four Redevelopment Areas have specific zoning as described in their respective Redevelopment Plans. In general, the goal of all of all four Redevelopment Areas is to encourage a transformation of this section of Jersey City from largely industrial uses and vacant land to a dense mix of uses that takes advantage of the proximity to transit. Within the Study Area or within a few blocks of the Study Area, 387 residential units and 37,670 square feet of retail space has recently been constructed and 2.664 residential units and 67,235 sf of retail are either under construction or have been approved for construction. A discussion of these areas is provided below.

Newport Redevelopment Area

The Newport Redevelopment Area is located in the northeastern corner of Jersey City, situated along the Hudson River. It is a 26-acre planned development that began in 1980. Land uses include residential apartment towers, office buildings, hotels, a marina, schools, retail stores, and parks. The purpose of the Newport Redevelopment Area is to take advantage of "The unique and dramatic location along the Hudson River waterfront across from Lower Manhattan, New York City." The area, which is south of the Hoboken rail yards, includes additional open space located north of 14th Street. It also includes additional commercial space. Also located within this area is The Ellipse, a 376-unit apartment building currently under construction and additional commercial space.

Jersey Avenue Light Rail Redevelopment Area

Located to the south of the Hoboken/Jersey City border is the 140-acre Jersey Avenue Light Rail Redevelopment Area. This district is bounded to the north by the Jersey City/Hoboken border, to the west by Jersey Avenue, to the south by Fourteenth Street, and to the east by Marin Boulevard. The purpose of the redevelopment project is to encourage the development of emerging residential and commercial areas, as well as to improve function and physical layout, as well as the vehicular and pedestrian flow. This redevelopment area is zoned for High Rise, Commercial Strip, and Neighborhood District.

Land uses in the area include: residential, commercial, and transportation (it includes a portion of the NJ TRANSIT Hoboken Rail Yards and the HBLR).

Hoboken Avenue Redevelopment Area

This development area is generally bound on the north and northeast by the NJ TRANSIT Morris and Essex Rail Line, New York Avenue, and the City of Hoboken boundary line; Hoboken Avenue on the south and southeast; and Monmouth Street on the west. The principal permitted uses for the 28-acre Hoboken Avenue Redevelopment Area are multi-family residential and transit/open space. The objectives of the Redevelopment Area include creating transit-oriented residential with ground floor commercial and to provide for new open space and recreation opportunities both within the redevelopment area and in immediately adjacent areas.

Jersey Avenue Park Redevelopment Area

The 60-acre Jersey Avenue Park Redevelopment Area is bordered by Hoboken Avenue to the north and west, Jersey Avenue to the east, and Twelfth Street to the south. Among the objectives of this redevelopment area is the creation of major new employment and housing opportunities for the residents of Jersey City, development of public open space, and encouragement of preservation and adaptive use of existing structures. The Redevelopment Plan contains three distinct areas: a medium rise district, a mixed use district, and a commercial strip district. Part of the open space designated in the redevelopment plan is within the Study Area boundary.

Master Plan - City of Jersey City

The City of Jersey City adopted its master plan in 2000. After the adoption of the master plan, the zoning ordinance was revised and adopted in 2001. Since the adoption of the master plan, several re-examination reports were prepared, with the most recent re-examination prepared in 2010.

In addition to its master plan and redevelopment plans, the City of Jersey City prepared a Sandy Recovery Strategic Planning Report in August 2014. This report places an emphasis on increasing resilience against future disasters. Jersey City is currently working on a number of resiliency planning documents, including a Resilience Master Plan, as recommended in the Sandy Recovery Strategic Planning Report. These documents are expected to be completed in spring 2017.

Land Use – Township of Weehawken

The portion of the Township of Weehawken in the Study Area contains a mix of land uses including industrial, residential, commercial, and public. As shown on **Figure 4.84**, land uses in Weehawken along the northwestern edge of the Study Area, including the area along 16th Street and Kennedy Boulevard, are largely residential. Land uses along the east side of Hackensack Plank Road and along Harbor Boulevard are primarily commercial/office and residential (multi-family). The three piers located off of Harbor Boulevard are also included in the Study Area. The northern pier is primarily used for parking for the Chart House Restaurant, which is located at the eastern end of the pier. The middle pier is commercial and houses the Lincoln Harbor Yacht Club marina. The southern pier contains the Riva Point residential development.

Zoning – Township of Weehawken

The Study Area includes the portion of the Township of Weehawken that extends between Harbor

Boulevard and the HBLR south towards Weehawken Cove (see **Figure 4.85**). The area adjacent to the north of the Hoboken/Weehawken border is designated as a Planned Development. It is zoned SW for special waterfront development. The area west of Willow Avenue is zoned R-3 residential.

Redevelopment Zones and Districts – Township of Weehawken

Located in the Study Area is the Lincoln Harbor redevelopment district. It is 60 acres in size and extends generally from JFK Boulevard east to the waterfront. Also located in the district is Weehawken Cove and Lincoln Harbor Park.

Master Plan – Township of Weehawken

The Township of Weehawken Master Plan was adopted in 1976, followed by the Master Plan Amendment for Weehawken Waterfront, The Land Use Element was adopted in 1984. Subsequent master plan documents include a re-examination report adopted in 1991 and the Land Use Plan Element for Upper Weehawken, which was adopted in 1998.

4.8.2.2.1 *Public and Affordable Housing*

The City of Hoboken continues to expand affordable housing options. Inclusionary standards for affordable housing are included in the city's Administrative Code. The code includes definitions for very low-, low-, and moderate-income households. New residential redevelopment projects are required to set aside 10 percent of all units as affordable housing.

The Hoboken Housing Authority (HHA) manages 1,353 units of public housing throughout the city for low-income households. This includes the Andrew Jackson Complex with 598 units, Harrison Gardens with 208 units, and Christopher Columbus with 97 family units. The 200-unit Fox Hill Gardens and 125-unit Adams and Monroe complex, which are also managed by HHA, are limited to senior housing. The HHA also manages 326 affordable rental units through leased housing contracts, which is also known as Housing Assistance.

Jersey City established an Affordable Housing Trust Fund that leverages funds raised through tax abatements to construct affordable housing city wide. The Affordable Housing Trust Fund also funds housing projects where 20 percent of the units are set aside for affordable housing. The Jersey City Housing Authority operates 21 properties, of which only one, the Holland Gardens housing complex, is located within the Demographic Analysis Area. An additional 39 low-income housing complexes are located in Jersey City, but none are located in the Jersey City portion of the Demographic Analysis Area.

The Weehawken Housing Authority operates 167 units of affordable senior and disabled housing and manages an additional 350 units of Section 8 housing throughout the township. No affordable housing complexes are located in the Weehawken portion of the Demographic Analysis Area.

4.8.2.2.2 *Together North Jersey Plan*

The TNJ Plan was developed by a planning consortium established in part by the North Jersey Transportation Planning Authority (NJTPA). The TNJ Plan was completed in 2015 and seeks to enhance the resiliency of the region's communities and infrastructure. It also seeks to identify the region's vulnerability to extreme weather and climate change.

4.8.2.2.3 *Hudson County 2008 Re-examination of the Master Plan*

The County of Hudson completed its master plan in 2002 and prepared a re-examination of the 2002 plan in 2008 and 2016. Included in the county's 2002 master plan was an evaluation of stormwater pollution, open space, recreation, and historic preservation. As part of the re-examination, these elements were also re-evaluated. Each of the elements in the 2002 master plan, as well as the Hudson County Stormwater Pollution Prevention Plan, the Hudson County Stormwater Pollution Prevention Plan, and the Hudson County Open Space Recreation and Historic Preservation Plan were evaluated. These plans supplement, update, and amend the Hudson County Master Plan. Within the Hudson County Master Plan's 2008 re-examination, Hoboken's 2004 Master Plan was also evaluated for its consistency with the county plan. The county found that the "Hoboken Master Plan appears to be in agreement with all the goals of the Hudson County Master Plan with the possible exception of encouraging manufacturing, as the plan focuses on residential and commercial uses and proposes re-zoning some industrial land to other uses."

4.8.2.3 Open Space

Public Parks – City of Hoboken

The City of Hoboken contained just 0.78 acres of park for every 1,000 residents, according to the 2004 master plan. This ratio is considered an open space deficit when compared to nearby urban areas, such as New York City, which has a standard of 2.5 acres per 1,000 residents. Additional parks were added in recent years, such that by the date of the 2010 Reexamination Report, the total acreage of parkland had increased from approximately 30 acres to 50.53 acres. Despite this increase, the City is still short of its 2004 land development objective to increase park acreage to 60 acres.

The State of New Jersey Green Acres Program assists municipalities and counties in the acquisition of open space for recreation and conservation purposes, as well as for the development of outdoor recreation facilities. Program funding is provided from the Garden State Preservation Trust and the Preserve New Jersey fund, and is supplemented by awards from federal programs such as the Land and Water Conservation Fund.

The City of Hoboken has historically accepted Green Acres funding for the acquisition and development of their parks and open space. These funded parks and open spaces are listed on the City's Recreation and Open Space Inventory (ROSI) along with the remainder of the municipally-owned parkland facilities regardless of Green Acres funding. Communities that

accept Green Acres funding are subject to Green Acres restrictions at N.J.A.C. 7:36:4.1(d).

A compilation of city-owned parks and significant publicly-owned recreational facilities within the Hoboken portion of the Study Area is listed below and is shown in **Figure 4.87.** Locations of parks and their facilities were confirmed in the field on September 8, 2016 and are as follows:

- Castle Point Skate Park, located on the east side of Sinatra Drive near 8th Street, under Castle Point, is 1.5 acres in size. The park is owned by the city, per a lease with the Stevens Institute of Technology. The park contains skateboarding facilities.
- Church Square Park, located between 4th, 5th, and Garden Streets and Willow Avenue, is 3.2 acres in size. The park includes basketball courts, a dog run, a playground, and passive space.
- The Community Garden, located at 3rd and Jackson Streets, is 0.17 acres in size. A playground is located at the park.
- Columbus Park, located on the west side of Clinton Street between 9th and 10th Streets, is 3.2 acres in size. The park is owned by Hudson County. The park includes basketball and tennis courts, a playground, and passive space.
- Elysian Park, located on the east side of Hudson Street between 10th and 11th Streets, is 2.69 acres in size. The park provides basketball courts, a dog run, a playground, and passive space.
- Erie-Lackawanna Plaza (a.k.a. Pocket Park), located at the foot of Hudson Place, at Newark Street and Jackson Street, is 1.20 acres in size. This open space is owned by NJ TRANSIT. Views of Manhattan are available from this park.
- Jackson Street Park, located at 116-118 Jackson Street, between 1st and 2nd Streets, is 0.12 acres in size. The park includes a jungle gym and play equipment.
- Jefferson Street Park is located on Jefferson Street, between 1st and 2nd Streets. The park includes a paved toddler play area and is used by the adjacent Hola School.
- JFK Field is located at 10th and Jefferson Streets, adjacent to Columbus Park. It is 4.0 acres in size and owned by the Board of Education. The park consists of a football field and bleachers.
- Legion Park, located at 1221 Willow Avenue near 13th Street, is 0.11 acres in size. The park provides a youth play area.
- Madison Street Park, located at 3rd and Madison Streets (300 Madison Avenue), is 0.17 acres in size. The park includes a playground with swings and a jungle gym.
- Maxwell Place Waterfront Park, located on a peninsula, platform, and pier at Sinatra Drive North and 11th Street, is 4.1 acres in size. The park includes a beach area, passive space, and waterfront walkway.
- Pier A Park, located at the Hudson River and 1st Street (100 Sinatra Drive), is 4.8 acres in size. The park includes fishing, a great lawn, and a gazebo.
- Pier C Park, located along the Hudson River at 4th Street and Sinatra Drive, is 5.1 acres in size. The park includes a fishing pier, play area, water play area, rookery, and promenade.
- The Housing Authority is located on 4th and Jackson Streets and is 1.7 acres in size. The property is owned by the Housing Authority. The park contains a ball field that is available to the public.
- The Multi-Service Center Park, located on Adams Street between 1st and 2nd Streets, is 0.46 acres in size. The park includes basketball courts and a roller rink.
- Sinatra Park, located on the east side of Sinatra Drive between 4th and 6th Streets, is 3.6 acres in size. The park includes a kayak launch, outdoor amphitheater, and soccer field.
- Stevens Park, located between 4th, 5th, and Hudson Streets and Sinatra Drive, is 2.99 acres in size. The park includes baseball fields and open space.
- 1600 Park is located at Willow Avenue at 16th Street. The park provides a multi-use field, dog run, and viewing mound/slide hill.
- Hoboken Cove Park (a.k.a. Harborside Park), located on 15th Street from Park Avenue to Garden Street, is 1.0 acre in size. The park includes active park space and a playground.
- The Hudson River Walkway is a 30-foot wide walkway along the Hudson River and currently extends from Bayonne to Fort Lee. The walkway is included in the NJDEP Green Acres Program Open Space Database. In Hoboken, the walkway begins at the Hoboken Terminal and extends north to 12th and Hudson Streets, where there is a detour around the Union Drydock. The walkway continues to the Hoboken/Weehawken border and is 4.5 acres in size.

Proposed Public Parks – City of Hoboken

Additional recreational facilities are currently in the late planning stages and may be complete by the Project's build year (2022). Of note, the City of Hoboken is currently constructing Southwest Park. This park is located north of Observer Highway, between Harrison Street and Jackson Street. The park is designed to hold over 200,000 gallons of stormwater runoff and has been designed to include green space, event space, and a playground. This park had been proposed prior to this project.

In addition, the proposed 7th Street and Jackson Street Park and Plaza is in the last stages of planning. This park is part of the Northwest Redevelopment Area and would add two acres of public parks and open space, including a municipal gymnasium. This park would also incorporate stormwater retention.

The City of Hoboken has acquired the BASF property,

Figure 4.87 Open Space

a 4.3-acre property in northwest Hoboken that includes the property at Block 107, Lot 1. A 'resiliency park' is proposed on this property as part of the Delay, Store, Discharge (DSD) strategy. The park would have a mix of active and passive recreational space with green infrastructure and an underground detention system to hold at least one million gallons of stormwater to help reduce localized flooding. Design of the resiliency park will be completed through a public process. The BASF site is bounded by Madison Street, Adams Street, 12th Street, and 13th Street. The City of Hoboken also intends to purchase the Block 10 site for a park. This is also included as a feature in the DSD strategy.

Public Parks – City of Jersey City

Within the portion of the Study Area located in the City of Jersey City, there are three open space/park areas. The first is the Newport Green Park, which is located within the Newport Redevelopment Area. It is a four-acre landscaped waterfront park with a merry-go-round, grassy field, picnic tables, bathrooms, spray park, swings, jungle gyms, waterfront seating, and an artificial beach. It is not listed on the NJDEP Green Acres Program Open Space Database. However, the Township currently has three open projects with Green Acres. As such, if Newport Green Park is held by the Township for park purposes, it is likely encumbered by Green Acres. The second area is the Hudson River Walkway, which also passes through Jersey City and is included in the Green Acres program, as mentioned above. The third area is open space located on NJ TRANSIT property. This area includes a bicycle path, which connects Jersey City to Hoboken, and provides for other passive recreational uses.

Public Parks – Township of Weehawken

One publicly-owned recreational park was identified within the portion of the Study Area in the Township of Weehawken. The park at West 18th Street and Grand Avenue, known as the Waterfront Park and Recreation Center, is included on the NJDEP Green Acres Program Open Space database. The Hudson River Walkway also passes through Weehawken, from the Weehawken/Hoboken border to Lincoln Harbor and north to the Study Area boundary. It is included in the Green Acres program, as mentioned above.

4.8.2.4 Critical Facilities

In accordance with the executive order on floodplain management (Executive Order 11988), FEMA has identified critical facilities where even the slight risk of flooding is too great (see **Figure 4.88**). These critical facilities include hospitals, police stations, EMT facilities, fire stations, emergency shelters, and facilities that store critical records. Within the Study Area, critical facilities have been identified as: the Hoboken Police Headquarters; four fire stations; Hoboken City Hall; the Hoboken University Medical Center; and the Wallace School, which serves as the emergency shelter. Hoboken has also identified the North Hudson Sewage Treatment Plant as a critical facility. Hoboken City Hall and the Hoboken Police Headquarters are not located in the 100-year floodplain.

There are no critical facilities located within the Jersey City or Weehawken portions of the Study Area.

4.8.2.5 Economic Conditions

Housing Market

Due to the proximity to New York City and the multimodal regional transit hub, the Study Area has a very strong economic base. The total assessed net valuation of taxable properties in Hoboken in 2014 was approximately $11 billion. In the 10 years ending in 2014, the value of real estate in Hoboken increased by more than 200 percent. During this same period, real estate values increased by approximately 40 percent in Weehawken and by less than 5 percent in Jersey City. According to the 2010-2012 American Community Survey, the residential vacancy rate in the local housing market was seven percent. Seventy five percent of the population reported that they lived at the same address in Hoboken for at least one year, which is an indicator of a strong real estate market.

According to the NJ Division of Taxation, in 2016, the average home prices in Weehawken and Hoboken were the first and second most expensive, respectively, of all the municipalities in Hudson County. **Table 4.40** contains the average home sales price from 2012 and 2016. As shown in the table, the average home price has been increasing since 2012 (the year Superstorm Sandy occurred) for all three municipalities. Please note, these prices represent average sales prices for the entire municipalities of Hoboken, Weehawken, and Jersey City, even though only portions of Jersey City and Weehawken are included in the Demographic Analysis Area.

Between 2012 and 2016, the average sales price for a home increased as follows:

- Hoboken: $186,043 (an increase of 34 percent)
- Jersey City: $128,636 (an increase of 49 percent)
- Weehawken: $244,927 (an increase of 38 percent)

Based on this information, the housing market within the Demographic Analysis Area has been experiencing an upward trend since Superstorm Sandy.

Table 4.40 Average Sales Price for a Home

MUNICIPALITY	2012	2013	2014	2015	2016
Hoboken	$547,704	$593,475	$613,213	$668,412	$733,747
Jersey City	$260,340	$297,756	$324,748	$329,493	$388,976
Weehawken	$637,193	$619,606	$685,237	$761,703	$882,120

Source: State of New Jersey, Dept. of the Treasury, Division of Taxation, 2012-2015, Average Resident Sales Price

Figure 4.88 Critical Infrastructure

Employment

In 2010, there were approximately 4,900 businesses registered in Hoboken with retail sales exceeding $312 million.

According to U.S. Census data from 2012, there were 5,946 businesses in Hoboken, 1,246 of which had paid employees that numbered 20,421. In 2007, there were 4,894 businesses in Hoboken, 1,158 of which had paid employees that numbered 28,990. During this five-year period, the number of businesses in Hoboken increased by 18 percent, while the number of paid employees decreased by almost 20 percent.

Major employers currently within the Study Area include Marsh USA Inc., a 1,500-employee financial company; Thomas Reuters, a 450-employee data analysis company; Wiley and Sons, Inc., a 1,519-employee publisher; and Pearson, a 900-employee educational testing firm. EY (formerly Ernst and Young) signed a lease in August 2016 and will be adding another 1,000 employees. Employment numbers were gathered from websites including www.northjersey.com, www.njbiz.com, and www.law360.com.

4.8.2.6 Public Health

Epidemiological evidence suggests that flooding and flood disasters can cause health impacts. The Centers for Disease Control and Prevention (CDC) has identified health risks from flood waters. These risks include infectious disease, injuries, and even death. Though many of these health effects result from major flooding disasters, negative health effects have also been associated with more routine flooding events. For example, the CDC points to the health risks associated with children playing with toys that have been in contact with contaminated flood waters.

Due to variability in the intensity and severity of flood events, from routine to catastrophic, potential health-related risks of flooding must be evaluated on an event-by-event basis. Such an approach would take into account contamination sources and the uses of areas inundated with flood waters. However, in general, the CDC has recommended that the public "avoid standing water, areas saturated with floodwater, and areas with visible debris" since these areas create the most risk for injury and microbial exposure.

Standing water can pose many health risks, including exposure to microbial pathogens. This is particularly true in combined sewer overflow (CSO) situations, when rainfall amounts exceed the capacity of sewer collection systems and/or treatment facilities and the sewer system overflows or backs up, discharging a combination of untreated sewage and stormwater. These CSO overflows and back-ups occur several times a year in low-lying areas in Hoboken. The pathogens which are often found in CSO back-ups and overflows may cause a number of health conditions and symptoms including rashes, respiratory issues such as asthma, eye irritation, gastrointestinal conditions such as vomiting and abdominal pain, muscle aches, and headaches. Exposure to pathogens occurs through all human orifices including eyes, ears, nose, mouth, and open cuts/abrasions.

The populations most at risk from exposure to pollutants are the elderly, children, and pregnant women. The elderly are at risk as a result of a weakened immune system that comes with age. Children and infants have immature immune systems and are also likely to participate in activities that raise exposure risk. Women who are pregnant may or may not experience illness after contracting a virus, but regardless may transmit illness to their fetus, during birth or shortly thereafter. Other individuals with compromised immune systems are also at higher risk. These populations are most likely to suffer from diarrhea resulting from waterborne or foodborne illness.

Repeated flooding that enters buildings resulting in saturation of carpets, insulation, and sheetrock can lead to mold growth. People with asthma, allergies, or other respiratory conditions may be more sensitive to mold. People with weakened immune systems or with chronic lung diseases can develop mold infections in their lungs.

There is considerable evidence that flooding causes mental health impacts. Severe flooding events, in particular, have been widely studied and have been found to cause an array of mental health issues including but not limited to stress, depression, anxiety disorders, and sleeplessness.

Among the Hoboken residents that completed a Health Impact Assessment (HIA) community-wide survey conducted by Rutgers University for rainfall flooding, the most frequently cited impact of flooding was sewer back-ups near residents' homes. Sixty percent of survey respondents listed sewer back-ups as a problem when it floods. As a consequence of coming in contact with contaminated flood waters or sewer back-ups, nearly one third of survey respondents (28 percent) reported experiencing one or more of the following symptoms: headaches, vomiting, abdominal cramping, nausea, diarrhea, muscle aches, eye irritation/infection, asthma or other respiratory condition, or skin rash. Fifteen percent of respondents reported seeking medical attention as a result of experiencing one or more of these symptoms. Only a small percentage of Hoboken residents reported experiencing an injury requiring medical attention as a result of flooding (three percent) and a similarly small percentage (two percent) reported seeking counseling or other mental health services to help them cope with periodic flooding.

According to the Rutgers HIA survey, low-income residents, people with disabilities, and older residents in Hoboken were identified as potentially more vulnerable to the impacts of flooding. Thirty-six percent of survey respondents in these groups reported being impacted every time it floods compared to 20 percent of the general population. Of those that were impacted by flooding at least one time in the past two years, 24 percent of vulnerable populations reported that their apartment/house was damaged. This compares to 13 percent of the general population. In terms of disruption, vulnerable populations were consistently

more likely to report having difficulty attending to activities of daily life such as picking up prescriptions, getting to doctor/medical appointments, picking up food and groceries, and getting to work or school.

4.8.2.7 Children's Health

Executive Order 13045 states that each federal agency should make it a high priority to identify and assess environmental health risks and safety risks that may disproportionally affect children and should verify that policies, programs, activities, and standards address disproportionate risks to children. Specific areas of impact to children include noise exposure, air pollution, contamination and hazardous material exposure, and site safety considerations. According to 2010 census data, within the Study Area, there are 6,515 people ages 18 and under. The people 18 and under are distributed throughout the entire Study Area with higher concentrations located in the northeast, southwest, and southeast areas. Areas of concentration for this demographic group includes schools and open space recreation areas.

Children's health and their cognitive development may be affected by chronic environmental stressors such as high noise levels, as detailed within the "Aircraft and Road Traffic Noise and Children's Cognition and Health: A Cross-National Study" dated June 2005. In addition, a study has also identified effects on motivation and cardiovascular performance of children due to high noise levels (Stansfeld, 2003). To address Resist infrastructure construction-related noise levels on children, noise levels and durations of noise impact were estimated at locations of frequent use for this population. In the absence of any weekday daytime construction-related noise level guidance established by federal, state, county or municipal governments, the procedures published by the Federal Highway Administration (FHWA) for abatement of highway noise (23 CFR 772) was reviewed and accepted as the best available criteria to evaluate potential noise impact on sensitive receptors including schools, libraries, places of worship, and recreational areas. FHWA 23 CFR 772 noise criteria were developed considering hearing impairment, annoyance, sleep and task interference or disturbance, as well as interference with speech communication. As detailed within the Noise and Vibration Technical Environmental Study (2017), construction of Resist structures are predicted to impact schools and recreational areas to a varying degree based on the Alternative.

Regarding air quality, as detailed within EPA's "Policy on Evaluating Health Risks to Children", dated 1995, children may be more sensitive than adults to air emissions. One factor for this sensitivity is that children breathe more rapidly than adults and can inhale more emissions per pound of body weight than adults. NJDEP has established several initiatives toward cleaner air in New Jersey through its 'Stop the Soot' program. Such initiatives include providing manufacturer credits for bringing and operating zero emission vehicles (such as battery electric and fuel cell vehicle), clean plug-in hybrids, clean hybrids, and clean gasoline vehicles with near-zero tail pipe emissions. Also, a sales tax break and tax incentive program offered by the State and federal government, respectively, allows the public benefits related to owning and operating electric vehicles. The State also offers employers grants to offset the cost of purchasing and installing electric vehicle charging stations. In addition, the State funds a program for retrofits and modernization of non-road construction equipment. NJDEP has also established three-minute engine idling regulations (N.J.A.C. 7:27-14 and N.J.A.C. 7:27015) required for cars, trucks, school buses, public and private transportation buses, and non-road construction vehicles. In addition, NJDEP initiated a program for New Jersey school districts and school bus drivers which implemented best practices for diesel-powered vehicles such as strategies developed to prevent buses from queuing and turning off engines while waiting to load and unload students.

Please See Section 4.8.3.9 for a discussion on impacts on Children's Health from the project.

4.8.2.8 Public Transit

Environmental Justice populations, particularly those that are low-income, are heavily dependent on public transportation. Many mass transit options are available to residents living within the Study Area. NJ TRANSIT's Hoboken Terminal is located in the Study Area and serves as a transportation hub for a variety of transportation modes. NJ TRANSIT rail lines that originate in Hoboken include the Main Line with service to Suffern and Port Jervis, the Bergen County Line, the Pascack Valley and Port Jervis Line, the Spring Valley Line, the Montclair and Boonton Line, the Morris and Essex Line, and the North Jersey Coast Line. The HBLR system also runs along the western edge of the Study Area. It connects residential Bayonne and western Jersey City with Jersey City's Exchange Place, Newport Center, and Hoboken Terminal.

Within the Study Area, the New York Waterway ferry service operates the Lincoln Harbor Terminal in Weehawken and the 14th Street and NJ TRANSIT Terminal in Hoboken. These provide connections to Midtown, Pier 11/Wall Street, and the Manhattan World Financial Center in Manhattan. The PATH train line (operated by the Port Authority) runs between Hoboken, Newark, and New York City, with stops in Jersey City and Harrison. Bus service also operates between Hoboken and New York City, as well as throughout Hudson County. The City of Hoboken has also established bike lanes, which includes shared lanes and marked bike only lanes. A bike share program is also available to Hoboken residents along with Zipcar, a car share service.

As a result of the transportation options available to residents in the Study Area, mass transit use is high. According to the US Census 2010 American Community Survey, the average number of commuters using mass transit is approximately 50 percent of the Study Area's workforce population (compared to about 5 percent nationwide, based on 2015 ACS 5-year estimates). This percentage represents the entire population including

Environmental Justice populations and is also evidence of the many individuals that choose to live in Hoboken, Jersey City, and Weehawken because of their urban and transit-friendly nature, regardless of whether they own a vehicle or not.

Traffic and Circulation is discussed in greater detail in Section 4.9.

4.8.3 Environmental Consequences

4.8.3.1 Population and Demographics Impacts

Alternative 1

Alternative 1 would result in minor to moderate short-term impacts on the Study Area population, as a result of construction activities and major beneficial impacts on the Study Area population associated with decreased flooding frequency and magnitude.

The construction impacts would include impacts on vehicular and pedestrian traffic patterns in construction areas, noise and vibration impacts during construction activities, and increased levels of construction-generated dust. These construction impacts are characterized in detail in other sections of this DEIS.

The major beneficial direct impact on the existing population would result from reducing the frequency and magnitude of future coastal flooding impacts for 98 percent of the persons who reside in the preliminary FEMA 100-year floodplain within the Study Area. Approximately 17 percent of this population is minority, 14 percent is Hispanic, 3 percent over the age of 75 and 10 percent of the households are below poverty. This is generally consistent with the demographic profile of the Study Area as shown on **Table 4.39.** These residents may see an indirect impact in the reduction of their federal flood insurance rates over the long term. The magnitude of this rate reduction cannot be determined at this time. Based on 2010 census data, major beneficial impacts are also expected for the 7,870 persons whose residences would no longer be flooded during a rain storm equal to or less than a five-year rainfall event (4.23 inches during a 24-hour period).

For further discussion of Alternative 1 impacts on Communities of Concern, see Section 4.8.3.7.

Alternative 2

The minor to moderate short-term impacts on the Study Area population as a result of construction activities and the major beneficial impacts on the Study Area population associated with decreased flooding frequency and magnitude would be similar to those described under Alternative 1, except that coastal flood risk reduction benefits would be provided to 86 percent of the persons who reside in the FEMA preliminary 100-year floodplain. Approximately (approximately 17 percent of this population is minority, 15 percent is Hispanic, 3 percent over the age of 75 and 9 percent of the households are below poverty. This is generally consistent with the demographic profile of the Study Area as shown on **Table 4.39**.

For further discussion of Alternative 2 impacts on Communities of Concern, see Section 4.8.3.7.

Alternative 3

The minor to moderate short-term impacts on the Study Area population as a result of construction activities and the major beneficial impacts on the Study Area population associated with decreased flooding frequency and magnitude would be similar to those described under Alternative 1, except that coastal flood risk reduction benefits would be provided to 85 percent of the persons who reside in the FEMA preliminary 100-year floodplain. Approximately 17 percent of this population is minority, 15 percent is Hispanic, 3 percent over the age of 75 and 9 percent

Table 4.41 Potential Construction Easements - Alternative 1

MUNICIPALITY	BLOCK	LOT	AREA OF EASEMENT (SQUARE FOOTAGE)	PERMANENT OR TEMPORARY EASEMENT
City of Hoboken	262.01	1	21,374	Permanent
City of Hoboken	264.01	1	8,817	Permanent
City of Hoboken	264.02	1	7,953	Permanent
City of Hoboken	268.01	3	14,089	Permanent
City of Hoboken	268.01	2	12,160	Permanent
City of Hoboken	268.01	1	6,824	Permanent
Weehawken Twp.	34.03	1.02	2,280	Permanent
Weehawken Twp.	34.03	1.01	1,475	Permanent
Weehawken Twp.	34.03	2	14,602	Permanent
Weehawken Twp.	34.03	3	25,856	Permanent
Weehawken Twp.	34.03	3.01	1,704	Permanent
Weehawken Twp.	34.03	4	71,631	Permanent
Weehawken Twp.	36.03	24	1,092	Permanent
Jersey City	6002	1	920	Permanent
City of Hoboken	259	1	53	Permanent
City of Hoboken	261.07	1	2,172	Permanent
City of Hoboken	210, 210.01	1-6, 29	2,304	Temporary

Source: Dewberry, 2015-2017

Figure 4.89 Potential Construction Easements - Alternative 1

Figure 4.90 Potential Construction Easements - Alternative 2

of the households are below poverty. This is generally consistent with the demographic profile of the Study Area as shown on **Table 4.39.**

For further discussion of Alternative 3 impacts on Communities of Concern, see Section 4.8.3.7.

No Action Alternative

The No Action Alternative is not anticipated to have a direct effect on population or demographics within the Study Area in the short-term. However, there is continued risk of significant coastal storm impacts to the entire population in the FEMA preliminary 100-year floodplain. These risks include coastal storm flooding and chronic flooding; loss of power lasting from several days to several weeks in duration; loss of local transportation networks, including public transportation; and loss of a full range of emergency services. No reduction in flood insurance rates would be expected under this alternative. In addition, due to climate change and sea level rise, the frequency and magnitude of coastal surge and rainfall flooding events would be expected to increase in the future. The No Action Alternative would therefore have long-term impacts by leaving the community exposed to increasingly severe flooding events.

4.8.3.1.1 *Mitigation Measures and Best Management Practices (BMPS) Included in Alternatives 1, 2, and 3*

There are no mitigation measures or BMPs related to population and demographics.

4.8.3.2 Land Use and Zoning Impacts

Alternative 1

No changes to zoning or land use are proposed with Alternative 1's Resist component. Easements (both temporary and permanent) would be required for construction and implementation of the Resist structure (see **Figure 4.89 and Table 4.41**), but these would not constitute changes to land use and no zoning changes would be required. Temporary easements would be necessary for up to approximately 3.5 years, which represents the construction duration of the Resist component. To facilitate this construction, one temporary easement is required. Permanent easements are required for the construction of above-ground infrastructure. Fourteen permanent easements on private property are required for the Alternative 1 Resist infrastructure. A total of 0.05 acres are required for temporary easements and a total of 4.4 acres are required for permanent easements.

Under Alternative 1, Resist structures would be located along Weehawken Cove and Sinatra Drive. In Hoboken, eight easements would be required along Sinatra Drive. In Weehawken, along Weehawken Cove, seven easements would be required. No land use changes would occur and no changes to zoning are anticipated for the Study Area. Alternative 1 is consistent with all applicable county and regional land use plans.

Alternative 1 would result in the permanent removal of 0 to 2 parking spaces.

As discussed in Section 3, Alternative 1, Option 1 features an alignment south of Observer Highway in the NJ TRANSIT Yard, while the Option 2 alignment runs along Observer Highway from Washington Street to Marin Boulevard. The land between these two options has been proposed for redevelopment

Table 4.42 Potential Construction Easements - Alternative 2

MUNICIPALITY	BLOCK	LOT	AREA OF EASEMENT (SQUARE FOOTAGE)	PERMANENT OR TEMPORARY EASEMENT
City of Hoboken	268.01	2	4,807	Permanent
City of Hoboken	268.01	1	1,911	Permanent
Weehawken Twp.	34.03	1.02	3,500	Permanent
Weehawken Twp.	34.03	4.01	17,507	Permanent
Weehawken Twp.	34.03	9.01	10,993	Permanent
Weehawken Twp.	34.03	4	12,391	Permanent
City of Hoboken	210, 210.01	1-6, 29	2,304	Temporary
Jersey City	6002	7	4,800	Permanent

Source: Dewberry, 2015-2017

Table 4.43 Potential Construction Easements - Alternative 3

MUNICIPALITY	BLOCK	LOT	AREA OF EASEMENT (SQUARE FOOTAGE)	PERMANENT OR TEMPORARY EASEMENT
City of Hoboken	269.02	1	3,722	Permanent
City of Hoboken	255	4.03	3,381	Permanent
City of Hoboken	268.01	1	51	Permanent
Weehawken Twp.	34.03	1.02	3,500	Permanent
Weehawken Twp.	34.03	9.01	10,993	Permanent
Weehawken Twp.	34.03	4	3,409	Permanent
City of Hoboken	210, 210.01	1-6, 29	2,304	Temporary
City of Hoboken	126	5	3,736	Permanent

Source: Dewberry, 2015-2017

Figure 4.91 Potential Construction Easements - Alternative 3

under the Hoboken Yard Redevelopment Plan. The more southerly Option 1 would provide flood risk reduction benefits for this proposed redevelopment site. However, for this redevelopment plan to proceed, existing railroad tracks in this area must be relocated. If these tracks cannot be relocated to meet the construction deadlines established for this project, then Option 2 would be implemented. Option 2 could pose challenges to the future construction of the Hoboken Yard Redevelopment Plan, as it would potentially impact accessibility to this area (both during construction of the redevelopment area and after completion) and it would not provide flood risk reduction benefits to the redevelopment area. Alternatively, Option 1, which would be located behind the redevelopment area, would not impact cohesion or accessibility to the redevelopment area and would provide flood risk reduction benefits to the redevelopment area. NJ TRANSIT, the property owner, is aware of both Option 1 and Option 2 on their property. The option constructed will be determined when a final agreement is made concerning the Hoboken Yard Redevelopment Area between NJ TRANSIT, the developer of record and the City of Hoboken.

The proposed DSD improvements represent the framework and provide recommendations for a future stormwater strategy that would need to be implemented by the City of Hoboken, as funding becomes available, and can be integrated into the city's existing plans. No changes to zoning are proposed under the DSD strategy. Long-term land use changes under DSD would include the approximately 4.3 acres associated with the BASF site, which is currently vacant land. Under the DSD strategy, the land use would change to recreation. In addition, the Block 10 DSD site is currently a parking lot; this property would change to recreational uses under the DSD strategy. No easements would be required under DSD. The City of Hoboken has acquired the BASF site and is looking to purchase the Block 10 property.

Alternative 2

No changes to zoning or land use are proposed with Alternative 2's Resist component. Easements (both temporary and permanent) would be required for construction and implementation of the Resist structure (see **Figure 4.90 and Table 4.42**), but these would not constitute changes to land use and no zoning changes would be required. Under Alternative 2, the direct impacts on land use and zoning would be both short term and long term. Temporary easements would be necessary for up to approximately 3.5 years, which represents the construction duration for the Resist component. To facilitate this construction, one temporary easement is required. Seven permanent easements on private property are required for Resist infrastructure construction under Alternative 2. A total of 0.05 acres are required for temporary easements and a total of 1.3 acres are required for permanent easements.

The proposed Resist structure would require easements on two parcels in Hoboken, one of which is currently open space/parkland. Four parcels in Weehawken would also require easements. While land uses would change, no changes to zoning are anticipated for the Study Area. Alternative 2 is consistent with all applicable county and regional land use plans.

Alternative 2 would result in the permanent removal of 13 to 31 parking spaces.

The impacts of Option 1 and Option 2 are the same as described for Alternative 1.

The proposed DSD improvements represent the framework and provide recommendations for a future stormwater strategy that would need to be implemented by the City of Hoboken, as funding becomes available, and can be integrated into the city's existing plans. No changes to zoning are proposed under the DSD strategy. Long-term land use changes under DSD would include the approximately 4.3 acres associated with the BASF site, which is currently vacant land. Under the DSD strategy, the land use would change to recreation. In addition, the Block 10 DSD site is currently a parking lot; this property would change to recreational uses under the DSD strategy. No easements would be required under DSD. The City of Hoboken has acquired the BASF site and is looking to purchase the Block 10 property.

Alternative 3

No changes to zoning or land use are proposed with Alternative 3's Resist component. Easements (both temporary and permanent) would be required for construction and implementation of the Resist structure (see **Figure 4.91 and Table 4.43**), but these would not constitute changes to land use, and no zoning changes would be required. Temporary easements would be necessary for up to approximately 3.5 years, which represents the construction duration for the Resist component. To facilitate this construction, one temporary easement is required. Seven permanent easements on private property are required for Resist infrastructure construction under Alternative 3. A total of 0.05 acres are required for temporary easements and a total of 0.7 acres are required for permanent easements.

Under Alternative 3, four parcels in Hoboken, three parcels in Weehawken, and one parcel in Jersey City are required to construct the Resist structure. In Hoboken, the land required includes the alleyway between Garden Street and Washington Street, north of 14th Street. In Weehawken, the parcels are located along Waterfront Terrace, north to Clinton Street. While land uses would change, no changes to zoning are anticipated for the Study Area. Alternative 3 is consistent with all applicable county and regional land use plans.

Alternative 3 would result in the permanent removal of 7 to 18 parking spaces.

The impacts of Option 1 and Option 2 are the same as described for Alternative 1.

The proposed DSD improvements represent the framework and provide recommendations for a future stormwater strategy that would need to be

implemented by the City of Hoboken, as funding becomes available, and can be integrated into the city's existing plans. No changes to zoning are proposed under the DSD strategy. Long-term land use changes under DSD would include the approximately 4.3 acres associated with the BASF site, which is currently vacant land. Under the DSD strategy, the land use would change to recreation. In addition, the Block 10 DSD site is currently a parking lot; this property would change to recreational uses under the DSD strategy. No easements would be required under DSD. The City of Hoboken has acquired the BASF site and is looking to purchase the Block 10 property.

No Action Alternative

The No Action Alternative would result in no change to land use or zoning.

4.8.3.2.1 *Mitigation Measures and BMPs Included in Alternatives 1, 2, and 3*

The following measures would be implemented to minimize impacts from the Resist portion of the project on land use and zoning:

- All easements acquired, whether temporary or permanent, would be the minimum size possible to meet project purposes.

The following measures would be implemented to minimize project impacts from both Resist and DSD portions of the project on land use and zoning:

- Construction staging areas would be located on publicly-owned and/or currently vacant land to the extent practicable.

4.8.3.3 Impacts to Open Space

Alternative 1

Under Alternative 1, there would be a direct, long-term, beneficial impact on open space which would be moderate in magnitude. Alternative 1 would provide for enhancements to 12.91 acres of open space or parks (including 6.91 acres associated with Resist and six acres associated with DSD). In some cases, there are currently no improvements to these undeveloped park lands, particularly the DSD sites. The enhancements would be located at 10 different locations. Seven park areas would be enhanced along the waterfront as part of the Resist infrastructure—Weehawken Cove Park (Hoboken), Sinatra Drive South near Pier A (Hoboken), Maxwell Place Amphitheater (Hoboken), Pier 13 amenities (Hoboken), Hudson Tea Building waterfront (Hoboken), elevated landscape along Harbor Boulevard (Weehawken), and kiosk near Lincoln Harbor Ferry Terminal (Weehawken). Three park areas in Hoboken would be enhanced as elements of the DSD infrastructure: Block 10, NJ TRANSIT site, and BASF property. Improvements at existing parks may include installation of developed recreation facilities such as playgrounds and picnic areas, trails and interpretive/educational signage, viewing decks, and gathering spaces. There would be a minor short-term impact to public use at these park areas during construction of these enhancements.

One of the more important park enhancements along the waterfront would be at the existing Cove Park, which is located adjacent to the west of 1500 Garden Street. This park is currently Green Acres-encumbered by the State of New Jersey and is deed-restricted to active/passive recreation use. Improvements proposed under Alternative 1 would be in accordance with this deed restriction. Potential enhancements to Cove Park include playgrounds, lawn areas, game courts, and a viewing deck overlooking Weehawken Cove.

Another important Green Acres-encumbered open space area in the Study Area is the 30-foot wide Hudson River Walkway. Under Alternative 1, the Resist barrier in the northern and southern portions of the Study Area would be located along the waterfront. The Hudson River Walkway would need to be elevated up to 12 feet along 7,950 linear feet of Hudson River shoreline to accommodate installation of the Resist barrier along the riverfront. Access to the riverfront would be accommodated via stairwells and ramps, which would reduce access to the walkway compared to the existing at-grade access along most of the walkway length. The elevated Hudson River Walkway in Alternative 1 would provide access to enhanced park space at Maxwell Place Park (located along the waterfront at Sinatra Drive North, from 12th Street to Frank Sinatra Drive) and at Shipyard Park. These modifications to the Hudson River Walkway would be coordinated with the State of New Jersey to ensure compliance with any deed restrictions. No impacts to any other Green Acres-encumbered property would occur.

The most substantial enhancements to open space under DSD would be to the 4.3-acre BASF property located on Adams Street. This site, which is currently paved and impermeable, would be converted to green park space with an underground stormwater storage/holding tank. Amenities under consideration for this park follow three themes: destination, recreational, and ecological. A destination park provides for trails and urban landscape features, a recreational park provides for developed recreational uses such as ball fields and skateboard areas, and an ecological park provides an opportunity for the public to engage with native vegetation and wildlife.

The open space located within Jersey City on NJ TRANSIT property along Jersey Avenue would be partially physically and visually closed off by a proposed Resist barrier located north of this open space. The existing bicycle path and walkway would be relocated to minimize impacts on current public use in this area.

There would be no impacts to open space or parks in Weehawken with the exception of the previously discussed Hudson River Walkway.

Alternative 2

Under Alternative 2, there would be a direct, long-term, beneficial impact on open space, which would be moderate in magnitude. Alternative 2 would provide enhancements to 9.53 acres of open space or parks (including 3.53 acres associated with Resist and six acres associated with DSD). In some cases, there are currently no improvement to these undeveloped park

Table 4.44 Summary of Businesses Impacted by Build Alternatives

TYPE OF BUSINESS	ALT. 1	ALT. 2	ALT. 3
Retail	154	109	108
Office	124	118	117
Industrial	13	11	10
Total	291	238	235

Source: Dewberry, 2015-2017

lands, particularly the DSD sites. The enhancements would be located at six different locations in Hoboken. Three park areas would be enhanced as part of the Resist infrastructure–Weehawken Cove Park, Washington Street, and Hudson Tea Park. Three park areas would be enhanced as elements of the DSD infrastructure–Block 10, NJ TRANSIT site and BASF property. Improvements at existing parks may include installation of developed recreation facilities such as playgrounds and picnic areas, trails and interpretive/educational signage, viewing decks, and gathering spaces. There would be a minor short-term impact to public use at these park areas during construction of these enhancements.

One of the more important park enhancements along the waterfront would be at the existing Cove Park, which is located adjacent to the west of 1500 Garden Street. This park is currently Green Acres encumbered by the State of New Jersey and is deed-restricted to active/passive recreation use. Improvements proposed under Alternative 2 would be in accordance with this deed restriction. Potential enhancements to Cove Park include playgrounds, lawn areas, game courts, and a viewing deck overlooking Weehawken Cove.

Another important Green Acres-encumbered open space in the Study Area is the 30-foot wide Hudson River Walkway. Under Alternative 2, the Resist barrier is not primarily located along the waterfront and any impacts to the Hudson River Walkway would be minimal. Any modifications to the Hudson River Walkway would be coordinated with the State of New Jersey to ensure compliance with any deed restrictions. No impacts to any other Green Acres-encumbered property would occur.

The most substantial enhancements to open space under DSD would be to the 4.3-acre BASF property located on Adams Street. This site, which is currently paved and impermeable, would be converted to green park space with an underground stormwater storage/holding tank. Amenities under consideration for this park follow three themes: destination, recreational, and ecological.

The open space located in Jersey City on NJ TRANSIT property along Jersey Avenue would be partially physically and visually closed off by a proposed Resist barrier located north of this open space. The existing bicycle path and walkway would be relocated to minimize and mitigate impacts on current public use in this area.

There would be no impacts to open space or parks in Weehawken.

Alternative 3

Under Alternative 3, there would be a direct, long-term, beneficial impact on open space, which would be moderate in magnitude. Alternative 3 would provide for enhancements to 8.55 acres of open space or parks (including 2.55 acres associated with Resist and six acres associated with DSD). In some cases, there are currently no improvements to these undeveloped park lands, particularly the DSD sites. The enhancements would be located at seven different locations in Hoboken. Four park areas would be enhanced as part of the Resist infrastructure–Weehawken Cove Park, Garden Street along the parking deck, the alleyway between Garden and Bloomfield Streets, and the alley between Bloomfield and Washington Streets. Three park areas would be enhanced as elements of the DSD infrastructure–Block 10, NJ TRANSIT site, and BASF property. Improvements at existing parks may include installation of developed recreation facilities such as playgrounds and picnic areas, trails and interpretive/educational signage, viewing decks, and gathering spaces. There would be a minor short-term impact to public use at these park areas during construction of these enhancements.

One of the more substantial park enhancements along the waterfront would be at the existing Cove Park, which is located adjacent to the west of 1500 Garden Street. This park is currently Green Acres encumbered by the State of New Jersey and is deed-restricted to active/passive recreation use. Improvements proposed under Alternative 3 would be in accordance with this deed restriction. Potential enhancements to Cove Park include playgrounds, lawn areas, game courts, and a viewing deck overlooking Weehawken Cove.

Another important Green Acres-encumbered open space area in the Study Area is the 30-foot wide Hudson River Walkway. Under Alternative 3, the Resist barrier is not primarily located along the waterfront and any impacts to the Hudson River Walkway would be minimal. Any modifications to the Hudson River Walkway would be coordinated with the State of New Jersey to ensure compliance with any deed restrictions. No impacts to any other Green Acres-encumbered property would occur.

The most substantial enhancements to open space under DSD would be to the 4.3-acre BASF property located on Adams Street. This site, which is currently paved and impermeable, would be converted to green park space with an underground stormwater storage/holding tank. Amenities under consideration for this park follow three themes–destination, recreational, and ecological.

The open space located within Jersey City on NJ TRANSIT property along Jersey Avenue would be partially physically and visually closed off by a proposed Resist barrier located north of this open space. The existing bicycle path and walkway would be relocated to minimize impacts on current public use in this area.

There would be no impacts to open space or parks in Weehawken.

No Action Alternative

Under the No Action Alternative, there would be no improvements to open space within the Study Area as it relates to the Resist structure. The City of Hoboken is in the process of acquiring the BASF property and intends to purchase the Block 10 property, which are included in the DSD strategy, and may pursue construction of park space and amenities on these parcels under the No Action Alternative.

4.8.3.3.1 *Mitigation Measures and BMPs Included in Alternatives 1, 2, and 3*

The following measure would be implemented to minimize project impacts from the Resist portion of the project on open space:

- The design team would work with Jersey City to reduce negative impacts to parkland/open space located on NJ TRANSIT property (e.g. through elevation of open space. improvements to open space, and/or through use of green walls, seating spaces, murals, etc.).

The following measure would be implemented to minimize impacts from the Resist and DSD portions of the project on open space:

- All improvements for parkland would be planned and designed in close coordination with the public and local jurisdictions to best meet the outstanding unmet recreational needs of residents.

4.8.3.4 Impacts to Critical Facilities

Alternative 1

Alternative 1 would provide major beneficial, long-term, direct impacts on critical facilities by reducing the frequency and magnitude of future flooding arising from both coastal storm surge and rainfall events for all critical facilities within the Study Area. The Project would improve emergency services for all residences within the Study Area during future flooding events because the critical facilities themselves would not be incapacitated and the communication and transportation routes relied on by the facilities would not be compromised.

Alternative 2

Alternative 2 would provide major beneficial, long-term, direct impacts on critical facilities by reducing the frequency and magnitude of future flooding arising from both coastal storm surge and rainfall events for all critical facilities within the Study Area, except the fire station located at 1313 Washington Street, which is located on the river side of the Resist structure. The Project would improve emergency services for all residences in the Study Area during future flooding events because the critical facilities themselves would not be incapacitated and the communication and transportation routes relied on by the facilities would not be compromised.

Alternative 3

The impact of Alternative 3 on critical facilities is the same as for Alternative 2.

No Action Alternative

The No Action Alternative would leave critical facilities exposed to the current level of flood risk from both coastal and rainfall flood events. During major flood events, access to these critical facilities by emergency personnel and residents is expected to be limited from a period of days to weeks, thereby likely resulting in large-scale evacuations, similar to those that occurred during Superstorm Sandy. Due to climate change and sea level rise, future storm events would represent increasing strains on critical facilities and emergency personnel.

4.8.3.4.1 *Mitigation Measures and BMPs Included in Alternatives 1, 2, and 3*

Mitigation measures would be as follows for both Resist and DSD portions of the project:

- NJDEP will coordinate with local emergency services (including fire, police and ambulance services) to make sure that access to critical facilities is provided to the community both during construction as well as once the project is complete. Accessibility during construction will be coordinated as part of the construction planning phase of the project. This will also require consideration for accessibility in the event a storm occurs while the project is still under construction. Emergency service accessibility during operational conditions (once the project elements are complete) will be part of the Operations and Maintenance plan that is being developed by the NJDEP in partnership with the local municipalities, transit and utility providers, and offices of emergency management.

4.8.3.5 Impacts on Economic Conditions

Alternative 1

Long-Term Impacts:

Based on calculations in accordance with FEMA's Hazard Mitigation Grant Program guidance, Alternative 1 would result in a major, long-term economic benefit of $1.814 billion (including Resist and DSD strategies) to the Study Area over the life of the Project. These benefits accrue from avoided property damage, avoided damage of property contents, and avoided homeowner displacement costs. Future development patterns would continue based on market conditions. The Project would enhance economic stability through the minimization of costly damages from coastal storms and rainfall events and have a beneficial impact on existing development.

As discussed in Section 4.8.2.5, the three municipalities have experienced an upward trend in housing prices since Superstorm Sandy. This trend has occurred even though no large-scale flood risk reduction measures have been implemented since Sandy. Therefore, it is expected that this upward trend would likely continue into the near future, regardless of which of the three Build Alternatives or the No Action Alternative is implemented. While the Project would not add housing, provisions currently exist in each municipality for affordable housing and the Project is

not proposing to change this. The real estate market in Hoboken, Jersey City, and Weehawken is diverse and includes a mix of market rate, public, and affordable housing. Development trends would continue to expand the housing market independently of the Project. Long-term trends in housing prices are less certain.

However, there would be long-term adverse impacts to certain retail businesses and local residents at Lincoln Harbor, as well as first floor businesses along Sinatra Drive North and Sinatra Drive South. There would be a loss of waterfront views from these eight retail businesses, which would be minor to moderate at dining establishments. In addition, the Resist feature would also be along Sinatra Drive in southern Hoboken; six retail businesses are along Sinatra Drive in this area, but because the Resist feature would only be approximately one to 2.5 feet in height in this location, no impact to waterfront views would be expected. Permanent easements would be required on 17 parcels of private property for construction of Resist infrastructure. Given the limited number and size of easements required for this infrastructure, long-term impacts on property tax revenues are expected to be minor.

Short-Term Impacts:
The total construction cost, including contingencies, for Alternative 1's Resist infrastructure is estimated to be between $531.5 million and $597.1 million. There would be a direct benefit to low-income residents in the local community through employment of construction workers. As required under Section 3 of the Housing and Urban Development Act of 1968, recipients of HUD funding direct new employment and contracting opportunities to low-income residents within the local community. The NJDCA has a Section 3 compliance program in place that includes a Compliance Coordinator. The NJDCA's July 2015 Implementation Policy requires the project comply with Section 3 and encourages opportunities through outreach, collaboration with stakeholders training and information to businesses on how to register with HUD as a Section 3 Business.

In addition, the 8,000-9,000 crew days which would be required to complete the Resist portion of the Project are expected to result in increased business for local retail stores and restaurants in the Study Area. The production rates for the crew days was developed using RS Means constructing estimating standards. The major areas of work were calculated based on the linear feet of wall and types of walls and structure (concrete, steel, excavation, etc.). This was also used to calculate the number of trucks and equipment necessary to do the work. Additionally, the construction progression was considered so that it accounted for the order of operations, warm months vs. cold months, and the physical constraints of the site so that there is logic executed in how the various trades perform their work and what is feasible with regards to how many crews can work in the same zone without interfering with each other.

However, there would be short-term adverse impacts to certain retail businesses and local residents at Lincoln Harbor and first floor businesses along Sinatra Drive North and Sinatra Drive South. A total of 291 businesses (154 retail, 124 office, and 13 industrial) that are located within 50 feet of proposed improvements for Alternative 1 would be impacted (see **Table 4.44**). The impacts would occur mainly during the construction of the Resist barrier, which may change pedestrian access to these businesses. Retail establishments are anticipated to be impacted more than office and industrial businesses due to their dependence on consumer traffic and access. Since construction would proceed in a linear fashion, these impacts would be short-term, lasting only a few weeks or months at any particular business.

Alternative 2

Long-Term Impacts:
Based on calculations in accordance with FEMA's Hazard Mitigation Grant Program guidance, Alternative 2 would result in a major, long-term, economic benefit of $1.783 billion (including Resist and DSD strategies) to the Study Area over the life of the Project. These benefits accrue from avoided property damage, avoided damage of property contents, and avoided homeowner displacement costs. Future development patterns would continue based on market conditions. The Project would enhance economic stability through the minimization of costly damages from coastal storms and rainfall events and the Project would have a beneficial impact on existing development.

As discussed in Section 4.8.2.5, the three municipalities have experienced an upward trend in housing prices since Superstorm Sandy. This trend has occurred even though no large-scale flood risk reduction measures have been implemented since Sandy. Therefore, it is expected that this upward trend would likely continue into the near future, regardless of which of the three Build Alternatives or the No Action Alternative is implemented. While the Project would not add housing, provisions currently exist in each municipality for affordable housing and the Project is not proposing to change this. The real estate market in Hoboken, Jersey City, and Weehawken is diverse and includes a mix of market rate, public, and affordable housing. Development trends would continue to expand the housing market independently of the Project. Long term trends in housing prices are less certain.

In some areas, the Resist structure would travel adjacent to buildings with retail businesses and be built above eye-level view. There may be long-term adverse impacts to these retail businesses, which are located along Washington Street from 15th Street to the Alleyway. The Resist structure would travel along the west side of Washington Street, starting at approximately seven feet in height at the Washington Street/15th Street intersection and taper down to about five feet in height at Washington Street and the Alleyway. The height of the Resist structure (above eye-level) in this area would block views of storefronts in the building at 1450 Washington from drivers on the road. This building has four storefronts in this

location. The remaining portion of the Resist structure along Washington Street (to 13th Street) tapers from five feet in height to 3.5 feet in height, so long-term adverse economic impacts to businesses/residences in this area would not occur. While the Resist structure would be above eye level (between eight and seven feet in height) along 15th Street from Garden Street to Washington Street, no long-term adverse economic impacts are anticipated because these buildings do not contain storefront businesses that rely on visibility from the street.

No economic impacts to retail businesses would occur as a result of impacts to waterfront views because the Resist structure in Alternative 2 is primarily located upland and does not block views of the waterfront for businesses.

Permanent easements would be required on six parcels of private property for construction of Resist infrastructure. Given the limited number and size of easements required for this infrastructure, long-term impacts on property tax revenues are expected to be minor.

Short-Term Impacts:

The total construction cost, including contingencies, for Alternative 2's Resist infrastructure is estimated to be between $238.2 million and $276.9 million. There would be a direct benefit to low-income residents within the local community through employment of construction workers. As required under Section 3 of the Housing and Urban Development Act of 1968, recipients of HUD funding direct new employment and contracting opportunities to low-income residents within the local community. The NJDCA has a Section 3 compliance program in place that includes a Compliance Coordinator. The NJDCA's July 2015 Implementation Policy requires the project comply with Section 3 and encourages opportunities through outreach, collaboration with stakeholders training and information to businesses on how to register with HUD as a Section 3 Business.

In addition, the 6,000-7,000 crew days that would be required to complete the Resist portion of the Project are expected to result in increased business for local retail stores and restaurants in the Study Area.

However, there would be short-term adverse impacts to certain retail businesses and local residents along Washington Street from 15th to 13th Streets. A total of 238 businesses (109 retail, 118 office, and 11 industrial) that are located within 50 feet of proposed improvements for Alternative 2 would be impacted (see **Table 4.44**). The impacts would occur mainly during the construction of the Resist barrier, which may change pedestrian access to these businesses. Retail establishments are anticipated to be impacted more than office and industrial businesses due to their dependence on consumer traffic and access. Since construction would proceed in a linear fashion, these impacts would be short term, lasting only a few weeks or months at any particular business.

Alternative 3

Long-Term Impacts:

Based on calculations in accordance with FEMA's Hazard Mitigation Grant Program guidance, Alternative 3 would result in a major, long-term, economic benefit of $1.782 billion (including Resist and DSD strategies) to the Study Area over the life of the Project. These benefits accrue from avoided property damage, avoided damage of property contents, and avoided homeowner displacement costs. Future development patterns would continue based on market conditions. The Project would enhance economic stability through the minimization of costly damages from coastal storms and rainfall events and the Project would have a beneficial impact on existing development.

As discussed in Section 4.8.2.5, the three municipalities have experienced an upward trend in housing prices since Superstorm Sandy. This trend has occurred even though no large-scale flood risk reduction measures have been implemented since Sandy. Therefore, it is expected that this upward trend would likely continue into the near future, regardless of which of the three Build Alternatives or the No Action Alternative is implemented. While the Project would not add housing, provisions currently exist in each municipality for affordable housing and the Project is not proposing to change this. The real estate market in Hoboken, Jersey City, and Weehawken is diverse and includes a mix of market rate, public, and affordable housing. Development trends would continue to expand the housing market independently of the Project. Long term trends in housing prices are less certain.

However, there would be long-term adverse impacts to certain retail businesses and local residents along Washington Street from 15th to 13th Streets. Long-term impacts relate to loss of waterfront views from these businesses, which would be minor to moderate at dining establishments.

Long-term economic impacts would not be anticipated as a result of the Resist structure obscuring the visibility of retail businesses from streets or public rights-of-way because the Resist structure would not be placed adjacent to these businesses in areas where it is above eye level in height. One location would have a Resist feature that would be above eye level. The location is along Garden Street from 15th Street to the Alleyway, where the structure tapers from eight feet to five feet in height, but this is the rear of the parking garage at 1450 Bloomfield Street, and no public entrances to the parking garage are located in this area. Therefore, no long-term economic impacts are anticipated.

No economic impacts to retail businesses would occur as a result of impacts to waterfront views because the Resist Structure in Alternative 3 is primarily located upland, and does not block views of the waterfront for businesses.

Permanent easements would be required on eight parcels of private property for construction of Resist infrastructure. Given the limited number and size of

easements required for this infrastructure, long-term impacts on property tax revenues are expected to be minor.

Short-Term Impacts:

The total construction cost, including contingencies, for Alternative 3's Resist infrastructure is estimated to be between $224.5 million and $268.5 million. There would be a direct benefit to low-income residents within the local community through employment of construction workers. As required under Section 3 of the Housing and Urban Development Act of 1968, recipients of HUD funding direct new employment and contracting opportunities to low-income residents within the local community. The NJDCA has a Section 3 compliance program in place that includes a Compliance Coordinator. The NJDCA's July 2015 Implementation Policy requires the project comply with Section 3 and encourages opportunities through outreach, collaboration with stakeholders training and information to businesses on how to register with HUD as a Section 3 Business.

In addition, the 6,000-7,000 crew days which would be required to complete the Resist portion of the Project are expected to result in increased business for local retail stores and restaurants in the Study Area..

However, there would be short-term adverse impacts to certain retail businesses and local residents along Washington Street from 15th the alleyway (between 15th and 14th Streets) to 13th Streets. A total of 235 businesses (108 retail, 117 office, and 10 industrial) that are located within 50 feet of proposed improvements for Alternative 3 would be impacted (see **Table 4.44**). The impacts would occur mainly during the construction of the Resist barrier, which may change pedestrian access to these businesses. Retail establishments are anticipated to be impacted more than office and industrial businesses due to their dependence on consumer traffic and access. Since construction would proceed in a linear fashion, these impacts would be short-term, lasting only a few weeks or months at any particular business.

No Action Alternative

Under the No Action Alternative, the significant long-term economic benefits of providing flood protection to persons and businesses within the Study Area would not occur. Instead, significant business and residential displacements would continue to occur during coastal storm surge events, likely increasing in frequency and severity over time due to climate change and sea level rise. In addition, business and resident displacements would occur during periodic rainfall events because roads would be inaccessible due to flooding. There would be no change to the real estate tax base as a result of land acquisition. Property values within the Study Area have escalated significantly in the absence of flood risk reduction measures; therefore, evidence of loss of economic stability under the No Action Alternative is not evident in the short term. There would be no change to flood insurance rates under the No Action Alternative.

4.8.3.5.1 *Mitigation Measures and BMPs included in Alternatives 1, 2 and 3*

Mitigation measures would be as follows for both Resist and DSD portions of the project:

- The project will be required to comply with HUD Section 3, and must to the greatest extent possible provide job training, employment, and contract opportunities for low- or very-low income residents in connection with projects and activities in their neighborhoods. The project will be required to document all actions taken to comply with the requirements of Section 3 and submit a Section 3 Annual Summary Report (Form HUD-60002) for all covered funding to the Office of Fair Housing and Equal Opportunity. The project is also required to comply with NJDCA Section 3 requirements, including submitting Quarterly Section 3 reports throughout the entire project, pursuant to NJDCA Policy 2.10.22 Section VIII. NJDCA's Section 3 policy can be found on their website at http://www.nj.gov/dca/divisions/sandyrecovery/links/DCA_Section_3_Policy_November_2014_amendment.pdf.
- Impacts to businesses during construction would be minimized by signage and provision of temporary access pathways. The project team would coordinate with businesses to address accessibility concerns.

Mitigation measures would be as follows for Resist:

- For Alternatives 1 and 2, coordinate with business owners, residents and the project team to incorporate context sensitive urban design features that complement local businesses to alleviate impacts of blocked views of storefronts from adjoining streets and public rights of way. Views of storefronts are not anticipated to be blocked under Alternative 3.

4.8.3.6 Impacts on Public Health

Alternative 1

Under Alternative 1, public health benefits would be provided to 98 percent of people within the Study Area who reside within the preliminary FEMA 100-year floodplain during future coastal storm surge events, and to the 7,870 persons (based on 2010 census data) whose residences would no longer be flooded during a rain storm equal to or less than a five-year rainfall event (4.23 inches during a 24-hour period).

Public health benefits would include a reduction in infectious disease, injuries, and death; a reduction in exposure to microbial pathogens from combined sewer overflow (CSO) situations; decreased mold growth and associated aggravation of respiratory conditions and lung infections; and a reduction in flood-induced mental health issues including stress, depression, anxiety disorders, and sleeplessness.

Alternative 2

Under Alternative 2, public health benefits would be provided to 86 percent of people within the Study Area who reside within the preliminary FEMA 100-year

floodplain during future coastal storm surge events and to the 7,870 persons (based on 2010 census data) whose residences would no longer be flooded during a rain storm equal to or less than a five-year rainfall event (4.23 inches during a 24-hour period).

Public health benefits would include a reduction in infectious disease, injuries, and death; a reduction in exposure to microbial pathogens from combined sewer overflow (CSO) situations; decreased mold growth and associated aggravation of respiratory conditions and lung infections; and a reduction in flood-induced mental health issues including stress, depression, anxiety disorders, and sleeplessness.

Alternative 3

Under Alternative 3, public health benefits would be provided to 85 percent of people within the Study Area who reside within the preliminary FEMA 100-year floodplain during future coastal storm surge events, and to the 7,870 persons (based on 2010 Census data) whose residences would no longer be flooded during a rain storm equal to or less than a five-year rainfall event (4.23 inches during a 24-hour period).

Public health benefits would include a reduction in infectious disease, injuries and death; a reduction in exposure to microbial pathogens from combined sewer overflow (CSO) situations; decreased mold growth and associated aggravation of respiratory conditions and lung infections; and a reduction in flood-induced mental health issues including stress, depression, anxiety disorders and sleeplessness.

No Action Alternative

There would be no public health benefits under the No Action Alternative. Health risks due to flooding would remain unchanged from current conditions. Continued flooding events would cause infectious disease, injuries, and death; exposure to microbial pathogens from combined sewer overflow (CSO) situations; mold growth and associated aggravation of respiratory conditions and lung infections; and mental health issues including stress, depression, anxiety disorders, and sleeplessness.

4.8.3.6.1 *Mitigation Measures and BMPs included in Alternatives 1, 2 and 3*

There are no mitigation measures or BMPs associated with public health.

4.8.3.7 Impacts to Minority and Low-Income Populations

Alternative 1

Under Alternative 1, direct impacts to minority and low-income populations would be both short term and long term. The short-term impacts are associated with construction activities and the long-term impacts are beneficial impacts arising from flood risk reduction associated with both future coastal storm surge flooding and rainfall induced flooding. Since the long-term impacts are beneficial for minority and low-income populations, the provisions of Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations do not apply. However, provisions of this executive order do apply to the short-term construction impacts associated with the Project.

Short-term construction impacts that are relevant to the provisions of Executive Order 12898 for this project are related to the quality of life and include dust, noise, and disruption of vehicular and pedestrian traffic patterns during construction. As discussed in Section 4.8.2.1, many of the Study Area's minority, Hispanic, low-income, and persons over age 75 populations reside in the western side of the Demographic Analysis Area, which includes Census Tracts 184, 190 (which includes the Hoboken Housing Authority's Andrew Jackson Gardens community), and 191. The DSD infrastructure would be concentrated in this portion of the Study Area. By contrast, the Resist infrastructure would be constructed in portions of the Study Area where minority and low-income populations are generally not found. Therefore, to determine whether construction impacts are disproportionate on minority and low-income populations, the scope of construction between DSD and Resist must be compared. To undertake this comparison, an assumption has been made that the nature of construction equipment and activities would be similar for Resist and DSD construction. This is generally a true statement, except that Resist construction would involve pile driving, which is not the case for DSD construction activities. Due to the noise and vibration impacts associated with pile driving, construction impacts for Resist infrastructure is greater than for DSD-related construction. Under Alternative 1, the period of Resist infrastructure construction is expected to last 3.5 years. By comparison, the total duration of DSD infrastructure construction is estimated to last 2.5 years, assuming full funding. Based on this comparison, construction impacts from Resist would be greater in duration and magnitude than construction impacts from DSD and the Project would not result in a disproportionately high and adverse human health or environmental impact on minority populations in the Study Area.

Beneficial, long-term impacts to minority and low-income populations are expected as a result of Alternative 1. Enhancements to 12.91 acres of open space or parks are proposed at 10 different locations, including along the waterfront, as well as in the western side of the Demographic Analysis Area at Block 10, the NJ TRANSIT site, and the BASF property. These enhanced open spaces would increase the parkland per capita and decrease the walking distance for many minority and low-income populations who would now live in close proximity to the enhanced parks.

Minority and low-income populations are expected to see a reduction in federal flood insurance rates over the long term. In addition, emergency service response times and ability to remain open would improve due to the protection of critical facilities.

Public health benefits expected for minority and low-income populations would include a reduction in infectious disease, injuries, and death; a reduction

in exposure to microbial pathogens from combined sewer overflow (CSO) situations; decreased mold growth and associated aggravation of respiratory conditions and lung infections; and a reduction in flood-induced mental health issues including stress, depression, anxiety disorders, and sleeplessness.

Beneficial, long-term impacts due to reduced rainfall flooding (through construction of the DSD features) are expected for 3,400 persons characterized as minority, 2,720 Hispanic persons, 370 persons over age 75, and 1,330 households in poverty. Beneficial, long-term impacts due to reduced coastal storm surge flooding (through construction of the Resist features) are expected for 7,970 persons characterized as minority, 6,520 Hispanic persons, 1,340 persons over age 75, and 2,400 households in poverty.

Alternative 2

Beneficial long-term impacts on minority and low-income populations under Alternative 2 are the same as under Alternative 1, except that beneficial, long-term impacts due to reduced coastal storm surge flooding would be slightly less due to the location of the Resist barrier. Beneficial, long-term impacts are expected for 7,280 persons characterized as minority, 6,200 Hispanic persons, 1,280 persons over age 75, and 1,990 households in poverty through a reduction in coastal flooding. Enhancements to 9.53 acres of open space or parks are proposed at six different locations, including along the waterfront, as well as in the western side of the Demographic Analysis Area at Block 10, the NJ TRANSIT site, and the BASF property. These enhanced open spaces would increase the parkland per capita and decrease the walking distance for many minority and low-income populations who would now live in close proximity to the enhanced parks. Provisions exist in all three municipalities for affordable housing and the project is not anticipated to change the current mix of housing.

Alternative 3

Beneficial long-term impacts of Alternative 3 on minority and low-income populations would be the same as under Alternative 2, except that enhancements to 8.55 acres of open space or parks are proposed at seven different locations, including along the waterfront, as well as in the western side of the Demographic Analysis Area at Block 10, the NJ TRANSIT site, and the BASF property. These enhanced open spaces would increase the parkland per capita and decrease the walking distance for many minority and low-income populations who would now live in close proximity to the enhanced parks. Provisions exist in all three municipalities for affordable housing and the project is not anticipated to change the current mix of housing.

No Action Alternative

Impacts to minority and low-income populations would remain unchanged under the No Action Alternative. There would be no potential short-term construction impacts , no beneficial short term construction employment opportunities (see discussion of Section 3 hiring within Section 4.8.3.5) and no beneficial long-term impacts due to flood risk reduction. Minority and low-income populations would remain at high risk of impact during both coastal storm surge and rainfall flooding events. The risk of coastal storm surge flooding is expected to increase with rising sea levels over time.

4.8.3.7.1 *Mitigation Measures and BMPS Included in Alternatives 1, 2, and 3*

Mitigation measures for both Resist and DSD portions of the project would be as follows:

- Construction managers would work with representatives of minority and low-income communities to ensure that construction activities would have the least possible impact on pedestrian and vehicle traffic patterns and that construction noise and dust associated with construction are reduced to the extent practicable.
- As described in Section 4.8.3.5, the project will be required to comply with HUD Section 3, and must to the greatest extent possible provide job training, employment, and contract opportunities for low- or very-low income residents in connection with projects and activities in their neighborhoods. The project will be required to document all actions taken to comply with the requirements of Section 3 and submit a Section 3 Annual Summary Report (Form HUD-60002) for all covered funding to the Office of Fair Housing and Equal Opportunity. The project is also required to comply with NJDCA Section 3 requirements, including submitting Quarterly Section 3 reports throughout the entire project, pursuant to NJDCA Policy 2.10.22 Section VIII. NJDCA's Section 3 policy can be found on their website at http://www.nj.gov/dca/divisions/sandyrecovery/links/DCA_Section_3_Policy_November_2014_amendment.pdf.

4.8.3.8 Impacts to Access to Public Transit

The location of the resist flood barriers and gates are, for the most part, relatively adjacent to buildings and streets. These areas are principally sidewalks and the edges of streets. The construction of these barriers and gates would result in inconvenience for residents and business owners with regard to pedestrian and vehicular access. The intervening streets, which are the cause and need for gates, break up the construction work into segments which may serve to contain the effort and localize the effects of closures and accessibility to mass transit.

During construction of a resist structure within a sidewalk area, one or more lanes occupied by traffic would likely have to be closed off, and for the duration of construction, all adjacent parking, sidewalks, and bicycle lanes would also have to be closed off.

Impacts to traffic and circulation, including impacts to the Study Area's mass transit systems, are described in detail in Section 4.9. Impacts to the accessibility of public transit is summarized below.

Alternative 1

Alternative 1 would have short-term, moderate adverse impacts to accessibility to mass transit

within the Study Area during construction of project components. Closure of sidewalks and streets would require detours for pedestrians and vehicles to and from transit stops. During operational conditions (leading up to a coastal storm surge event), gates associated with the Resist features would need to be closed. Under Alternative 1, there are more gates than any other alternative (29 gates in Option 1 and 31 gates in Option 2) and the length of the Resist barrier is longer than under any other alternative; although in northern Hoboken and Weehawken, the majority of these gates are located along the waterfront. The closure of gates would impact accessibility to transit stops and could impact bus routes. The closure of gates along Observer Highway (at Hudson Street for Option 1 and at Washington Street for Option 2) would impact accessibility for those individuals who access Hoboken Terminal from Observer Highway. Under a gate closure condition, these individuals would still be able to access Hoboken Terminal, but it would require walking one block to the north, to Newark Street, before proceeding south along Hudson Street to Hudson Place. Detours and evacuation routes will be identified as part of the project's O&M plan, in coordination with transit providers, and routes would be clearly marked in the event of a storm.

At the time of gate closures, transit facilities would be operating under emergency conditions and would be either shut down or in the process of shutting down service. In accordance with the NJ TRANSIT emergency operation plans, HBLR and heavy rail cease operations between 12 and 18 hours prior to a storm in order to locate vehicles in areas that are safe from flooding. Direct accessibility to transit facilities would be impacted by the project when gates are deployed but the actual impact of the project on mass transit is considered negligible because these facilities would not be operational at that time.

Alternative 2

Alternative 2 would have short term, moderate adverse impacts to accessibility to mass transit within the Study Area during construction of project components. Closure of sidewalks and streets would require detours for pedestrians and vehicles to and from transit stops. During operational conditions (leading up to a coastal storm surge event), gates associated with the Resist structure would need to be closed. Under Alternative 2, there are 21 gates in Option 1 and 25 gates in Option 2) and the length of the Resist barrier is substantially shorter than under Alternative 1. The closure of gates would impact accessibility to transit stops and bus routes. The gate crossings over the HBLR line at Lincoln Harbor would also impact access to the HBLR station from the street. The closure of gates along Observer Highway (at Hudson Street for Option 1 and at Washington Street for Option 2) would impact accessibility for those individuals who access Hoboken Terminal from Observer Highway. Under a gate closure condition, these individuals would still be able to access Hoboken Terminal, but would require walking one block to the north, to Newark Street, before proceeding south along Hudson Street to Hudson Place. Detours and evacuation routes will be identified as part of the project's O&M plan, in coordination with transit providers, and routes would be clearly marked in the event of a storm.

At the time of gate closures, transit facilities would be operating under emergency conditions and would be either shut down or in the process of shutting down service. In accordance with the NJ TRANSIT emergency operation plans, HBLR and heavy rail cease operations between 12 and 18 hours prior to a storm in order to locate vehicles in areas that are safe from flooding. Direct accessibility to transit facilities would be impacted by the project when gates are deployed but the actual impact of the project on mass transit is considered negligible because these facilities would not be operational at that time.

Alternative 3

Alternative 3 would have short term, moderate adverse impacts to accessibility to mass transit within the Study Area. Alternative 3 has the least number of gates of any alternative (19 gates in Option 1 and 23 gates in Option 2) and the length of the resist barrier is shortest among all alternatives. The closure of gates would impact accessibility to transit stops and bus routes. The gate crossings over the HBLR line at Lincoln Harbor would also impact access to the HBLR station from the street. The closure of gates along Observer Highway (at Hudson Street for Option 1 and at Washington Street for Option 2) would impact accessibility for those individuals who would try to access Hoboken Terminal from Observer Highway. Under a gate closure condition, these individuals would still be able to access Hoboken Terminal, but would require walking one block to the north, to Newark Street, before proceeding south along Hudson Street to Hudson Place. Detours and evacuation routes will be identified as part of the project's O&M plan, in coordination with transit providers, and routes would be clearly marked in the event of a storm.

At the time of gate closures, transit facilities would be operating under emergency conditions and would be either shut down or in the process of shutting down service. In accordance with the NJ TRANSIT emergency operation plans, HBLR and heavy rail cease operations between 12 and 18 hours prior to a storm in order to locate vehicles in areas that are safe from flooding. Direct accessibility to transit facilities would be impacted by the project when gates are deployed but the actual impact of the project on mass transit is considered negligible because these facilities would not be operational at that time.

No Action Alternative

Under the No Action Alternative, there would be no impacts to accessibility to mass transit during most conditions. However, in the event of a coastal storm surge or severe rainfall flood event, accessibility to transit stations would be impacted by flood waters on streets, sidewalks and on railway tracks. In particular, during coastal surge flooding, transit systems would need to cease operations prior to flooding to ensure

that equipment and personnel are safely away from flood waters.

4.8.3.8.1 *Mitigation Measures and BMPs included in Alternatives 1, 2 and 3*

Mitigation measures would be as follows for the Resist portion of the project. The DSD portion of the project is not anticipated to impact transit accessibility; therefore, no mitigation measures or BMPs are proposed for that aspect of the project.

- Traffic closures for gate installation would be minimized and performed during off-peak hours to the greatest extent practicable.
- All closures for traffic and pedestrians, including temporary detour routes, would be coordinated well in advance with local jurisdictions. The O&M Plan will require that alternate routes be clearly marked.
- Gate testing and maintenance activities following installation would be performed during non-peak traffic hours to the extent practicable and would be coordinated with transit providers to reduce disruption to transit systems.
- Gate closures due to storm surges (during emergency events) would be coordinated with transit systems and the local community to ensure that individuals are informed of when transit systems would cease operations. The details regarding the timing of gate closures for emergency conditions will be closely coordinated with local transit providers as part of the O&M plan.

4.8.3.9 Impacts on Children's Health and Safety

The pathways for potential risk to children's health and safety include air pollution, exposure to hazardous soils and groundwater, noise, and safety at construction sites.

Contaminated soils and groundwater are anticipated to be encountered during excavation under all alternatives. Best management practices including: development of a Health and Safety Plan, development of a Material Management Plan, covering of all excavated soils, off-site transport of contaminated groundwater, etc. would be implemented. Based on the comprehensive suite of BMPs to be implemented, potential risks of exposure to hazardous soils and groundwater for all demographic groups would be minimized. Removal of contaminated soils excavated under the project would reduce long-term potential for exposure to hazardous soils under all alternatives for children and other demographic groups. For further discussion of contaminated soils and groundwater impacts see Section 4.7.3.

In addition, construction sites are a potentially attractive nuisance for children. A public safety plan, to be developed in coordination with the local jurisdictions, would provide for safety of the public, including children, during construction activities.

Following is a detailed discussion by alternative of impacts to children's health and safety.

Alternative 1

No noise impacts are predicted for schools or recreational areas as a result of operational noise associated with the pump stations. Three academic buildings associated with Stevens Institute of Technology (McClean Hall, Edwin A. Stevens Hall and Babbio Center) were estimated to possess interior noise levels above the FHWA NAC of 51 dBA (LAeq) ranging from one to three months during construction of the Resist structures. The Elysian Charter School is anticipated to possess interior noise levels above the FHWA NAC of 51 dBA (LAeq) for 11 months during construction. These school buildings possess alternative means of ventilation (i.e., air conditioning) therefore; windows can be closed during construction periods to eliminate the noise impact. In order to minimize noise impacts, construction schedules could include performing adjacent construction activities during periods of lower attendance. School building attenuation studies are recommended during final design to confirm building attenuation values utilized to determine interior school noise impact. Thirteen recreational areas within project limits are expected to possess exterior noise levels above the FHWA NAC of 66 dBA (LAeq) for a range of duration depending on the location (2 – 15 months).

As described, the noise mitigation (including closing school windows year round), will assist in minimizing fugitive dust exposure. Further, applicability analyses were performed and determined construction-related air emissions were below *de minimis* levels or minimum thresholds for individual air pollutants (see Section 4.6). In addition, mitigation measures will be included within contract documents intended to minimize noise impact and fugitive dust exposure for this sensitive population as well as the general public.

Temporary closure of Harborside Park will be required as the Resist feature is proposed to cross through it, and it is a part of what will become the new Cove Park. This park is used by local schools (including the Hoboken Montessori School) as recreational, outdoor space for children. Community outreach will continue during the next phase of the project (final design), to understand what the community needs are for the new park. The impact is limited to the yet undetermined construction time frame, but it will occur during the 3.5 years scheduled to complete the project. To mitigate this temporary loss of open space, NJDEP will coordinate with the City of Hoboken and community partners to identify other recreational spaces that can be utilized as recreational space or if temporary recreational space can be created for the community to use during this timeframe.

Construction activities would require use of heavy machinery; result in open excavations; stockpiling of materials and contaminated soils; and extensive construction traffic on streets in a highly urbanized area. These construction activities and conditions pose some level of safety risk to the public, including children. In order to ensure public safety, including safety of children, public access to these construction sites would be restricted through the use of fences,

barriers, and temporary walls. Construction personnel would direct traffic as required to ensure public safety during construction activities. A public safety plan, to be developed in coordination with the local jurisdictions, would provide for safety of the public, including children, during construction activities.

Alternative 2

No noise impacts are predicted for schools or recreational areas as a result of operational noise associated with the pump stations. The Elysian Charter School is anticipated to possess interior noise levels above the FHWA NAC of 51 dBA (LAeq) for 17 months during construction of Alternative 2 Resist structures. Since the Elysian Charter School is located within a building that possesses an alternative means of ventilation, windows may be closed year round and reduce the duration of noise impact to three months during construction of Alternative 2. In order to minimize noise impacts, construction schedules could include performing adjacent construction activities during periods of lower attendance. A school building attenuation study is recommended during final design to confirm the building attenuation value utilized to determine interior school noise impact. Four recreational areas within project limits are expected to possess exterior noise levels above the FHWA NAC of 66 dBA (LAeq) for a range of duration depending on the location (2 – 15 months).

As described, the noise mitigation (including closing school windows year round), will assist in minimizing fugitive dust exposure. Further, applicability analyses were performed and determined construction-related air emissions were below *de minimis* levels or minimum thresholds for individual air pollutants (see Section 4.6). In addition, mitigation measures will be included within contract documents intended to minimize noise impact and fugitive dust exposure for this sensitive population as well as the general public.

Other construction impacts (temporary impacts to Harborside Park and site safety considerations) would be similar to those described under Alternative 1.

Alternative 3

No noise impacts are predicted for schools or recreational areas as a result of operational noise associated with the pump stations. Interior noise levels within the Elysian Charter School and both locations of the Hoboken Montessori School (14th Street and Bloomfield Street) are anticipated to possess interior noise levels above the FHWA NAC of 51 dBA (LAeq) during construction of Alternative 3. The duration of noise impact for Elysian Charter School is estimated to be 18 months since it was assumed that all classroom windows will possess a direct line-of-sight to construction activities. The Elysian Charter School is located within a building that possesses alternative means of ventilation; therefore, windows may be closed during construction periods to reduce the duration of noise impact to four months for construction of Alternative 3. Both Hoboken Montessori Schools are located within buildings with inoperable windows, therefore the duration of noise impact is expected to be one month at the 14th Street location and less than one month at the Bloomfield Street location. In order to minimize noise impacts, construction schedules could include performing adjacent construction activities during periods of lower attendance. School building attenuation studies are recommended during final design to confirm building attenuation values utilized to determine interior school noise impact. Four recreational areas within project limits are expected to possess exterior noise levels above the FHWA NAC of 66 dBA (LAeq) for a range of duration depending on the location (2 – 13 months).

As described, the noise mitigation (including closing school windows year round), will assist in minimizing fugitive dust exposure. Further, applicability analyses were performed and determined construction-related air emissions were below *de minimis* levels or minimum thresholds for individual air pollutants (see Section 4.6). In addition, mitigation measures will be included within contract documents intended to minimize noise impact and fugitive dust exposure for this sensitive population as well as the general public. Other construction impacts (temporary impacts to Harborside Park and site safety considerations) would be similar to those described under Alternative 1.

No Action Alternative

Children's health and safety risks associated with flooding would remain unchanged from current conditions. Flooding events would contribute to infectious disease, injuries, and death; exposure to microbial pathogens from combined sewer overflow (CSO) situations; mold growth and associated aggravation of respiratory conditions and lung infections. The risk of health and safety flooding impacts on children and the elderly is greater than for other demographic groups. There would be no impact to children from construction noise at any school or recreation area. There would be no risk to children's safety at construction sites.

4.8.3.9.1 *Mitigation Measures and BMPs under Alternatives 1, 2 and 3*

The following mitigation measures would be undertaken to ensure children's health and safety for the Resist portion of the project:

- School building noise attenuation studies are recommended for the Elysian Charter School and both locations of the Hoboken Montessori School (14th Street and Bloomfield Street) during final design to confirm building attenuation values utilized to determine interior school noise impact.
- Noise mitigation, including closing school windows during construction, will assist in minimizing fugitive dust exposure. In addition, project-related air emissions have been estimated to fall below associated thresholds for these alternatives. Mitigation measures intended to minimize noise impact and fugitive dust exposure for this sensitive population as well as the general public will be included within construction contract documents .

The following mitigation measures would be

undertaken to ensure children's health and safety at construction sites for both Resist and DSD portions of the project:

- Secure sites adequately when finishing work for the day.
- Barrier off or cover over excavations and pits.
- Isolate and immobilize vehicles and where possible lock them in a compound.
- Store building materials (such as pipes, manhole rings, and cement bags) so that they cannot topple or roll over.
- Remove access ladders from excavations and scaffolds.
- Lock away hazardous substances

In addition, see BMPs for noise in Section 4.3.3.2