

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the existing conditions in and around the four study areas at the Jamaica Bay unit of Gateway (Floyd Bennett Field, Jacob Riis Park, Riis Landing, and the New NPS Sites at Pennsylvania and Fountain Avenues) that could potentially be impacted by the proposed action. It provides basic information about current conditions to be used as context for comparing the potential impacts of each alternative, which are presented in “Chapter 4: Environmental Consequences.” Relevant impact topics were selected based on agency and public concerns, regulatory and planning requirements, and known resource issues. They include natural and physical resources (soils and topography, vegetation, wildlife and wildlife habitat, water resources, floodplains, air quality, and noise); cultural resources (archeological resources, historic structures, and cultural landscapes); visual resources; transportation, site access, and circulation; visitor use and experience; and operations. Impact topics dismissed from further consideration are discussed in “Chapter 1: Purpose and Need.”

Regional Overview

Over the last three years, Gateway has received an average 8.5 million visitors annually, representing nearly every type of race, religion, ethnicity, and socioeconomic class. The park is spread out across the southern end of New York City and northern New Jersey, covering approximately 26,000 acres of land. The park consists of three administrative units that surround New York Harbor: the Sandy Hook unit, located in Monmouth County, New Jersey, is situated on the western side of the outer harbor; the Staten Island unit, which stretches between Raritan Bay and the Verrazano Narrows, is positioned at the northern end of the outer harbor; and the Jamaica Bay unit, located in the Brooklyn and Queens Boroughs, is on the eastern side of the outer harbor (Figure 2). The climate in this area, characterized by hot summers and severe winters, is intensified by the park’s proximity to the Atlantic Ocean.

The Jamaica Bay unit, which contains the four study areas, is located along the southeastern tip of Long Island and also includes the Bay, the Jamaica Bay Wildlife Refuge, Fort Tilden, Canarsie Pier, Breezy Point, Plumb Beach, and Bergen Beach. Jamaica Bay was initially formed by glacial activity but has since been filled, dredged, and impacted by human development. Despite these impacts, the NYSDEC has

designated Jamaica Bay as a Critical Environmental Area¹. The Bay is the only area in New York City to receive this designation. Also, the New York State Department of State (NYSDOS) has designated the Bay as a Significant Coastal Fish and Wildlife Habitat.

While the Jamaica Bay Wildlife Refuge, the only refuge located on NPS property, is one of the dominant sources of natural resources in the unit, the entire area represents a wide variety of physical, natural, and cultural resources. The remainder of the unit is characterized by maintained lawns with native and exotic species of shrubs and trees scattered throughout the heavily developed urban landscape. The wildlife that inhabits these areas consists of a variety of birds and small mammals that have adapted to the urban environment.

Study Area Overview

The four study areas included in this document -- Floyd Bennett Field, Jacob Riis Park, Riis Landing, and the New NPS Sites at Pennsylvania and Fountain Avenues -- are spread across the Jamaica Bay unit.

Floyd Bennett Field is located on a peninsula along the North Shore of Rockaway Inlet (Figure 4). The site is serviced by Flatbush Avenue, which connects to the Belt Parkway directly north of the Field and to the Marine Parkway (Gil Hodges Memorial) Bridge. The park straddles Flatbush Avenue, with residential and commercial developments isolated to the north of the Belt Parkway. The portion of the site that abuts Flatbush is separated from the road by a bike path and steel fence. Beyond the fence, the Ryan Visitor Center and several of the site's historic hangars abut the site boundary. Further into the site, the historic runways spread out across the site, providing access and recreational opportunities to its visitors. The southern end of the site houses the USMC property, as well as NPS offices and visitor services. The eastern edge of the site consists of the NYPD, the NYCDOS land assignments, and water access opportunities for visitors. Finally, the northern edge of the Field is home to the North Forty Natural Area. Along with the Grassland Management Areas, the North Forty represents the only natural area on the peninsula. Within the core of the Field, there are a number of areas that support a variety of active recreational opportunities, as well as the Grassland Management Areas, which provide habitat and chances for passive recreation.

Jacob Riis Park consists of over 200 acres of land located on the western side of the Rockaway Peninsula. It is bordered to the north by Rockaway Inlet and Jamaica Bay and to the south by the Atlantic Ocean. The Neponsit and Belle Harbor residential communities line its eastern border, while Fort Tilden and the Breezy Point neighborhood lie to the west (Figure 5). Jacob Riis Park includes a public beach and boardwalk that connect the park Bathhouse, the Mall, a golf course, and remaining open space. These facilities are used for both passive and active recreation. The site's most dominant feature, a 62-acre parking lot, is connected to the regional road network by a series of roads and ramps that date to the initial development of the recreational site in the 1930s.

Across the bridge, Fort Tilden and **Riis Landing** cover much of the western end of the Rockaway Peninsula. The peninsula has a history of military use but has more recently developed into a residential and commercial center that surrounds the NPS properties on the east and west (Figure 6). The site is bordered to the north by Rockaway Inlet and to the south by the Atlantic Ocean. The Fort Tilden/Riis

¹ A specific geographic area designated by a state or local agency having exceptional or unique environmental characteristics. 6 NYCRR § 617.2(i).

Landing area is comprised primarily of recreational fields and lawns, with a scattering of historic and non-historic buildings that serve visitor services, NPS operations, and staff housing. These buildings and fields are linked by the park's unique system of roads that date back to its military use. These facilities merge almost seamlessly into Jacob Riis Park, which sits to the east of Fort Tilden.

Finally, the **New NPS Sites at Pennsylvania and Fountain Avenues** (Figure 7) are located on the north shore of Jamaica Bay, between JFK Airport and Floyd Bennett Field. The site is bound by the Belt Parkway to the north and by water in all other directions. Despite their location along the Belt Parkway, the physical connections between the two sites and the surrounding area are limited, based on the history of landfill operations. These operations, and the current capping and landscaping activities, require a certain amount of safety and security. As such, there is a large steel fence that lines the boundary between the sites and the Belt Parkway. Upon completion of landscaping and planting activities, the sites will be handed over to the NPS and opened for passive recreation.

NATURAL AND PHYSICAL RESOURCES

Soils and Topography

Based on guidance from *NPS Management Policies 2001* (NPS 2000), Gateway and all other NPS units seek to protect soil conditions within their boundaries. This includes maintaining naturally occurring soils where possible and taking action to prevent erosion or contamination of these resources. *NPS Management Policies 2001* also directs parks to maintain and protect natural topographic features.

Because of the history of development in New York City and the Jamaica Bay area specifically, naturally existing soils have already been excavated, covered with fill material, compressed, or covered by impervious surfaces. Similarly, the topography of the region has been altered by development: cut and fill activities have created many new, man-made topographic features. The Natural Resource Conservation Service (NRCS) has classified all of the soils within the region, and they are described below along with the topographic conditions present at the four sites.

Floyd Bennett Field

Within the developed areas of the field, soils are comprised of the Bigapple-Fortress complex, the Bigapple-Verrazano-Pavement and Buildings Complex, Gravesend and Oldmill coarse sands, and Flatland-Fishkill sandy loams (NRCS 2004). Many of these soils are related to fill or development activities, and like the naturally occurring soils in the area, lack any manmade or natural debris. The lack of debris allows for easy cut, fill, or grading activities that are required for many construction projects, as any large amount of debris would either require significant work to remove or careful planning to avoid these disruptions. The lack of debris also contributes to the soils ability to absorb water.

The soils at Floyd Bennett Field have moderate to rapid permeability and a water table that is at least 18 inches below the surface. These conditions allowed for the construction of and continued use of the large amount of impervious surface that covers much of the site.

As mentioned above, the history of development within the region, along with its location in the coastal plane, has left the area relatively flat. This is especially true at Floyd Bennett Field where the land was

specifically manicured to support the airfield, which was made possible by the soil attributes described above. Most developed areas within Floyd Bennett Field have very little variability in their topography, ranging from 12.0 to 15.0 feet based the North American Vertical Datum of 1988 (NAVD 88)². The lowest elevations are found along the shoreline that surrounds the site. Elevations within the center of the site are higher than those along the shoreline, but have been flattened to support the airfield. Areas that have not been developed, like the North Forty, have not been flattened and achieve higher elevations, reaching 17.0 feet NAVD 88. The higher elevations continue northwards to the Belt Parkway and surrounding residential neighborhoods. Heading south, however, elevations remain constant and then begin to decrease as the peninsula gives way to the Rockaway Inlet.

Jacob Riis Park

There are two primary soil complexes within the boundaries of Jacob Riis Park. The Hooksan-Verrazano-Pavement and Buildings Complex covers the area around the bridge and extends along the southern end of the parking lot in front of the Bathhouse. The Bigapple-Verrazano-Pavement and Buildings Complex occurs along the northern edge of the Jacob Riis Park parking lot, bordering the Rockaway Inlet. Both soil complexes are similar to one another, and in some cases, they are also similar to the soils found at Floyd Bennett Field.

Although the history of development at the site has undoubtedly required some cut and fill activities, they are not at the scale of those required at Floyd Bennett Field. The undeveloped soils at Jacob Riis Park are naturally capable of supporting most types of development. The soils are free of most debris, making them easy to manage and prepare for construction activities. Like Floyd Bennett Field, these soils are also well drained, allowing for relatively easy development, long-term use of the land, and at the same time supporting certain types of vegetation. In fact, some of the soils in the Hooksan complex drain so rapidly they form sands and other marine sediments that line the shores of the peninsula.

Though the road network, buildings, cement boardwalk, and 62-acre parking lot represent a great deal of impervious space, there are areas where the land is left pervious. The grass fields that surround the parking lot, the roadway medians, the Mall area, and even the beach all represent areas that are large green spaces, relative to much of the urban environment. Based on the rapid drainage exhibited by the soils in the area, these spaces allow for the absorption of much of the stormwater that accumulates on the surrounding impervious surfaces.

Like many other coastal areas, Jacob Riis Park is a relatively flat piece of land located close to sea level. The lowest points, less than 7.5 feet NAVD 88, exist along the beach and a pocket extending from Jamaica Bay to the northwest corner of the Jacob Riis Park parking lot. The surrounding areas reach a maximum height of approximately 15.0 feet NAVD 88 along the roads northeast of the parking lot. The remainder of the site is characterized by relatively low, flat areas ranging from 7.0 to 11.0 feet NAVD 88.

Riis Landing

The Fort Tilden/Riis Landing area is dominated by two soil types: Hooksan-Verrazano-Pavement and Buildings Complex and the Hooksan-Dune Land complex. The Hooksan-Verrazano complex covers the

² Vertical control datum established in 1991 by the minimum-constraint adjustment of the Canadian-Mexican-U.S. leveling observations.

southern and western portions of the site, while the Hooksan-Dune Land complex covers much of the northern and eastern portions of the site. The Hooksan-Verrazano soils are similar to those described above and are able to support various types of vegetation along with physical development. The dune land complex, however, is excessively drained, creating sandy conditions that support different types of vegetation than the other soils. Similarly, these soils cannot support the same level of development but are capable of support structures commonly associated with beaches and waterfront developments. Although the site also possesses a relatively high percentage of impervious surface, its core is nearly all pervious.

Riis Landing and the surrounding Fort Tilden area have topography similar to the Jacob Riis Park site, but at lower elevations. The elevations range from approximately 3.0 to 8.0 feet NAVD 88, with the topography gently sloping towards the water.

New NPS Sites at Pennsylvania and Fountain Avenues

The soils within the former landfill sites are categorized as Greatkills-Freshkills complex. These soils are associated with fill activities that support development, and are very deep and well-drained, allowing them to absorb stormwater while still supporting vegetation. The soils along the entrances to the former landfill sites, which include the Belt Parkway, are categorized as the Bigapple-Verrazano-Pavement and Buildings Complex described above. Because the permeability of these soils is not as great in the upper layers, some ponding or runoff may occur during storm events. Currently, there are no impervious surfaces in the two sites. However, the administrative areas at both sites have been used to store heavy machinery and trailers for many decades. The weight and motion of these elements have compacted the soil to the point where it can almost be considered impervious.

The topography in and around the former landfill sites can be divided into three categories: undeveloped land, roadways, and the capped landfills. Those areas that border the local roadways and the undeveloped areas adjacent to the former landfill sites are considered undeveloped land. At the Pennsylvania Avenue site, these areas vary in topography, ranging from 3.0 to 19.0 feet NAVD 88. The local roadways are slightly elevated above the surrounding area, reaching maximum heights of 19.0 and 26.0 feet NAVD 88 at the foot of the Fresh Creek overpass and the Pennsylvania Avenue overpass, respectively. The Pennsylvania Avenue overpass leads to the administrative area of the former landfill site where elevations range from 14.0 to 19.0 feet NAVD 88.

The Fountain Avenue site is situated at a relatively lower elevation than the Pennsylvania Avenue site. The undeveloped area surrounding the site ranges from 0 to 18.0 feet NAVD 88. The Belt Parkway is situated between 8.0 and 13.0 feet NAVD 88, rising to elevations ranging between 13.0 and 30.0 feet NAVD 88 at the Fountain Avenue and Old Mill Creek overpasses. Within the administrative area of the former Fountain Avenue Landfill, elevations range from 0 to 18.0 feet NAVD 88. Deeper into the two sites, both capped landfills rise quickly in elevation, reaching elevations above 100 feet NAVD 88.

Vegetation

As is the case with soils and topography, *NPS Management Policies 2001* (NPS 2000) also addresses vegetation. The topic is discussed in terms of the benefit it brings to the natural or manmade landscape, its role as wildlife habitat, as well as its ability to naturally remove air and water pollutants. The NPS continually works to maintain naturally occurring vegetation within its boundaries and avoid the spread of exotic and/or invasive species.

The area included within the Jamaica Bay unit has undergone centuries of development, which has caused the loss of many naturally occurring species and the introduction of invasive species. Today the vegetation in the unit is maintained primarily in support of a park-like design and includes maintained lawns, shrubs, and trees surrounded by the highly developed, urban environment.

The vegetative species within the unit include five state-listed species. These species are all found in marshy habitats or along the edge of dunes where water is abundant. They include the threatened red pigweed (*Corydalis aurea*) and dune sandspur (*Cenchrus tribuloides*); as well as the endangered globe sedge (*Cyperus echinatus*), the narrow-leaf sea-blite (*Suaeda linearis*), and Roland's sea blite (*Suaeda rolandii*). Despite their presence within the unit, the habitats that support these species are all outside of the individual study areas, which are described below.

Floyd Bennett Field

Much of Floyd Bennett Field is dominated by impervious surfaces associated with the historic airport, as well as more modern-day structures; however, the NPS and its partners have worked hard to develop and sustain productive vegetative communities within this landscape. Approximately 420 acres of coastal scrub habitat is spread out across the southernmost and northernmost reaches of the landing strips, along the west side of Flatbush Avenue, and the North Forty. Japanese black pine (*Pinus Thunbergi*), black cherry (*Prunus serotina*), beach plum (*Prunus maritime*), salt spray rose (*Rosa rugosa*), cottonwood (*Populus* spp.), mulberry (*Morus* spp.), greenbriar (*Smilax* spp.), oriental bittersweet (*Celastrus orbiculatus*), and blackberry (*Rubus* spp.) dominate upland areas, while phragmites (*Phragmites australis*), willow (*Salix* spp.), viburnum (*Viburnum* spp.), greenbriar (*Smilax* spp.), cinnamon fern (*Osmunda cinnamomea*), and camphorweed (*Pulchea purpurascens*) dominate the wetland scrub areas.

Within the center of the site, the NPS maintains its Grassland Management Areas (Figure 25). The areas consist of approximately 120 acres of meadows that are bisected by the site's runways. Plants within the meadows include fescue grass (*Festuca* spp.), broom sedge (*Andropogon* spp.), blackberry, switchgrass (*Panicum virgatum*), and various other herbs such as dandelion (*Taraxacum officinale*). Remaining vegetation within the unit is confined to maintained lawns that surround the NPS offices along the southern end of the site, as well as along the border and median of Flatbush Avenue.

INSERT FIGURE 25

INSERT FIGURE 26

Jacob Riis Park

Based on the history of development along the Rockaway Peninsula, the vegetative communities at Jacob Riis Park have undergone periodic changes. These changes have come through physical development and selected planting schemes (Figure 27).

- **Coastal scrub/herbaceous complex** – The northernmost portion of the site adjacent to Rockaway Inlet contains a mixture of scrub and herbaceous vegetation. This vegetation is reflective of past disturbances from road installation and excessively drained soils. Dominant species include various beach grasses (*Ammophila breviligulata*, *Poa pretense*, *Andropogon* spp., *Panicum virgatum*), cocklebur (*Xanthium strumarium*), seaside goldenrod (*Solidago sempervirens*), sea rockets (*Cakile lanceolata*), mulberry, salt spray rose, black cherry, Japanese black pine, beach plum, autumn olive (*Eleagnus umbellata*), Princess tree (*Paulownia tomentosa*), and poplar (*Populus* spp.).
- **Maintained lawn (meadow)** – Large sections of Jacob Riis Park have been converted and maintained as lawns for general recreational use. These areas include the areas lining the roads on the eastern side of the Park, an approximate 14-acre chip-n-putt golf course in the center of the Park, and lawned areas surrounding buildings at the western side of the Park. Dominant species include fescue grass with weedy herbaceous plants that may include wild onion (*Allium canadensis*), chickweed (*Stellaria* spp.), and henbit (*Lamium amplexicaule*).
- **Coastal scrub** – The areas within Jacob Riis Park that have experienced the least disturbance are still capable of supporting a naturally occurring, coastal scrub habitat, which covers approximately 32 acres. The largest coastal scrub vegetative community (26.5 acres (1,154,340 sf)) is located immediately east of the parking lot, and a 10-acre area occurs immediately west of the chip-n-putt golf course. Dominant vegetation includes Japanese black pine, salt spray rose, poplar, coreopsis (*Coreopsis* spp.), beach plum, mulberry, Washington hawthorn (*Crataegus phaenopyrum*), European privet (*Ligustrum vulgare*), autumn olive, thorny olive (*Eleagnus pungens*), crabapple (*Malus* spp.), Chanticleer pear (*Pyrus calleryana*), honeysuckle (*Lonicera* spp.), Princess tree, and spreading euonymus (*Euonymus kiautschovicus*).

Throughout these habitats, select plantings were installed at various times for landscaping and design purposes. For example, the Japanese black pine was planted to frame the central lawn of the Mall, while Washington hawthorn, ligustrum (*Ligustrum* spp.), and salt spray rose were used to define the border of the Bathhouse area. These select plantings, along with the site's open lawns, create the park-like environment that, along with the beachfront, contributes to the popularity of the site.

Despite the careful plantings, the impacts of the urban environment coupled with disease and age have led to the loss of some of the trees and shrubs. One area where this is particularly evident is along the northern edge of the parking lot. Two species planted in the 1930s no longer exist today: the groundsel bush (*Baccharis halimifolia*) and sand cherry (*Prunus pumila*). Autumn olive, another introduced species, has adapted to survive in the urban environment dominant and spread into areas where it was not

originally planted. The NPS and its partners are working to replace these dead or dying species as funding becomes available.

Riis Landing

Fort Tilden/Riis Landing is comprised primarily of the same vegetation that exists at Jacob Riis Park. However, the Fort Tilden landscape includes more buildings and athletic fields than Jacob Riis Park. As such, more of the landscape is dominated by maintained lawns that, in many locations, abut the streets or sidewalks that bisect them. While this vegetation may not support the diverse habitat that others do, it greatly enhances the park-like setting that the NPS strives to maintain at Gateway. In this manner, the maintained vegetation at Fort Tilden/Riis Landing provides an equal or greater value to the urban environment than more diverse habitats (Figure 29).

New NPS Sites at Pennsylvania and Fountain Avenues

Vegetation at the New NPS Sites is limited due to the capping and landscaping activities. Species present today include those pioneering species that have the capacity to quickly occupy void areas such as broomsedge and goldenrod (*Solidago* spp.). In some locations, these species are continually disturbed by the construction process, while in other areas, including the waterfront portions of the site, these species are more thoroughly established. Upon completion of the capping and landscaping, the entire site will be planted with native grasses, shrubs, and potentially some small trees that are consistent with vegetation in the surrounding area and other parts of Jamaica Bay (Figure 31).

Wildlife and Wildlife Habitat

Wildlife and wildlife habitat are central to the NPS's efforts to maintain and protect natural resources within and outside of its boundaries. The protection of any natural resource directly relates to the protection of wildlife and wildlife habitat. *NPS Management Policies 2001* and several of the agency's Director's Orders are designed to provide habitat protection through the management of natural resources. The goal is not only to promote wildlife and wildlife habitat within a given park unit, but also to allow these species to naturally expand to the surrounding community in a health and safe manner.

Jamaica Bay's location within the urban environment makes this difficult. The park's sites sit as virtual islands within the busy city. While the bay provides some movement for species, much of the wildlife that resides in the Jamaica Bay unit is confined to the small pieces of viable habitat the park is able to maintain. A full listing of the animal species that exist within the Jamaica Bay unit are included in Appendix B of this document. Scientific names for all species can also be found in the Appendix.

Insert Figure 27

INSERT FIGURE 28

INSERT FIGURE 29

INSERT FIGURE 30

INSERT FIGURE 31

Floyd Bennett Field

Like many other active and inactive airports, Floyd Bennett Field has developed into a prime habitat for many birds. The Grassland Management Areas, the North Forty, and open waterfront attract a variety of migrating species. In the winter, these species include the red-tailed hawk, Coopers hawk, sharp-shinned hawk, American kestrel, and the northern harrier. During spring migrations, grasshopper sparrows, bobolinks, eastern meadowlarks, upland sandpipers, northern harriers, and American kestrels are regular visitors. Additionally, in autumn, thousands of tree swallows stop at the site to feed during their seasonal migration. These birds travel up and down the Atlantic seaboard during their migration and have grown accustomed to developed urban areas. Floyd Bennett Field represents a relatively undisturbed, open expanse for these birds to use.

Several small mammals, described in Appendix B also use the Field's grasslands, waterfront, and North Forty for feeding, breeding, and nesting. Because the site is surrounded by busy roads, urban development, and water, it is not easy for these small mammals to travel in and out of the Field. Therefore, the species that do exist at Floyd Bennett Field have adapted to the noises and other disturbances that exist on and around the site and have made the site their home.

Jacob Riis Park

Jacob Riis Park is a prime example of how Gateway offers a refuge for human and animal species. The park sits between two residential communities, allowing various species to seek shelter from the threats posed by vehicles, land development, and other related activities. Based on the variety of vegetative types described in the "Vegetation" section above, as well as the beach front areas, the park provides an attractive location for many species. The peninsula has one of the highest concentrations of beach nesting birds in the state, including the least tern, black skimmer, common tern, and the federally listed piping plover (these species and the others that inhabit the site are listed in Appendix B). Most of these species utilize the beachfront and are out of reach of the study area.

Along with providing permanent habitat, the site also offers a corridor that connects the western and eastern ends of the peninsula. The undeveloped nature of the corridor provides safe passage for many of the mammalian species that inhabit the region; such as the gray squirrel, the cottontail rabbit, and the raccoon (See Appendix B). Because the southern end of the site is relatively undeveloped, and possess many of the site's diverse habitats, species are able to travel with little to no interaction with vehicular traffic. Also, the easy access to the water prevents most of the area's wildlife from attempting to access the water along the Bay side of the Park, an effort that would involve crossing through the busiest pieces of the regional transportation network.

Riis Landing

Fort Tilden/Riis Landing provides similar habitats as Jacob Riis Park. However, the road network through the area is much more complex, bisecting many of the lawns and meadows. This requires many of the more mobile species; such as the cottontail rabbit, the raccoon, or the eastern chipmunk; to make more regular road crossings. However, based on the park-like environment and narrow roads, vehicle speeds do not reach the speeds they do in other areas and therefore do not pose a great threat to existing species. These roads, coupled with the overall developed nature of the Fort Tilden/Riis Landing area, is best suited

for species that have adapted to human activities, including the catbird, American robin, European starling, Norway rat, and house mouse. These species are able to isolate their activities to the small undisturbed areas within Fort Tilden/Riis Landing or are capable of moving through the busy environment to reach their desired location. Wildlife may also utilize the relatively undisturbed beach front environment, along Fort Tilden's southern border, for habitat or safe passage.

New NPS Sites at Pennsylvania and Fountain Avenues

Wildlife species that inhabit the former landfill sites consist primarily of birds that use the sites for feeding or roosting. Short-eared owls, northern harriers, rough-legged hawks, and barn owls all regularly hunt mice and other small animals listed in Appendix B. However, the recent construction activities have resulted in the temporary decline of many of these frequent visitors. Once landscaping activities cease and vegetation is established, these sites will serve as an important habitat along the highly developed north shore of the Bay. The habitat will most likely be home to a number of the small mammalian species that have been known to exist in the area. This should attract more birds and other predators to the site as a temporary resting and feeding ground, as well as a full-time home amidst the busy urban environment.

Water Resources

The protection of water resources is key to the NPS's mission of preserving natural resources. Water resources provide habitat, breeding grounds, and food sources for all species. *NPS Management Policies 2001* recognizes the connection between water quality and the health of the surrounding environment and directs all parks to preserve water quality and avoid further contamination.

Jamaica Bay is a prime example of how the loss of water quality can impact the surrounding environment, as decades of pollution have led to the loss of many species and habitats within the Bay and in the surrounding area. However, the presence of the NPS and its partners in the region, over recent years, has reversed this cycle and led to the gradual improvement in water quality. This improvement includes the control of pollutants reaching surface water bodies, as well as those being absorbed into ground water supplies. Regional surface water bodies are display on Figures 1 and 2, and again on Figures 25, 27, 29, 31. Conditions at the four study areas are described in greater detail below.

Floyd Bennett Field

Floyd Bennett Field is located on a peninsula on the northern shore of Rockaway Inlet. The Bay borders the Field's eastern shore. To the north, Mill Basin flows in a northwesterly direction, forking into two separate channels just after it passes under the Belt Parkway. To the south of Floyd Bennett Field, Rockaway Inlet connects the Bay to the Atlantic Ocean, and Dead Horse Bay abuts the site's marina to the west. These smaller bays and tributaries face the same water quality challenges that affect the rest of the region.

There are no water resources within the main part of the Field, though some do exist within the North Forty. Due to the highly developed nature of the site, there is very little natural stormwater management on site. The Grassland Management Areas create some natural buffering to absorb stormwater runoff. The runoff contains pollutants associated with the motor vehicles that travel on the runways, as well as other

pollutants described under the “Air Quality” section of this chapter. Those pollutants that are not accumulated by the natural buffers continue to be washed across the paved site. Because much of the shoreline along the bayside is paved, stormwater in the vicinity of the Bay can easily be washed into the Bay, depositing the pollutants it was carrying.

The developed nature of the site also prevents water from being absorbed into groundwater tables. These water tables do exist within the Grassland Management Areas and in the North Forty. Those found within the grassland areas are subjected to greater pollutant loads than those in the North Forty, which do not come in contact with motor vehicles.

Jacob Riis Park

Jacob Riis Park is bordered to the north by Rockaway Inlet and Jamaica Bay and to the south by the Atlantic Ocean. There are no streams or other surface waters that run through the site, although there are a series of manmade drainages that run under the site. On the oceanside, water quality is influenced by natural beach erosion. The dunes and beach create a large enough buffer to capture stormwater pollutants before they can reach the water.

The Bay side of the Jacob Riis Park does not have the natural buffer that the southern side does: the waterline is defined by a sheer wall that protects the bank from erosion. Along the road, a ledge and railing line the edge of the wall. The ledge is high enough to contain all but the largest rain events. Therefore, stormwater that collects on Beach Channel Drive and the surrounding roads is absorbed by adjacent vegetation or storm drains and does not flow into Rockaway Inlet or Jamaica Bay.

As was the case at Floyd Bennett Field, the highly developed nature of the site often prevents the absorption of water into groundwater tables. Also, the sandy soil types that exist within the site allow water to pass through the ground and quickly return to the Bay or ocean.

Riis Landing

Like Jacob Riis Park, Fort Tilden/Riis Landing is bound to the north by Rockaway Inlet and the Atlantic Ocean to the south. The study area has no other water resources within its boundaries. Along the southern border, the dunes and beach continue to provide a natural buffer against stormwater runoff. Therefore, stormwater running towards the ocean is absorbed by the sand, vegetation, or storm drains.

The waterline along Rockaway Inlet, however, has a variety of different developments. Within the Fort Tilden area, Riis Landing represents the only NPS land that borders Rockaway Inlet. The Landing is a highly developed area with a limited amount of natural buffering. Because there are no storm drains within the developed portion of the site, stormwater accumulates on the pavement and either forms puddles that eventually evaporate or run off onto the surrounding undeveloped land. The runoff may be absorbed by the narrow beach or limited vegetation, but it can be assumed that during major storm events, runoff enters Rockaway Inlet, contributing to the regional stormwater runoff pollutant load.

Based on its similarity and proximity to Jacob Riis Park, the highly developed nature of the site often prevents the absorption of water into groundwater tables. Also, the sandy soil types that exist within the site allow water to pass through the ground and quickly return to the Bay or ocean.

New NPS Sites at Pennsylvania and Fountain Avenues

The former landfill sites are surrounded by water on the east and west and are bisected by Hendrix Creek. To the east, Old Mill Creek connects Jamaica Bay to the Spring Creek system, which is a series of three creeks that flow through the Brooklyn and Queens Boroughs. To the west, Fresh Creek Basin flows into Jamaica Bay. Along with various pollution sources that are common throughout the Bay, the area surrounding these sites has been plagued by its history as a landfill operation. Surface and groundwater sampling found these pollutants were isolated in the area immediately surrounding the two sites and did not spread through the rest of the watershed. These pollutants and the remediation efforts taken to correct them are more thoroughly addressed in two individual RODs (NYSDEC 1995) and their related documents.

As efforts to remediate these pollutants continue, the site is being capped and landscaped. This process involves exposed soils and piles of fill. Under uncontrolled conditions, these soils could easily be carried into the surrounding water bodies by wind or rain. However, the construction process has included appropriate erosion and sediment control measures to capture any runoff. As the capping and landscaping process concludes, plantings will help secure the soils and provide natural erosion control.

Within the administrative areas of the two sites, the compacted soils prevent water from entering groundwater tables. Similarly, the new landfill cap covering the rest of the site keeps water in the uppermost layers of the soil.

Floodplains

Floodplains are fluvial lands adjacent to freshwater streams and rivers that receive floodwaters once the water has overtopped the bank of the main channel. This is typically the result of a higher than normal influx of upstream water supplies (water moving from higher elevations to lower elevations). Floodplains are important resources in the storage and filtering of these floodwaters. Executive Order 11988, “Floodplain Management” and NPS DO# 77-2, “Floodplain Management” and its procedural manual provide the NPS with requirements for protecting these resources. These requirements include restricting the type and amount of physical development that may occur within the floodplain. Physical development that reduces the plain’s ability to absorb floodwaters could have a detrimental effect on the surrounding area.

Based on its proximity to Jamaica Bay and the Atlantic Ocean, much of the Jamaica Bay unit falls within the 100- or 500-year floodplain³. Prior to the NPS presence in the area, a great deal of development had already occurred within the floodplain. Much of the development that occurred has been maintained to support recreational and educational opportunities, as well as other NPS infrastructure needs.

³ A 100-year floodplain is the elevation along the water that has a 1 in 100 chance of experiencing a specific-sized flood in a given year, or a flood that will occur once every 100 years. A 500-year floodplain is similar, only the chance of a specific sized flood occurring is 1 in 500, or once every 500 years.

Floyd Bennett Field

Floyd Bennett Field is situated such that most of the site is above both the 100- and 500-year floodplains. The Federal Emergency Management Agency (FEMA) has defined the 100-year floodplain in and around the study area to be approximately 8.0 feet NAVD 88, and the 500-year floodplain rises to an elevation of 11.0 feet NAVD 88. These elevations are isolated to the edges of the site, covering most of the marina, USMC property, portions of the far eastern edge of the site, and the west side of Flatbush Avenue (Figure 25).

Jacob Riis Park

Almost the entire southern portion of the Rockaway Peninsula is situated within the 500-year floodplain, which FEMA has defined as being approximately 11.0 feet NAVD 88. This includes the Bathhouse, the boardwalk, and other associated structures. It also includes the parking lot and surrounding road network.

The 100-year floodplain has been defined as being approximately 7.5 feet NAVD 88. The 100-year floodplain abuts the shoreline on the Atlantic Ocean side of Jacob Riis Park. On the Jamaica Bay side, the 100-year floodplain extends over Beach Channel Drive into the center of the northern third of the parking lot. The floodplain also covers much of the lawn and roads east of the Park (Figure 27).

Riis Landing

Based on its location and proximity to Jacob Riis Park, the Fort Tilden/Riis Landing area shares the same floodplain elevations as Jacob Riis Park. Almost all of Fort Tilden and Riis Landing are located within the 500-year floodplain. This includes the road networks, athletic fields, buildings, and associated structures. The 100-year floodplain is confined the northern most portion of the area. It includes much of the area west of Jacob Riis Park, as well as portions of Riis Landing and all of Station Rockaway and the boat basin (Figure 29).

New NPS Sites at Pennsylvania and Fountain Avenues

Because of manmade modifications, the former landfill sites reach some of the highest elevations in the region. Varying topography in and around the two landfill sites has created conditions in which the floodplain elevations differ between the Pennsylvania Avenue site and the Fountain Avenue site. At the Pennsylvania site, the FEMA has identified the 100-year floodplain elevation to be approximately 7.5 feet NAVD 88 and the 500-year floodplain to be approximately 11.0 feet NAVD 88. Based on the elevations of the Pennsylvania Avenue site, only the site's shoreline falls within either the 100- or 500-year floodplain (Figure 31). Therefore, during flood events, the shoreline could experience high rates of erosion.

At the Fountain Avenue site, the 100-year floodplain elevation is approximately 7.0 feet NAVD 88, and the 500-year floodplain is an estimated 10.0 feet NAVD 88. Within the site, only the area south of the Belt Parkway is situated within the 500-year floodplain. This includes the northern portion of the administrative area and the current access road to the site (Figure 31). The access road is paved, with cracks and loose pavement. The administrative area is unpaved and unvegetated and contains construction equipment and trailers that support the capping activities.

Air Quality

In response to numerous federal mandates, including the Clean Air Act (42 USC 7401-7661), *NPS Management Policies 2001* (NPS 2000) directs all NPS units to work to protect and preserve air quality in and around its boundaries for the protection of natural and cultural resources, as well as for the safety, health, and enjoyment of its visitors. The EPA defines ambient air as “the portion of the atmosphere, external to buildings, to which the general public has access.” The EPA has developed National Ambient Air Quality Standards (NAAQS) to protect public health and has developed standards for six criteria pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), ozone, particulate matter (to include particles with a diameter less than or equal to 10 and 2.5 micrometers (PM₁₀) and (PM_{2.5}), lead (Pb), and sulfur dioxide (SO₂)⁴. The state of New York has adopted the same standards as those prescribed by the EPA.

Because air quality is something that is shared over a wide area and not confined to an individual study area, the subject is discussed below as it relates to the entire Jamaica Bay unit and the proposed transportation improvements.

Jamaica Bay Unit

The Jamaica Bay unit’s location within the New York City/New Jersey metropolitan area has led to many of the park sites being impaired by the pollutants that have accumulated over centuries of intense development. The predominant sources of air pollution within the study area are emissions from motor vehicles, which include CO, a product of incomplete combustion that originates primarily from mobile sources; NO_x, a product of high temperature combustion; PM₁₀, produced by engines, paved and unpaved roads, and a variety of other activities; and volatile organic compounds (VOCs), evaporative emissions typically occurring from unburned fuel. VOCs and NO_x are important pollutants because of their role in forming ozone, also referred to as photochemical smog.

The NYSDEC maintains an air quality monitoring system that includes the Jamaica Bay unit. The most recent monitoring data indicates that the pollution levels for CO, NO_x, and PM₁₀ are below the NAAQS. The ozone concentrations exceed the NAAQS for both the 1-hour and 8-hour averaging period. The PM_{2.5} concentration for the 24-hour averaging period meets the NAAQS, but the annual concentrations continue to violate the standard. Table 2 presents monitoring data collected from 2001 to 2003.

Table 2: Ambient Air Quality Monitoring Data

Pollutant	Averaging Period	Monitoring Station		NAAQS
		Location	Concentrations	
CO	8-hour	Queens College 2	2.5 ppm	9 ppm
	1-hour	Queens College 2	3.2 ppm	35 ppm
NO _x	Annual	Queens College 2	0.027 ppm	0.053 ppm
Ozone	8-hour	Queens College 2	0.086 ppm	0.08 ppm
	1-hour	Queens College 2	0.116 ppm	0.12 ppm
PM ₁₀	Annual	JHS 126	20 µ g/m ³	50 µ g/m ³
	24-hour	JHS 126	50 µ g/m ³	150 µ g/m ³
PM _{2.5}	Annual	PS 314	16.3 µ g/m ³	15 µ g/m ³
	24-hour	PS 314	36.5 µ g/m ³	65 µ g/m ³

µ g/m³ = micrograms per cubic meter

ppm = parts per million

⁴ Pb and SO₂ are mentioned in the text because EPA has set criteria for them. However, they are not transportation-related pollutants and are typically not of concern when looking at transportation projects.

Under the Clean Air Act, New York has designated the Jamaica Bay unit as a Class II airshed. This designation implies that air quality is protected by allowing limited increases over baseline concentrations for NO_x, SO₂, and PM. These conditions are characteristic of the EPA's New York-New Jersey-Connecticut Air Quality Control Region, which Jamaica Bay is a part of. Table 3 summarizes the air quality attainment status for the six criteria pollutants. Those pollutants that meet the NAAQS have reached "attainment" status. Those pollutants that are still above the levels allowed by the NAAQS are still in "Non-attainment". And those pollutants that were in non-attainment, but have been improved to meet attainment standards are listed as "maintenance areas," and will be reclassified as attainment as soon as a maintenance plan for maintaining these levels is approved by the EPA. The "moderate" classification for non-attainment areas implies that that pollutant is well over the NAAQS criteria, but has not reached a critical level yet.

Table 3: Study Area Attainment Status

Pollutant	Averaging Period	Attainment Status	Classification
CO	8-hour	Maintenance Area	NA
NO _x	Annual	Attainment	NA
Ozone	1- and 8-hour	Non-attainment	Moderate
PM ₁₀	Annual/24 hours	Attainment	NA
PM _{2.5}	Annual/24 hours	Non-attainment	NA
Pb	Quarterly	Attainment	NA
SO ₂	Annual/24 and 3 hours	Attainment	NA

NA = Not Applicable

Noise

NPS Management Policies 2001 (NPS 2000) and Director's Order #47, *Sound Preservation and Noise Management* address the topic of soundscapes. Soundscapes are a combination of all of the natural sounds that exist within and around a park, and often contribute to the natural setting and tranquil environment that they promote. Therefore, the NPS seeks to avoid introducing new sounds to a park that could detract from its natural setting.

At the Jamaica Bay unit, maintaining an undisturbed, natural soundscape is impossible due to the park's close proximity to JFK Airport, the Belt Parkway, and other highly developed areas. Instead, efforts are focused around minimizing the intrusion of the city noise on the park environment. These efforts are common for all FHWA projects, and are described in 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. Existing noise levels for the four study areas are discussed below and a methodology for this analysis is attached in Appendix B. Analysis included a general measure of existing sound levels, taken at 50 feet from the centerline of the roadway in question, as well as the distance to impact. For transportation studies, any noise level over 66 A-weighted sound levels in decibels (dBA) is considered to be an impact. Therefore, anything that falls within the distance to impact, is receiving noises from the nearby road(s). Tables 4 and 5, which follow the study area discussions, provide a summary of the existing sound levels at 50 feet and the distance to impact, respectively.

Floyd Bennett Field

Floyd Bennett Field is located in an area that is relatively isolated, and its size also creates zones with different noise characteristics. Along the hangar row, the site borders Flatbush Avenue, which provides a connection between the Belt Parkway and the Jacob Riis Park area. In other parts of the Field, the NYCDOS conducts driver training and has trucks passing through the site; the NYPD uses a portion of the Field for high-speed driving training and helicopter exercises; there is an annual landing of historic airplanes at the site; and there are overhead flights to and from JFK Airport. The portion of the Field located along the waterline may experience additional noise from boats. Large tugboats or other freight boats use the inlet year-round, and they create minimal noise disturbance. Smaller, personal boats with outboard motors may also use the area, but are more likely to be present in the spring and summer months. The existing sound levels in this area at 50 feet from Flatbush Avenue are approximately 66 dBA, which also represents the distance to impact.

Jacob Riis Park

Access to Jacob Riis Park is provided by Beach Channel Drive eastbound and Rockaway Beach Boulevard westbound. The Jacob Riis Park site is located furthest from JFK Airport. The existing sound levels in this area at 50 feet from the surrounding roadways range from 59 dBA at Rockaway Beach Boulevard to 66 dBA at Beach Channel Drive (north of Jacob Riis Beach). The distance to impact (66 dBA) ranged from less than 30 feet to within 50 feet of the nearby roadway centerline.

Riis Landing

Riis Landing is currently used for fishing and occasional, seasonal ferry excursions and ecological tours of Jamaica Bay. The study area is situated along the water, isolated from the surrounding roadways and other developments; however, the site is still subject to airplane and general urban noises. It may also be subject to boat noise passing through the Rockaway Inlet, as described above for Floyd Bennett Field. The existing sound levels in this area at 50 feet from the surrounding roadways ranged from 60 dBA at Rockaway Point Boulevard to 66 dBA at Beach Channel Drive (north of Jacob Riis Beach). The distance to impact (66 dBA) ranged from less than 30 feet to within 50 feet of the nearby roadway centerline. The surrounding area in Fort Tilden exhibits similar conditions to those identified at Jacob Riis Park.

New NPS Sites at Pennsylvania and Fountain Avenues

The former landfill sites are located at the southern end of Pennsylvania and Fountain Avenues, with the Belt Parkway extending along the northern boundary of both sites. The Pennsylvania Avenue site is accessible from the Belt Parkway and from Pennsylvania Avenue, and the former Fountain Avenue site is accessible via an access road extending from Fountain Avenue. The landfill sites are the closest point within the study area to JFK Airport, approximately 1 mile west of the airport boundary. The existing sound level in this area at 50 feet from the Belt Parkway is approximately 81 dBA. The distance to impact (66 dBA), as detailed in Table 5, is approximately 900 feet from the centerline of the Belt Parkway.

Table 4: Existing Sound Levels at 50 Feet

Site/Segment	Existing (2005) Sound Levels (dBA)
Floyd Bennett Field	
Flatbush Avenue	66
Jacob Riis Park	
Rockaway Beach Boulevard	59
Connector - (West of Jacob Riis Beach Parking Lot)	61
Beach Channel Drive (Rockaway)	64
Beach Channel Drive (north of Jacob Riis Park)	66
Riis Landing	
Rockaway Point Boulevard (State Road)	60
Beach Channel Drive (north of Jacob Riis Park)	66
New NPS Sites	
Belt Parkway (Queens County Line to Rockaway Parkway)	81

Table 5: Distances from Edge of Highway to Sound Level Impacts

Site/Segment	Distance (feet)
Floyd Bennett Field	
Flatbush Avenue	50
Jacob Riis Park	
Rockaway Beach Boulevard	Less than 30
Connector - (West of Jacob Riis Beach Parking Lot)	Less than 30
Beach Channel Drive (Rockaway)	35
Beach Channel Drive (north of Riis Beach)	50
Riis Landing	
Rockaway Point Boulevard (State Road)	Less than 30
Beach Channel Drive (north of Riis Beach)	50
New NPS Sites	
Belt Parkway (Queens County Line to Rockaway Parkway)	900

CULTURAL RESOURCES

Cultural resources examined for the study area include archeological resources, historic structures, and cultural landscapes. Prior to the discussion of these specific topics, a general summary of the history and significance for each of the sites is presented below.

History and Significance

Floyd Bennett Field

The Floyd Bennett Field historic era dates to its commercial aviation period when it played an important role in New York City's aviation history, as well as its role as a military air base in World War II. According to an evaluation of Floyd Bennett Field for potential National Historic Landmark Designation, the site appears to be nationally significant as an important early municipal airport and as the location of many record-setting flights by nationally known aviators during the "Golden Age" of flight in the 1930s. The site may also be nationally significant for the activities of the various Navy Units stationed there during World War II, including the Coast Guard's role in the development of the helicopter.

Prior to Floyd Bennett Field, documentation of occupation of the area indicates that the community known as Barren Island began in the early 1800s. This self-sustaining community developed further in the mid 1800s and was associated with animal rendering, fish oil, and garbage processing plants that lined the shoreline. This community, known as the Barren Island community, continued until the Navy takeover of the property in 1941.

Activities associated with the airfield also occurred prior to the Navy acquiring the property. The first municipal airport was constructed in 1928-1931. This was the first municipal airport in New York City and was designed to attract increasing volumes of air traffic directly to the city rather than to the Newark, New Jersey airport where the vast majority of New York bound flights terminated. Due to its unusually long runways and fair weather conditions, Floyd Bennett Field also became notable as a prime airport for experimental fliers seeking to establish speed and distance records. However, the construction of the Idlewild Airport in 1939 forced Floyd Bennett Field to close to commercial use on May 26, 1941. One week later, Naval Air Station New York was commissioned and the airfield formally became Navy property on February 18, 1942.

The Navy undertook extensive new construction in the summer of 1941 filling the remaining areas of wetlands and shoreline to the present outline of Floyd Bennett Field. The former site of the Barren Island community became home to Navy housing, classrooms, dining and recreational facilities, and maintenance areas. This expansion program was necessary to convert the municipal airfield into a wartime naval air station. During World War II, Floyd Bennett Field's multi missions ensured its ranking as one of the busiest airfields in the United States.

In July 1946, after World War II, Naval Air Station New York was re-designated as a naval air reserve training station. With America's withdraw from Vietnam a massive military demobilization occurred. As a result, Naval Air Station New York was decommissioned in 1971. The naval air reserve detachment and Coast Guard air station retained their facilities on the eastern side of the field and the remainder of the field was transferred to the Department of the Interior for creation of Gateway.

Today, the site has historical value because it retains much of its original structures and setting, which tell the story of aviation's early years. The Floyd Bennett Field Historic District was listed to the National Register on April 11, 1980. The NPS is currently working on a revised National Register nomination for Floyd Bennett Field that will expand on the historic significance of the 1980 nomination and revise the district boundaries to include the present park boundaries rather than the original boundaries of the airfield during its operations in 1931-1941. Figure 26 depicts the site's cultural resources and Appendix C contains additional information on cultural resources.

Jacob Riis Park

The entire Jacob Riis Park facility is considered a significant historic resource representative of public park development in this country and an excellent example of New York City municipal recreational architecture and planning of the 1930s. The Park contains a diverse assemblage of varying architectural styles ranging from Byzantine/Morris (1932) to Modern (1937). Buildings within the area, especially the Bathhouse, are excellent examples of recreational architecture of the early 1930s and of public park design and community planning of the 1920s and 1930s. Because the Park was funded, designed, and built by the Works Progress Administration (WPA), it also serves as a good example of architecture completed under this program.

The significance of the Park is also strongly related to its regional linkage to the parkway system, constructed by Robert Moses, which enabled both public and private transportation linkages to the beach. Nearly all pedestrian and vehicular circulation paths remain in the same location today as when built and as such, are of vital importance to Jacob Riis Park. The primary pedestrian systems in use today, much as they were in 1937, include the boardwalk/promenade, back beach walkways, and the mall walkways. In some cases, the original material used in these walkways has been changed but the integrity of the original layout is intact.

Jacob Riis Park further retains substantial integrity as an overall designed landscape intended to provide a comprehensive mix of outdoor recreational activities and indoor support services. The park remains in constant relationship with the beach, the natural resource that motivated initial development, and with parkway circulation that leads to it. The design is remarkably intact and the circulation and relationship of buildings has not changed. Symmetrical organization, major axis of orientation, principle buildings and structures, and overall configuration of uses and areas remains similar to 1937.

Jacob Riis Park was listed on the National Register in 1981 as a historic district. Today, the Park exhibits a formality of design and sophisticated layout that interweaves active and passive recreational areas and a large scale unity of layout relating a natural resource (the beach), manmade linkages (the parkway and access system), and diverse recreational areas. Figure 28 depicts the cultural resources at this site and Appendix C contains additional information on cultural resources.

Riis Landing

Riis Landing is a relatively new nomenclature for this area, having been associated with this area only within the past five years. Prior to this, the area was referred to the Fort Tilden Wharf area. It should be noted that this area and Jacob Riis Park have not historically been connected, although the common name would suggest such a connection.

In February 1917, the Coast Guard granted the Army permission to erect temporary buildings on the land it operated on Rockaway Peninsula. This gave the Army greater flexibility in the use of permanent utilities. On the landing portion of the property, the United States Army Corps of Engineers (USACE) constructed a dock that jutted into Rockaway Inlet with a small standard gauge railroad connecting this dock on Jamaica Bay to coal pockets, large warehouses, and the western end of Fort Tilden. The Army also constructed buildings within this approximate 10-acre area including warehouses, maintenance facilities, and administration buildings.

Between 1938 and 1941, WPA funds were used for construction of a modern, consolidated facility at Riis Landing for use by the Coast Guard. The buildings constructed for this facility were designed in the then-popular Colonial Revival style, augmenting a comprehensively planned facility designed with a boat basin, piers, breakwaters, railroad, and radio communications.

Despite the removal of various support facilities upon the withdrawal of military and Coast Guard operations, Riis Landing retains substantial integrity from its construction period. Architecturally, the site is significant and highly representative of the building style associated with the formative years of the modern Coast Guard, with distinct examples of Colonial Revival institutional architecture. The site also maintains two structures, which separately served as Fort Tilden Headquarters during the military occupation of the site. To have two headquarters building to support such a small site is of significance in itself. Figure 30 depicts the cultural resources at this site.

New NPS Sites at Pennsylvania and Fountain Avenues

Based on the amount of fill on these sites, their history as landfills, and the recent plan for capping the facilities and landscaping the area, it is highly unlikely that cultural resources exist at these sites.

Archeological Resources

A key component of the NPS mission is to protect, preserve, and present the history of its various units. One means of doing this is through continued archeological investigations and education. In addition to the NHPA, NPS DO #28 and *NPS Management Policies 2001* (NPS 2000) direct the NPS on means of investigating unknown resources, and preserving and presenting known resources.

The Jamaica Bay area has a long history of human occupation, which would in most cases create a vast archeological resource. However, based on the high level of development that has occurred in the region over the last two centuries, many of these resources have been disturbed or destroyed. The lack of these resources is documented below for each site.

Floyd Bennett Field

The area now known as Floyd Bennett Field was originally made up of small islands including Barren Island, and marshes interconnected by estuarine streams. It is believed that a Canarsie Indian village, Enquendito, was once located in close proximity to the present park headquarters. During the 19th century, a small village grew on Barren Island in part because of a large fertilizer and glue factory. By the mid 1880s, 500 workers and families associated with the factory lived in an area now occupied by part of

Floyd Bennett Field. This small community declined in the early decades of the 20th century as the factories closed.

A Phase Ia cultural resources inventory was completed for Floyd Bennett Field in June 2005 (URS Corporation, June 2005). This report suggests that the potential for locating intact prehistoric cultural deposits within the original Floyd Bennett Field area is very low as the subsurface construction activities do not extend below the nine feet of fill on the property. There is also a low potential for historic archeological resources within the original area of the airfield as the area consisted of low marshland or shallow bays and early historic activities such as fishing and harvesting would not have left sufficient evidence. However, historic documentary research and historic maps do indicate that the area that has a high potential for both prehistoric and historic archeological evidence in the upland areas of Barren Island located south of the airfield. This area would include the southern entrance to present day Floyd Bennett Field and the roadway leading from this entrance to portions of the airfield.

Jacob Riis Park

Based on the limited studies preformed at the site and limited information on land use of the site before the 1880s, there are no known archeological resources at Jacob Riis Park. However, even if archeological resources exist, they would not be impacted by any of the action alternatives as construction activities proposed are not expected to extend below the layers of fill that cover the site.

Riis Landing

Prior to the mid 1800s, most of the land comprising Riis Landing was under water. As a result, little archeological evidence is anticipated in this area. A Phase Ia archeological investigation was undertaken in 2005 and 2006 at Fort Tilden in support of replacing a water distribution system at Fort Tilden (Northern Ecological Associates Inc., 2006). Relatively shallow, developed soils were found during fieldwork and no substantial sample of historic periods or prehistoric artifacts or materials were uncovered. This report recommended that no discernable prehistoric or historic sites or features potentially eligible for the National Register are located at Fort Tilden. Based on this report and other limited studies preformed at the site, as well as its history of physical development; there are no known archeological resources at Riis Landing or the rest of Fort Tilden. However, even if archeological resources exist, they would not be impacted by any of the action alternatives as construction activities proposed are not expected to extend below the layers of fill that cover the site.

New NPS Sites at Pennsylvania and Fountain Avenues

As previously mentioned, based on the amount of fill on these sites, their history as landfills, and the recent plan for capping the facilities and landscaping the area, no archeological resources exist at these sites.

Historic Structures

As was the case with archeological resources, the NHPA, NPS DO #28, and *NPS Management Policies 2001* (NPS 2000) also direct the agency on its treatment of historic structures. Many historic structures relate directly to the history that a given park seeks to present. The NPS, therefore, seeks to preserve these structures with proper care and in a manner that is befitting to their historical significance.

At the Jamaica Bay unit, many of the structures related to the unit's history are still intact and in use. These structures include buildings, fields, parking lots, roads, and pedestrian circulation networks. They provide the visitor with some perspective about the historic use of the sites and also support recreational and operational activities. Structures that exist at the four study areas are discussed below.

Floyd Bennett Field

No significant aboveground evidence remains today of the industrial structures or their associated community on Barren Island that developed in the 1860s. However, original hangars and an administration building that were first constructed for the airport still dominate Hangar Row along Flatbush Avenue. Today, these are referred to as Hangar Complexes 1, 2, 3, 4, 5, 6, 7, and 8 numbered from south to north. Historic structures dating from 1928-31 and 1936-38 include eight hangars with attached service wings, an administration building, a garage, two pump houses, an electrical vault, a transformer building, and a pump station. With the exception of the steel-frame hangars, these are all constructed of brick. There are a number of more recent and less significant buildings that were constructed during the U.S. Navy occupation of the Field. The most notable structures are the hangars, the administration building, the taxiway, and the runways, and the Coast Guard Hangar. Table 6 provides a list of historic structures at Floyd Bennett Field, taken from the National Register nomination, as well as their National Register eligibility (Gateway 1976). The National Historic Landmark Commission recently evaluated Floyd Bennett Field for NHL designation and determined that while the site is not eligible as an NHL, Floyd Bennett Field is nationally significant as an historic district (National Register of Historic Places and National Historic Landmarks Program, 2005). The NPS is currently reviewing the original National Register nomination and updating eligibility information.

Runways and Taxiways. Two 100-foot-wide, reinforced concrete runways and a concrete taxiway were constructed between 1929 and 1931. One runway was 4,200 feet long and oriented on a northeast/southwest axis, while the other runway was 3,110 feet long and oriented on a north-northwest/south-southeast axis. The two runways, located to the east of the building complex, formed a "T" with the intersection slightly south of the administration building site. With the expansion of the airfield and its continuing maintenance by the U.S. Navy, the original runways have been extended, widened, and presumably resurfaced. However, the best-preserved runway, in terms of scale, is the 4,200-foot runway. The historic pattern is an integral part of the current runway system.

Table 6 Historic Structures at Floyd Bennett Field

Building Name	Date of Construction	National Register Eligibility
Runway, taxiway, and apron system	1930	Listed on National Register, contributing resource
Administration Building (Ryan Center)	1931	Listed on National Register, contributing resource
Hangar Complex 3	1931	Listed on National Register, contributing resource
Hangar Complex 4	1931	Listed on National Register, contributing resource
Hangar Complex 5	1931	Listed on National Register, contributing resource
Hangar Complex 6	1931	Listed on National Register, contributing resource
Pedestrian Tunnel	1935	Listed on National Register, contributing resource
Fire pump house (Building 29)		Date to historic period
Sewage pump house (Building 30)		Date to historic period
Electrical vault (Building 57)		Date to historic period
South vault (Building 88 and 88A)		Date to historic period
Utility vault (Building 101)		Date to historic period
North vault (Building 117)		Date to historic period
Transformer vaults (Buildings 120 and 82)		Date to historic period
Storage building (Building 126)		Date to historic period
Building 273		Date to historic period
Building 274		Date to historic period

Notes:

Listed on the National Register – the building, site, structure, or object is already listed on the National Register either individually or as part of a historic district.

Contributing resource – a building, site, structure, or object adding to the historic significance of a property.

Date to historic period – the building, site, structure, or object is not listed on the National Register but does date to the historic period of the district.

The following structures fall within the study area and relate directly to access and circulation within the site.

Hangar Complexes 1, 2, 3, 4, 5, 6, 7 and 8/Hangar Row. The first and most important buildings to be erected at Floyd Bennett Field were a complex of four pairs of hangars built between 1929 and 1931. Basically identical in design, these hangars are of steel-frame construction with steel-trussed arched roofs and wooden decks. Their very shallow gable roofs, clear-span roof trusses, open steel framing, and immense hangar doors defined these original eight hangars. Attached to the exterior side of each hangar is a 2,400-square-foot, two-story service wing of buff-colored brick. Before the WPA work in 1936-38, each hangar was a separate structure. During the second period of construction at the Field, central service wings, constructed of brick and along the same lines as the side wings, were erected between the paired hangars. This addition created one continuous structure composed of two hangars. These new hangar pairs have some Art Deco ornamentation in concrete panels on central wings and in stamped metal on hangar gables. With the exception of some minor alterations, such as bricked-in windows and removed hoods, the hangars are basically unchanged. Only Hangars 3 and 4 are presently occupied and in use by the NYPD. Hangars 5 and 6 are currently undergoing renovation to support the new sports complex. There was also a Coast Guard Hangar built in 1930.

Jacob Riis Park

Although the period of significance for the historic district spans between 1932 and 1937, the primary development period is 1936-37. These two years mark the end of the Robert Moses period for the park (1934-37), which culminated in the overall site development concept becoming a successful, popular site. The Jacob Riis Park Historic District includes three significant recreational buildings constructed between

1932 and 1937: the Bathhouse and the two central Mall buildings. Although there are other small buildings in Jacob Riis Park, they do not significantly add to the historic district.

Outside of the recreational facilities, the parking lot and pedestrian circulation system within the site also represent historic structures. As part of the 1936 development concept under Robert Moses, the parking lot was redesigned and enlarged. With a 9,000-car capacity, this element was not only the largest design feature of Jacob Riis Park, but also the largest paved parking area in the world at that time of construction.

The parking lot was connected to an elaborate vehicular and pedestrian circulation network. This network created the frame that defined the zones of activity in the site design. The integration of roadway and vehicular circulation elements into the overall site plan concept still unify all areas of the Park and contribute to the perception that the various individual areas all come together to form the whole design composition planned by Robert Moses. Today, nearly all of the pedestrian and vehicular pathways remain in their original locations, and they are of primary importance to the historical significance of Jacob Riis Park (Lane, Frenchman and Associates 1992).

Riis Landing

Evaluated for National Register eligibility in 1983, Riis Landing was determined not eligible. At that time, the Coast Guard complex on the site was less than 50 years old, thus, by definition, it was ineligible for listing. However, in August 2004, the New York SHPO determined that the station complex at Riis Landing met the criteria for listing on the National Register, as it is historically and architecturally significant for its association with the history of coastal life-saving and as a distinctive example of Colonial Revival institutional architecture that is greater than 50 years old.

As a result of the previous non-eligible determination, little information has been collected to-date on the specific buildings within the complex. However, information is available on the railroad tracks that traverse the site. Five examples of mid-1920s railroad tracks, including those found in Riis Landing, were found to be the only surviving evidence of the transportation of armaments at Battery Harris within Fort Tilden, a piece of New York's coastal defense network that operated during World War II and part of the Cold War. The surviving railroad tracks were determined to be of National Register significance because of their association with artillery guns and Battery Harris (NPS 2005).

In 2004, a Cultural Landscape Report was initiated to document and evaluate the entire Fort Tilden Area, including Jacob Riis Park. In early 2005, an Initial Findings and Suggested Landscape Guidelines report was submitted to identify areas for further consideration. This report acknowledged 17 buildings and structures as well as circulation, vegetation, and small-scale features at Fort Tilden that warranted further consideration in the cultural landscape report. As recommended, the park is working to complete a cultural landscape report for Fort Tilden. The *Draft Fort Tilden Cultural Landscape Report* (NPS 2005) provides background and historical significance information for Fort Tilden. This report is not a full treatment plan, but provides direction for maintaining the historic structures within the site while further developing the site.

New NPS Sites at Pennsylvania and Fountain Avenues

Based on the amount of fill on these sites, their history as landfills, and the recent plan for capping the facilities and landscaping the area, no cultural resources exist at these sites.

Cultural Landscapes

As defined by DO #28, a cultural landscape is, “a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.” The NHPA, DO #28, and *NPS Management Policies 2001* (NPS 2000) direct the NPS in preserving and protecting significant cultural landscapes.

Floyd Bennett Field

The boundaries of the existing National Register historic district at Floyd Bennett Field have been drawn to include the area encompassing the runway system in existence before 1941. The Park is currently reviewing the National Register nomination to revise the historic boundaries to include the present day park boundaries. Floyd Bennett Field retains the layout and surface of the original 1930's airport. The efforts of its planners to follow the 1928 Department of Commerce guidelines for airport construction are readily apparent. Not only are the hangars and support buildings arranged linearly to one side of the runways, but they are also easily accessible from Flatbush Avenue, a main highway that passes directly behind them. As a result, the area was listed on the National Register in 1980, with the boundaries of the district drawn to include only that area of the runway system in existence prior to 1941. Military use after 1941 resulted in the widening of the runways and the airfield as a whole.

The majority of formerly unsurfaced land around the runways has been surfaced to create the runways, taxiways, aprons, and roads required for an airfield the size of Floyd Bennett Field. In some cases, these facilities have taken away from the historic nature of the site. Similarly, the hangars within the district have deteriorated, but they still convey the historic nature of the site.

Jacob Riis Park

The significance of the historic district derives from implementation and construction during the 1930s and its association with a major innovation in public policy, specifically the WPA. The park is also associated with Robert Moses, influential New York City Commissioner of Parks in the 1930s. The overall spatial circulation, spatial relationship, alignment, symmetry, views, and vistas remain relatively unchanged from the original layout and are strongly related to its regional linkage to the parkway system, also designed by Robert Moses, which enabled both public and private transportation linkages to the beach. His final plan involved making Jacob Riis Park accessible to the public via the Marine Parkway Bridge, allowing New Yorkers to drive or take public transportation to the park from any borough. This plan eventually linked Flatbush Avenue to the Belt Parkway. As with many Robert Moses projects, the large parkway provided easy access to recreational areas and became an integral part of the design. Nearly all pedestrian and vehicular circulation patterns remain in the same location today as when built. While the roads surrounding Jacob Riis Park are not considered part of the National Register Historic

District, they are important to the overall development of the park and the design concept created by Robert Moses.

The primary pedestrian systems include the Boardwalk/Promenade, Back Beach walkways, and the Mall walkways. In some cases, the original material used in these walkways has been changed, but the integrity of the original layout is intact. This loss of original fabric is most apparent along the Boardwalk where the wood decking has been replaced with concrete. Later modifications to the Park have had little impact on the overall design, for example plantings throughout the Park still reflect much of the original.



Approaching Jacob Riis Park

Jacob Riis Park further retains substantial integrity as an overall designed landscape intended to provide a comprehensive mix of outdoor recreational activities and indoor support services. The Park remains in constant relationship with the beach, the natural resource that motivated initial development, and with the parkway and access system that leads to it. The design is remarkably intact and the circulation and relationship of buildings has not changed. Symmetrical organization, major axis of orientation, principle buildings and structures, and overall configuration of uses and areas remains similar to 1937, such as the seaside setting and the narrow, sandy area within a residential neighborhood. The complex retains its overall association and feeling of a bathing beach, although changing social groups have affected the way the Park is used with old activities replaced with new. However, the intent to relax and enjoy the day at the beach remains.

Jacob Riis Park retains integrity of location, setting, design, materials, workmanship, feeling, and association – all of which must be evaluated for the National Register process. The architectural design, general topography, and pedestrian circulation system still unify all of the areas of the Park, as do the natural resources of the beach and linear Boardwalk/Promenade that connect all parts of the Park. Though site furnishings, plantings, and other landscape elements have been altered, their complimentary design enables visitors to understand how each of the Park's elements contributes to its overall character. The location of buildings containing visitor services, including the Bathhouse and two Mall buildings, was an integral and highly significant part of the original Jacob Riis Park design concept. These key buildings remain very much as they were in 1937 (Lane, Frenchman and Associates 1992).

Riis Landing

Today, the landscape of Fort Tilden consists of three landscape characteristics, which reflect the historic use and development of the landscape as well as current park operations. These characteristics include the Fortification area, Post area, and Wharf area. The Fortification area was listed to the NRHP in 1980 and has been managed primarily as a natural area since then. The Post area contained over 100 buildings at its height during World War II. Today, the area contains only 30 buildings. This area also includes the one-time ceremonial center of Fort Tilden, the parade ground. To date, the Post area has not been formally evaluated for NRHP significance. Although several buildings in this area may have individual significance, as a whole, the post area has lost a substantial amount of historic integrity. Finally, the Wharf area is the small portion north of Rockaway Beach Boulevard that fronts Rockaway Inlet known as Riis Landing. Historically, this area has been considered part of the Post, and it contained the main dock,

warehouses, maintenance facilities, and administrative buildings with rail lines connecting the main dock with the fortification area (NPS 2005).

New NPS Sites at Pennsylvania and Fountain Avenues

Based on the amount of fill on these sites, their history as landfills, and the recent plan for capping the facilities and landscaping the area, no cultural landscapes exist at these sites.

VISUAL RESOURCES

High-quality visual resources are the result of successful NPS efforts to properly manage natural and cultural resources. Visual resources may provide some insight into the historic conditions of the site, display vibrant natural resources that exist in the area, or add to the tranquil environment that is sought by the visiting public.

At the Jamaica Bay unit, these resources are especially important as they are surrounded by the gray, developed, urban environment. This environment often causes the park sites to blend in to rest of the landscape, reducing their historical and aesthetic significance.

Floyd Bennett Field

Situated alongside Flatbush Avenue, Floyd Bennett Field is a historic aviation facility dominated by constructed and man-altered landscapes. Many of Floyd Bennett Field's dominant structures are primary pieces of the area's viewshed. The Ryan Visitor Center and historic hangars located in Hangar Row provide a visual representation of the site's historic nature. The hangars, grouped in pairs, are arranged in a linear pattern to one side of the runways and taxiways that parallel Flatbush Avenue.

Along with the airport structures, the NPS also supports the Grassland Management Areas and North Forty Natural Area. These areas offer some natural views in an otherwise highly developed area. The North Forty screens the site from the Belt Parkway and other developments to the north, while the grassland areas provide some separation between the Bay side waterfront and the busier roadways.

While the views at Floyd Bennett Field play a role in interpreting its history and furthering the visitor experience, they are hidden behind the fronts of the historic hangars and a large steel fence divides the site from Flatbush Avenue. The fence, along with the lack of signage explaining what the large structures are, allows the initial views of the site to blend in to the industrial/commercial environment that dominates much of the region. When passing the site, many people are unaware of what they are seeing, what its significance is, or how to reach it. Within the site, views of the runways, historic structures, and natural areas are routinely interrupted by traffic related to the site's "recreational" and "partner and tenant" users. These interruptions make the runways look like large roads, rather than historic structures within the site, thus detracting from the NPS's intent at Floyd Bennett Field.

Jacob Riis Park

For Jacob Riis Park, the existing visual environment is defined in part by the visual character of the transportation network that dates to the construction of the Park. This network carries visitors coming

from the north and west directly into the site through a series of gradual curves, which allow the landscape to slowly unfold into distinct zones of activity. Visitors arriving at Jacob Riis Park from these directions are led to the large parking lot designed to be the largest parking lot in the world at the time of construction in the 1930s. As visitors move through the parking lot, the Bathhouse and other Park structures become visible. The Bathhouse was constructed as the focal point of Jacob Riis Park and remains that way today. Located on the edge of the parking lot, it is the first element of the symmetrical design seen by visitors. The transportation network also provides access to scenic views of the Manhattan skyline, with Jamaica Bay providing a scenic foreground.

For visitors coming to the park from the east, these visual resources are not presented in the same manner. Coming from this direction, the residential community surrounding the park abruptly gives way to the federal site. As a result, traveling along Beach Channel Drive, Jacob Riis Park is seen from some distance with the site's large parking lot lying in the foreground. During busy days, the crowded parking lot may be observed as an intrusion on the Bay side viewshed. Or, it may simply blend into the general urban viewshed where the site of a crowded parking lot is nothing unusual. During empty days, the barren, paved surface is uninviting and detracts from the Bay side viewshed. Regardless of the status of the parking lot, views of Jacob Riis Park provided to potential visitors traveling along Beach Channel Drive are distant at best, with various urban intrusions imposing on the park-like atmosphere. It is not until visitors have absorbed these views and gone through the maze of ramps and bridges that they are introduced to the planned, park-like viewshed seen by visitors traveling north and west.

Riis Landing

The Fort Tilden/Riis Landing area provides one of the more consolidated green spaces in the Jamaica Bay unit. The Atlantic Ocean, Rockaway Beach Boulevard, and several local roadways bound this area. A small northern extension of the fort fronts on Rockaway Inlet north of Rockaway Beach Boulevard between the former Coast Guard Rockaway Station and the community of Roxbury. Manicured lawns, athletic fields, and beachfront vegetation all contribute to this site's environment. These green spaces are bisected by narrow roads, which add a visual perspective to Fort Tilden's historic nature and create a sense of cohesion across the site. Fort Tilden is a former military base commissioned in 1917, and it retains some features of a military base, such as the narrow roads, pedestrian paths between buildings, and several buildings that date back to its military use. One of the most dominant features of the area is a large parade ground or drill field. This one time ceremonial center of Fort Tilden is still visible to visitors using the main entrance of the site. Maintained as a mowed lawn area, this large open space fronts several World War II era buildings and retains its appearance from this period.

Across the street from the parade ground, Riis Landing includes an adjoining complex of buildings that once formed the Coast Guard Station Rockaway associated with Fort Tilden. Today, the original administration building sits at the main entrance to the area. A new parking lot and ferry dock are also present. This new parking area removed a portion of the original concrete roadway and rail spur, although pieces of these features are still visible.

Additional undeveloped roads and parking lots give the site a neighborhood feel. This feeling is emphasized in some areas by vegetative screens that block the site from more developed sights in the surrounding area. However, even in areas where screening is not available, such as along portions of Rockaway Point Boulevard, the open green environment of the site dominates the viewshed.

New NPS Sites at Pennsylvania and Fountain Avenues

The New NPS Sites sit along a busy stretch of the Belt Parkway that connects JFK Airport with Staten Island and other western points. The sheer height of the two former landfills is the most notable visual resource along this stretch of the Bay's north shore. Because these two sites have not been open to the public in the past, they appear visually separated from the surrounding community. This separation is physically present through landscaping and a tall, steel fence. Long, undeveloped roads lead from the local transportation network to the gated entrances. The undeveloped nature of these roads makes them visibly uninviting to potential visitors.

The site of bulldozers, dump trucks, and piles of dirt present during the current construction activities make the entire site seem unappealing to most members of the community. These detract from the natural environment that the NPS attempts to preserve throughout the region. However, upon completion of the landscaping activities, the two sites will dramatically change the local viewshed, providing much needed green space along the north shore of Jamaica Bay.

TRANSPORTATION, SITE ACCESS, AND CIRCULATION

In relation to the variety of resources that the NPS manages, *NPS Management Policies 2001* (NPS 2000) discusses transportation systems as a means of providing the visitor with an enjoyable experience without adversely impacting the surrounding resources.

The Jamaica Bay unit is located in the highly developed New York City environment. Although this environment often adversely impacts many of the park's natural resources, it provides a great deal of options for accessing the park. The developed nature of many of the sites within the unit also provides various transportation options. Because the regional transportation network is necessary for providing transportation, site access, and circulation to the four study areas, it is discussed below before the individual study area descriptions.

Regional Transportation Network

The transportation assessment identifies area-wide circulation patterns and operating conditions along the roads accessing the four study sites to assist in developing traffic circulation and access management alternatives. The data collection program for the study was conducted during the months of September and November, 2004. The typical weekday and weekend peak traffic conditions were analyzed to ensure that the period of peak travel demand combining both background traffic and park facilities-generated traffic was included in the assessment.

Regional Road Network

Direct access to the Jamaica Bay unit is provided via the Belt Parkway, with bridge connections to the Rockaway section of Queens at Exit 11, to Flatbush Avenue and the Marine Parkway (Gil Hodges Memorial) Bridge; and at Exit 17 to Cross Bay Boulevard and the Cross Bay Bridge. For those more familiar with the area, the site can also be accessed via Exit 21 by traveling Rockaway Boulevard. Rockaway Boulevard joins the Nassau Expressway and Seagrit Boulevard, which provide access to the area from Long Island and through the neighborhoods of East Rockaway and Far Rockaway.

The Verrazano Narrows Bridge provides more regional connectivity to the west and south, connecting through Staten Island to I-95 (the New Jersey Turnpike) and I-78 in central New Jersey. The Van Wyck Expressway and Cross Island Parkway provide regional access to the north via I-87 (New York Thruway) and to New England via I-95 (New England Thruway).

Public Transportation

Parts of the Jamaica Bay unit are served indirectly by two MTA subway lines: the A line and the L line. The A line (8th Avenue Express) runs from the Inwood section of Manhattan down 8th Avenue and into Brooklyn. It continues through Brooklyn along Fulton Street and through Queens along Pitkin Avenue and Liberty Street. Along its route, the A line connects with many of the MTA's other subway lines. In Brooklyn, the A line provides connections to an extensive bus service area, including routes that service the area near the Fountain Avenue Landfill. After the JFK Airport and Broad Channel stops, the A line splits north towards Far Rockaway and south toward Rockaway Park. The south split of the A line runs only during rush hours and terminates at Beach 116th Street, where it provides connections to bus lines that service Jacob Riis Park, Riis Landing, and Floyd Bennett Field. During off-peak hours, A line service is provided by the S line shuttle, which mirrors the A line service route. The L Line (14th Street – Canarsie Local) runs from the Lower West Side of Manhattan across Northern Brooklyn to Rockaway Park in Canarsie. It connects to several local bus lines, including one that provides service near the Pennsylvania Avenue Landfill site.

Five bus routes provide direct access to various parts of the Jamaica Bay Unit. Three of these routes are operated by the MTA, and two are operated by the Green Bus Company. The MTA operates the B13, B82, and B83 routes. The B13 bus runs local service from the Williamsburg section of Brooklyn, through Queens, to the Gateway Center Mall and Spring Creek. The B-82 and B-83 bus routes provide local connections between Spring Creek Towers and other sections of Brooklyn. The B82 runs along Flatlands Avenue and Kings Highway to Coney Island, and the B83 runs along Pennsylvania and Van Siclen Avenues to East New York.

The Green Bus Company operates the Q22 and Q35 bus lines. The Q35 bus runs the length of Flatbush Avenue, from Brooklyn College over the Marine Parkway (Gil Hodges Memorial) Bridge. On the Queens side of the bridge, the bus travels east along Beach Channel Drive, Rockaway Beach Boulevard, and Newport Street to Beach 116th Street, where it connects to the MTA A Line and S Shuttle. The Q22 bus runs from Mott Street in Far Rockaway west down Beach Channel Drive and Rockaway Beach Boulevard past Jacob Riis Park, terminating on Beach 169th Street (across from Riis Landing). Connections to the A Line and S Shuttle are also provided at Beach 116th Street.

Pedestrian/Bicycle Access

Along with vehicular and transit access, the sites are also accessible by bike or on foot. All of the sites except for Floyd Bennett Field are within walking distance of residential neighborhoods. Riis Landing abuts the Roxbury neighborhood, Jacob Riis Park abuts the Neponsit neighborhood, and the new NPS site at Pennsylvania Avenue is located near the Spring Creek Towers housing development.

Bicycle/pedestrian access is enhanced by the Belt Parkway Bikeway that runs along the northern edge of Jamaica Bay, including the entire frontage of the new sites at Pennsylvania and Fountain Avenues. The bikeway connects with the Rockaway Greenway Bikeway along the frontage of Floyd Bennett Field.

Plans call for further bikeway links along the Rockaway Peninsula, so that eventually a complete circuit around Jamaica Bay can be established. In-road bicycle paths along Rockaway Point Boulevard connect the Breezy Point neighborhood with Riis Landing and Jacob Riis Park.

Floyd Bennett Field

Access to Floyd Bennett Field is provided by Flatbush Avenue, south of the Belt Parkway and north of the Marine Parkway (Gil Hodges Memorial) Bridge (Figure 4). This section of Flatbush Avenue consists of a four-lane median-divided roadway. There are several median breaks along the road to support U-turns or site access, as well as a 12-foot curb lane for right turns in both directions.

The entrance to Floyd Bennett Field is at Floyd Bennett Drive, a four-lane roadway located 0.25 miles north of the Marine Parkway (Gil Hodges Memorial) Bridge toll plaza. The intersection is signalized. At this location there are two through lanes in each direction on Flatbush Avenue, as well as a southbound left-turn lane and a northbound right-turn lane.

There is an additional exit located along the north end of Floyd Bennett Field. The intersection is used only during special events and leads directly onto Flatbush Avenue. The intersection that services this entrance is unsignalized and is aligned with a break in the median along Flatbush Avenue. There are left-turn lanes in both directions of Flatbush Avenue at this location.

Public transportation to the site is provided by the Q35 bus. The bus line runs the length of Flatbush Avenue, from Brooklyn College over the Marine Parkway (Gil Hodges Memorial) Bridge to Jacob Riis Park. There are stops near the Ryan Visitor Center and at Floyd Bennett Field Drive.

Pedestrian and bicycle access are also provided by the Rockaway Greenway, a path that travels the length of the Flatbush Avenue frontage. The path runs along the east side of Flatbush Avenue, adjacent to the site. The path crosses Flatbush Avenue at the signalized intersection of Flatbush Avenue and Floyd Bennett Drive. The path then extends to connect with the Belt Parkway Bikeway to the north and continues south over the Marine Parkway (Gil Hodges Memorial) Bridge to the Jamaica Bay shoreline of the Rockaway peninsula.



Floyd Bennett Field Drive

The circulation within Floyd Bennett Field is comprised of roadways and the historic runways and taxiways. Floyd Bennett Drive is the entrance road and provides access to all of the uses within the south section of the Field. This route terminates at the NYPD site. Because they are unable to travel through the NYPD site, NYCDOS drivers use Runway 15-33 and Old Runway 6-24 to access their training site.

Runway 15-33 provides access to the north section of the Field and is used by those traveling to the parking lot at the Ryan Visitor Center. Other visitors use Runway 15-33 and Old Runway 6-24 to access other locations such as the Community Gardens, fishing areas, camping areas, and the aircraft restoration hangar. During larger special events, drivers use routes demarcated through the tarmac to get to the Flatbush Avenue exit at the north end of the Field.

There are a variety of activities at Floyd Bennett Field that generate traffic demands. Camping, bird watching, hiking, airplane restoration, bicycling, jogging, and fishing all draw visitors to the field. In addition, the NYPD, the NYCDOS, and the USMC conduct training on Floyd Bennett Field. Parking for staff, tenants, and visitors is provided at building locations throughout the site. Two large lots, totaling approximately 200 spaces, have been built on the tarmac area adjacent to the Ryan Visitor Center. Informal parking along tarmac, taxiway, and runway areas also occurs. The parking areas are not fully utilized, except during special events. During extremely large special events, drivers are directed to park on runways and tarmac areas. Several thousand cars could be parked in this manner if desired.

Flatbush Avenue carries approximately 26,000 vehicles per day on weekdays and about 19,000 vehicles per day on weekend days. Excluding the summer season, there are approximately 1,600 vehicles per weekday entering/exiting Floyd Bennett Drive and about 1,000 vehicles per weekend day. During the summer months, traffic activity (exclusive of special events) can be up to 3,000 vehicles per day, both weekdays and weekend days. Approximately 85 percent of the Floyd Bennett Drive traffic either arrives from or departs to the north. Typical peak hour traffic on Flatbush Avenue is 1,500 (AM) to 1,900 (PM) vehicles per day weekdays and 2,100 vehicles per day on Saturday midday. Peak hour traffic using Floyd Bennett Drive is 150 vehicles (AM) to 200 vehicles per day (PM). Saturday midday peak hour traffic is slightly more than 200 vehicles per day.

Traffic operations are measured in levels of service (LOS). Similar to a school report card, LOS A represents the best operating conditions (little to no congestion) and LOS F represents the worst operating conditions (severe, heavy congestion). The signalized intersection of Flatbush Avenue at Floyd Bennett Drive operates at LOS D during the weekday morning peak hour and LOS C during the weekday evening peak hour and the weekend midday peak hour.

Once drivers enter the site, they use either Floyd Bennett Drive to access the south end of the site or turn onto Runway 15-33 to circulate among the historic runways and taxiways to access other areas, including the Ryan Visitor Center. During weekday peak hours, approximately 70% of the park traffic continues along Floyd Bennett Drive and 30% uses Runway 15-33. On Saturday midday, the traffic flow is evenly split. Peak hour traffic volumes on Runway 15-33 range from 90 to 120 vehicles per hour.

Jacob Riis Park

As shown in Figure 5, access to Jacob Riis Park is provided by Beach Channel Drive eastbound and Rockaway Beach Boulevard westbound. The NYSDOT classifies Beach Channel Drive as a minor arterial carrying an average daily traffic (ADT) volume of 25,600 vehicles in 2002.

Jacob Riis Park generates 100 vehicular trips (65 entering and 35 exiting) during the weekday morning peak hour and 210 trips (60 entering and 150 exiting) during the weekday evening peak hour. During the Saturday midday peak hour, the Park generates 540 vehicular trips (450 entering and 90 exiting). Approximately 30 percent of the traffic to the Jacob Riis Park beach area arrives from the east and most vehicles use Rockaway Beach Boulevard.



Marine Parkway (Gil Hodges Memorial) Bridge ramps

Typical peak hour traffic Beach Channel Drive, between the Park and the Marine Parkway (Gil Hodges Memorial) Bridge is 1,600 (AM) to 1,900 (PM) vehicles per day weekdays and 1,700 vehicles per day on Saturday midday. During the weekday commuter peak hours the Park-related traffic is fewer than 150 vehicles, less than 10% of the roadway traffic. During a peak Saturday midday hour the Park-related traffic on that segment of Beach Channel Drive exceeds 400 vehicles per hour, one-third of the total traffic volume.

Weekday peak hour traffic volumes on Rockaway Beach Boulevard range from 400 (AM) to 600 (PM) vehicles, with approximately 10% of the traffic Park-related. On Saturday midday, the hourly volumes are approximately 500 vehicles, including 150 (30%) that are related to Jacob Riis Park beach activities.

Riis Landing

Riis Landing is located immediately west of the ramps at the end of the Marine Parkway (Gil Hodges Memorial) Bridge, as shown in Figure 6. It is accessible from the bridge ramps and also from Beach Channel Drive. Visitors from Breezy Point arrive from the west via Rockaway Point Boulevard. The NPS-owned section of Riis Landing maintains a single access road off of Rockaway Point Boulevard. From this access road, service roads provide access around the buildings on the west section of the site. The access road forms a four-way signalized intersection with Rockaway Point Boulevard and the Fort Tilden entrance. Rockaway Point Boulevard is a wide two-lane roadway with turn lanes at the signalized entrance to Riis Landing. The Riis Landing and Fort Tilden roadways are single-lane approaches to the intersection. Approximately 50 feet east of the intersection there is a driveway into the former Coast Guard Station Rockaway portion of the site.

Public transportation is provided by the Q22 bus, which runs from Mott Street in Far Rockaway west down Beach Channel Drive and Rockaway Beach Boulevard past, Jacob Riis Park, terminating one block east of Riis Landing on Beach 169th Street.

Bicycle lanes are provided along the length of Rockaway Point Boulevard. Additionally, bicycle use is supported by the streets through Fort Tilden and along the beach adjacent to the Fort. A series of paths and low-volume roadways provide connections between Riis Landing and Jacob Riis Park. The pathways within Fort Tilden are separated from those along the Marine Parkway (Gil Hodges Memorial) Bridge and Beach Channel Drive by a short section of undeveloped land.

An 84-space parking lot serves the existing uses on the Riis Landing site. Normally, the parking lot is not heavily utilized given the relatively low level of activity that currently occurs on the landing. Occasionally, during a marine charter excursion, the parking lot fills and visitors must park across Rockaway Point Boulevard in one of the parking lots located at Fort Tilden.

There are several existing parking areas on Fort Tilden that have been used when parking at Riis Landing is full. Of particular note is the T-4 parking lot. This lot is utilized primarily for after school activities and in the evening hours. Daytime restrictions are currently in place at the lot to discourage visitors from using it for beach parking.

Hourly traffic volumes at Riis Landing are typically fewer than 20 vehicles. Volumes at the Fort Tilden entrance road are fewer than 100 vehicles per hour. Peak-hour traffic along Rockaway Point Boulevard

ranges from 1,050 (AM) to 1,200 (PM) vehicles per hour on weekdays, and about 900 vehicles per hour on Saturday midday. The signalized intersection operates at LOS A during peak periods.

New NPS Sites at Pennsylvania and Fountain Avenues

Currently, the only access points to the two sites exist at their respective construction entrances. The construction vehicle access to the Pennsylvania Avenue site is provided from the intersection between Pennsylvania Avenue and the Belt Parkway, Exit 14. Traveling south on Pennsylvania Avenue, there are two travel lanes and a parking lane in each direction, with additional turning lanes at selected locations (Figure 7). Upon reaching the Belt Parkway, the construction entrance to the Pennsylvania Avenue site is incorporated into the signalized intersection for the eastbound Belt Parkway ramps. There is no direct access for westbound vehicles.

The construction entrance for the Fountain Avenue site is located at the end of Fountain Avenue, which runs beneath an elevated portion of the Belt Parkway, near Exit 15. The entrance is accessed from the local road network or from the Belt Parkway. Coming from the Belt Parkway, travelers use Exit 15 to head north on Erskine Street. Erskine Street leads to Seaview Avenue, which connects to Fountain Avenue shortly to the east. These roads are all four-lane median divided roadways with signalized intersections.

Along with private vehicles, these local roads also support public transportation. The B82 and B83 MTA transit routes layover on Seaview Avenue, approximately two blocks from the Pennsylvania Avenue site. These buses operate daily, arriving to pick-up and discharge passengers every five to six minutes (known as five to six minute headways). The B13 route lays over on Seaview Avenue at Erskine Street, approximately 0.25 miles from the entrance road to the Fountain Avenue site. The B13 route operates daily, arriving every 15 minutes during peak periods.



**Intersection at Fountain and
Seaview Avenues**

The Belt Parkway Bikeway runs along the south side of the Parkway, within the NYCDOT right-of-way. The bikeway runs along the entire frontage of the two former landfills. In addition to the bikeway, sidewalks are provided along both sides of Pennsylvania Avenue including along the Exit 14 bridge over the Belt Parkway. There is a sidewalk along the east side of Erskine Avenue that extends across the Exit 15 bridge over the Parkway. Signalized bicycle/pedestrian crosswalks are provided at both signalized bridge intersections. While there are currently no sidewalks along this southern section of Fountain Avenue, sidewalks are provided along the balance of Fountain Avenue and along Seaview Avenue. Because the two sites are not yet open to the public, there is no internal circulation. Once complete, the majority of the site will be accessible only by foot along designated pathways.

Currently, the only traffic generated by the landfills is from construction-related activity. The landfills are located adjacent to the Belt Parkway, which carries approximately 130,000 vehicles per day. Pennsylvania Avenue, which leads to the Pennsylvania Avenue Landfill construction entrance, carries 27,000 vehicles per day.

Peak hour volumes at the signalized eastbound Exit 14 ramp intersection (Pennsylvania Avenue) range from 1,070 (AM) to 1,470 (PM) vehicles per hour on weekdays and 875 vehicles per hour Saturday midday. The traffic volumes at the Exit 15 ramps (Fountain Avenue) are lower on weekdays. The eastbound signalized ramp intersection has peak hour traffic volumes ranging from 350 (AM) to 735 (PM) vehicles per hour on weekdays and 930 vehicles per hour on Saturday midday.

These key intersections, along with the surrounding local roadways, operate at LOS A or LOS B during all peak travel periods, indicating that there is light congestion during these times. At the Pennsylvania Avenue site, the nearby intersection of Pennsylvania Avenue and Seaview Avenue operates at LOS C during the busiest hours (typically weekday). Near the Fountain Avenue site, the intersection of Erskine Avenue and Gateway Mall Drive/Seaview Avenue operates at LOS C during the busiest hours (Saturday midday). Although not quantified as part of this study, field observations show that the Belt Parkway operates at a poor level of service during the busiest hours.

Energy Requirements

This section presents the results of the energy study, which evaluated the regional energy use from motor vehicle traffic within the study area for the proposed transportation improvements. The entire study area is addressed as one unit.

The energy analysis estimated the study area's fuel usage from average daily traffic volume and vehicle mileage characteristics. Energy consumption was estimated by dividing the Vehicle Miles of Travel (VMT) by an average fuel efficiency figure for vehicles⁵. The yearly VMT was calculated for existing conditions based on existing traffic volumes and length of roadway segments within the study area. Under existing conditions, the annual fuel consumption for the study area was estimated to be 4.032 billion gallons, as shown in Table 7.

Table 7: Jamaica Bay Study Area Energy Consumption

Roadways	Annual VMT (millions)	Annual Fuel Consumption (millions of gallons)
Belt Parkway (between Queens County Line and Rockaway Parkway)	104	2,857
Flatbush Avenue	11	308
Rockaway Point Boulevard (State Road)	2	56
Beach Channel Drive (at Jacob Riis Park)	4	119
Beach Channel Drive (Rockaway)	13	367
Rockaway Beach Boulevard	3	93
Pennsylvania Avenue	8	232
Total	145	4,032

Source: VHB, Inc.

⁵ Calculation assumed 27.5 miles per gallon for passenger vehicles as stated in the Corporate Average Fuel Efficiency (CAFE) standards set by the National Highway Traffic Safety Administration (NHTSA).

VISITOR USE AND EXPERIENCE

Along with resource management and protection, the NPS works to provide its visitors with a high-quality experience at its parks. The visitor experience starts before visitors reach their destination and continues throughout their stay at the park. *NPS Management Policies 2001* (NPS 2000) addresses some of these elements specifically, and relates many others to the specific resources that make up the visitor experience.

At the Jamaica Bay unit, the visitor experience is spread out across many different sites, including the study areas. Because the study areas are scattered throughout the region, an important element of the visitor experience is the recognition of the NPS sites and the means by which visitors may reach them. Because all of the study areas are so different, they are addressed individually below.

Floyd Bennett Field

Floyd Bennett Field offers one of the most consolidated centers of recreational and educational activities in Gateway. The Ryan Visitor Center, hangars, and runways offer interpretation of the historic airport; the Ecology Village, Environmental Study Center, and historic airplane restoration offer different educational opportunities; and active and passive recreational opportunities are available across the site including hiking, bird watching, fishing, boating, bicycling, jogging, land sailing, and remote control airplane operation.



**Historic aircraft restoration at
Floyd Bennett Field**

In 2003, approximately 1,997,760 people visited the Field. However, this number includes those visitors traveling to the non-NPS sites, as well. In 2003, concessionaires at the Field reported visitation to be approximately 350,500. Therefore, the remaining 1,647,200 visitors' destination cannot be determined; it may be assumed that most of them were NPS visitors. These visitors come to the site throughout the year, although there are several large events during the spring and summer months which attract large crowds to the site. Currently, the NPS is modifying two existing hangars, along the Field's northern border with Flatbush Avenue, to support a new sports complex that will include ice rinks and other indoor activities. This new facility will attract new visitors to the already well-visited site.

Prior to reaching the Field, there is limited signage along Flatbush Avenue to inform the visitor they are passing an NPS site. The lone entrance to the site is located south of the Ryan Visitor Center and other structures that are visible from the road. This entrance serves the site's visitors that use the site for recreational activities, as well as those that visit the site for its educational programs.

Once visitors have entered the Field, there is still little visual recognition of the structures seen from the road, other than a few small signs directing drivers towards different locations within the site. From this point, visitors may use a variety of small roads or wide runways to reach their destination across the site. Many of these attractions are located in the northern or eastern edges of the site, requiring a relatively long drive to reach them.

The Field's partner and tenant users also enter the site in the same manner as the NPS visitors. These partner and tenant users include the USMC, NYPD, and the NYCDOS. The USMC's land assignment is located close to the entrance, allowing these users to quickly access their site. Once on site, the USMC confines all of its activities within the borders of its assigned space. The NYPD has a larger land assignment located along the eastern edge of the Field. NYPD users enter and exit their site at regular intervals throughout the day. To reach their site, the NYPD travels through areas used by NPS administrators, as well as educational programs at the Ecology Village and Environmental Study Center. Once on site, the NYPD activities include high speed driver training along their portion of Runway 12-30, helicopter exercises, and other emergency event training. Finally, the NYCDOS uses their land assignment along the eastern edge of the site as a base for driver training. NYCDOS employees enter the site at the southern entrance, drive down Runway 15-33 and park their vehicles at the intersection of Runway 15-33 and Old Runway 6-24. Along with parking, their activities are not confined to their land assignment. The driver training activities involves driving vehicles of various sizes along the runways and other roads at the site.



Canoeing at the Jamaica Bay Unit

The partner and tenant users at the site also must travel across much of the site to reach their destinations. During this travel, they are intermixed with other site users, and pass through many of the site's popular recreational and educational sites, such as the Grassland Management Areas and Ecology Village.

Jacob Riis Park

In 2003, approximately 762,500 people visited Jacob Riis Park to make use of its beachfront, golf course, and open green space. These areas support swimming and other beach activities, golfing, picnicking, and other organized and unorganized recreational activities. During the summer, Jacob Riis Park hosts several large events that attract enough visitors to nearly fill the 9,000 car parking lot. The NPS is currently renovating the Jacob Riis Park Bathhouse to support additional food and other visitor services. Some of these services will be provided year round, attracting additional visitors to the site.

A large number of these visitors came to the park via the Marine Parkway (Gil Hodges Memorial) Bridge and either live on the north shore of Jamaica Bay or in other parts of the city that are accessible via the Belt Parkway. By accessing the site from this direction, visitors are led directly to the designed entranceway to the site. The curved roads allow the landscape to slowly expand in front of the visitor. This not only presents a picturesque approach, but also allows visitors to recognize the NPS presence at the site, as well as the relationship between the various structures on the site.

While the access and circulation system is designed to primarily accept visitors traveling from the north or west, Jacob Riis Park may also be reached from the east, via Beach Channel Drive. This approach requires travel through the local communities that border the site to the east. Once on Beach Channel Drive, visitors drive past Jacob Riis Park, merge with other traffic, and access the site through the existing circulation network. Initial views of the site from this approach are distant, and often dominated by the large parking lot that sits between Beach Channel Drive and the rest of the site.

Riis Landing

Fort Tilden offers a wide range of educational and recreational opportunities. Visitors may tour the grounds of the former military site and learn about its role in the history of our nation or browse the works of local artists. The site also offers a number of athletic fields for organized sports or unorganized games and open lawn space for other activities. The narrow roads that run through the site are able to support biking, jogging, or walking along with regular vehicular traffic, while the beach offers a prime location for summer activities. The proximity of these sites, along with the abundance of activities, creates a true park-like environment for the visitor. Because many of the sites are outdoors, with out official entrances, there are no solid numbers on visitation to the site.

Visitor activity at the Riis Landing site is currently limited to fishing and occasional, seasonal ferry tours. The tours are operated by NPS partners, with the NPS providing the docking and parking infrastructure. When these tours occur, some visitors may park in the on site parking lot. However, for larger tours, visitors must park in the T-4 lot, or other Fort Tilden parking options, and then walk to the site.

The Coast Guard has recently transferred the remaining buildings on site to NPS ownership. The boat basin will continue to be used by the park and other local agencies, and is also occasionally used as a passenger ferry terminal. The site will also continue to support the United States Park Police (USPP) Marine Unit. Now that the NPS has obtained Station Rockaway, it will move forward with plans to further develop the site. These developments could include a year-round, regular ferry service, a bed and breakfast, and other visitor support facilities.

New NPS Sites at Pennsylvania and Fountain Avenues

Currently, there is no visitor access to the former landfill sites. Access will be restricted until the capping and landscaping activities are complete. When the sites are opened to the public as part of Gateway, they will support a variety of passive recreational activities that will attract a number of new visitors.

OPERATIONS

Compared to many other NPS facilities, the Jamaica Bay unit has a large number of employees. However, when considering the size of the area and the number of services offered, the size of the staff seems relatively small. In some cases, operations are uniform across the unit, while in other cases they are site-specific. Most operations at the Jamaica Bay unit are focused in areas that offer the most visitor services and/or attract the most visitors, as described below.

Floyd Bennett Field

Operations at Floyd Bennett Field are the most elaborate within the study area, as they cover a wide variety of activities that occur on a year-round basis. Operations at the Field include security patrols,



Camping at the Jamaica Bay Unit

issuing of special use permits, overseeing special events, and conducting interpretive and environmental education programs (such as camping programs, guided walks, and historic interpretation). Operations also require staffing the visitor center, resource management, and administrative functions. Resource management activities include mowing grasslands to support bird habitats, as well as managing other lawns and the trails along the North Forty. To support all of these activities, 25 full time equivalencies (FTEs) are dedicated to the site.

Jacob Riis Park

Operations at Jacob Riis Park are primarily confined to seasonal activities that the site supports. This includes operating parking lot toll booths, directing traffic during busy days, and managing concession contracts. The few year-round activities that occur at the site include security patrols, landscaping, and garbage clean up, as well as administrative duties. These activities require approximately 76 seasonal FTEs. During the winter months, there is only one maintenance employee available to address any issues at Jacob Riis Park.

Riis Landing

As there are few visitor opportunities at Riis Landing, operations at the site are minimal. The site serves as the maintenance hub for the Breezy Point District of Jamaica Bay. As a result, there is the potential for a large amount of staff activity at the Landing, but very little is dedicated to the site. The majority of the operations at the site are focused on contact with fishermen and other visitors, security patrols, and the clean up and maintenance of the parking lot and dock area. Overall, these activities require 5 FTEs for full-time maintenance operations and an additional 20 FTEs for seasonal activities.

New NPS Sites at Pennsylvania and Fountain Avenues

Currently, there are no park operations at the former landfill sites. Both sites are still under the supervision of the city as capping activities are completed.