A. INTRODUCTION

According to the *City Environmental Quality Review (CEQR) Technical Manual*, a shadow is defined as the circumstance in which a building or other built structure blocks the sun from the land. An adverse shadow impact is considered to occur when the shadow from a proposed development falls on a publicly accessible open space, historic landscape, or other historic resource if the features that make the resource significant depend on sunlight, or if the shadow falls on an important natural feature and adversely affects its use and/or important landscaping and vegetation. In general, shadows on city streets and sidewalks or on other buildings are not considered significant under CEQR. In addition, shadows occurring within an hour and a half of sunrise or sunset generally are also not considered significant under CEQR.

The Proposed Action would facilitate the construction of a second emergency communications 911 center (the Public Safety Answering Center II [PSAC II]) for the City that would consist of an approximately 640,000 gross square foot (gsf) office building and a 500-space accessory parking garage structure on an approximately 8.75-acre site in the Pelham Parkway area of the Bronx. The proposed development site comprises the northern portion of the Hutchinson Metro Center (HMC) office complex, and is generally bounded by the Pelham Parkway to the north, the Hutchinson River Parkway to the east, an existing 4-story office building to the south, and an Amtrak right-of-way to the west. The proposed office building would contain 14 levels above grade levels with a maximum height of approximately 350 feet tall (elevation of 374 feet), and the proposed garage structure is expected to contain 3 levels with rooftop green space, and have a maximum height of approximately 30 feet (elevation of 55 feet).

In accordance with CEQR guidelines, this chapter provides a shadows assessment, to determine whether the Proposed Action would result in new shadows long enough to reach a publicly accessible open space (except within an hour and a half of sunrise or sunset). There are no historic or natural features within the study area. As discussed below, the Proposed Action would result in new shadows being cast on three existing open space resources, which would not be significant either in terms of frequency or duration.

B. METHODOLOGY

As described in the *CEQR Technical Manual*, a shadow assessment is required if the Proposed Action would facilitate the construction of new structures tall enough for the shadows to reach an open space or historic resource. Also, an assessment is required because the proposed PSAC II development would result in a new structure that would be more than 50 feet high.

The shadow screening analysis was used to identify the study area and those open spaces and historic resources and natural features that could be affected. The purpose of the shadow assessment was to define the extent and duration of additional or new shadows that the proposed development would cast on shadow-sensitive resources. The uses and vegetation in an open space determine its sensitivity to shadows. Uses that rely on sunlight include passive use, such as sitting or sunbathing, and such activities as gardening or children's wading pools. Vegetation requiring sunlight includes the tree canopy and flowering plants. In open spaces where lawns are actively used, the grass also requires extensive sunlight. Four to six hours a day of sunlight is generally a minimum requirement, particularly in the growing season.

Study Area

For purposes of the shadow analysis, a maximum shadow study area (study area) was defined through the screening procedures as set forth in the *CEQR Technical Manual*. The screening procedure notes that the longest shadow that any structure could cast during the year is 4.3 times its height at the beginning and end of the December 21 analysis period when shadows are cast to the northwest and northeast, respectively. The proposed office building would be approximately 350 feet (elevation of 374 feet) in height (including mechanical space on the roof) and would have a maximum shadow length of approximately 1,505 feet. The proposed garage would have a height of 30 feet (elevation of 55 feet) and would have a maximum shadow length of approximately 129 feet. The boundaries of the study area are shown in Figure 4-1, and roughly extend to Astor Avenue to the north, Continental Avenue to the east, East 194th Street to the south, and Stillwell Avenue to the west.

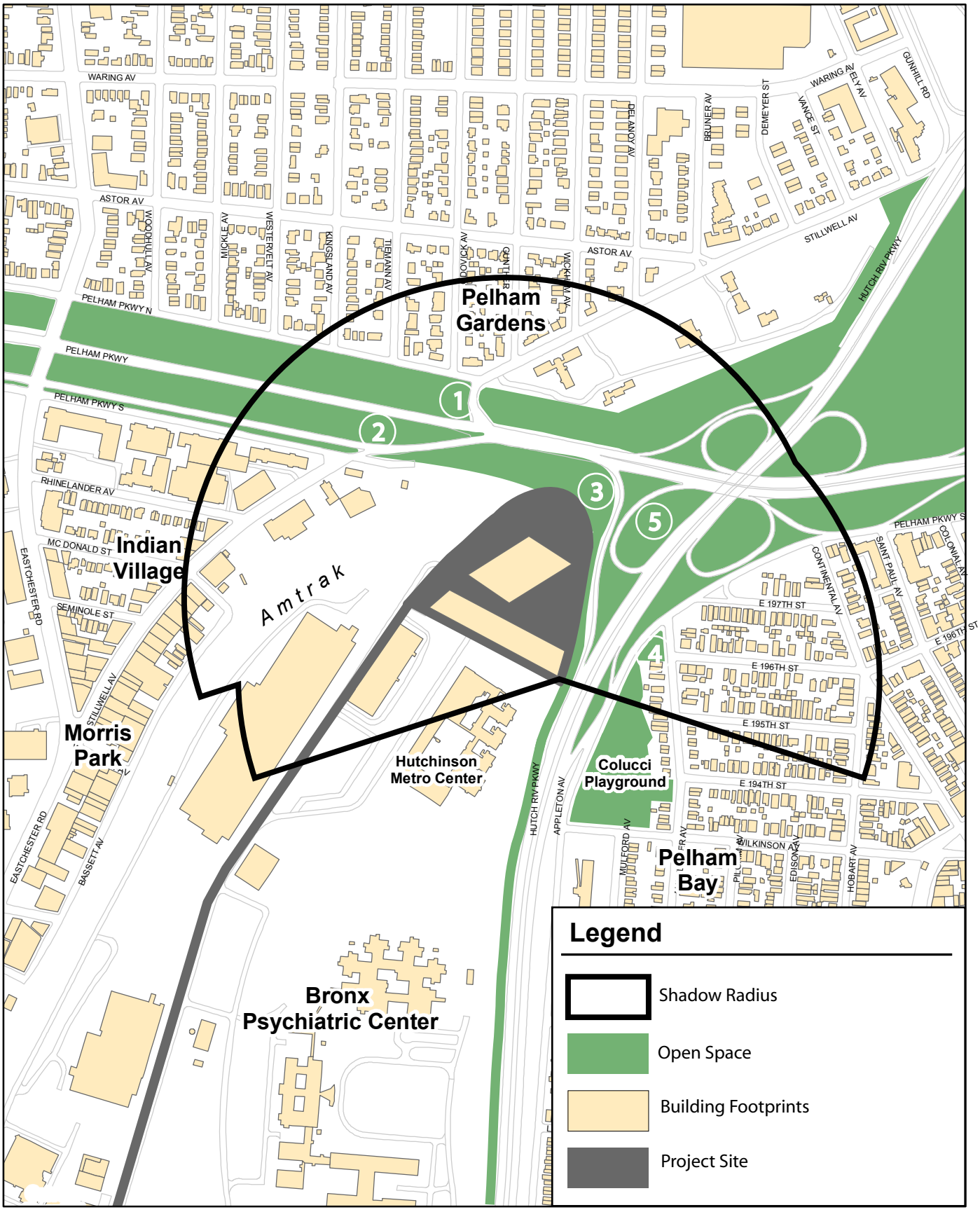
Resources of Concern

In coordination with Chapter 3, "Open Space," publicly accessible open spaces to the north, east, and west of the proposed development were identified, as shadows created by the proposed development could fall in the direction of these resources. These resources are also illustrated in Figure 4-1. According to the *CEQR Technical Manual*, historic resources that need to be considered in a shadows analysis must have sunlight-dependent features such as stained glass windows or historic landscapes. There are no structures of historic/architectural significance located within the vicinity of the proposed development site, nor are there any important natural features, which have sunlight-dependent features.

The identified resources of concern include the associated mapped linear open spaces along the Pelham Parkway, the Hutchinson River Greenway, and Colucci Playground. These are described below.

The Pelham Parkway borders the proposed development site to the north and features associated linear green spaces that contain pedestrian/bicyclist paths along both the north and south sides of the parkway, a bridle path, as well as open grass lawns between the traffic lanes. This open space also features rows of mature trees and is known for its numerous American elm trees (for an aerial view of this open space refer to Figure 1-3 in Chapter 1, "Project Description"). In its entirety, the Pelham Parkway contains approximately 109-acres of linear open space. Further to the west of the site near Bronx Park and the Pelham Parkway station serving the 2 subway line, the linear green space contains formal seating areas and benches. For analysis purposes, this linear open space has been divided into smaller segments based on the use and location of the particular area (refer to Site Numbers 1, 2, 3, and 5 in Figures 4-1 to 4-5). Sites 1 and 2, located to the northwest of the proposed development site, encompasses open green lawns that extend between the service roads of the Pelham Parkway, which are used for sunbathing during the warmer months of the year. Site 3, located directly north of the

Figure 4-1
Shadow Radii for Proposed PASC II Development



proposed development site, comprises a small open space area that features small trees and shrubs, as well as paved pathways. Site 5, located to the northeast of the proposed development, includes the open space areas within the loop ramps of the traffic interchange for the Pelham and the Hutchinson River Parkways that contain grass lawns, mature trees, and asphalt pathways.

The Hutchinson River Greenway, which is also a linear green space, bounds the proposed development site to the east and extends along the west side of the Hutchinson River Parkway (Site 3). In its entirety, the Hutchinson River Greenway extends for approximately three miles from Ferry Point Park in the south to the Pelham Parkway in the north. It features a paved trail for pedestrians and cyclists, as well as landscaped areas and some small trees (refer to Figure 5-11 in Chapter 5, "Urban Design and Visual Resources).

Colucci Playground is an approximately 4-acre public park located approximately 500 feet to the southeast of the proposed development site along the east side of Hutchinson River Parkway (Site 4). Wilkinson Avenue, Mayflower Avenue and the Hutchinson River Parkway roughly bound the park. It features a variety of active recreational amenities including seating areas, picnic and game tables, play equipment, spray showers, basketball backboards, racquetball courts, bocce and a baseball field with bleachers. The northern tip of the playground features a paved seating area with benches that is surrounded by small trees (refer to Figure 5-11 in Chapter 5, "Urban Design and Visual Resources).

C. FUTURE WITHOUT THE PROPOSED ACTION (NO-BUILD CONDITIONS)

In absence of the Proposed Action, the proposed development site is expected to remain undeveloped, and will continue to accommodate accessory parking for the HMC and vacant land, as well as pedestrian connection to the Pelham Parkway. Further to the south of the proposed development site, within the HMC, two new commercial buildings (Towers One and Two of the "Towers at Hutchinson Metro Center") will be constructed. These two commercial buildings are anticipated to be approximately 180 and 268 feet tall, respectively. The longest shadow that would be cast by these new buildings would be approximately 1,152 feet, which would reach as far as the southern portion of the proposed development site. No other development entailing new construction of significant height that would affect baseline shadows is anticipated in the study area in the future without the Proposed Action.

D. FUTURE WITH THE PROPOSED ACTION (BUILD CONDITIONS)

In the future with the Proposed Action, the largely unimproved proposed development site would be developed with a new public facility, PSAC II. The proposed development would consist of an approximately 640,000 gsf office building and 500-space accessory parking garage structure ("proposed PSAC II development"). The proposed office building would be a modern structure containing 14 levels above grade with an overall height of 350 feet (elevation of 374 feet). The accessory garage structure would have three levels with rooftop green space and have a height of approximately 30 feet tall. The longest shadow that could be cast by the proposed development is 1,505 feet.

The shadow analysis considers the times when the proposed development would increase shadows falling on open space or historic resources. As the sun travels across the sky during the day, shadows

fall in a curve on the ground opposite the sun. When the sun rises, shadows fall to the west. As the sun travels across the southern part of the sky throughout the day, shadows move in a clockwise direction until they stretch east, as the sun sets in the west. Midday shadows are always shorter than those at other times of the day because the sun is highest in the sky at that time. Further, because of the tilt of the earth's axis, the angle at which the sun's rays strike the earth varies throughout the year, so that during the summer, the sun is higher in the sky and shadows are shorter than during the winter. Winter shadows, although longest, move the most quickly along their paths (because of the earth's tilt) and do not affect the growing season of outdoor trees and plants.

As directed by the *CEQR Technical Manual*, shadow analyses were performed for the proposed development, for four representative days of the year: March 21/September 21, the equinoxes; May 6, the midpoint between the summer solstice and the equinox (and equivalent to August 6); June 21, the summer solstice and the longest day of the year; and December 21, the winter solstice and shortest day of the year. The *CEQR Technical Manual* defines the temporal limits of a shadow analysis period to fall from an hour and a half after sunrise to an hour and a half before sunset. The results of the shadow analysis on the three resources of concern are summarized in Table 4-1 and discussed below. The enter times shown in the table represent the time that shadows first hit any part of the resource being considered, and the exit times represent the time that shadows would leave that resource completely.

TABLE 4-1
Results of Shadow Analysis

Site No.	Resource	Shadow Increment June 21	Shadow Increment May 6/August 6	Shadow Increment March 21/September 21	Shadow Increment December 21
1	Pelham Parkway Malls to the north of Pelham Parkway E	None.	None.	None.	Enter: 8:51 AM Exit: 11:44 AM Duration: 2 hrs. 53 mins.
2	Pelham Parkway Mall to the south of Pelham Parkway W	None.	None.	None.	Enter: 8:51 AM Exit: 11:40 AM Duration: 2 hrs. 49 mins.
3*	Mapped Open Space to the north of proposed development site and the Hutchinson River Greenway	Enter: 12:55 PM Exit: 6:01 PM Duration: 5 hrs. 6 mins.	Enter: 12:29 PM Exit: 5:18 PM Duration: 4 hrs. 49 mins	Enter: 11:11 AM Exit: 4:29 PM Duration: 5 hrs. 18 mins	Enter: 10:47 AM Exit: 2:53 PM Duration: 4 hrs. 6 mins
4	Colucci Playground	Enter: 4:59 PM Exit: 6:01 PM Duration: 1 hr. 2 mins.	None.	None.	None.
5	Mapped Open Space within the traffic interchange	Enter: 1:49 PM Exit: 6:01 PM Duration: 5 hrs. 10 mins.	Enter: 1:45 PM Exit: 5:18 PM Duration: 3 hrs. 33 mins.	Enter: 1:49 PM Exit: 4:29 PM Duration: 2 hrs. 40 mins.	Enter: 2:09 PM Exit: 2:53 PM Duration: 44 mins.

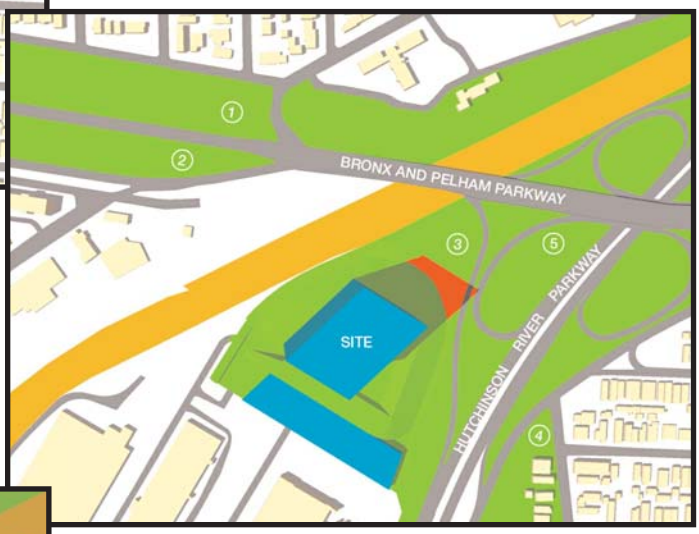
Notes:
Times are Eastern Standard times.
* The public open space resource indicated by Site No. 3 encompasses the associated mapped open space of the Pelham Parkway, which abuts the proposed development site to the north, and the portion of the Hutchinson River Greenway, which abuts the proposed development site to the east.

June 21

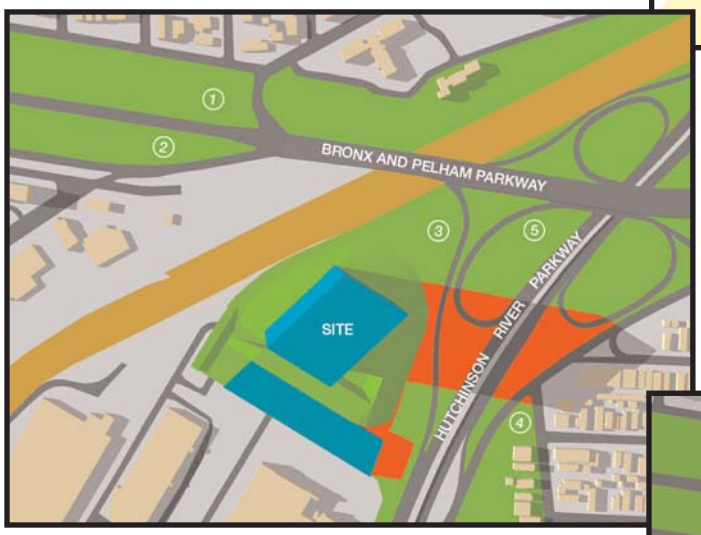
On the longest day of the year, the sun is most directly overhead and shadows are shortest. Incremental shadows created by the proposed PSAC II development during representative afternoon and evening hours on this date are depicted in Figure 4-2. The proposed development would cast incremental shadows on the mapped open space directly north of the site and the Hutchinson River Greenway, Colucci Playground, and on the mapped open space areas within the loop ramps of the traffic interchange for the Pelham and the Hutchinson River Parkways. No incremental shadows would fall on the Pelham Parkway malls to the northwest of the proposed development site.

Figure 4-2
Shadow Diagram- June 21

1:10 PM



2:00 PM



5:15 PM

6:01 PM

LEGEND

Proposed PSAC II Development

Shadow Increment

Open Space

As indicated in Table 4-1, the proposed development's incremental shadow would begin to fall on the mapped open space area directly to the north of the proposed development site in the early afternoon at roughly 12:55 PM, moving rapidly over this open space resource throughout the afternoon. By roughly 1:30 PM, the proposed development's shadow would begin to fall on the Hutchinson River Greenway and bike path, extending along the eastern edge of the site, until the end of the analysis period (refer to Figure 4-2). The northern tip of Colucci Playground, which features a paved seating area with benches, would be cast in shadow by the proposed PSAC II development in the late afternoon and early evening from roughly 4:59 PM until the end of the analysis period for approximately one hour and two minutes. The mapped open space areas of the Pelham Parkway, which are located within the loop ramps of the Pelham and the Hutchinson River Parkways traffic interchange, would be cast in shadow by the proposed development throughout most of the afternoon and early evening hours for approximately 5 hours and 6 minutes (refer to Figure 4-2).

May 6

On May 6 (and August 6), which is halfway between the solstice and equinox, the proposed PSAC II development would cast incremental shadows on the mapped open space directly north of the site and the Hutchinson River Greenway and on the mapped open space areas within the loop ramps of the traffic interchange for the Pelham and the Hutchinson River Parkways. No incremental shadows would fall on the Pelham Parkway malls to the northwest of the proposed development site, or on Colucci Playground. Incremental shadows created by the proposed development are depicted in Figure 4-3.

As indicated in Table 4-1, the proposed development would begin to cast incremental shadows on the mapped open space directly north of the site and the Hutchinson River Greenway in the early afternoon at 12:29 PM, moving rapidly over this open space resource throughout the afternoon. By roughly 2:00 PM, the proposed development's shadow would begin to fall on the Hutchinson River Greenway and bike path, extending along the eastern edge of the site, until the end of the analysis period. Incremental shadows from the proposed development would begin to fall on the mapped open space areas within loop ramps of the Pelham and the Hutchinson River Parkways traffic interchange during the mid-afternoon at 1:45 PM until the end of the analysis period at 5:18 PM for approximately 3 hours and 33 minutes.

March 21

On the spring (and fall) equinox, as shadows grow in length, the proposed PSAC II development would cast incremental shadows on the mapped open space directly north of the site and the Hutchinson River Greenway and on the mapped open space areas within the loop ramps of the traffic interchange for the Pelham and the Hutchinson River Parkways (see Figure 4-4). No incremental shadows would fall on the Pelham Parkway malls to the northwest of the proposed development site, or on Colucci Playground.

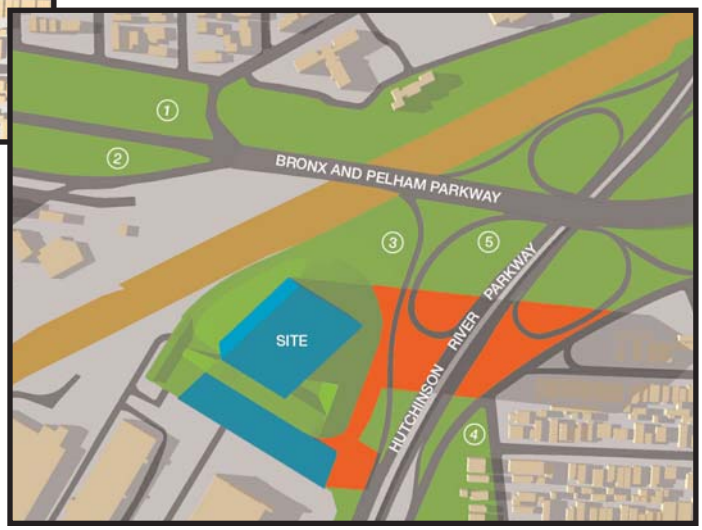
As indicated in Table 4-1, the proposed development would begin to cast incremental shadows on the mapped open space directly north of the site at 11:11 AM, moving rapidly over this open space throughout the late morning and early afternoon. By roughly 2:30 PM, the proposed development's shadow would begin to fall on the Hutchinson River Greenway and bike path, extending along the eastern edge of the site, until the end of the analysis period. Incremental shadows from the proposed development would begin to fall on the mapped open space areas within loop ramps of the Pelham and the Hutchinson River Parkways traffic interchange in the mid-afternoon at 1:49 PM until the end of the analysis period at 4:29 PM for approximately 2 hours and 40 minutes.

Figure 4-3
Shadow Diagram- May 6

12:45 PM

1:30 PM

3:30 PM



5:18 PM

LEGEND

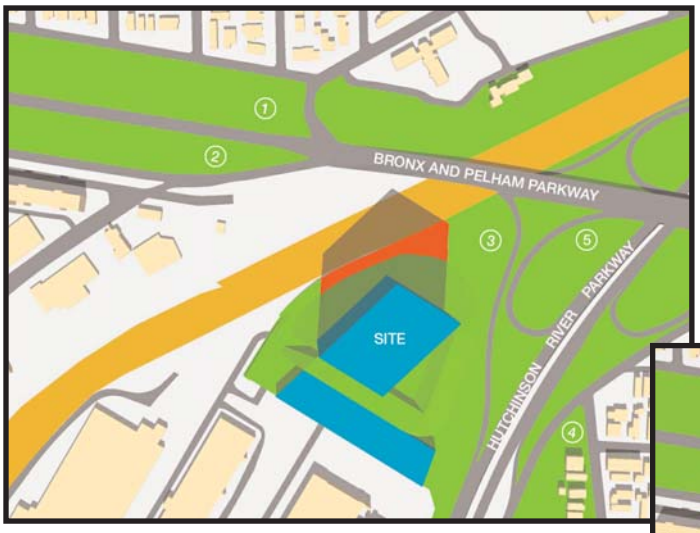
Proposed PSAC II Development

Shadow Increment

Open Space

Figure 4-4

Shadow Diagram- March 21



12:00 PM

1:30 PM

3:30 PM

4:29 PM

LEGEND

Proposed PSAC II Development

Shadow Increment

Open Space

December 21

On the shortest day of the year, the shadows are the longest but move rapidly. The incremental shadows created by the proposed PSAC II development during representative morning and afternoon hours on this date are depicted in Figure 4-5. As described in Table 4-1, the proposed development would cast incremental shadows on the Pelham Parkway Malls, the mapped open space directly north of the proposed development, the Hutchinson River Greenway, and the mapped open space areas within the loop ramps of the traffic interchange for the Pelham and the Hutchison River Parkways. No incremental shadows would fall on Colucci Playground.

On this date, the Pelham Parkway Malls, located to the northwest of the proposed development site, would be cast in incremental shadow by the proposed PSAC II development throughout the mid-morning hours from roughly 8:51 AM to 11:44 AM for slightly less than 3 hours. The proposed development would also cast incremental shadows on the public open space to the north of the site for approximately 4 hours and 6 minutes throughout the late morning and afternoon hours. As shown in Figure 4-5, only a small portion of the Hutchinson River Greenway, which extends along the eastern edge of the proposed development, would only be cast in shadow towards the end of the analysis period. In addition, the proposed development would cast incremental shadows on the mapped open space areas within the loop ramps of the traffic interchange for the Pelham and the Hutchison River Parkways for approximately 44 minutes at the end of the analysis period.

Assessment

As discussed previously, according to the *CEQR Technical* Manual, a shadow is identified as the circumstance in which a building or other built structure blocks sun from the land. An adverse shadow impact is considered to occur when the shadow from the proposed development falls on a publicly accessible open space, historic landscape, or other historic resource if the features that make the resource significant depend on sunlight, or if the shadow falls on an important natural feature and adversely affects its use and/or important landscaping and vegetation. The uses and vegetation in an open space establish its sensitivity to shadows. Uses that rely on sunlight include passive use, such as sitting or sunning, and such activities as gardening, or children's wading pools and sprinklers. Vegetation requiring sunlight includes tree canopy and flowering plants. Where lawns are actively used, the turf also requires extensive sunlight. For these activities and plants, four to six hours a day of sunlight, particularly in the growing season (defined as April to October), is often a minimum requirement. In general, shadows on city streets and sidewalks and on other buildings are not considered significant under CEQR.

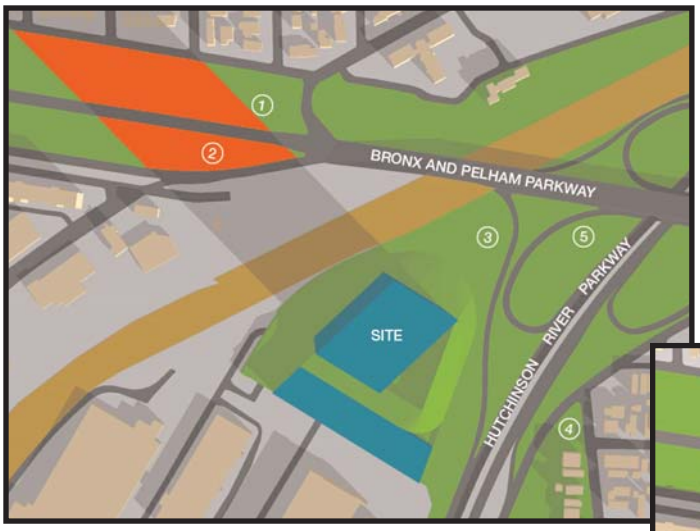
The proposed PSAC II development would cast incremental shadows on all of the resources of concern identified within the 1,505-foot radius of the proposed development site during at least one of the analysis periods. The largest shadows would be cast during the winter months, whereas those cast during the summer would be minimal in size and of the shortest duration. The following provides an assessment of the affect of the proposed development’s incremental shadows on each of the resources of concern.

Pelham Parkway Malls

The Pelham Parkway malls (Sites 1 and 2) are located to the northwest of the proposed development to the west of the Amtrak right-of-way between the service roads for the Pelham Parkway. This space consists of two large rectangular center plots that contain a few small trees and open grassy lawns, which are used for sunbathing during the warmer months of the year. This resource does not feature any formal recreational amenities (i.e., benches, seating areas, tables etc.).

Figure 4-5

Shadow Diagram- December 21



8:51 AM

11:25 AM

2:00 PM

2:53 PM

LEGEND

Proposed PSAC II Development

Shadow Increment

Open Space

The proposed PSAC II development would cast incremental shadows on the Pelham Parkway malls for a brief period during the morning hours on the December analysis day. The proposed development's shadow would leave this resource by midday. The proposed development would not cast any shadows on the Pelham Parkway malls during the June, May, and March analysis days. Given the short duration, the small area affected, and the season that the incremental shadows are cast upon the Pelham Parkway malls, there would be no significant adverse impacts to this resource.

Open Spaces Abutting the Proposed Development Site

Abutting the proposed development site to the north is a small open space area, which is part of the mapped open space of the Pelham Parkway. It is a vegetated area that is not well maintained and features a grass lawn and small trees and shrubs, as well as a narrow asphalt pathway. There are no formal seating areas and the space is very lightly used. The Hutchinson River Greenway abuts the proposed development site to the east, and is directly connected to the linear open spaces of the Pelham Parkway. It is a narrow linear open space that extends along the west side of the Hutchinson River Parkway and features a paved trail for pedestrians and cyclists and landscaped areas with a few small trees. It is in good condition and well maintained.

The proposed PSAC II development would cast incremental shadows on these open space resources for extended periods of the late morning and/or afternoon during each of the four analysis dates. As discussed above, the duration of incremental shadows falling on this mapped open space would be more than 4 hours during each of the analysis dates. Incremental shadows would range in total duration from 4 hours and 6 minutes on December 21 to 5 hours and 18 minutes on March 21. According to the *CEQR Technical Manual*, vegetation (including tree canopies and plantings) requires a minimum of 4 to 6 hours a day of sunlight, particularly during the growing season (i.e., between April and October). As the sun rises at approximately 6:45 AM on June 21 and 7:15 AM on May 6, this open space would receive 5 or more hours of sunlight before the incremental shadows of the proposed development would enter the resource on either analysis date. This open space would not receive 4 or more hours of sunlight prior to the incremental shadows of the proposed development entering the resource on either the March 21 or December 21 analysis days. However, as shadows travel throughout the day, following the sun's path in the sky, they would not cover any substantial portion of this open space for an extended amount of time. The proposed development would cast a band of shadow that moves across the open space throughout the afternoon on June 21, May 6, March 21 and September 21 analysis days, and therefore, would not affect any particular area for an extended amount of time. In addition, as the Hutchinson River Green is a narrow linear green space that extends along the eastern edge of the proposed development site, incremental shadows would generally begin to fall on the Hutchinson River Greenway in the mid-to late afternoon periods until the end of the analysis period (refer to Figures 4-2 through 4-5). Therefore, the Hutchinson River Greenway would experience sunlight for the entire morning and most of the early afternoon hours during all four of the analysis periods. It is expected that this open space would still obtain adequate sunlight for its vegetation, and there would not be significant adverse impacts. Furthermore, the incremental shadows created by the proposed development are not expected to substantially reduce the usability of this open space.

Colucci Playground

Colucci Playground (Site 4) is located on the east side of Hutchinson River Parkway, directly southeast of the proposed development site. It comprises approximately 4-acres of parkland and contains a variety of active and passive recreational amenities, including children's play equipment, seating areas, tables, basketball courts, bocce, and a baseball diamond.

The proposed PSAC II development would cast incremental shadows on the northern tip of Colucci Playground, which features a paved seating area with benches surrounded by shade trees, for a brief period during the late afternoon/early evening on the June analysis day. The proposed development would not cast shadow on Colucci Playground on the May/August, March/September and December analysis days. Due to the short durations and small size of the incremental shadows, there would be no significant adverse impacts to Colucci Playground. Incremental shadows would be cast on Colucci Playground for slightly more than one hour on the June analysis day, and therefore, are not expected to substantially reduce the usability of this open space.

Open Space within Traffic Interchange for the Pelham and the Hutchinson River Parkways

To the northeast of the proposed development site are mapped open space areas within the loop ramps of the Pelham and the Hutchinson River Parkways (Site 5). This open space features grass lawns, trees, and a few narrow asphalt pathways. There are no formal seating areas. This space is very lightly used.

The proposed PSAC II development would cast incremental shadows on the mapped open space areas within the loop ramps of the Pelham and the Hutchinson River Parkways for extended periods of the afternoon during each of the four analysis dates. According to the *CEQR Technical Manual*, vegetation (including tree canopies and plantings) requires a minimum of 4 to 6 hours a day of sunlight, particularly during the growing season (i.e., between April and October). Excluding the June 21 analysis day, the duration of incremental shadows falling on this mapped open space would be less than 4 hours (refer to Table 4-1). On June 21, the proposed development would cast incremental shadows on the mapped open space areas within the loop ramps of the Pelham and the Hutchinson River Parkways for approximately 5 hours and 10 minutes throughout most of the afternoon until the end of the analysis period. As the sun rises at approximately 6:45 AM on June 21, this open space would receive more than 6 hours of sunlight before the incremental shadows of the proposed development would enter the resource. Similarly during each of the other analysis dates, the mapped open space areas within the loop ramps of the Pelham and the Hutchinson River Parkways would receive more than 6 hours of sunlight prior to the incremental shadows of the proposed development entering the resource. Therefore, this open space would still obtain adequate sunlight for its vegetation, and there would not be significant adverse impacts. Furthermore, the incremental shadows created by the proposed development are not expected to substantially reduce the usability of this open space.

E. CONCLUSION

Overall, the Proposed Action would not result in significant adverse shadow impacts on open space resources in the surrounding area. The incremental shadows from the proposed PSAC II development would reach portions of the associated linear open spaces of the Pelham Parkway and the Hutchison River Greenway during all four representative analysis periods, and Colucci Playground during the June analysis period.

Although the proposed PSAC II development would cast incremental shadows on the linear open spaces of Pelham Parkway, located directly north and northeast of the proposed development site, for extended amounts of time during the late morning and/or afternoon on each of the four analysis periods, these open space areas are very lightly used, contain open grass lawns, trees and a few narrow asphalt pathways, and do not feature any recreational amenities, such as benches, seating areas, tables,

etc. The linear open spaces of the Pelham Parkway to the northwest of the site, which consist of two large rectangular center plots that are used for sunbathing during the warmer months of the year, would only be cast in incremental shadow by the proposed development for a brief period (slightly less than three hours) during the morning hours on the December 21 analysis day. As shadows travel throughout the day, following the sun's path in the sky, they would move in a band and not cover any substantial portion of the Pelham Parkway at any given time. The proposed development's incremental shadows would generally be cast mostly upon minimally utilized portions of the Pelham Parkway, and therefore, there would be no significant adverse shadow impacts to the linear open spaces of Pelham Parkway.

The proposed PSAC II development would also cast incremental shadows on the Hutchinson River Greenway on each of the four analysis periods during the afternoon. As the Hutchinson River Greenway is a narrow linear open space that extends along the eastern edge of the proposed development site, the proposed PSAC II development would generally begin to cast incremental shadows on this open space in the mid-to late afternoon period until the end of the analysis period. Therefore, the Hutchinson River Greenway would experience sunlight for the entire morning and most of the early afternoon hours during all four of the analysis periods. It is expected that this open space would still obtain adequate sunlight for its vegetation, and there would not be significant adverse shadow impacts. Furthermore, the incremental shadows created by the proposed development are not expected to substantially reduce the usability of this open space, which features landscaping and a narrow asphalt pathway for pedestrians and cyclists.

In addition, the proposed PSAC II development would also cast incremental shadows on the northern tip of Colucci Playground, which features a paved seating area with benches surrounded by shade trees, for a brief period during the late afternoon/early evening on the June analysis day. Due to the short duration (less than an hour) and small size of the incremental shadows, there would be no significant adverse shadow impacts to Colucci Playground.

Overall, there would be no noticeable reduction in the usability of any open space resources as a result of incremental shadows created by the Proposed Action. As there are also no historic resources or natural features within the shadow radius, there are no significant adverse impacts anticipated as a result of shadows created by the Proposed Action.