HERKIMER-WILLIAMS EIS
Chapter 6: Shadows

A. INTRODUCTION

This chapter assesses the potential for the Proposed Actions to result in incremental shadows long enough to reach any nearby publicly accessible open spaces or other sunlight-sensitive resources. According to the 2021 *City Environmental Quality Review* (CEQR) *Technical Manual*, a shadows assessment is appropriate if a project would either (a) result in structures (or additions to existing structures including the addition of rooftop mechanical equipment) of 50 feet or more; or (b) be located adjacent to, or across the street from, a sunlight-sensitive resource. As described in **Chapter 1, "Project Description,"** approval of the Proposed Actions would facilitate the development of five new buildings taller than 50 feet in height (on Projected Development Sites 1B, 1C, 1D, 1E and Projected Development Site 2) that would also be located adjacent to Jewel Square, a sunlight-sensitive resource. As such, a detailed shadows analysis was prepared in accordance with 2021 *CEQR Technical Manual* guidance to determine the potential for the Proposed Actions to result in significant adverse impacts on sunlight-sensitive resources.

B. PRINCIPAL CONCLUSIONS

The Proposed Actions would result in incremental shadow coverage (i.e., additional, or new, shadow coverage) on portions of six sunlight-sensitive resources: the Eastern Parkway Greenstreet, Callahan-Kelly Playground, Jewel Square, the Jamaica Avenue Greenstreet, the Jackie Robinson Parkway Greenstreets, and Cemetery of the Evergreens. Incremental shadow coverage cast on these six sunlight-sensitive resources would not affect the utilization, enjoyment, or character of these sunlight-sensitive resources and all vegetation would continue to receive appropriate durations of direct sunlight throughout the growing season.

C. METHODOLOGY

According to the 2021 *CEQR Technical Manual*, the longest shadow a structure will cast in New York City, except for periods close to dawn or dusk, is 4.3 times its height. For actions or projects resulting in structures less than 50 feet tall, a shadows analysis is generally not necessary, unless the structures are adjacent to a park, historic resource, or important natural feature (if the feature that makes the structure significant depends on sunlight).

First, a preliminary screening assessment must be conducted to ascertain whether shadows resulting from an action or project could reach any sunlight-sensitive resource at any time of year. The 2021 *CEQR Technical Manual* defines sunlight-sensitive resources as those resources that depend on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity. The following are considered sunlight-sensitive resources:

- *Public open space* (e.g., parks, beaches, public outdoor pools, playgrounds, plazas, schoolyards, greenways, and landscaped medians with seating). Pursuant to Chapter 7, Section 100 of the 2021 *CEQR Technical Manual*, open space that is accessible to the public on a constant and regular basis for active and passive recreation, including for designated daily periods, is defined as "public" and

analyzed under CEQR. The use of a public open space establishes its sensitivity to shadows. This sensitivity is assessed for both (1) warm-weather dependent features, such as wading pools and sandboxes, or vegetation that could be affected by loss of sunlight during the growing season (i.e., March through October); and (2) features, such as benches, that could be affected by a loss of winter sunlight. Open space uses that rely on sunlight include passive uses, such as sitting or sunning areas; active uses, such as playfields or paved courts; and such activities as gardening, or children's wading pools and sprinklers. Where lawns are actively used, the turf may require extensive sunlight. Vegetation requiring direct sunlight includes the tree canopy, flowering plants, and plots in community gardens. Generally, six to eight hours a day of direct sunlight, particularly in the growing season, is a minimum requirement. However, certain plantings and vegetation can tolerate partial sun, with a reduced minimum requirement of four to six hours of direct sunlight. Examples of areas that can tolerate partial sun are established tree canopies, shrubs or perennials.

- *Features of historic architectural resources that depend on sunlight for their enjoyment by the public*. Only the sunlight-sensitive features are considered, as opposed to the entire architectural resource. Sunlight-sensitive features include the following: design elements that are part of a recognized architectural style that depends on the contrast between light and dark (e.g., deep recesses or voids, such as open galleries, arcades, recessed balconies, deep window reveals, and prominent rustication); elaborate, highly carved ornamentation; stained glass windows; exterior building materials and color that depend on direct sunlight for visual character (e.g., the polychromy [multicolored] features found on Victorian Gothic Revival or Art Deco facades); historic landscapes, such as scenic landmarks, including vegetation recognized as an historic feature of the landscape; and structural features for which the effect of direct sunlight is described as playing a significant role in the structure's importance as an historic landmark.

- *Natural resources where the introduction of shadows could alter the resource's condition or microclimate*. Such resources could include community gardens, surface water bodies, wetland resources, upland resources, or significant, sensitive, or designated resources, such as coastal fish and wildlife habitats. Community gardens are defined as community gardens that are City-owned and licensed through the NYC Parks GreenThumb program, or Non-City-owned community gardens that are owned by land trust organizations or other governmental entities and are currently registered with NYC Parks GreenThumb.

- *Other resources*. Greenstreets (planted areas within the unused portions of roadbeds that are part of the Greenstreets program).

According to the 2021 *CEQR Technical Manual*, the following are not considered to be sunlight-sensitive resources and their assessment for shadow impacts is not warranted:

- City streets and sidewalks (except when improved as part of a Greenstreet).

- Buildings or structures other than those defined above as historic architectural resources.

- Private open space (e.g., front and back yards). Pursuant to Chapter 7, Section 100 of the 2021 *CEQR Technical Manual*, open space that is not publicly accessible or restricts public accessibility to a limited number of users (e.g., requiring membership) and/or is not publicly available on a regular and constant basis, is defined as "private."

- Project-generated open space. Shadows on project-generated open space are not considered significant under CEQR. However, when the condition of the project-generated open space is included as part of the qualitative open space analysis in Chapter 7, "Open Space," of the 2021 *CEQR Technical Manual*, a discussion of how shadows would affect the new project-generated open space may be warranted.

The preliminary shadow screening assessment consists of three tiers of analysis. The first tier determines a simple radius around a particular site representing the longest shadow that could be cast by a project. If there are sunlight-sensitive resources within the radius, the analysis proceeds to the second tier, which reduces the area that could be affected by project-generated shadows by accounting for a specific range of angles south of a given site that can never receive shade in New York City due to the path of the sun in the northern hemisphere. If the second tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a third tier of screening analysis further refines the area that could be reached by new shadows by looking at specific representative days of the year and determining the maximum extent of shadow coverage over the course of each representative day.

If the third tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a detailed shadows analysis is required to determine the extent and duration of the incremental shadow – or the additional, or new, shadow that a building or other built structure resulting from a project would cast on a sunlight-sensitive resource during the year. Incremental shadows are determined by establishing a baseline condition (i.e., the No-Action condition) and comparing it to the future condition resulting from a project (i.e., the With-Action condition), thus illustrating the shadows cast by existing or future buildings and distinguishing the additional (incremental) shadows cast by a project. In accordance with 2021 *CEQR Technical Manual* guidance, shadows on sunlight-sensitive resources of concern were modeled for four representative days of the year. For the New York City area, the months of interest for an open space resource encompass the growing season (i.e., March through October) and one month between November and February representing a cold-weather month (usually December). Representative days for the growing season are generally the March 21 vernal equinox (or the September 21 autumnal equinox, which is approximately the same), the June 21 summer solstice, and a spring or summer day halfway between the summer solstice and equinoxes, such as May 6 or August 6 (which are approximately the same). For the cold weather months, the December 21 winter solstice is included to demonstrate conditions when open space users rely most heavily on available sunlight warmth. As these months and days are representative of the full range of possible shadows, they are also used for assessing shadows on sunlight-sensitive resources.

The 2021 *CEQR Technical Manual* defines the temporal limits of a shadows analysis period to fall from an hour and a half after sunrise to an hour and a half before sunset.

The detailed analysis provides the data needed to assess the shadow impact. The effects of the new shadows on the sunlight-sensitive resources are described, and their degree of significance is considered. The results of the analysis are documented with graphics, a table of incremental shadow durations, and narrative text. As described in the 2021 *CEQR Technical Manual*, an incremental shadow is generally not considered significant when its duration is no longer than 10 minutes at any time of year and the resource continues to receive substantial direct sunlight. A significant shadow impact generally occurs when an incremental shadow of 10 minutes or longer falls on a sunlight-sensitive resource and results in one of the following:

- *Vegetation:* A substantial reduction in sunlight available to sunlight-sensitive features of the resource to less than the minimum time necessary for their survival (when there would be sufficient sunlight

in the future without the project) or a reduction in direct sunlight exposure where the sensitive features of the resource are already subject to substandard sunlight (i.e., less than the minimum time necessary for their survival).

- *Historic and cultural resources:* A substantial reduction in sunlight available for the enjoyment or appreciation of the sunlight-sensitive features of an historic or cultural resource.
- *Open space utilization:* A substantial reduction in the usability of open space as a result of increased shadow, including information regarding anticipated new users and the open space's utilization rates throughout the affected time periods.
- *For any sunlight-sensitive feature of a resource:* Complete elimination of all direct sunlight on the sunlight-sensitive feature(s) of the resource, when the complete elimination results in substantial effects on the survival, enjoyment, or, in the case of open space or natural resources, the use of the resource.

In general, a significant adverse shadow impact occurs when the incremental shadow added by a project falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight exposure, thereby significantly altering the public's use and enjoyment of the resource or threatening the viability of vegetation or other resources.

D. PRELIMINARY SCREENING

Tier 1 Screening Assessment

According to the 2021 *CEQR Technical Manual*, the longest shadow that a structure will cast in New York City, except for periods close to dawn or dusk, is 4.3 times its height.

As described in "**Chapter 1, Project Description,"** both the Proposed Development and the Alternate Community Facility Scenario would comprise the same maximum bulk envelope permitted by the LSGD Special Permit. The maximum permitted development envelope is slightly larger than the space that would be occupied by the Proposed Development or the Alternate Community Facility Scenario. As the maximum development envelope is slightly larger than the Proposed Development or the Alternate Community Facility Scenario, the potential effects associated with the maximum development envelope are considered herein.

The Project Area is comprised of several projected development sites including Projected Development Site 1A (Block 1555, Lot 19), Projected Development Site 1B (Block 1576, Lots 1 and 34), Projected Development Site 1C (Block 1577, Lots 17 and 26), Projected Development Site 1D (Block 1577, Lots 32, 35, 51, and 53), and Projected Development Site 1E (Block 1577, Lots 1, 7, 56, and 58). Approval of the Proposed Actions would facilitate the development of five new buildings taller than 50 feet in height on Projected Development Sites 1B, 1C, 1D, 1E, and 2. **Table 6-1** displays the proposed maximum permitted building heights, as well as the proposed maximum bulkhead heights for Projected Development Sites 1B, 1C, 1D, 1E, and 2.

TABLE 6-1
Maximum Building and Bulkhead Heights Under the Proposed Actions

Projected Development Site	Maximum Permitted Building Height (ft)	Maximum Bulkhead Height (ft)	Maximum Shadow Radius (ft)
1B	265’	295’	1,269’
1C	300’	330’	1,419’
1D	350’	380’	1,634’
1E	280’	320’	1,376’
2	175’	205’	882’

As shown in **Table 6-1**, the largest maximum shadow radius for the With-Action condition (1,634’) was determined using the maximum permitted development envelope bulkhead height for Projected Development Site 1D (380’) under both the Proposed Development and Alternate Community Facility Scenario.

A base map was prepared (refer to **Figure 6-1**) for the Project Area, which identifies all potentially sunlight-sensitive resources within the combined maximum shadow radius for Projected Development Sites 1B, 1C, 1D, 1E, and 2. As shown in **Figure 6-1** and **Table 6-2**, within the longest shadow study area, there are eight potentially sunlight-sensitive resources as defined by the 2021 *CEQR Technical Manual*. Therefore, further screening was warranted to determine whether these resources could be affected by project-generated shadows.

Tier 2 Screening Assessment

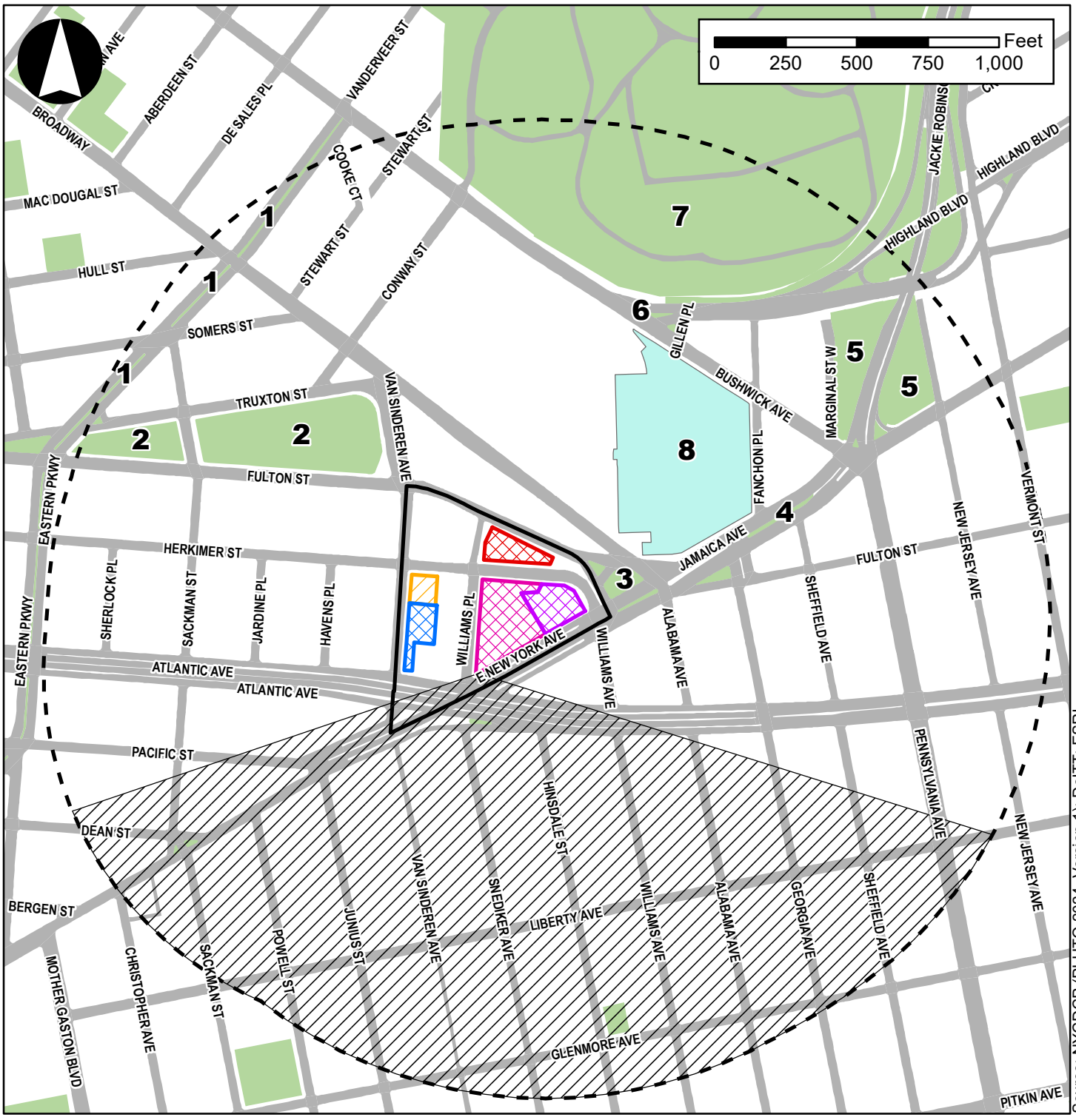
Due to the path of the sun across the sky in the northern hemisphere, no shadow can be cast in a triangular area south of any given site. In New York City, this area lies between -108 and +108 degrees from true north. The purpose of the Tier 2 screening assessment is to determine whether the potentially sunlight-sensitive resources identified in the Tier 1 screening assessment are located within portions of the longest shadow study area that can receive shade from the With-Action condition.

Figure 6-1 provides a base map illustrating the results of the Tier 2 screening assessment (i.e., the portion of the longest shadow study area lying within -108 degrees from true north and +108 degrees from true north as measured from the southernmost corner of Projected Development Site 1E.

As shown in **Table 6-2**, there are seven sunlight-sensitive open space resources that warrant further assessment based on the Tier 2 screening assessment. Callahan-Kelly Playground, Jewel Square, and Cemetery of the Evergreens are public open space resources[1], while the Eastern Parkway Greenstreets, the Jamaica Avenue Greenstreet, the Jackie Robinson Parkway Greenstreets, and the Evergreen Greenstreets are Greenstreets without seating designated as “other” sunlight-sensitive open space resources. According to the 2021 *CEQR Technical Manual*, Greenstreets (planted areas within the unused portions of roadbeds that are part of the Greenstreets program) are considered sunlight-sensitive.

[1] In addition to being classified as a public open space resource, Cemetery of the Evergreens is also an historic and cultural resource listed on the State/National Registers of Historic Places (S/NR).

Tier I and II Screening Assessments



Legend

- Project Area
- Projected Development Site 1B
- Projected Development Site 1C
- Projected Development Site 1D
- Projected Development Site 1E
- Projected Development Site 2
- Tier 1 Screening Assessment: Longest Shadow Study Area
- Tier 2 Screening Assessment: Area That Cannot Be Shaded
- Open Space
- East New York Bus Depot Shops and Garage (S/NR-Eligible)

TABLE 6-2
Resources Warranting Further Analysis Based on Tier 2 Screening Assessment

Map ID[1]	Resources	Sunlight-Sensitive (Yes/No)
	Resources	
1	Eastern Parkway Greenstreets	Yes
2	Callahan-Kelly Playground	Yes
3	Jewel Square	Yes
4	Jamaica Avenue Greenstreet	Yes
5	Jackie Robinson Parkway Greenstreets	Yes
6	Evergreen Greenstreets	Yes
7	Cemetery of the Evergreens (S/NR-Listed)	Yes
8	East New York Bus Depot Shops and Garage (S/NR-Eligible)	No

Note:
[1] The resources are identified in **Figure 6-1**.

As shown in **Table 6-2**, the S/NR-eligible East New York Bus Depot Shops and Garage and the S/NR-listed Cemetery of the Evergreens are two historic and cultural resources identified in **Table 6-2**. The S/NR-listed Cemetery of the Evergreens is also considered a sunlight-sensitive public open space resource and warrants further assessment. However, the S/NR-eligible East New York Bus Depot Shops and Garage does not warrant further assessment based on the Tier 2 screening assessment. According to the 2021 *CEQR Technical Manual*, only the sunlight-sensitive features of historic and cultural resources should be considered, as opposed to the entire resource. The S/NR-eligible East New York Bus Depot Shops and Garage that can be shaded by the With-Action condition was determined to not contain sunlight-sensitive features such as stained glass windows and does not depend on direct sunlight for its visual character. The New York City Landmarks Preservation Commission (LPC) concurred with this finding in a letter dated July 23, 2024 (provided in **Appendix B**).

Tier 3 Screening Assessment

According to the 2021 *CEQR Technical Manual*, a Tier 3 screening assessment should be performed to determine if, in the absence of intervening buildings, shadows resulting from a project can reach a sunlight-sensitive resource, thereby warranting a detailed shadows analysis. The Tier 3 screening assessment is used to determine if shadows resulting from a project can reach a sunlight-sensitive resource at any time between an hour and a half after sunrise and an hour and a half before sunset on representative analysis days.

As project-generated shadows could reach seven sunlight-sensitive resources, a Tier 3 assessment was performed using three dimensional (3D) computer mapping software. The 3D model was used to calculate and display project-generated shadows on individual representative analysis days. The model contained 3D representations of the elements in the base map used in the preceding assessments and a 3D model of the With-Action condition located on Projected Development Sites 1B, 1C, 1D, 1E, and 2. In the Tier 3 screening assessment, surrounding buildings within the longest shadow study area are not included in the model so that it may be determined whether project-generated shadows would reach the seven sunlight-sensitive resources identified in **Table 6-2**.

TABLE 6-3
Sunlight-Sensitive Resources Warranting Further Analysis Based on Tier 3 Screening Assessment

Map ID.[1]	Name	March 21/Sept. 21 7:36 AM - 4:29 PM	May 6/August 6 6:27 AM - 5:18 PM	June 21 5:57 AM - 6:01 PM	December 21 8:51 AM - 2:53 PM	Number of Representative Analysis Days
Sunlight-Sensitive Resources						
1	Eastern Parkway Greenstreets	NO	NO	NO	YES	1
2	Callahan-Kelly Playground	YES	NO	NO	YES	2
3	Jewel Square	YES	YES	YES	YES	4
4	Jamaica Avenue Greenstreet	YES	NO	NO	NO	1
5	Jackie Robinson Parkway Greenstreets	NO	NO	NO	YES	1
6	Evergreen Greenstreets	NO	NO	NO	YES	1
7	Cemetery of the Evergreens (S/NR-Listed)	NO	NO	NO	YES	1

Note:
[1] The resources are identified in **Figure 6-1**.

As shown in **Figures 6-2a** and **6-2b**, and presented in **Table 6-3**, based on the Tier 3 screening assessment, the potential for project-generated shadows to be cast on all seven sunlight-sensitive resources could not be ruled out. Therefore, a detailed shadows analysis is warranted for these sunlight-sensitive open space resources.

E. DETAILED ANALYSIS OF SHADOW IMPACTS

Resources of Concern

Eastern Parkway Greenstreets

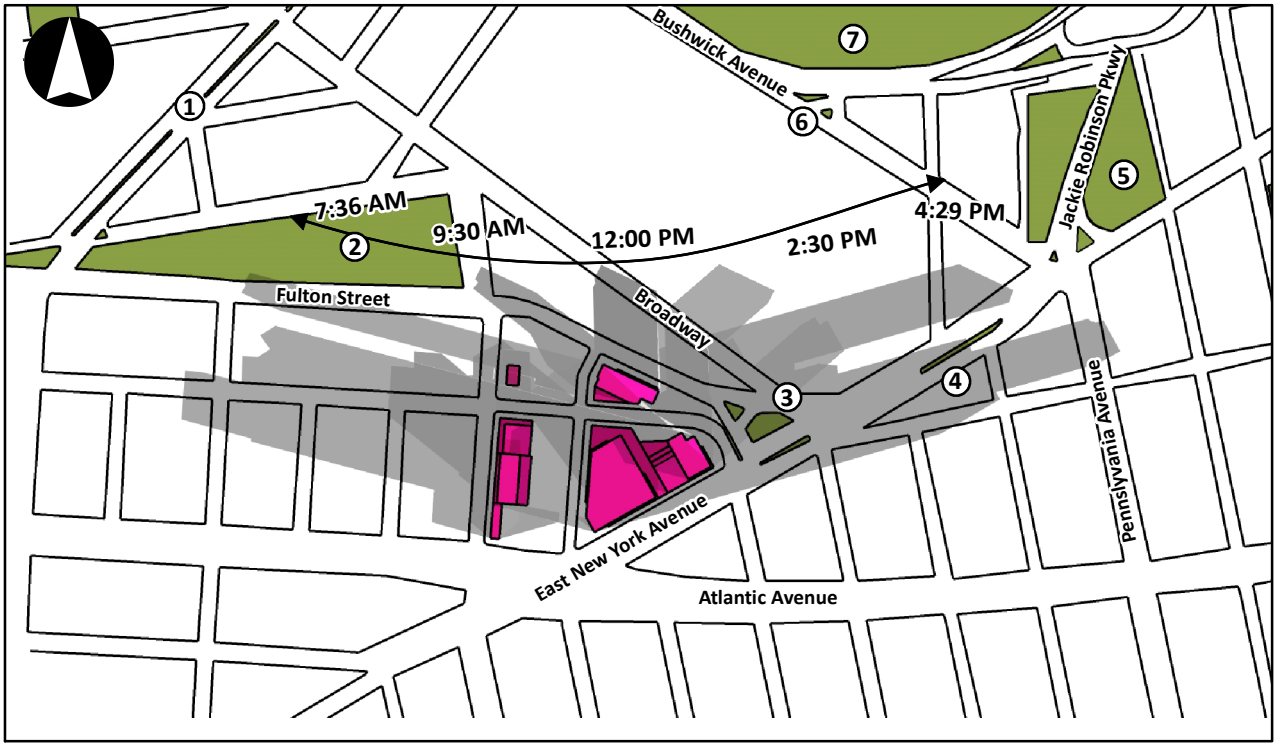
Eastern Parkway between Bushwick Avenue and Fulton Street contains three medians featuring trees and plantings classified as Greenstreets.

Callahan-Kelly Playground

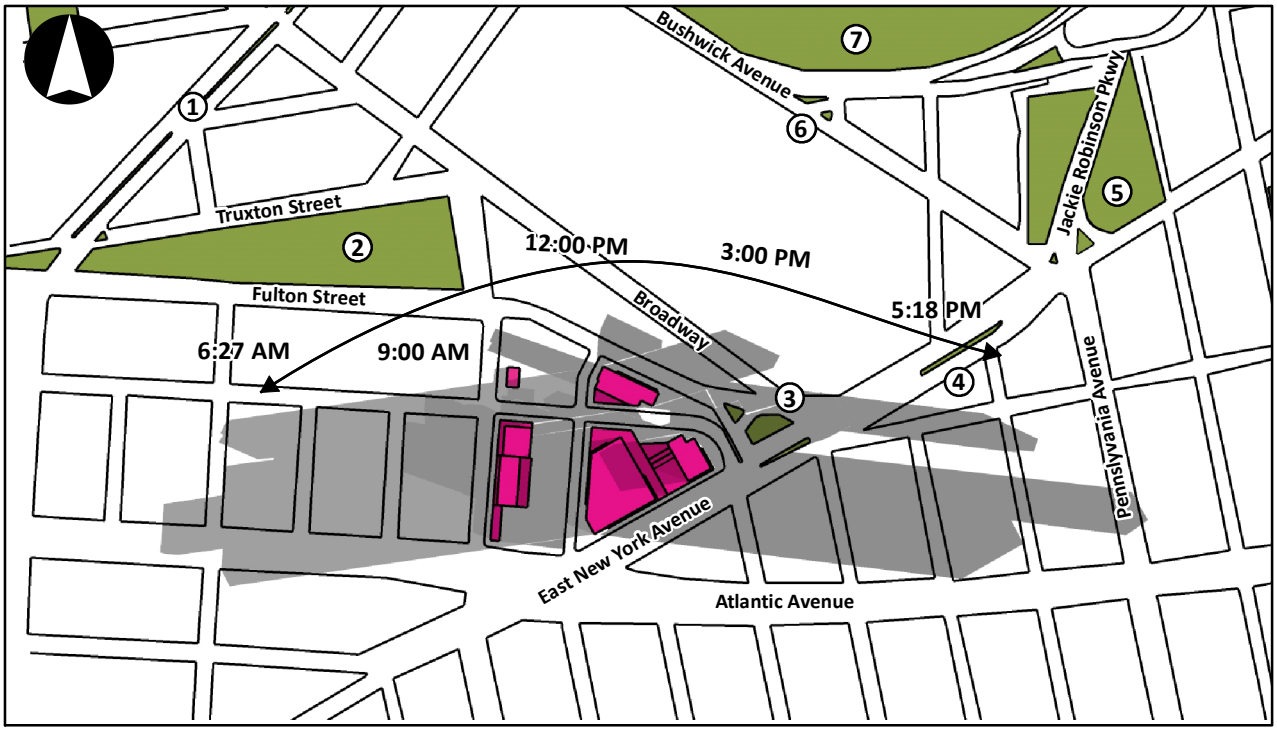
Callahan-Kelly Playground is a 3.25-acre public park bounded by Truxton Street to the north, Van Sinderen Avenue to the east, and Eastern Parkway to the west. The open space contains a skate park, handball courts, playgrounds, basketball courts, spray showers, and fitness equipment, as well as benches and landscaping.

Jewel Square

Jewel Square is a 0.13-acre public plaza bounded by East New York Avenue, Fulton Street, Broadway, and Williams Avenue. The open space features five benches and landscaping. This analysis also assumes the landscaped median between Williams Avenue and Fulton Street and the landscaped median on East New York Avenue between Alabama Avenue and Fulton Street to be a part of Jewel Square.



MARCH 21/SEPTEMBER 21

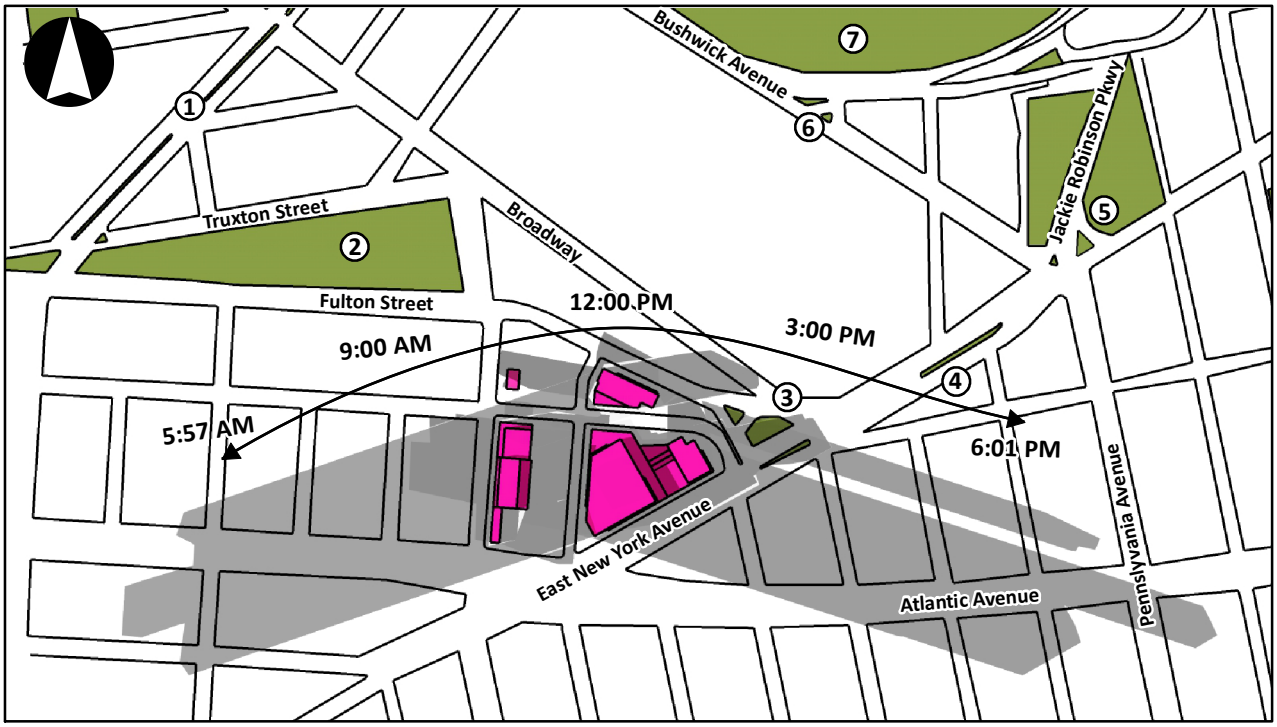


MAY 6/AUGUST 6

With-Action Condition

1 Sunlight-Sensitive Resources

Project-Generated Shadows



JUNE 21



DECEMBER 21

With-Action Condition

1 Sunlight-Sensitive Resources

Project-Generated Shadows

Jamaica Avenue Greenstreet

Jamaica Avenue between Bushwick Avenue and Fanchon Place contains a median featuring trees and plantings classified as a Greenstreet.

Jackie Robinson Parkway Greenstreets

At the entrance to Jackie Robinson Parkway, between Marginal Street West and Marginal Street East, there are two Greenstreets featuring lawns, trees, and landscaping.

Evergreen Greenstreets

Adjacent to the southern boundary of Cemetery of the Evergreens, at the intersection of Bushwick Avenue and Highland Boulevard, there are two medians classified as Greenstreets featuring trees and landscaping.

Cemetery of the Evergreens (S/NR-Listed)

Cemetery of the Evergreens is an historic cemetery covering 225 acres on the border of Brooklyn and Queens. The cemetery includes paths, trees, landscaping, benches, and burial plots. Incorporated in 1849, Cemetery of the Evergreens was listed on the S/NR in 2007.

Detailed Shadows Analysis

In accordance with 2021 *CEQR Technical Manual* guidance, shadows analyses were performed for the seven sunlight-sensitive open space resources identified above on four representative days of the year: March 21/September 21 (the equinoxes); May 6 (the midpoint between the summer solstice and the equinoxes, 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). As noted previously, 2021 *CEQR Technical Manual* guidance defines the temporal limits of a shadows analysis period to fall from an hour and a half after sunrise to an hour and a half before sunset. The results of the shadows analysis show the incremental difference in shadow impact between the No-Action and With-Action conditions; **Table 6-4** summarizes the results of the shadows analysis.

TABLE 6-4
Incremental Duration of Shadows on Sunlight-Sensitive Resources

Resource	Representative Analysis Day	March 21/Sept. 21 7:36 AM – 4:29 PM	May 6/August 6 6:27 AM – 5:18 PM	June 21 5:57 AM – 6:01 PM	December 21 8:51 AM – 2:53 PM
Eastern Parkway Greenstreet	Shadow enter-exit time				8:51 – 8:58 AM
	Incremental shadow duration				7 minutes
Callahan-Kelly Playground	Shadow enter-exit time	7:36 – 9:22 AM			8:51 – 10:12 AM
	Incremental shadow duration	1 hour 46 minutes			1 hour 21 minutes
Jewel Square	Shadow enter-exit time	12:29 – 4:29 PM	12:16 – 5:18 PM	12:42 – 6:01 PM	12:33 – 2:53 PM
	Incremental shadow duration	4 hours	5 hours and 2 minutes	5 hours 19 minutes	2 hours 20 minutes

Notes:
[A] All times are Eastern Standard Time; Daylight Saving Time was not accounted for per 2021 *CEQR Technical Manual* guidance.
[B] Table indicates the entry and exit times and total approximate duration of incremental shadows for the sunlight-sensitive resources.

TABLE 6-4 (Cont.)
Incremental Duration of Shadows on Sunlight-Sensitive Resources

Resource	Representative Analysis Day	March 21/Sept. 21 7:36 AM – 4:29 PM	May 6/August 6 6:27 AM – 5:18 PM	June 21 5:57 AM – 6:01 PM	December 21 8:51 AM – 2:53 PM
Jamaica Avenue Greenstreet	Shadow enter-exit time	3:37 – 4:29 PM			
	Incremental shadow duration	52 minutes			
Jackie Robinson Parkway Greenstreets	Shadow enter-exit time				2:52 – 2:53 PM
	Incremental shadow duration				1 minute
Evergreen Greenstreets	Shadow enter-exit time				No Incremental Shadows
	Incremental shadow duration				-
Cemetery of the Evergreens (S/NR-Listed)	Shadow enter-exit time				2:11 -2:53 PM
	Incremental shadow duration				42 minutes

Notes:
[A] All times are Eastern Standard Time; Daylight Saving Time was not accounted for per 2021 *CEQR Technical Manual* guidance.
[B] Table indicates the entry and exit times and total approximate duration of incremental shadows for the sunlight-sensitive resources.

As shown in **Table 6-4**, incremental project-generated shadows would reach six of the seven sunlight-sensitive resources identified in the Tier 3 screening assessment: the Eastern Parkway Greenstreet, Callahan-Kelly Playground, Jewel Square, the Jamaica Avenue Greenstreet, the Jackie Robinson Parkway Greenstreets, and Cemetery of the Evergreens (S/NR-listed). Incremental project-generated shadows would not reach the Evergreen Greenstreets on any of the four representative analysis days and further analysis is not required for this sunlight-sensitive resource.

It should be noted that, in accordance with 2021 *CEQR Technical Manual* guidance, all times reported herein are Eastern Standard Time and do not reflect adjustments for Daylight Saving Time that is in effect from mid-March to early November. Therefore, the times reported in this attachment for March 21/September 21, May 6/August 6, and June 21 need to have one hour added to reflect Daylight Saving Time.

Eastern Parkway Greenstreets

DECEMBER 21

On December 21, the period for shadows analysis begins at 8:51 AM and continues until 2:53 PM. On the winter solstice, which is the day of the year with the shortest period of daylight, the sun is low in the sky and shadows are at their longest but move rapidly. On the winter solstice, incremental shadows from the With-Action condition would reach portions of the Eastern Parkway Greenstreets for a total duration of approximately seven minutes, entering the resource at 8:51 AM and continuing until 8:58 AM. The portions of the Eastern Parkway Greenstreets that would experience incremental shadow coverage on the March 21/September 21 representative analysis day contain trees and landscaping.

ASSESSMENT

The With-Action condition would cast incremental shadows on portions of the Eastern Parkway Greenstreets on one of the four representative analysis days for approximately seven minutes. As stated

in the 2021 *CEQR Technical Manual*, an incremental shadow is generally not considered significant when its duration is no longer than 10 minutes at any time of year and the resource continues to receive substantial direct sunlight. Therefore, as the extent and duration of the incremental shadows would: (1) not significantly reduce or completely eliminate direct sunlight exposure on any of the sunlight-sensitive features found within the resource; and (2) would not significantly alter the public's use of the resource or threaten the viability of vegetation or other sunlight-sensitive features, incremental shadows from the With-Action condition on the Eastern Parkway Greenstreets would not be considered a significant adverse impact, in accordance with 2021 *CEQR Technical Manual* guidance.

Callahan-Kelly Playground

MARCH 21/SEPTEMBER 21

On March 21/September 21, the period for shadows analysis begins at 7:36 AM and continues until 4:29 PM. March is considered the beginning of the growing season in New York City, and September 21, which has the same shadow patterns as March 21, is also within the growing season. On the March 21/September 21 representative analysis day, incremental shadows from the With-Action condition would reach portions of Callahan-Kelly Playground for a total duration of approximately one hour and 46 minutes, entering the resource at 7:36 AM and continuing until 9:22 AM.

As shown in **Figure 6-3a**, during the early morning hours before 9:00 AM, incremental shadows would be limited to the south-central portion of the resource fronting Fulton Street. By 9:00 AM, incremental shadow coverage would be limited to the easternmost portion of the resource, exiting Callahan-Kelly Playground by 9:22 AM (refer to **Figure 6-3b**). After 9:22 AM, the resource would not experience incremental shadow coverage from the With-Action condition. The portions of Callahan-Kelly Playground that would experience incremental shadow coverage on the March 21/September 21 representative analysis day contain benches, trees, and landscaping.

DECEMBER 21

On December 21, incremental shadows from the With-Action condition would reach portions of Callahan-Kelly Playground for a total duration of approximately one hour and 21 minutes, entering the resource at 8:51 AM and continuing until 10:12 AM.

As shown in **Figure 6-4a**, during the early morning hours before 10:00 AM, incremental shadows would be limited to the eastern portion of the resource near the Broadway Junction Subway Station complex. As shown in **Figure 6-4b**, by 10:00 AM, incremental shadow coverage would decrease, moving in an easterly direction across the resource towards Van Sinderen Avenue. After 10:12 AM, Callahan-Kelly Playground would not experience incremental shadow coverage from the With-Action condition. The portions of Callahan-Kelly Playground that would experience incremental shadow coverage on the December 21 representative analysis day contain a skate park, benches, trees, and landscaping.

ASSESSMENT

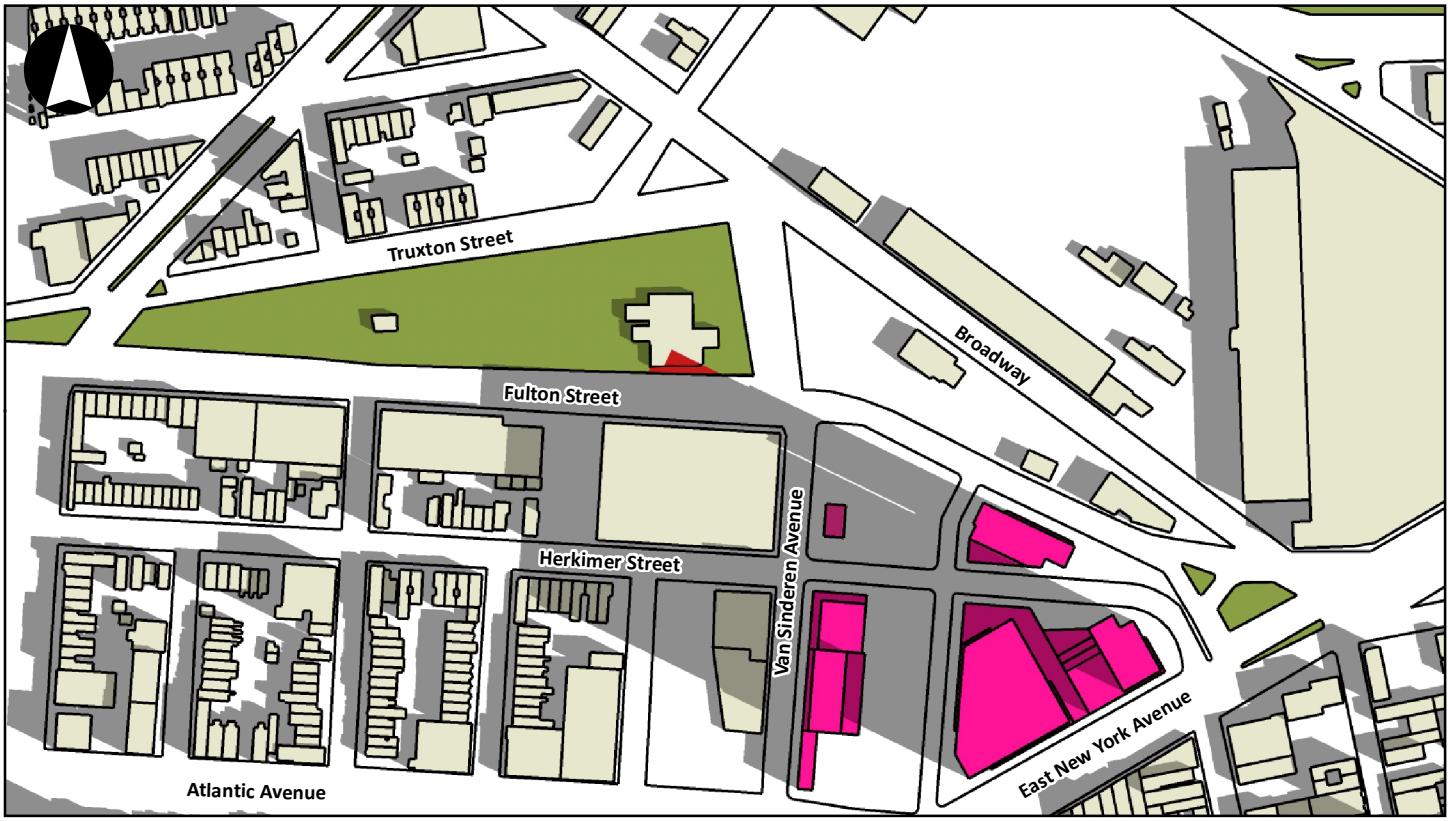
The With-Action condition would cast incremental shadows on Callahan-Kelly Playground on two of the four representative analysis days. Incremental shadow duration would affect the resource for a total duration of approximately one hour and 46 minutes on the March 21/September 21 representative analysis day and approximately one hour and 21 minutes on the December 21 representative analysis day.

On the March 21/September 21 representative analysis day, incremental shadow duration would be

Figure 6-3a
Callahan-Kelly Playground
Incremental Shadows on March 21/September 21 Analysis Day



7:50 AM



8:35 AM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

Figure 6-3b
Callahan-Kelly Playground
Incremental Shadows on March 21/September 21 Analysis Day



9:15 AM

With-Action Condition

Open Space Resources

Project-Generated Shadows

Figure 6-4a
Callahan-Kelly Playground
Incremental Shadows on December 21 Analysis Day



9:00 AM



9:30 AM

With-Action Condition | Open Space Resources | Project-Generated Shadows

Figure 6-4b
Callahan-Kelly Playground
Incremental Shadows on December 21 Analysis Day



10:00 AM

With-Action Condition

Open Space Resources

Project-Generated Shadows

minimal, affecting Callahan-Kelly Playground for a total duration of approximately one hour and 46 minutes. Incremental shadow coverage would generally be limited in scope and would not be cast on any single area of the resource for an extended period. This would allow the resource's sunlight-sensitive vegetation to receive adequate direct sunlight (at least the six to eight hours recommended in the 2021 *CEQR Technical Manual*) during the growing season. Furthermore, on the March 21/September 21 representative analysis day, the duration of incremental shadow coverage would occur in the early morning hours before 9:30 AM when the public's use of Callahan-Kelly Playground would be lower than in during afternoon and after school hours.

On the December 21 representative analysis day, incremental shadow duration would be minimal, affecting Callahan-Kelly Playground for a total duration of approximately one hour and 21 minutes. Incremental shadow coverage would generally be limited in scope and would not be cast on any single area of the resource for an extended period, as shadows move from west to east throughout the day. This would allow the resource's sunlight-sensitive features, principally benches, which could be affected by a loss of winter sunlight, to receive adequate direct sunlight. On the December 21 representative analysis day, the duration of incremental shadow coverage would occur during a cold-weather month when the public's use of Callahan-Kelly Playground would be lower than warm-weather months of the year. In addition, the December 21 representative analysis day is outside the growing season and incremental shadow coverage would not affect the viability of the resource's vegetation.

Therefore, as the extent and duration of the incremental shadows would: (1) not significantly reduce or completely eliminate direct sunlight exposure on any of the sunlight-sensitive features found within the resource; and (2) would not significantly alter the public's use of the resource or threaten the viability of vegetation or other sunlight-sensitive features, incremental shadows from the With-Action condition on Callahan-Kelly Playground would not be considered a significant adverse impact, in accordance with 2021 *CEQR Technical Manual* guidance.

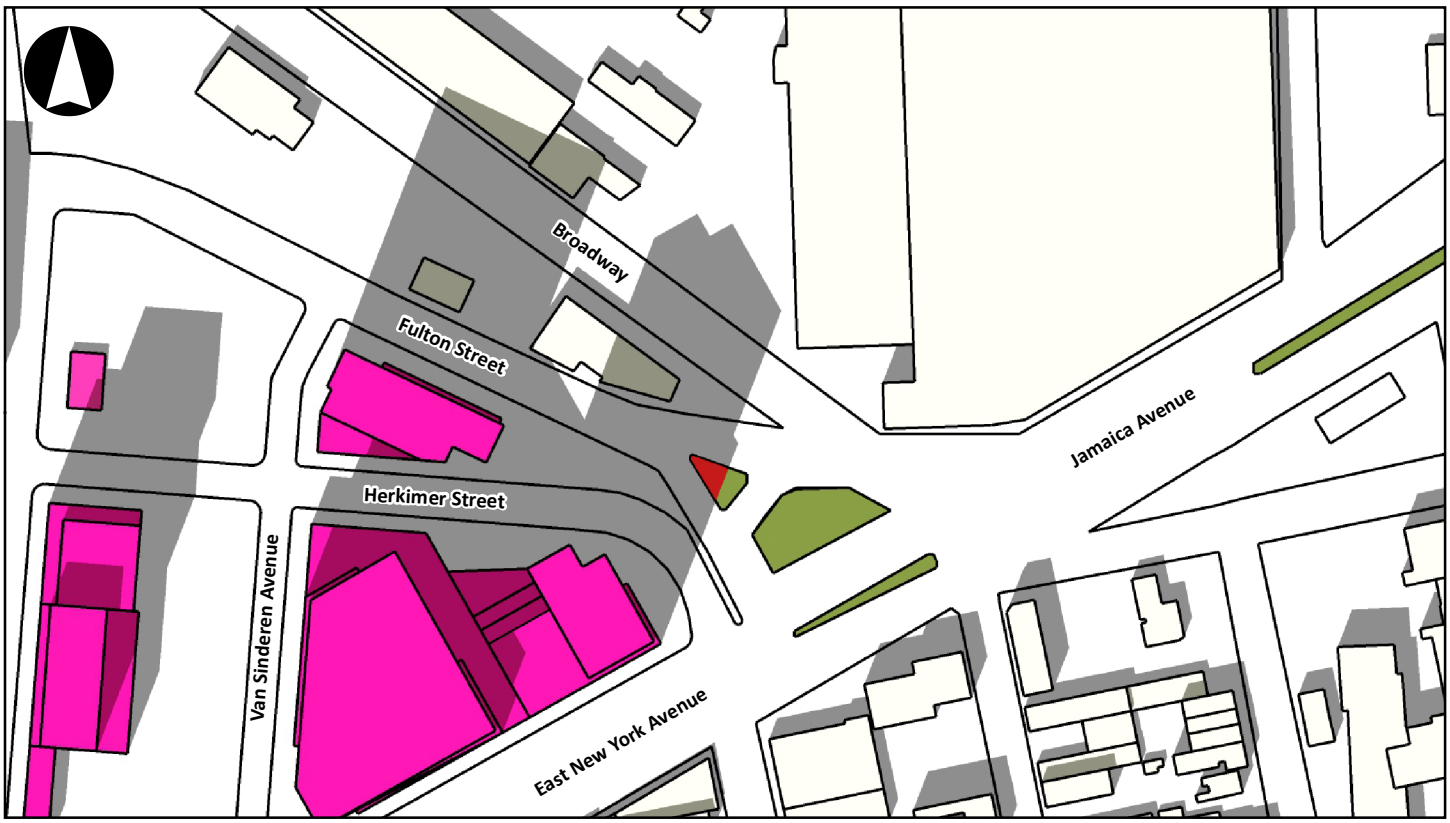
Jewel Square

MARCH 21/SEPTEMBER 21

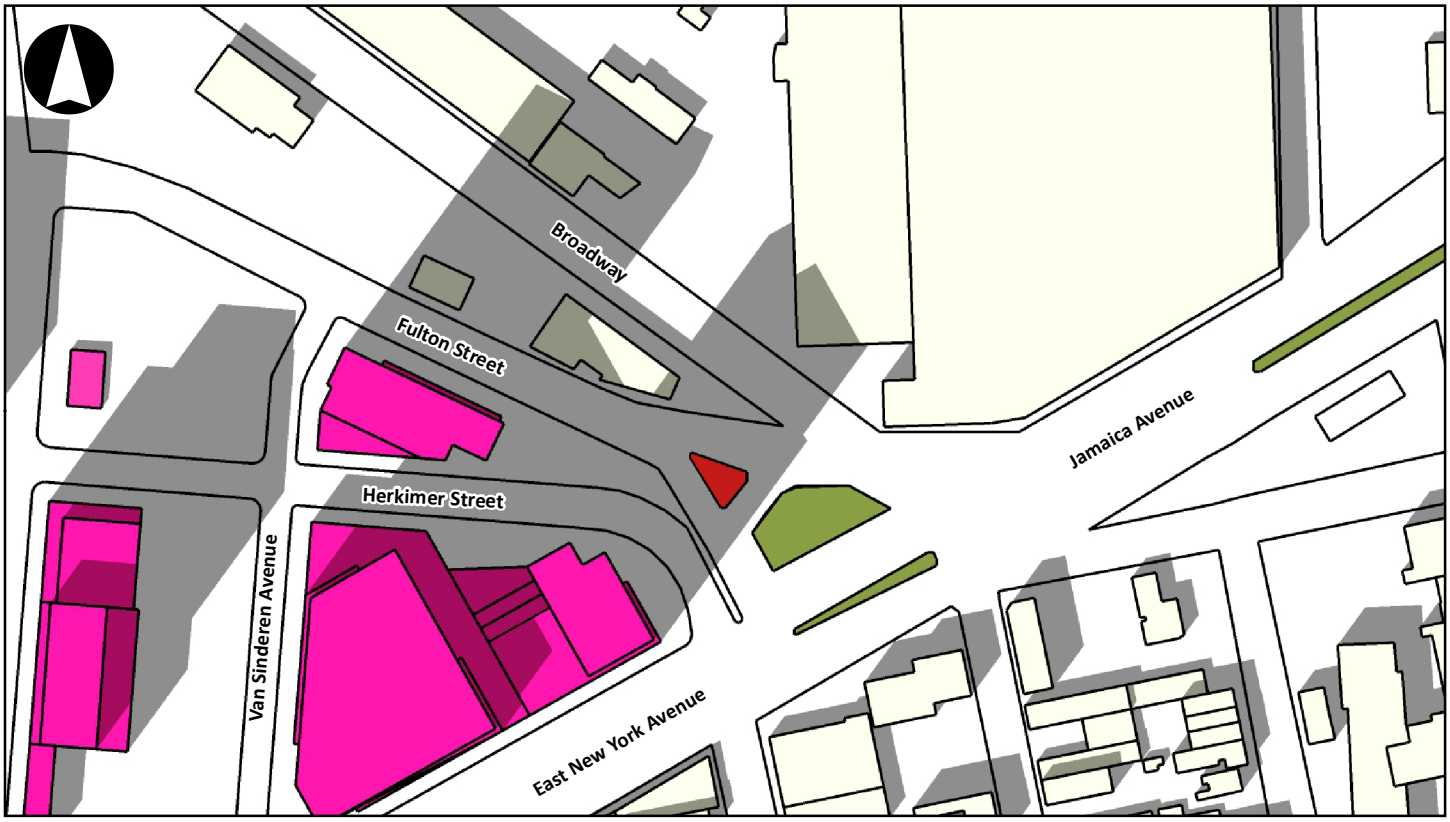
On March 21/September 21, incremental shadows from the With-Action condition would reach portions of Jewel Square for a total duration of approximately four hours, entering the resource at 12:29 PM and continuing until 4:29 PM. Before 12:29 PM, the resource would not experience incremental shadow coverage from the With-Action condition.

As shown in **Figure 6-5a**, during the early afternoon hours between 1:00 PM and 1:45 PM, incremental shadows would be limited to the northwestern portion of the resource (i.e., the landscaped median between Williams Avenue and Fulton Street). As shown in **Figure 6-5b**, by 2:30 PM, incremental shadow coverage would increase and begin to enter the central portion of Jewel Square that contains benches, trees, and landscaping. As also shown in **Figure 6-5b**, by 3:15 PM, incremental shadow coverage would move in an easterly direction across the resource towards Jamacia Avenue, casting both the northwestern and central portions of Jewel Square in shadow and eliminating direct sunlight exposure on those portions of the resource. As shown in **Figure 6-5c**, by 4:00 PM, incremental shadow coverage would increase further, eliminating direct sunlight exposure on the entire resource, including the landscaped median on East New York Avenue between Alabama Avenue and Fulton Street, until 4:29 PM – the end of the representative analysis day. The portions of Jewel Square that would experience incremental shadow coverage on the March 21/September 21 representative analysis day contain benches, trees, and landscaping.

Figure 6-5a
Jewel Square
Incremental Shadows on March 21/September 21 Analysis Day



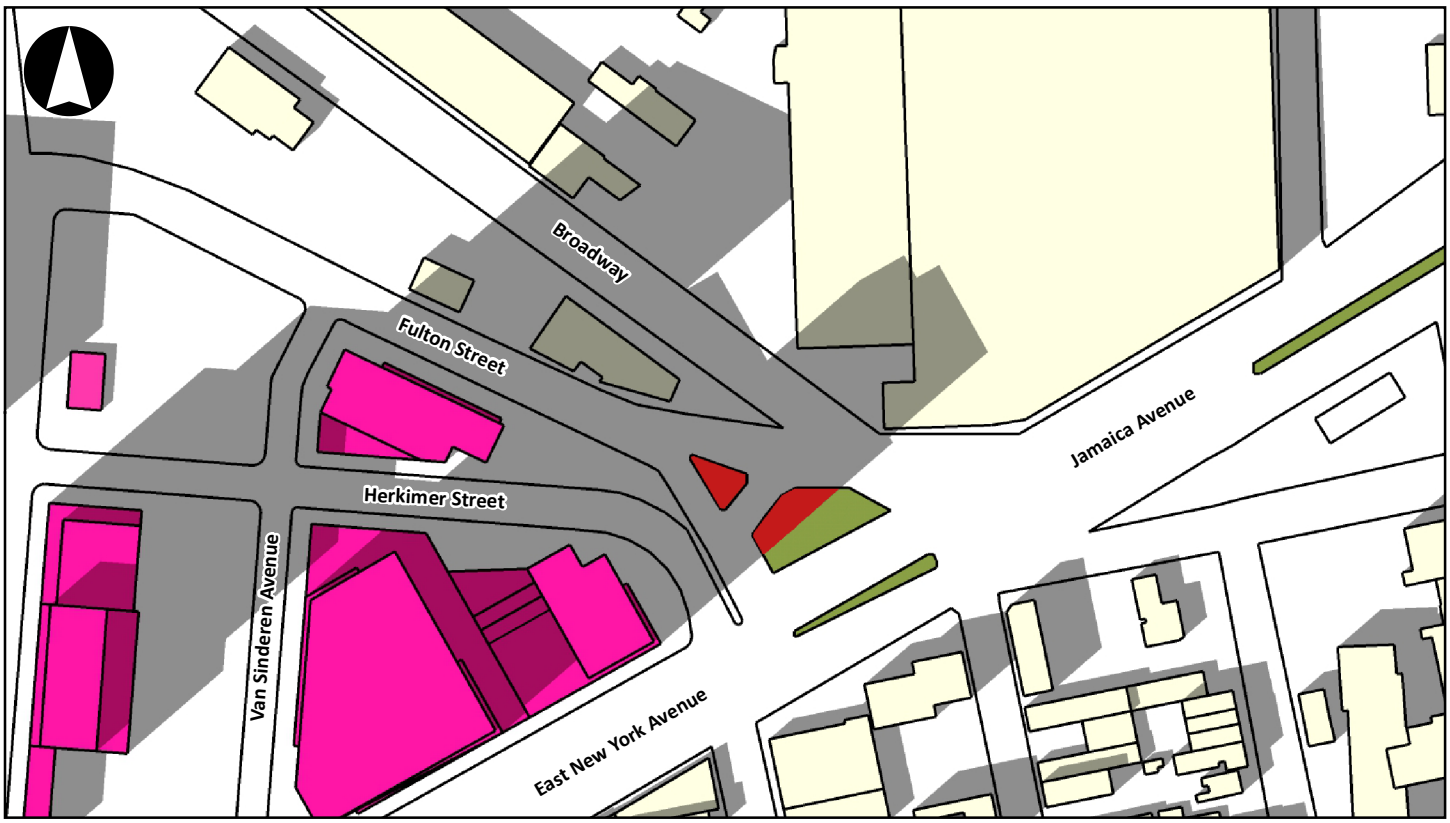
1:00 PM



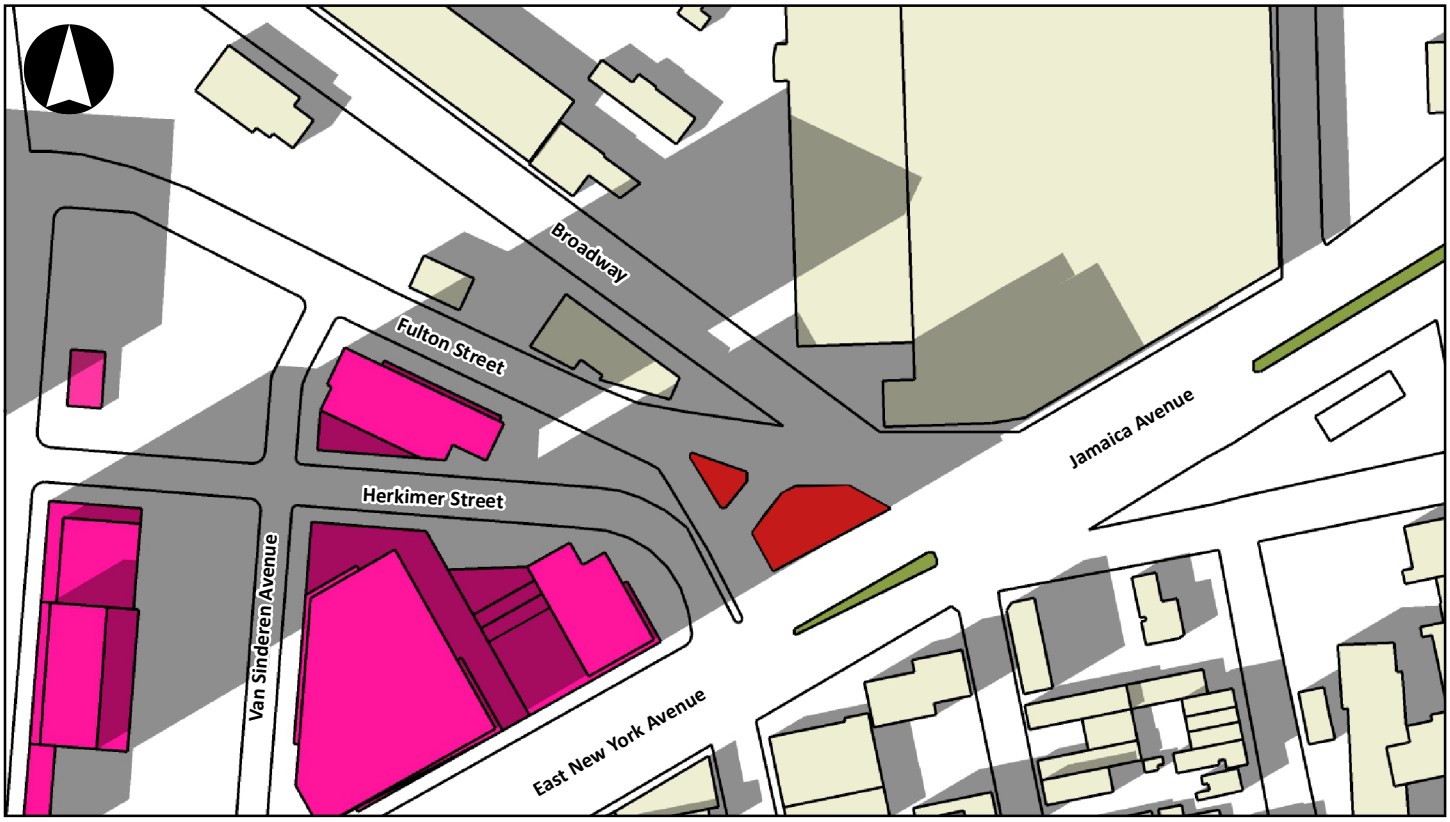
1:45 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

Figure 6-5b
Jewel Square
Incremental Shadows on March 21/September 21 Analysis Day



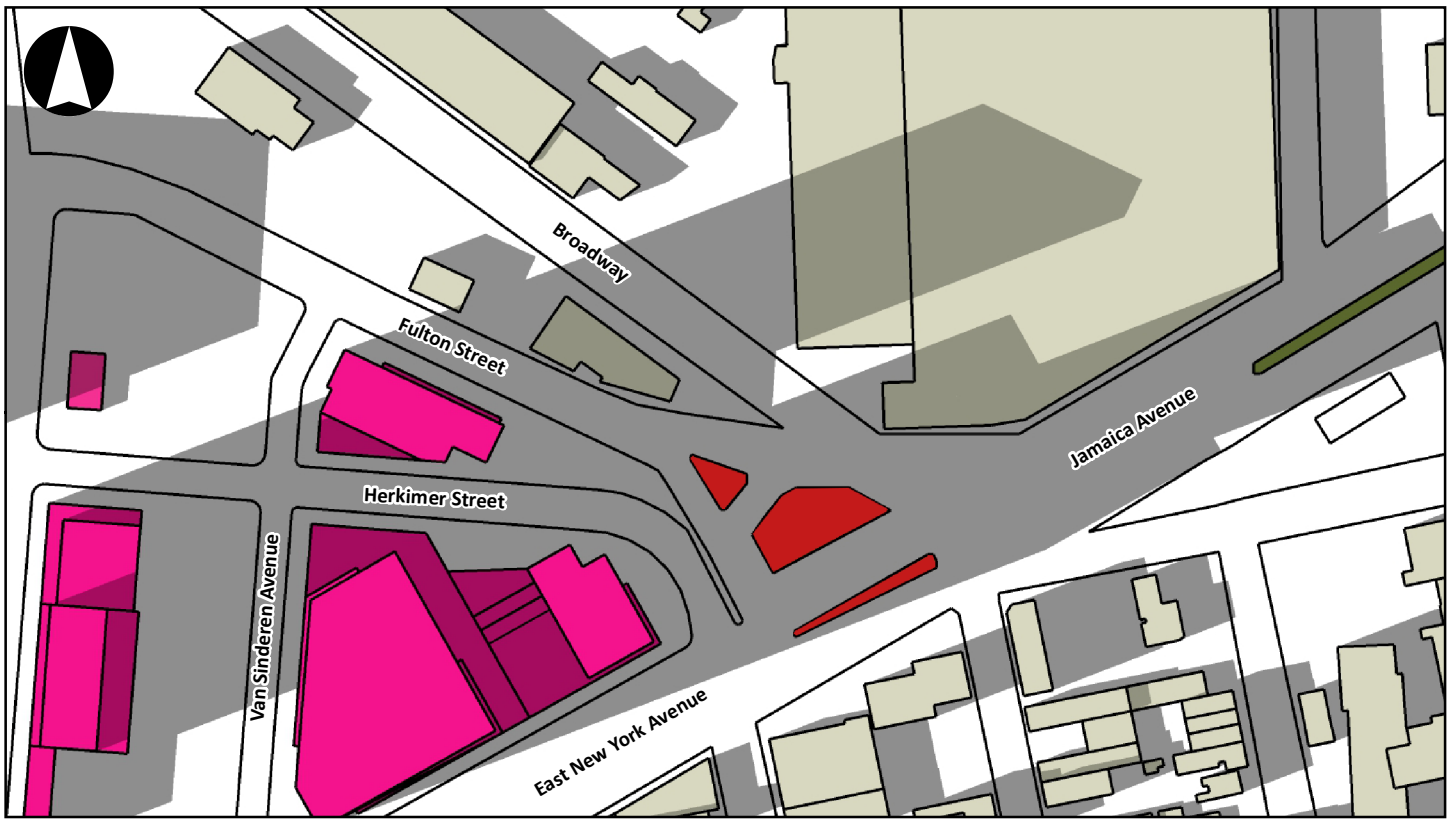
2:30 PM



3:15 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

Figure 6-5c
Jewel Square
Incremental Shadows on March 21/September 21 Analysis Day



4:00 PM

With-Action Condition

Open Space Resources

Project-Generated Shadows

MAY 6/AUGUST 6

On May 6/August 6, the period for shadows analysis begins at 6:27 AM and continues until 5:18 PM. On the midpoint between the equinoxes and the solstices, incremental shadows from the With-Action condition would reach portions of Jewel Square for a total duration of approximately five hours and two minutes, entering the resource at 12:16 PM and continuing until 5:18 PM. Before 12:16 PM, the resource would not experience incremental shadow coverage from the With-Action condition.

As shown in **Figure 6-6a**, at 12:30 PM, incremental shadows would be limited to the northwestern portion of the resource (i.e., the landscaped median between Williams Avenue and Fulton Street). As also shown in **Figure 6-6a**, by 1:30 PM, incremental shadow coverage would increase and begin to enter the central portion of Jewel Square that contains benches, trees, and landscaping. As shown in **Figure 6-6b**, at 2:30 PM, incremental shadow coverage would decrease on the northwestern portion of the resource and increase on the central portion of the resource, casting the entirety of the central portion of Jewel Square in shadow and eliminating direct sunlight exposure on this portion of the resource.

As also shown in **Figure 6-6b**, by 3:30 PM, incremental shadow coverage would move in an easterly direction across the resource towards Jamacia Avenue, continuing to cover much of the central portion of Jewel Square and casting the entirety of the southeastern portion of the resource (i.e., the landscaped median on East New York Avenue between Alabama Avenue and Fulton Street) in shadow and eliminating direct sunlight exposure on this portion of the resource. As also shown in **Figure 6-6b**, while incremental shadows would eliminate direct sunlight exposure on much of the central portion and the entirety of the southeastern portion of Jewel Square, the northwestern portion of the resource would receive partial direct sunlight exposure at 3:30 PM.

As shown in **Figure 6-6c**, by 4:30 PM, incremental shadow coverage would decrease and only cover small areas of the northwestern and central portions of the resource (i.e., less than half of these portions of the resource), while the entirety of the southeastern portion of the resource would be cast in shadow. Between 4:30 PM and 5:18 PM (i.e., the end of the representative analysis day), incremental shadow coverage would move in a southeasterly direction re-entering the northwestern and central portions of Jewel Square. The portions of Jewel Square that would experience incremental shadow coverage on the May 6/August 6 representative analysis day contain benches, trees, and landscaping.

JUNE 21

On June 21, the period for shadows analysis begins at 5:57 AM and continues until 6:01 PM. On the summer solstice, which is the day of the year with the longest period of daylight, the sun is most directly overhead and generally shadows are shortest and move across the widest angular range from west to east. On the summer solstice, incremental shadows from the With-Action condition would reach portions of Jewel Square for a total duration of approximately five hours and 19 minutes, entering the resource at 12:42 PM and continuing until 6:01 PM. Before 12:42 PM, the resource would not experience incremental shadow coverage from the With-Action condition.

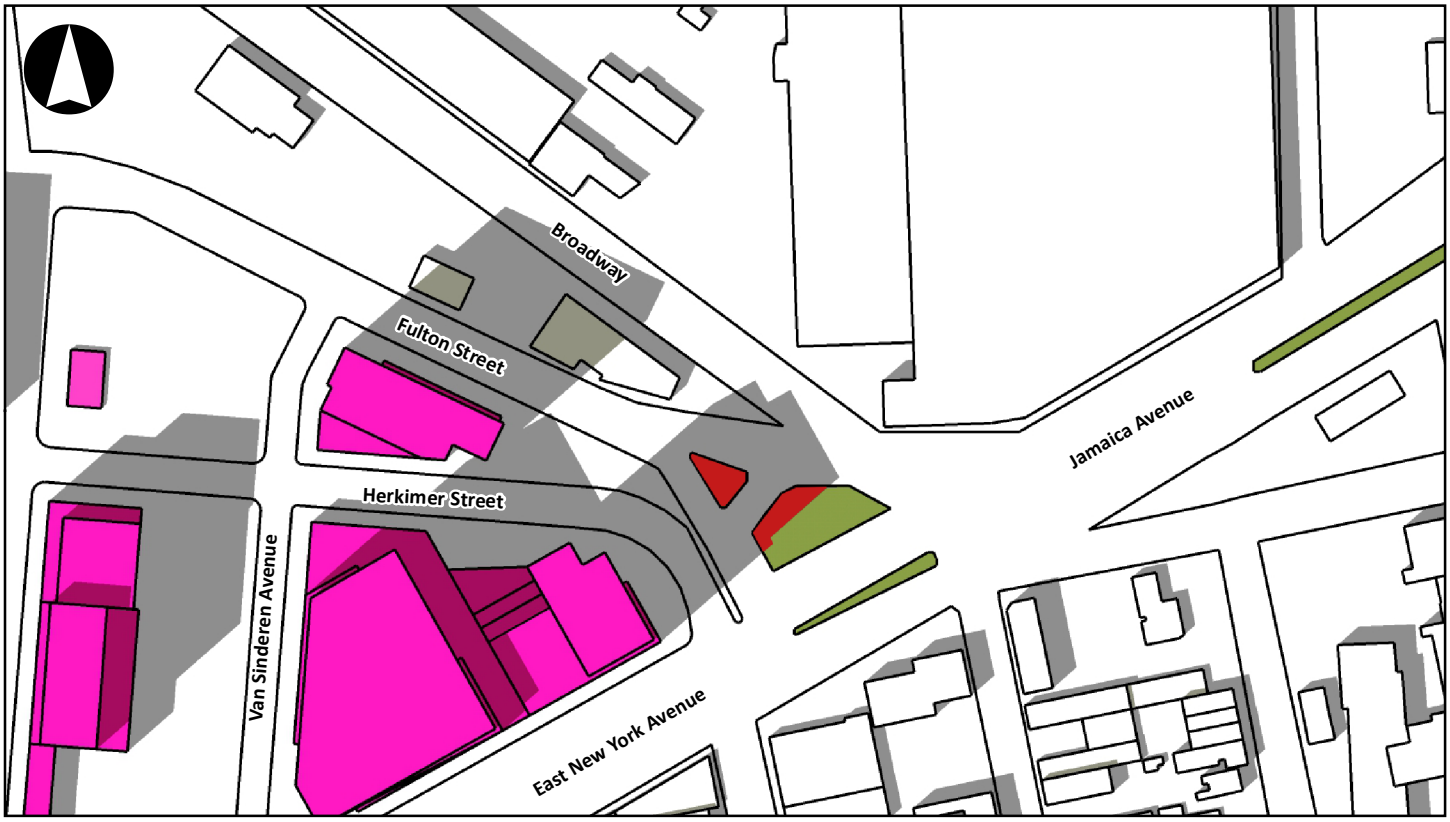
As shown in **Figure 6-7a**, at 1:00 PM, incremental shadows would be limited to the northwestern portion of the resource (i.e., the landscaped median between Williams Avenue and Fulton Street). As also shown in **Figure 6-7a**, by 2:00 PM, incremental shadow coverage would increase, moving in an easterly direction towards Jamacia Avenue to cover much of the central portion of Jewel Square that contains benches, trees, and landscaping.

As shown in **Figure 6-7b**, at 3:00 PM, incremental shadow coverage would continue to move in an easterly

Figure 6-6a
Jewel Square
Incremental Shadows on May 6/August 6 Analysis Day



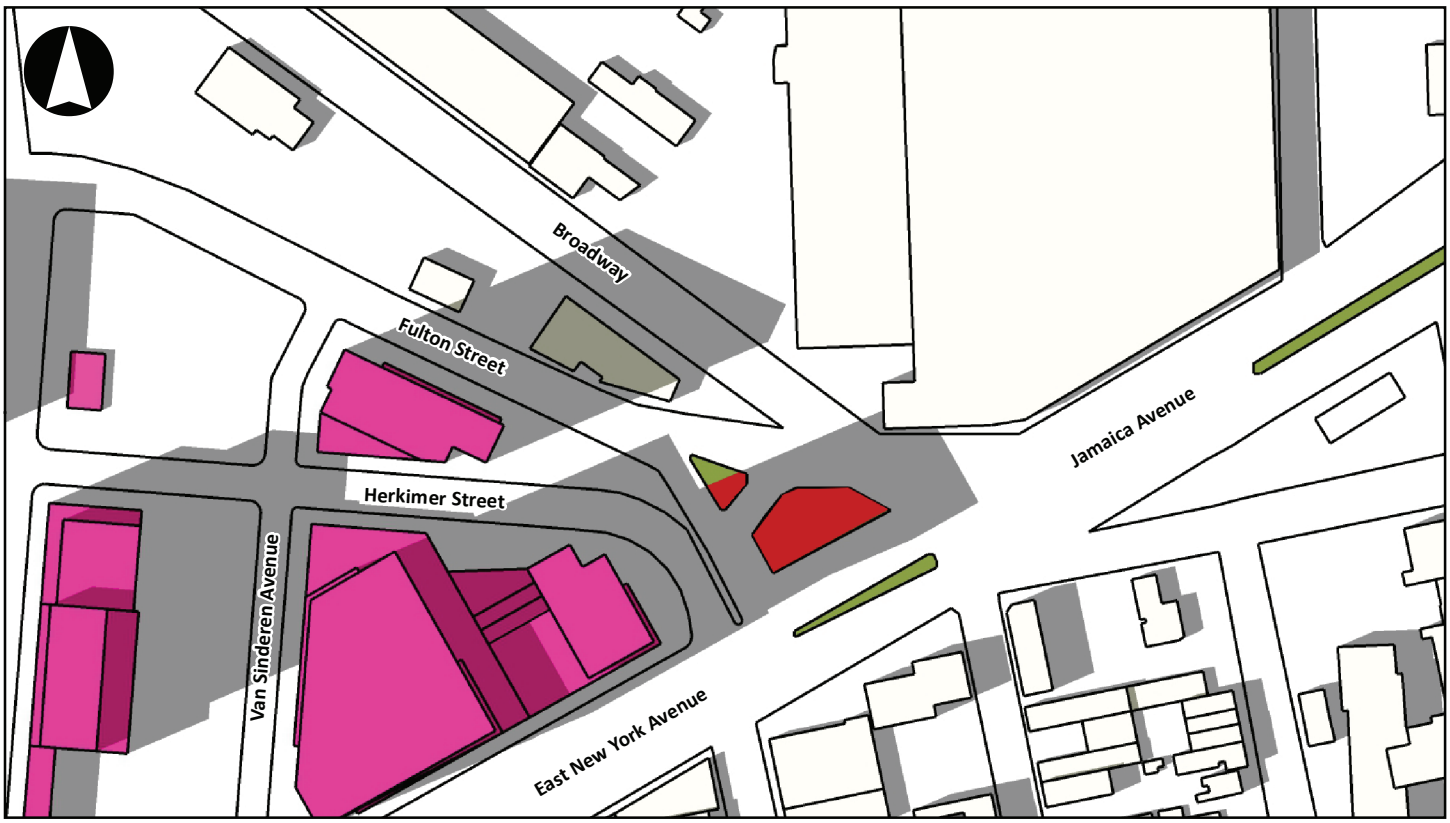
12:30 PM



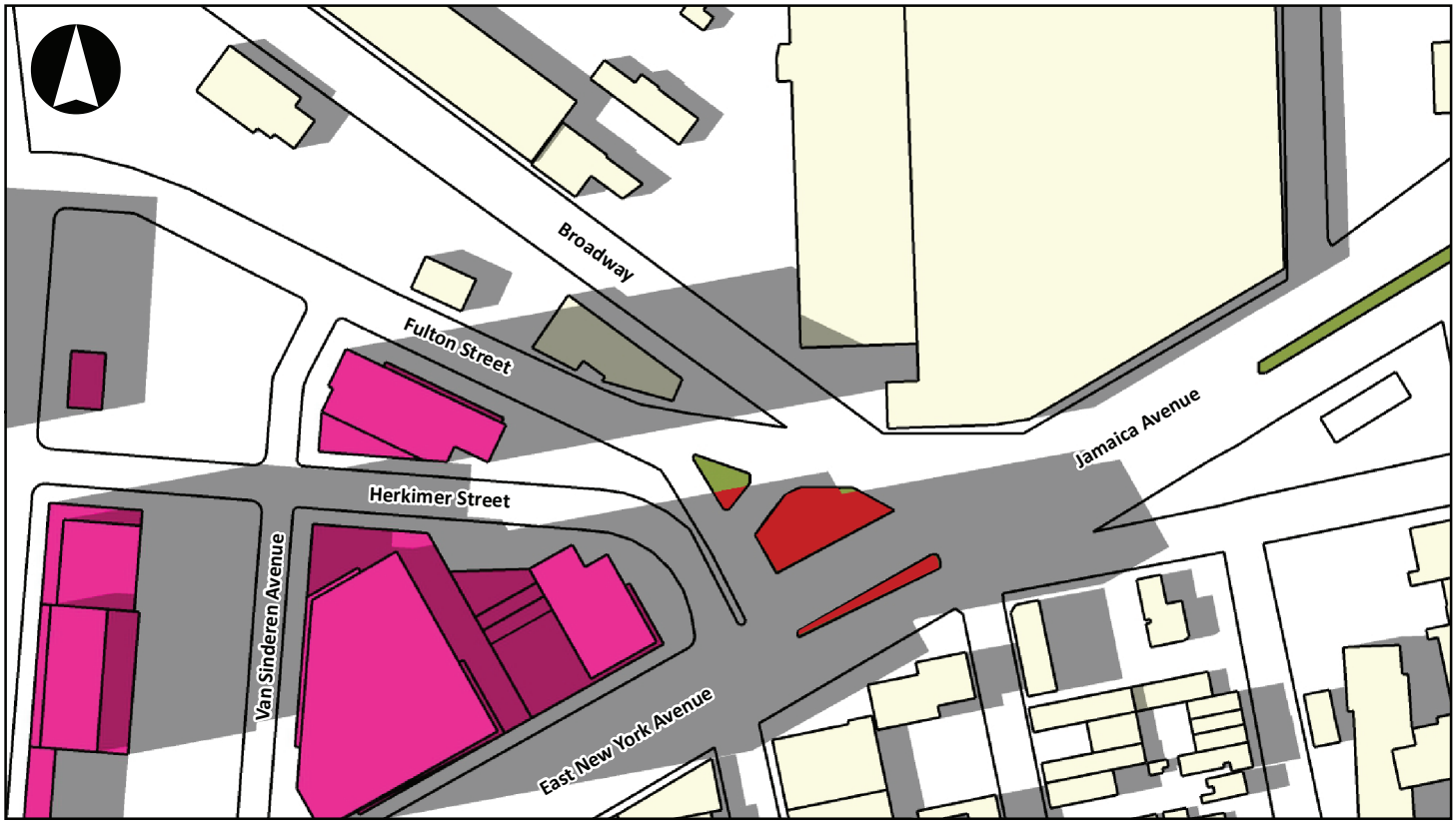
1:30 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

Figure 6-6b
Jewel Square
Incremental Shadows on May 6/August 6 Analysis Day



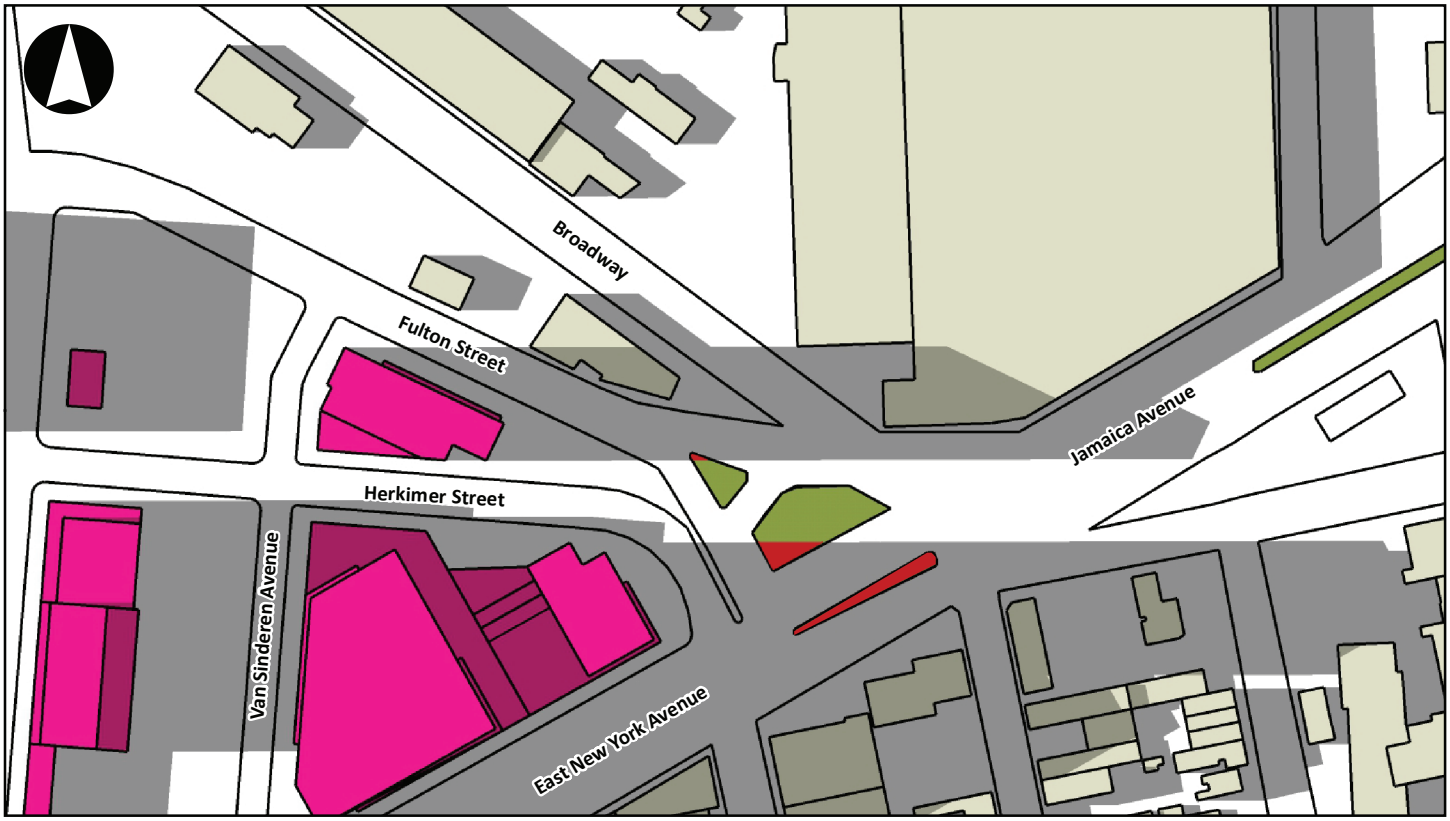
2:30 PM



3:30 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

Figure 6-6c
Jewel Square
Incremental Shadows on May 6/August 6 Analysis Day



4:30 PM

With-Action Condition

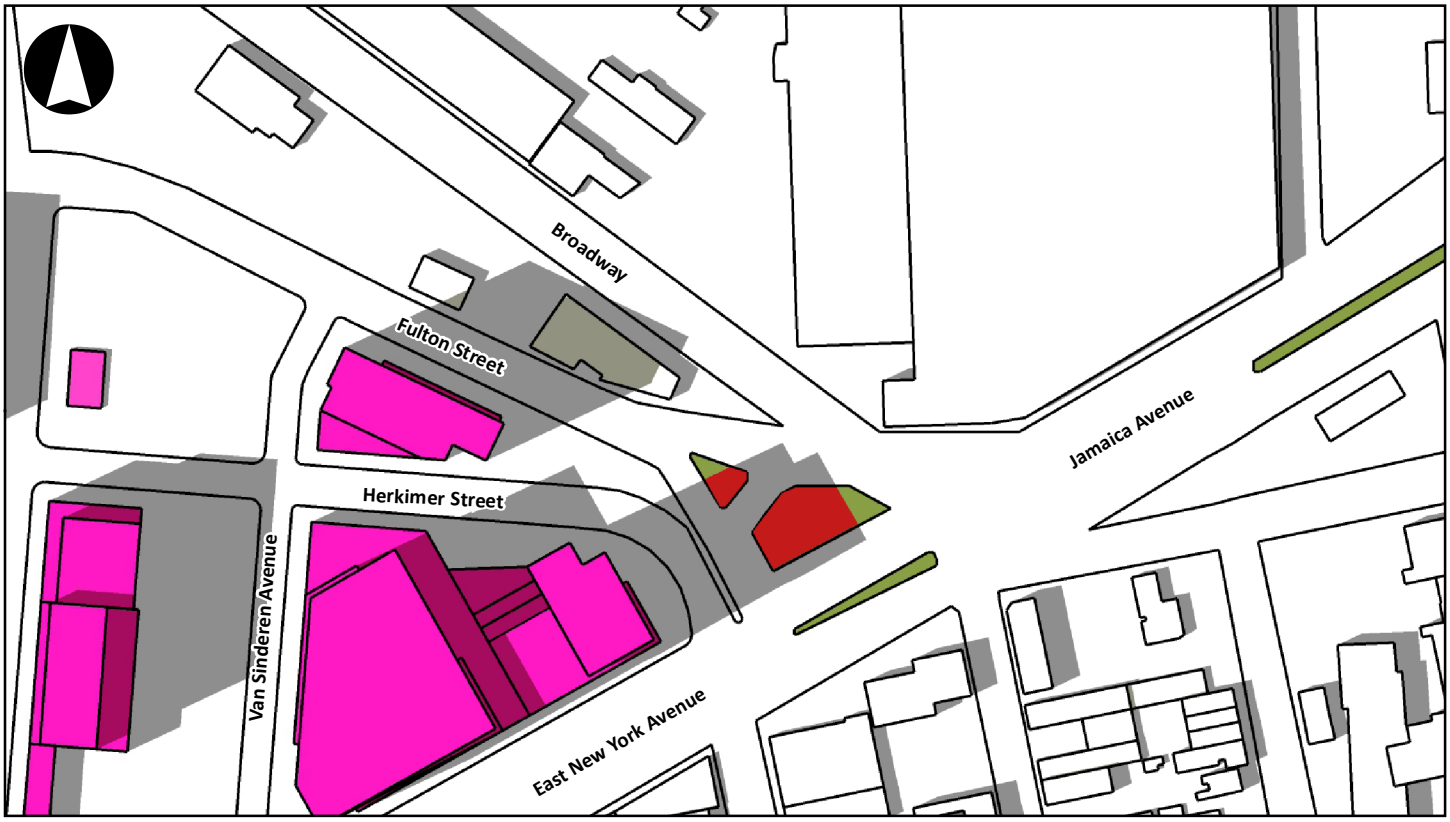
Open Space Resources

Project-Generated Shadows

Figure 6-7a
Jewel Square
Incremental Shadows on June 21 Analysis Day



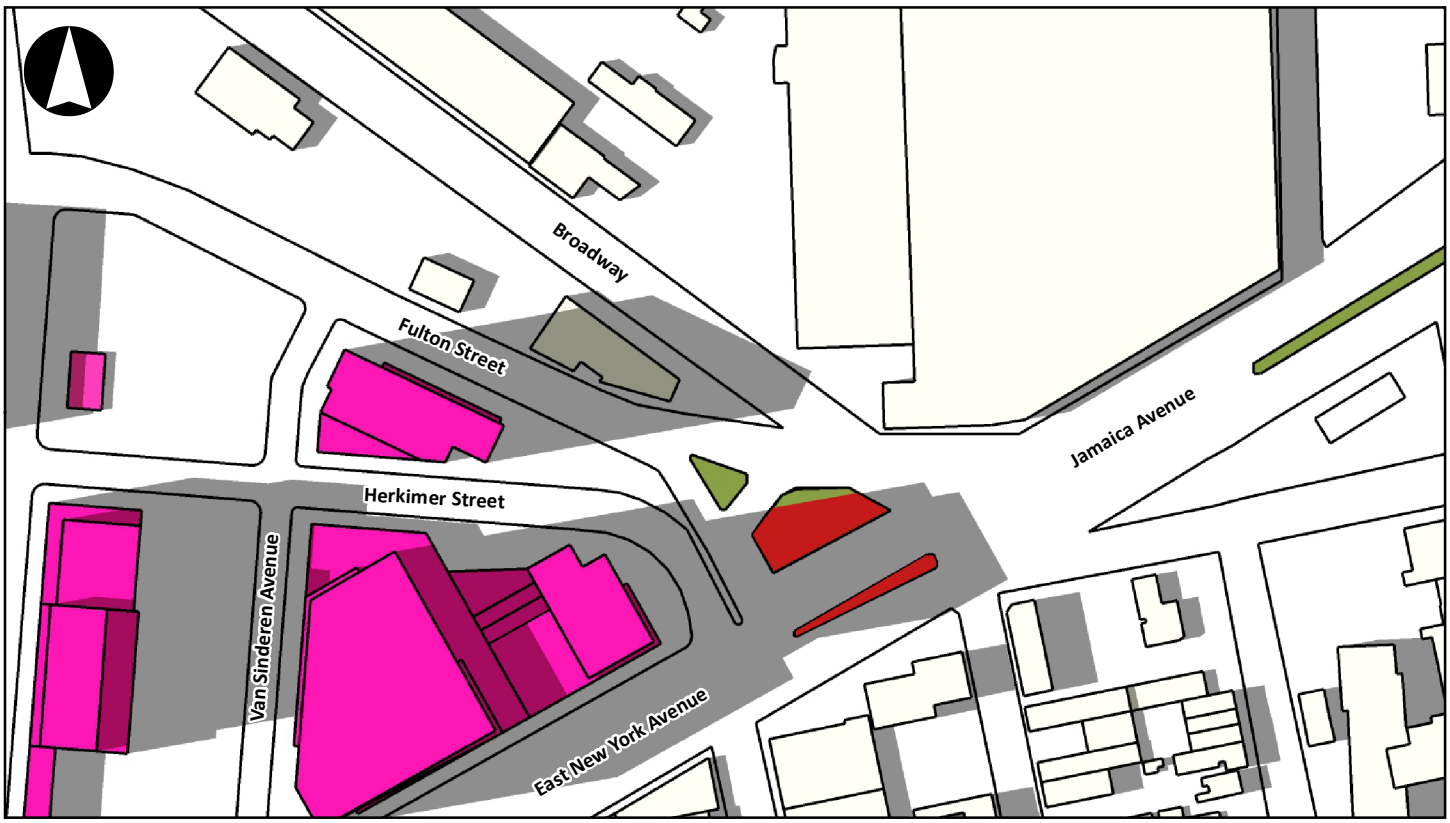
1:00 PM



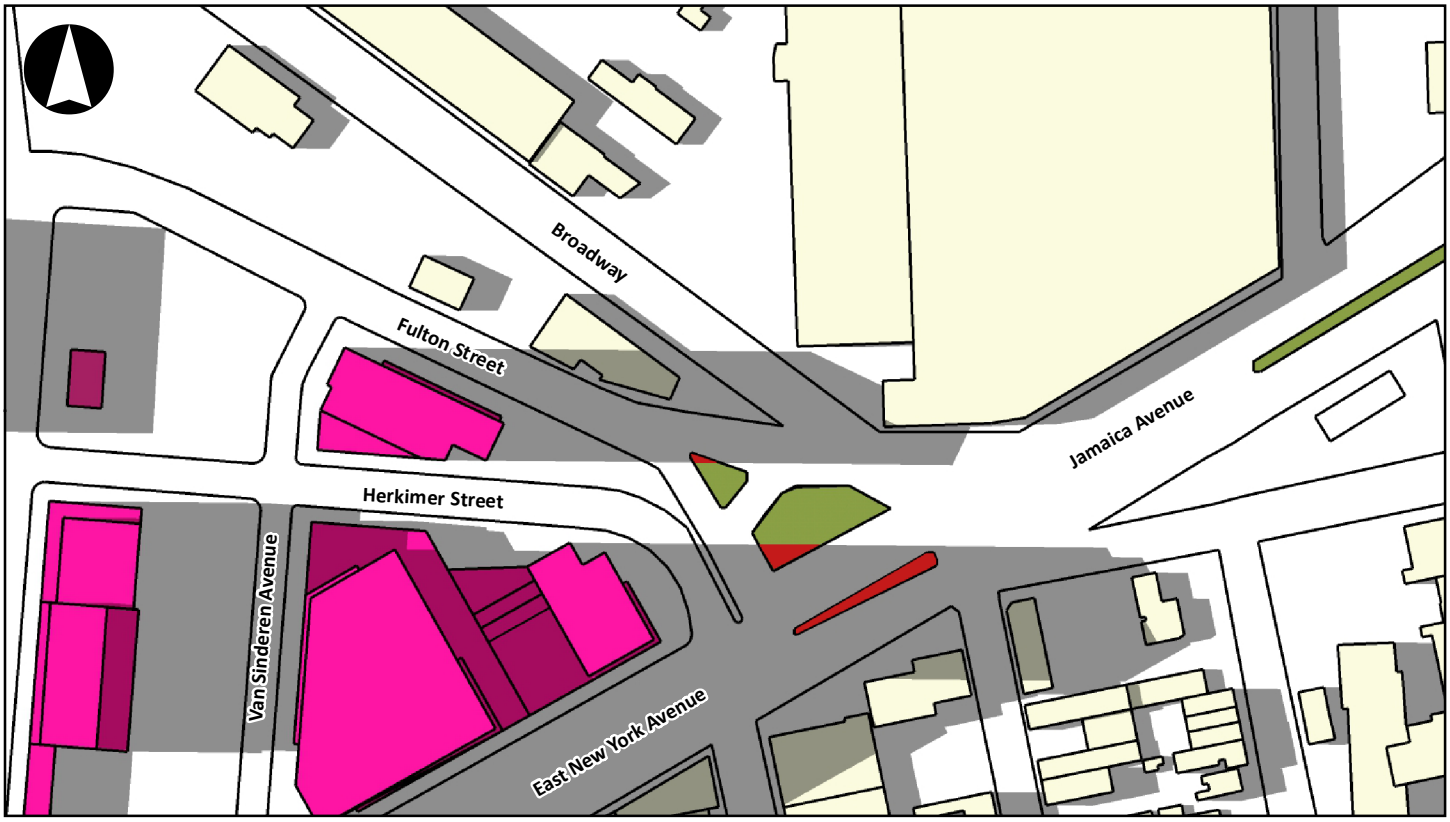
2:00 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

Figure 6-7b
Jewel Square
Incremental Shadows on June 21 Analysis Day



3:00 PM



4:00 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

direction across the resource towards Jamacia Avenue, continuing to cover much of the central portion of Jewel Square and casting the entirety of the southeastern portion of the resource (i.e., the landscaped median on East New York Avenue between Alabama Avenue and Fulton Street) in shadow and eliminating direct sunlight exposure on this portion of the resource. As also shown in **Figure 6-7b**, at 3:00 PM, while incremental shadows would eliminate direct sunlight exposure on much of the central portion and the entirety of the southeastern portion of Jewel Square, the northwestern portion of the resource would receive direct sunlight exposure. As also shown in **Figure 6-7b**, by 4:00 PM, incremental shadow coverage would decrease and only cover small areas of the northwestern and central portions of the resource (i.e., less than half of these portions of the resource), while the entirety of the southeastern portion of the resource would be cast in shadow.

As shown in **Figure 6-7c**, at 5:00 PM, incremental shadow coverage would increase, moving in a southeasterly direction across the resource towards Jamacia Avenue, casting the entirety of the northwestern portion and approximately half of the central and southeastern portions of Jewel Square in shadow. As also shown in **Figure 6-7c**, by 6:00 PM, near the end of the representative analysis day, incremental shadow coverage would cover majorities of Jewel Square's northwestern, central, and southeastern portions. The portions of Jewel Square that would experience incremental shadow coverage on the June 21 representative analysis day contain benches, trees, and landscaping.

DECEMBER 21

On December 21, incremental shadows from the With-Action condition would reach portions of Jewel Square for a total duration of approximately two hours and 20 minutes, entering the resource at 12:33 PM and continuing until 2:53 PM. Before 12:33 PM, the resource would not experience incremental shadow coverage from the With-Action condition.

As shown in **Figure 6-8a**, at 12:45 PM, incremental shadows would enter the northwestern portion of the resource (i.e., the landscaped median between Williams Avenue and Fulton Street). As also shown in **Figure 6-8a**, by 1:30 PM, incremental shadow coverage would increase, moving in an easterly direction towards Jamacia Avenue to cover much of the northwestern portion of Jewel Square. As shown in **Figure 6-8b**, by 2:30 PM, incremental shadow coverage would increase on the northwestern portion of the resource, casting the entirety of the northwestern portion of Jewel Square in shadow and eliminating direct sunlight exposure on this portion of the resource. The portions of Jewel Square that would experience incremental shadow coverage on the December 21 representative analysis day contain trees and landscaping; Jewel Square's benches would not experience incremental shadow coverage on the December 21 representative analysis day.

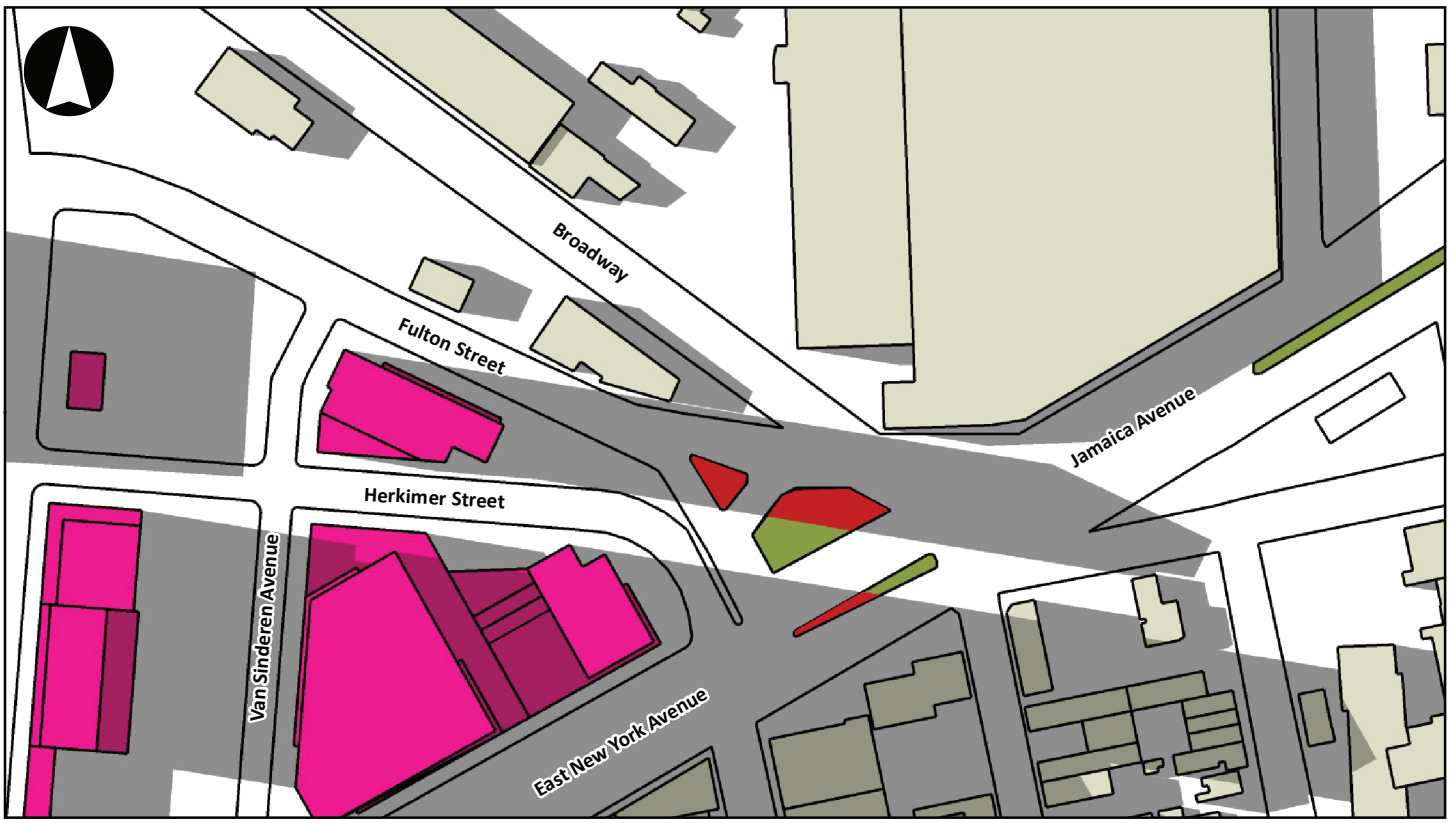
ASSESSMENT

The With-Action condition would cast incremental shadows on Jewel Square on all four representative analysis days. Incremental shadow duration would range from two hours and 20 minutes on the December 21 representative analysis day to five hours and 19 minutes on the June 21 representative analysis day.

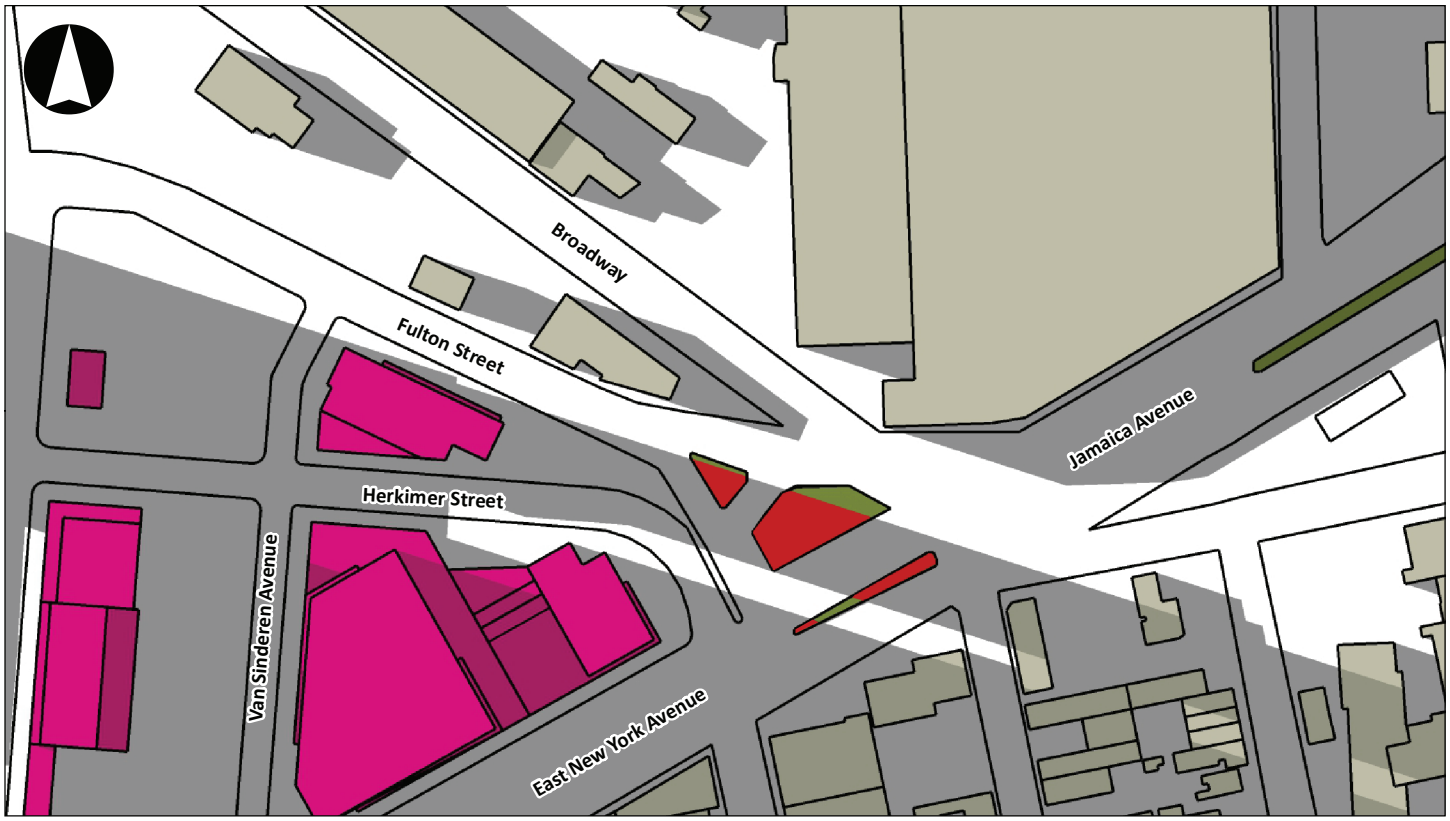
A field visit was conducted in October 2024 during morning hours to document existing conditions at Jewel Square. An aerial view of Jewel Square's northwestern, central, and southeastern components is provided in **Figure 6-9**.

The northwestern portion of the resource is triangular and comprises a landscaped median between Williams Avenue and Fulton Street. The landscaping includes approximately 10 small shrubs including a

Figure 6-7c
Jewel Square
Incremental Shadows on June 21 Analysis Day



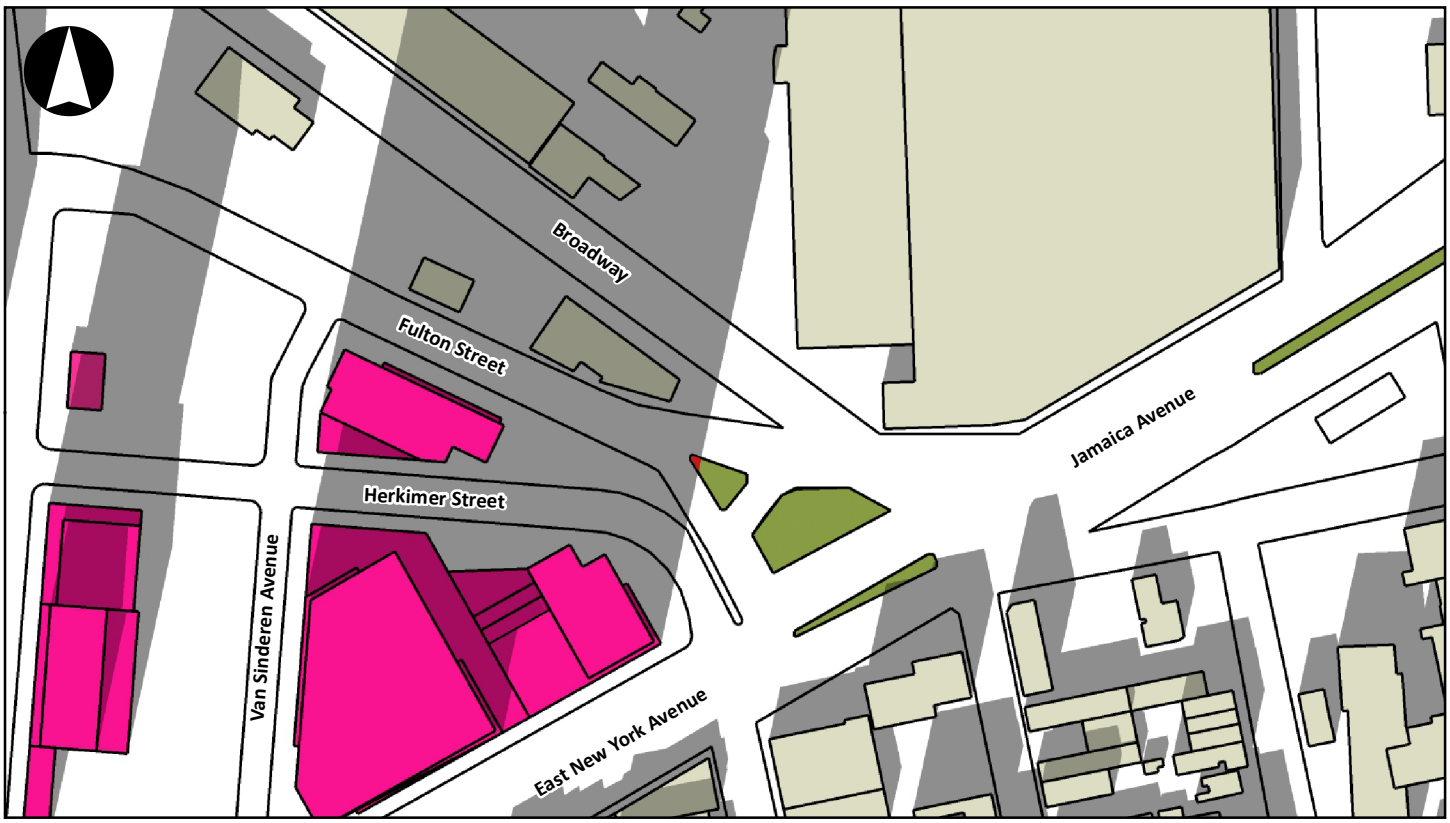
5:00 PM



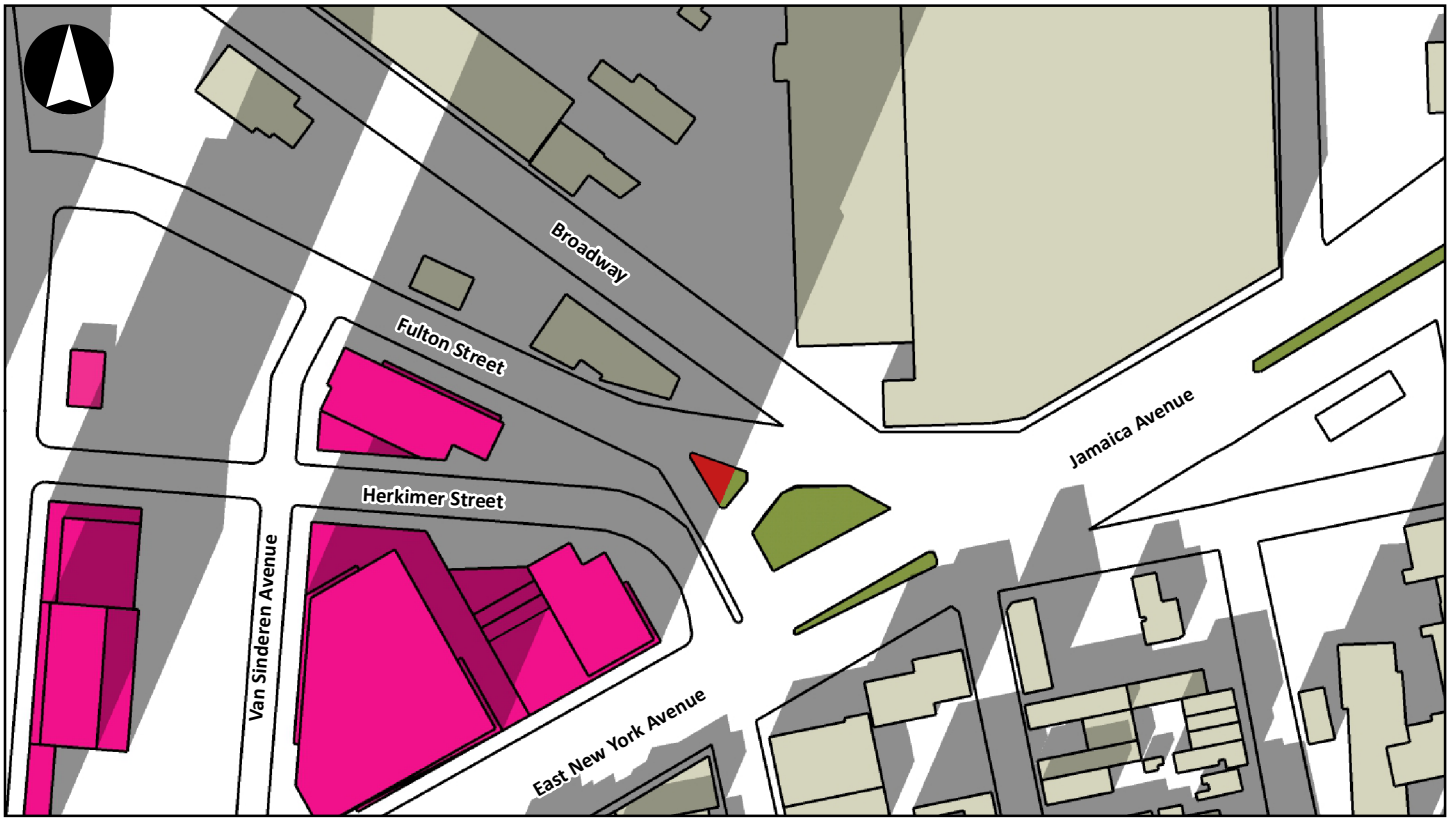
6:00 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

Figure 6-8a
Jewel Square
Incremental Shadows on December 21 Analysis Day



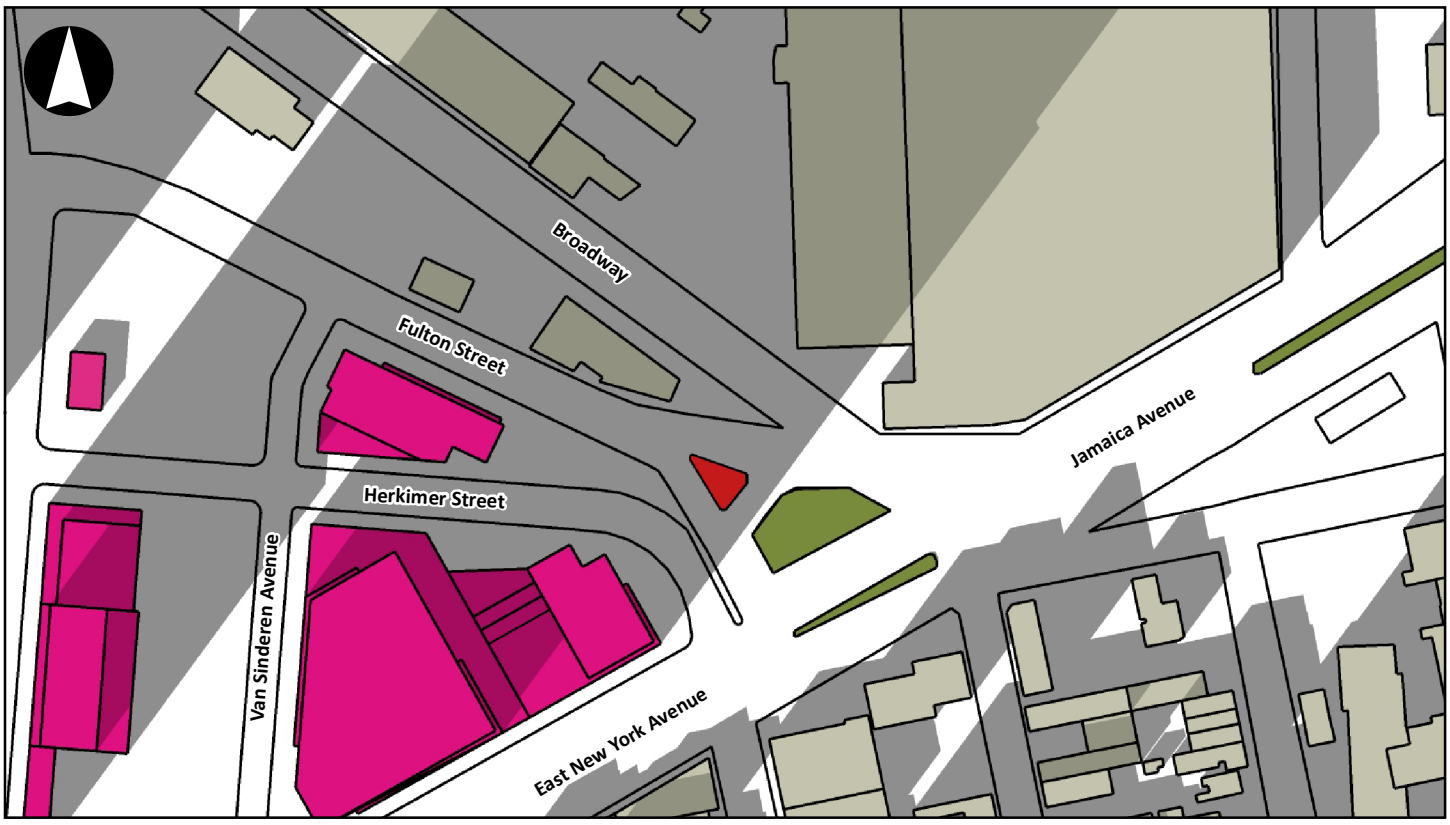
12:45 PM



1:30 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

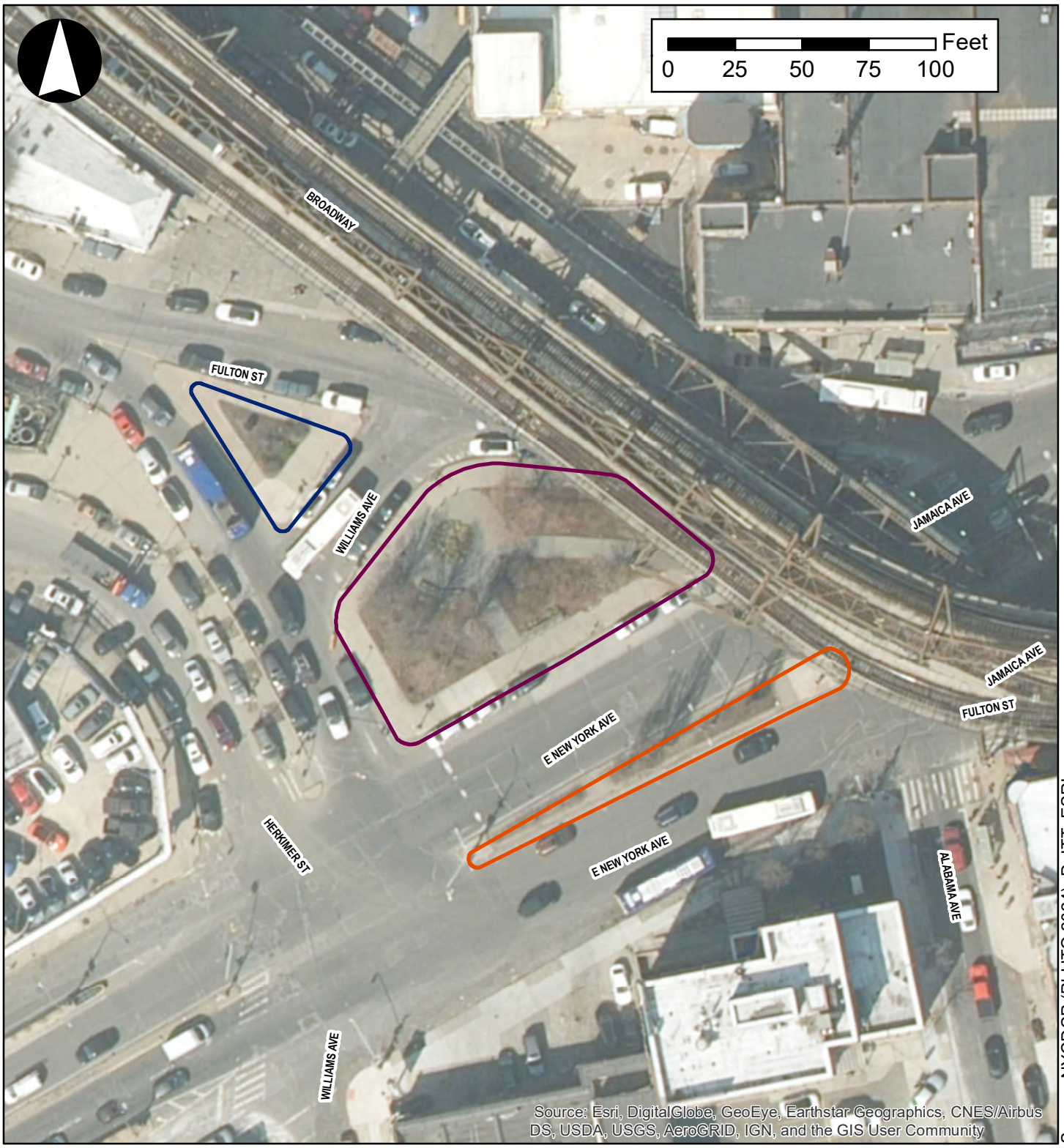
Figure 6-8b
Jewel Square
Incremental Shadows on December 21 Analysis Day



2:30 PM

With-Action Condition | **Open Space Resources** | **Project-Generated Shadows**

Figure 6-9
Aerial View of Jewel Square



Source: NYCDCP (PLUTO 2024); DoITT; ESRI

Legend

- Jewel Square Northwestern Portion
- Jewel Square Southeastern Portion
- Jewel Square Central Portion

yew bush, two juniper bushes, and seven barberry bushes. The central portion of Jewel Square contains two small concrete paths that converge onto a circular concrete plaza featuring three benches and a circular center plot planted with border grass. Apart from the central portion's circular concrete plaza, the resource contains three distinctive plots landscaped with numerous shrubs – primarily forsythia – as well as six trees, of which one is a mature Kousa dogwood (*Cornus kousa*), two are mature English oaks (*Quercus robur*) and three are mature Dawn redwoods (*Metasequoia glyptostroboides*). The Kousa dogwood and two English oaks appeared healthy during the October 2024 field visit (i.e., their canopies appeared full and lush). One of the three Dawn redwoods appeared healthy during the October 2024 field visit, while two appeared unhealthy (i.e., their canopies appeared sparse). Two additional benches are located along the central portion's East New York Avenue sidewalk. The central portion's five benches were observed to be in good condition, although litter was observed throughout the resource's central portion. Utilization of Jewel Square's benches was low — during the October 2024 field visit, no person was seated or within the resource's boundaries. The southeastern portion of the resource comprises the landscaped median on East New York Avenue between Alabama Avenue and Fulton Street. The landscaping includes several small shrubs and three mature English oaks; the three English oaks appeared healthy during the October 2024 field visit.

On the March 21/September 21 representative analysis day, incremental shadow coverage would eliminate direct sunlight exposure on Jewel Square from approximately 3:15 PM until 4:29 PM (i.e., the end of the analysis day). However, incremental shadow coverage would not be cast on any single area of the resource for an extended period, as shadows move from west to east throughout the day. In sum, the March 21/September 21 representative analysis day spans approximately eight hours and 53 minutes of daylight hours; as described above, before 12:29 PM, the resource would not experience incremental shadow coverage from the With-Action condition and would experience direct sunlight for approximately four hours and 53 minutes. Furthermore, the central portion of Jewel Square containing the six mature trees (i.e., Kousa dogwood, two English oaks, and three Dawn redwoods) would not receive incremental shadow coverage from the With-Action condition until approximately 2:00 PM; therefore, from 7:36 AM to approximately 2:00 PM (a period totaling approximately six hours and 24 minutes), the six mature trees would experience direct sunlight. The southeastern portion of Jewel Square containing the three mature trees (i.e., three English oaks) would not receive incremental shadow coverage from the With-Action condition until approximately 3:45 PM; therefore, from 7:36 AM to approximately 3:45 PM (a period totaling approximately eight hours and nine minutes), the three mature trees would experience direct sunlight. These sunlight durations would allow the resource's sunlight-sensitive vegetation to receive adequate direct sunlight during the growing season. As described in the 2021 *CEQR Technical Manual*, vegetation requiring direct sunlight includes the tree canopy, flowering plants, and plots in community gardens. Generally, six to eight hours a day of direct sunlight, particularly in the growing season, is a minimum requirement. However, certain plantings and vegetation can tolerate partial sun, with a reduced minimum requirement of four to six hours of direct sunlight. Examples of areas that can tolerate partial sun are established tree canopies, shrubs or perennials. Jewel Square contains seven healthy mature trees and numerous shrubs, which, in accordance with 2021 *CEQR Technical Manual* guidance, may tolerate partial sun, with a requirement of four to six hours of direct sunlight. Specifically, in partially shaded conditions, English oaks[2] and Kousa dogwoods[3] require a minimum of four to six hours of light daily; in full sun conditions, these two species require a minimum of six hours of direct light daily. Dawn redwoods[4] require full sun conditions and a minimum of six hours of direct light daily.

[2] https://mortonarb.org/plant-and-protect/trees-and-plants/english-oak/
[3] https://mortonarb.org/plant-and-protect/trees-and-plants/kousa-dogwood/
[4] https://mortonarb.org/plant-and-protect/trees-and-plants/dawn-redwood/

On the May 6/August 6 representative analysis day, incremental shadow coverage would eliminate direct sunlight exposure on Jewel Square between approximately 2:00 PM and 4:00 PM. However, incremental shadow coverage would not be cast on any single area of the resource for an extended period, as shadows move from west to east throughout the day. In sum, the May 6/August 6 representative analysis day spans approximately 10 hours and 51 minutes of daylight hours; as described above, before 12:16 PM, the resource would not experience incremental shadow coverage from the With-Action condition and would experience direct sunlight for approximately five hours and 49 minutes. Furthermore, the central portion of Jewel Square containing the six mature trees (i.e., Kousa dogwood, two English oaks, and three Dawn redwoods) would not receive incremental shadow coverage from the With-Action condition until approximately 1:15 PM; therefore, from 6:27 AM to approximately 1:15 PM (a period totaling approximately six hours and 48 minutes), the six mature trees would experience direct sunlight. The southeastern portion of Jewel Square containing the three mature trees (i.e., three English oaks) would not receive incremental shadow coverage from the With-Action condition until approximately 2:45 PM; therefore, from 6:27 AM to approximately 2:45 PM (a period totaling approximately eight hours and 18 minutes), the three mature trees would experience direct sunlight. These sunlight durations would allow the resource's sunlight-sensitive vegetation to receive adequate direct sunlight during the growing season. As described above, Jewel Square contains seven healthy mature trees and numerous shrubs, which, in accordance with 2021 *CEQR Technical Manual* guidance, may tolerate partial sun, with a requirement of four to six hours of direct sunlight.

On the June 21 representative analysis day, incremental shadow coverage would eliminate direct sunlight exposure on much of Jewel Square between approximately 2:30 PM and 3:30 PM, and between approximately 5:30 PM until 6:01 PM (i.e., the end of the analysis day). However, incremental shadow coverage would not be cast on any single area of the resource for an extended period, as shadows move from west to east throughout the day. In sum, the June 21 representative analysis day spans approximately 12 hours and four minutes of daylight hours; as described above, before 12:42 PM, the resource would not experience incremental shadow coverage from the With-Action condition and would experience direct sunlight for approximately six hours and 45 minutes. Furthermore, the central portion of Jewel Square containing the six mature trees (i.e., Kousa dogwood, two English oaks, and three Dawn redwoods) would not receive incremental shadow coverage from the With-Action condition until approximately 1:00 PM; therefore, from 5:57 AM to approximately 1:00 PM (a period totaling approximately seven hours and three minutes), the six mature trees would experience direct sunlight. The southeastern portion of Jewel Square containing the three mature trees (i.e., three English oaks) would not receive incremental shadow coverage from the With-Action condition until approximately 2:30 PM; therefore, from 5:57 AM to approximately 2:30 PM (a period totaling approximately eight hours and 33 minutes), the three mature trees would experience direct sunlight. These sunlight durations would allow the resource's sunlight-sensitive vegetation to receive adequate direct sunlight during the growing season. As described above, Jewel Square contains seven healthy mature trees and numerous shrubs, which, in accordance with 2021 *CEQR Technical Manual* guidance, may tolerate partial sun, with a requirement of four to six hours of direct sunlight.

On the December 21 representative analysis day, incremental shadow duration would be minimal, affecting Jewel Square for a total duration of approximately two hours and 20 minutes. Incremental shadow coverage would generally be limited in scope and would not be cast on any single area of the resource for an extended period, as shadows move from west to east throughout the day. Jewel Square's sunlight-sensitive features, principally benches, which could be affected by a loss of winter sunlight, would not experience incremental shadow coverage and would therefore receive adequate direct sunlight during winter. In addition, the December 21 representative analysis day is outside the growing season and incremental shadow coverage would not affect the viability of the resource's vegetation (i.e., trees and

landscaping).

Therefore, as the extent and duration of the incremental shadows would: (1) not significantly reduce or completely eliminate direct sunlight exposure on any of the sunlight-sensitive features found within the resource; and (2) would not significantly alter the public's use of the resource or threaten the viability of vegetation or other sunlight-sensitive features, incremental shadows from the With-Action condition on Jewel Square would not be considered a significant adverse impact, in accordance with 2021 *CEQR Technical Manual* guidance. Furthermore, it should be noted that (as discussed further below), Projected Development Site 1A's future PAA space would experience compensatory direct sunlight exposure during hours when portions of Jewel Square are projected to receive incremental shadow coverage. This ameliorative condition could compensate somewhat for the incremental shadow coverage occurring during the afternoon hours on Jewel Square during the four representative analysis days. Moreover, Projected Development Site 1A's future PAA space would include seating options, which would provide potential users of Jewel Square with an additional reservoir of sunlit seating options when Jewel Square's seating options are projected to receive incremental shadow coverage during the afternoon hours.

Jamaica Avenue Greenstreet

MARCH 21/SEPTEMBER 21

On March 21/September 21, incremental shadows from the With-Action condition would reach portions of the Jamaica Avenue Greenstreet for a total duration of approximately 52 minutes, entering the resource at 3:37 PM and continuing until 4:29 PM. Before 3:37 PM, the resource would not experience incremental shadow coverage from the With-Action condition.

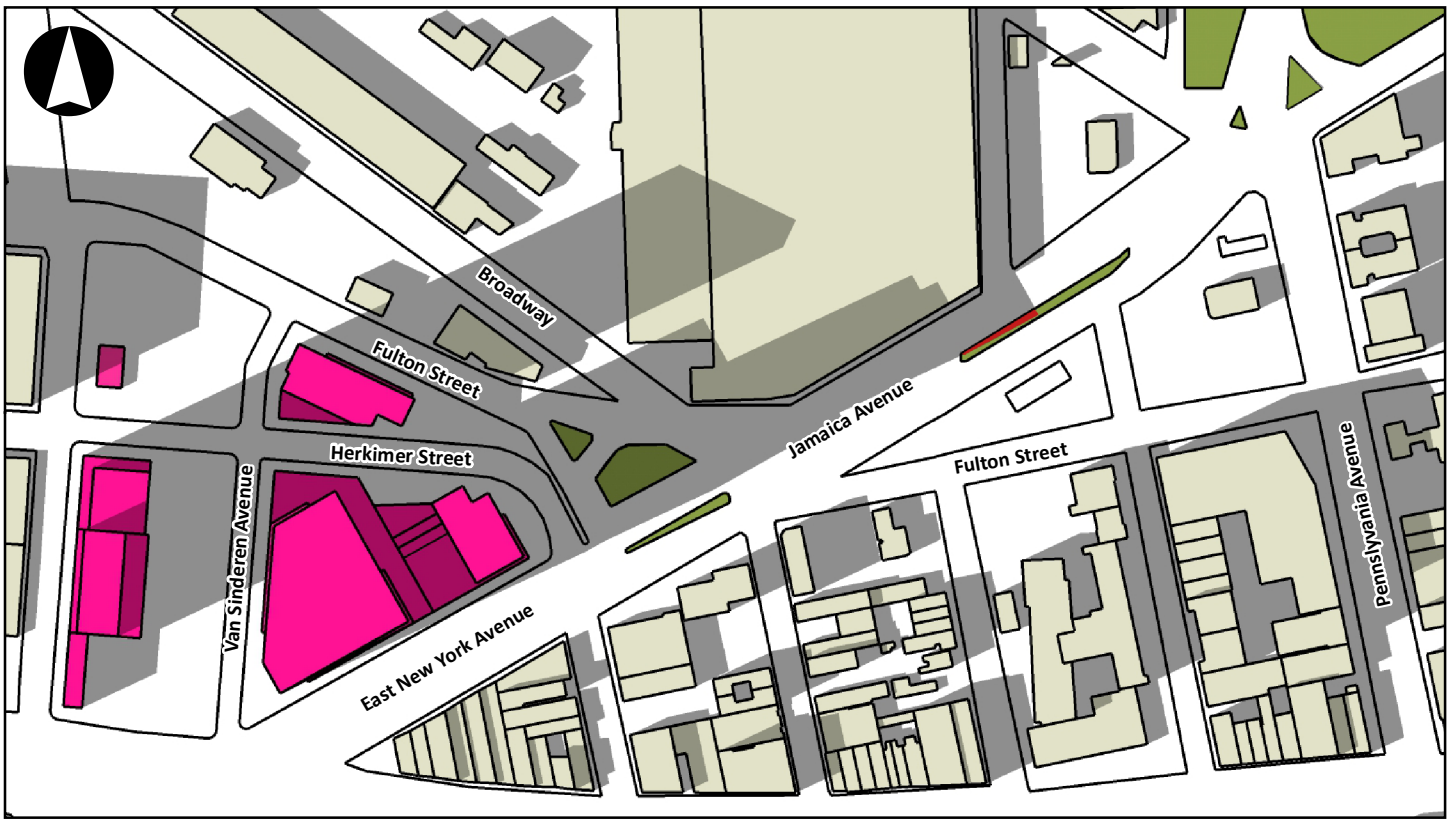
As shown in **Figure 6-10**, at 3:40 PM, incremental shadows would cover the western and central portions of the resource. As also shown in **Figure 6-10**, by 4:15 PM, incremental shadow coverage would increase, moving in an easterly direction to cover a majority of the Jamaica Avenue Greenstreet until the end of the representative analysis day (i.e., 4:29 PM). The portions of the Jamaica Avenue Greenstreet that would experience incremental shadow coverage on the March 21/September 21 representative analysis day contain trees and landscaping.

ASSESSMENT

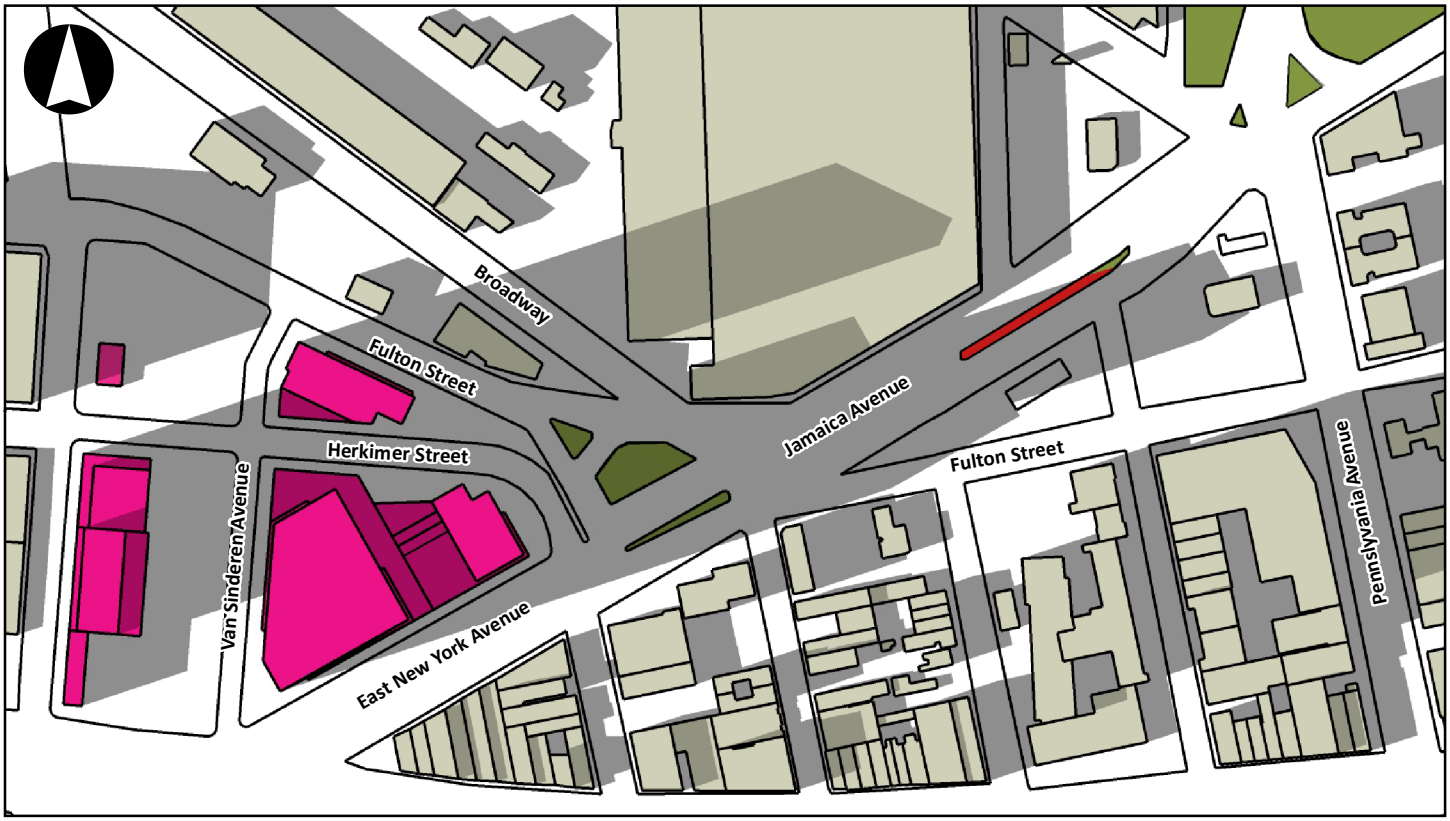
The With-Action condition would cast incremental shadows on portions of the Jamaica Avenue Greenstreet on one of the four representative analysis days for approximately 52 minutes. On the March 21/September 21 representative analysis day, incremental shadow duration would be minimal, affecting the resource for a duration of approximately 52 minutes. Incremental shadow coverage would generally be limited in scope and would not be cast on any single area of the resource for an extended period. This would allow the resource's sunlight-sensitive vegetation to receive adequate direct sunlight (at least the six to eight hours recommended in the 2021 *CEQR Technical Manual*) during the growing season.

Therefore, as the extent and duration of the incremental shadows would: (1) not significantly reduce or completely eliminate direct sunlight exposure on any of the sunlight-sensitive features found within the resource; and (2) would not significantly alter the public's use of the resource or threaten the viability of vegetation or other sunlight-sensitive features, incremental shadows from the With-Action condition on the Jamaica Avenue Greenstreet would not be considered a significant adverse impact, in accordance with 2021 *CEQR Technical Manual* guidance.

Figure 6-10
Jamaica Avenue Greenstreet
Incremental Shadows on March 21/September 21 Analysis Day



3:40 PM



4:15 PM

With-Action Condition | Open Space Resources | Project-Generated Shadows

Jackie Robinson Parkway Greenstreets

DECEMBER 21

On December 21, incremental shadows from the With-Action condition would reach portions of the Jackie Robinson Parkway Greenstreets for a total duration of approximately one minute, entering the resource at 2:52 PM and continuing until 2:53 PM. The portions of the Jackie Robinson Parkway Greenstreets that would experience incremental shadow coverage on the December 21 representative analysis day contain trees and landscaping.

ASSESSMENT

The With-Action condition would cast incremental shadows on portions of the Jackie Robinson Parkway Greenstreets on one of the four representative analysis days for approximately one minute. As stated in the 2021 *CEQR Technical Manual*, an incremental shadow is generally not considered significant when its duration is no longer than 10 minutes at any time of year and the resource continues to receive substantial direct sunlight. Therefore, as the extent and duration of the incremental shadows would: (1) not significantly reduce or completely eliminate direct sunlight exposure on any of the sunlight-sensitive features found within the resource; and (2) would not significantly alter the public's use of the resource or threaten the viability of vegetation or other sunlight-sensitive features, incremental shadows from the With-Action condition on the Jackie Robinson Parkway Greenstreets would not be considered a significant adverse impact, in accordance with 2021 *CEQR Technical Manual* guidance.

Cemetery Of The Evergreens (S/NR-Listed)

DECEMBER 21

On December 21, incremental shadows from the With-Action condition would reach portions of the Cemetery of the Evergreens (S/NR-listed) for a total of approximately 42 minutes, entering the resource at 2:11 PM and continuing until 2:53 PM. Before 2:11 PM, the resource would not experience incremental shadow coverage from the With-Action condition.

As shown in **Figure 6-11**, at 2:30 PM, incremental shadows would cover a small portion of the resource's southernmost acreage. As also shown in **Figure 6-11**, by 2:50 PM, near the end of the representative analysis day, incremental shadow coverage would increase, moving in a northeasterly direction towards Jackie Robinson Parkway. The portions of the Cemetery of the Evergreens (S/NR-listed) that would experience incremental shadow coverage on the December 21 representative analysis day contain burial plots, trees, and landscaping.

ASSESSMENT

The With-Action condition would cast incremental shadows on portions of the Cemetery of the Evergreens (S/NR-listed) on one of the four representative analysis days for approximately 42 minutes. On the December 21 representative analysis day, incremental shadow duration would be minimal, affecting the resource for a duration of approximately 42 minutes. Incremental shadow coverage would generally be limited in scope and would not be cast on any single area of the resource for an extended period. The portions of the Cemetery of the Evergreens (S/NR-listed) that would experience incremental shadow coverage on the December 21 representative analysis day contain burial plots, trees, and landscaping. As such, no areas of the resource containing benches or seating, which could be affected by a loss of winter sunlight, would experience incremental shadow coverage. Furthermore, the December 21

Figure 6-11
Cemetery of the Evergreens
Incremental Shadows on December 21 Analysis Day



2:30 PM



2:50 PM

With-Action Condition | Open Space Resources | Project-Generated Shadows

representative analysis day is outside the growing season and incremental shadow coverage would not affect the viability of the resource's trees and landscaping.

Therefore, as the extent and duration of the incremental shadows would: (1) not significantly reduce or completely eliminate direct sunlight exposure on any of the sunlight-sensitive features found within the resource; and (2) would not significantly alter the public's use of the resource or threaten the viability of vegetation or other sunlight-sensitive features, incremental shadows from the With-Action condition on the Cemetery of the Evergreens (S/NR-listed) would not be considered a significant adverse impact, in accordance with 2021 *CEQR Technical Manual* guidance.

Project-Generated Open Space

Pursuant to 2021 *CEQR Technical Manual* guidance, shadows on project-generated open space are not considered significant. However, as future project-generated open space (i.e., the publicly accessible area ["PAA"] space) is included as part of the analysis presented in **Chapter 5, "Open Space,"** a discussion of how project-generated shadows could affect the new PAA space planned under the Proposed Actions is provided.

As described in **Chapter 5, "Open Space,"** both the Proposed Development and Alternate Community Facility Scenario would include approximately 20,080 sf (approximately 0.46 acres) of PAA space (refer to **Appendix A** for an illustrative plan of the proposed PAA space).

On Projected Development Site 1A, the proposed PAA space would measure approximately 4,904 sf and provide passive recreation space and amenities, inclusive of a pathway running diagonally from Van Sinderen Avenue to Herkimer Street, along with several planters, trees, seating options (i.e., bench seating with and without backs), PAA signage, and a small lawn on the northern portion of the site.

On Projected Development Site 1C, the proposed PAA space would measure approximately 4,190 sf and consist of sidewalk widenings along Williams Place and Fulton Street, with more centralized meeting and gathering spaces along Herkimer Street and near the corner of Projected Development Site 1C towards the junction of Herkimer Street, Fulton Street, and East New York Avenue. The inclusion of sidewalk widenings would promote increased pedestrian usability and walkability along the site's frontages. The largest portion of the PAA space would contain several planters, seating options (i.e., bench seating with and without backs, movable tables/chairs, and wall seating), and PAA signage.

On Projected Development Site 1D, the proposed PAA space would measure approximately 3,689 sf and consist of pocket spaces along Herkimer Street as the street curves towards the junction of Fulton Street and East New York Avenue. The PAA space would line the curvature of Herkimer Street with amenities including planters, trees, various seating options (i.e., bench seating with and without backs, movable tables/chairs, and wall seating), and PAA signage.

On Projected Development Site 1E, the proposed PAA space would measure approximately 7,297 sf and consist of sidewalk widenings on Williams Place and East New York Avenue, a triangular meeting and gathering area at the corner of Williams Place and East New York Avenue, and a larger meeting and gathering space along the south side of Herkimer Street. The PAA space would contain amenities including planters, trees, various seating options (i.e., linear seating, bench seating with and without backs, movable tables/chairs, and wall seating), and PAA signage.

On the March 21/September 21, May 6/August 6, June 21, and December 21 representative analysis days, project-generated shadow coverage on Projected Development Site 1A's future PAA space is expected to

be greatest during the early and late morning hours (several hours after the start of the analysis day) and would exit by noon, leaving Projected Development Site 1A's future PAA space in direct sunlight. On the December 21 representative analysis day, Projected Development Site 1A's future PAA space would receive the greatest extent of project-generated shadow coverage from 8:51 AM (i.e., the start of the analysis day) until approximately 10:30 AM, at which point Projected Development Site 1A's future PAA space would receive limited project-generated shadow coverage through the remainder of the December 21 representative analysis day. Overall, because shadows are not static and move from west to east throughout the analysis day, it is anticipated that much of Projected Development Site1A's future PAA space would receive adequate direct sunlight throughout the day (at least the six to eight hours recommended in the 2021 *CEQR Technical Manual*), and vegetation would not be affected by project-generated shadows.

On the March 21/September 21, May 6/August 6, June 21, and December 21 representative analysis days, project-generated shadow coverage on Projected Development Sites 1C, 1D, and 1E's future PAA spaces is expected to be greatest during the late morning and early afternoon hours. On the December 21 representative analysis day, Projected Development Sites 1C, 1D, and 1E's future PAA spaces would receive the greatest extent of project-generated shadow coverage from approximately 9:30 AM until 2:53 PM (i.e., the end of the analysis day). Although project-generated shadow coverage would limit direct sunlight exposure on Projected Development Sites 1C, 1D, and 1E's future PAA spaces on the December 21 representative analysis day, pursuant to 2021 *CEQR Technical Manual* guidance, shadows on project-generated open space are not considered significant.

During the March 21/September 21, May 6/August 6, June 21, and December 21 representative analysis days, Projected Development Site 1A's future PAA space would provide new sunlit areas during times when Jewel Square is projected to experience incremental shadow coverage. As described above, Projected Development Site 1A's future PAA space would receive the greatest extent of project-generated shadow coverage on the December 21 representative analysis day, from 8:51 AM until approximately 10:30 AM. Therefore, on all four representative analysis days, Projected Development Site 1A's future PAA space would experience direct sunlight exposure during the afternoon hours, when portions of Jewel Square are projected to receive incremental shadow coverage. This ameliorative condition could compensate somewhat for the incremental shadow coverage occurring during the afternoon hours on Jewel Square during the four representative analysis days. Moreover, Projected Development Site 1A's future PAA space would include seating options, which would provide potential users of Jewel Square with an additional reservoir of sunlit seating options when Jewel Square's seating options are projected to receive incremental shadow coverage during the afternoon hours.