East New York Rezoning Proposal
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. Public open spaces, historic resources, and natural resources are all potentially sunlight-sensitive resources, and, thus, this chapter is closely linked to the information presented in other chapters of the environmental impact statement (EIS), particularly Chapter 5, "Open Space," and Chapter 7, "Historic and Cultural Resources."

According to the *City Environmental Quality Review* (CEQR) *Technical Manual*, a shadows assessment is required if a proposed action would result in structures (or additions to existing structures) of 50 feet in height or greater, or those that would be located adjacent to, or across the street from, a sunlight sensitive resource. As discussed in Chapter 1, "Project Description," the reasonable worst case development scenario (RWCDS) for the Proposed Actions identifies 80 projected development sites and 105 potential development sites in the East New York rezoning area. The redevelopment of the projected development sites, and the less likely development of the potential development sites is expected to result in new buildings greater than 50 feet in height over the No-Action condition at most development sites. As such, a detailed shadows analysis was prepared 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 on 25 total resources, including: 20 open space resource and five historic resources. With the exception of the Holy Trinity Russian Orthodox Church, project-generated shadows would not affect the utilization or enjoyment of any sunlight-sensitive resources and all open spaces would continue to receive a minimum of four hours of direct sunlight throughout the growing season.

As project-generated incremental shadows would reach a maximum of eight of the church's twenty-two stained glass windows at any one time, incremental shadows would not result in the complete elimination of direct sunlight on all sunlight-sensitive features of this historic resource. However, as these incremental shadows may have the potential to affect the public's enjoyment of this feature, albeit for a brief duration of approximately 36 minutes on March 21, 45 minutes on May 6, 49 total minutes on June 21, and one hour and 59 minutes on December 21, this is being considered a significant adverse shadow impact. Measures to mitigate this impact (e.g., special lighting features) will be considered between the DEIS and FEIS. Absent the identification and implementation of feasible and practicable measures, the Proposed Actions could have an unmitigated significant adverse shadows impact on the Holy Trinity Russian Orthodox Church.

C. METHODOLOGY

According to the *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 projects or actions resulting in structures less than 50 feet tall, a shadow assessment is generally not necessary, unless the site is 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 a project could reach any sunlight-sensitive resource at any time of year. The *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 to be sunlight-sensitive resources:

- *Public open space* (e.g., parks, playgrounds, plazas, schoolyards, greenways, and landscaped medians with seating). Planted areas within unused portions or roadbeds that are part of the Greenstreets program are also considered sunlight-sensitive resources. The use of vegetation in an open space establishes its sensitivity to shadows. This sensitivity is assessed for both (1) warm-weather dependent features, like 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. Uses that rely on sunlight include: passive use, such as sitting or sunning; active use, 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 requires extensive sunlight. Vegetation requiring direct sunlight includes the tree canopy, flowering plants, and plots in community gardens. Generally, four to six hours a day of sunlight, particularly in the growing season, is a minimum requirement.

- *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 surface water bodies, wetlands, or designated resources, such as coastal fish and wildlife habitats.

The preliminary screening assessment consists of three tiers of analysis. The first tier determines a simple radius around the proposed buildings representing the longest shadow that could be cast. 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 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 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 shadow analysis is required to determine the extent and duration of the incremental shadow resulting from the project. In accordance with the *CEQR Technical Manual*, 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 21st vernal equinox (or the September 21st autumnal equinox, which is approximately the same), the June 21st summer solstice, and a spring or summer day halfway between the summer solstice and equinoxes, such as May 6th or August 6th (which are approximately the same). For the cold-weather months, the December 21st 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 historic and natural resources.

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 detailed analysis provides the data needed to assess the shadow impacts. The effects of the new shadows on the sunlight-sensitive resources are described, and their degree of significance is considered. The result of the analysis and assessment are documented with graphics, a table of incremental shadow durations, and narrative text. As described in the *CEQR Technical Manual*, an incremental shadow is generally not considered significant when its duration is no longer than ten 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 ten 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 its survival (when there would be sufficient sunlight in the future without the project) or a reduction in direct sunlight exposure where the sensitive feature of the resource is already subject to substandard sunlight (i.e., less than the minimum time necessary for its 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 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 proposed action falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight exposure, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources.

D. PRELIMINARY SCREENING ASSESSMENT

First, an assessment of the 80 projected and 105 potential development sites was performed in order to determine which sites required a preliminary screening assessment. As noted above, pursuant to CEQR guidelines, only new development or enlargement that would result in an incremental increase of 50 feet or more compared to the No-Action alternative require assessment. In addition, any development site adjacent to, or across the street from, a sunlight sensitive resource requires a preliminary screening, regardless of its height.

Table 6-1 below summarizes this initial screening. As indicated in the table, new structures of greater than 50 feet in incremental height are anticipated on 75 of the 80 projected development sites and 95 of the 105 potential development sites, and consequently require a preliminary screening assessment. Of the 15 remaining sites that would be developed with incremental heights of less than 50 feet, none were adjacent to sunlight-sensitive resources, as defined in the *CEQR Technical Manual*, and therefore, no further analysis was warranted for these sites.

TABLE 6-1
RWCDS Sites Warranting Preliminary Shadow Analyses

Sites Warranting Preliminary Shadow Analysis		Sites Not Warranting Preliminary Shadow Analysis
Sites with 50-Foot or Greater Height Increment[1]	**Sites with Less than 50-Foot Height Increment Adjacent to Sunlight Sensitive Resources**	**Sites with Less than 50-Foot Height Increment Not Adjacent to Sunlight Sensitive Resources**
Projected Sites		
1-12, 14-30, 32-39, 41-43, 46-70, 72-81	None	13, 31, 44, 45, 71
Potential Sites		
A1-A18, A21-A34, A36-A38, A42-A43, A46-A56, A58-A79, A81, A83-A87, A89-A106	A88	A19, A20, A35, A39, A40, A41, A44, A45, A80, A82

Notes:
[1] Based on maximum zoning envelopes.

A base map was prepared (see Figure 6-1) showing the projected and potential development sites identified for analysis in Table 6-1, as well as the proposed rezoning area, the surrounding street layout, and all sunlight-sensitive resources (publicly-accessible open spaces, architectural resources, natural resources, and Greenstreets).

Tier 1 Screening Assessment

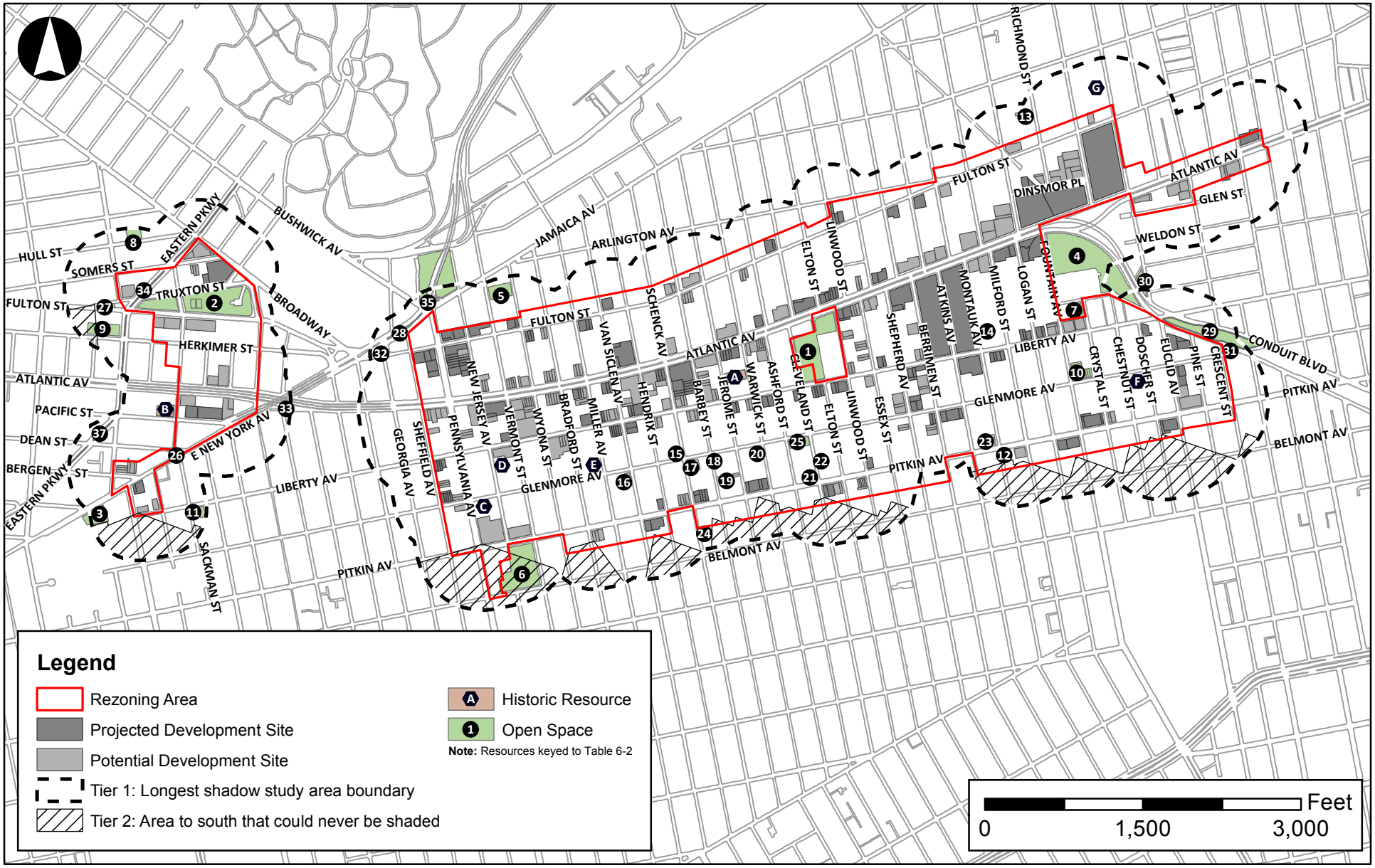
According to the *CEQR Technical Manual*, the longest shadow that a structure will cast in New York City, except for periods close to dawn or dusk, is 4.3 times its height. The maximum shadow radius for each of the 170 development sites warranting a preliminary shadow analysis was determined using each site's maximum zoning envelope. The maximum shadow radius for each development site was merged to form the longest shadow study area (Tier 1 Assessment).

Within this longest shadow study area, there are a number of potentially sunlight-sensitive open spaces and historic resources. Therefore, further screening was warranted in order to determine whether any 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 project site. In New York City, this area lies between -108 and +108 degrees from true north. The purpose of the Tier 2 screening is to determine whether the sunlight-sensitive resources identified in the Tier 1 screening are located within portions of the longest shadow study area that can receive shade from the projected and potential developments.

Figure 6-1 provides a base map illustrating the results of the Tier 1 and Tier 2 screening assessments (i.e., the portion of the longest shadow study area lying within -108 degrees from the true north and +108 degrees from true north as measured from southernmost portions of the development sites). A total of 35 open space resources and 7 historic resources were identified in consultation with other city agencies (Department of Parks and Recreation (DPR) and the Landmarks Preservation Commission (LPC)) as sunlight-sensitive resources that warranted further assessment. A list of these resources is provided below in Table 6-2.



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Figure 6-1
Longest Shadow Study Area - Tier 1 and Tier 2 Screening

TABLE 6-2
Sunlight-Sensitive Resources Warranting Further Analysis Based on Tier 1 and 2 Screening

No.[1]	Open Space Resources	22	Cleveland Street Vegetable Garden
1	Sperandeo Brothers Playground	23	Manley's Place
2	Callahan-Kelly Playground	24	Jerry & the Senior Gents of East New York
3	Howard Playground & Pool	25	PS 4 Paradise Garden
4	City Line Park	26	Dean St. at Sackman St. & E. New York Av. Greenstreet
5	George Walker Jr. Park	27	Fulton St. and Eastern Parkway Greenstreet
6	Grace Playground	28	E. New York Av. Greenstreet btwn Penn./Williams Avs.
7	Crystal Street Block Association	29	N. Conduit Blvd. Greenstreet btwn Hemlock St. & Liberty Av.
8	Hull Street Garden	30	N. Conduit Blvd. Greenstreet btwn Hill St. & McKinley Av.
9	PS/IS 155 Schoolyard	31	N. Conduit Av. Greenstreet at Glenmore Av.
10	Green Gems	32	Jamaica Av. Greenstreet at Georgia Av.
11	McLeod's Community Garden	33	Atlantic Av. Greenstreet at Williams Pl.
12	Upon this Rock Community Garden	34	E. Parkway Greenstreet btwn. Bushwick Av. & Prospect Pl.
13	Achievement First East New York School	35	Jamaica Av. Greenstreet at Pennsylvania Av.
14	Shield of Faith	**No.[1]**	**Historic Resources**
15	Clara's Garden	A	St. Michael's Roman Catholic Church
16	East End Community Garden	B	Our Lady of Loreto Church Complex
17	Herbal Garden	C	Holy Trinity Russian Orthodox Church
18	Concerned Residents of Barbey Street	D	Grace Baptist Church
19	Mw United Orient Grand Lodge	E	Second Calvary Baptist Church
20	Warwick Block Association	F	Glenmore Av. Presbyterian Church
21	Floral Vineyard	G	Church of the Blessed Sacrament

[1] **Note:** Numbers keyed to Figure 6-1

Tier 3 Screening Assessment

According to the *CEQR Technical Manual*, a Tier 3 screening assessment should be performed to determine if, in the absence of intervening buildings, shadows resulting from a proposed action can reach a sunlight-sensitive resource, thereby warranting a detailed shadow analysis. The Tier 3 screening assessment is used to determine if shadows resulting from a proposed action can reach a sunlight-sensitive resource at any time between 1.5 hours after sunrise and 1.5 hours before sunset on representative analysis dates.

As project-generated shadows could reach a number of 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 dates. The model contained 3D representations of the elements in the base map used in the preceding assessments and a 3D model of the projected and potential developments. At this stage of the assessment, surrounding buildings within the study area were not included in the model so that it may be determined whether project-generated shadows would reach any sunlight sensitive resources.

The Tier 3 analysis showed that some sunlight-sensitive resources would not receive project-generated shadows on any of the four analysis days, and these resources therefore did not require any further analysis. Table 6-3 presents a summary of the Tier 3 assessment, showing the 22 open spaces and 5 historic resources that could, in the absence of intervening buildings, receive project-generated shadows, and on which analysis days the new shadows would occur.

TABLE 6-3
Tier 3 Assessment Results

No.[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 Analysis Days
Open Space Resources						
1	Sperandeo Brothers Playground	YES	YES	YES	YES	4
2	Callahan-Kelly Playground	YES	YES	YES	YES	4
3	Howard Playground & Pool	NO	YES	YES	NO	2
4	City Line Park	YES	YES	YES	YES	4
5	George Walker Jr. Park	NO	NO	NO	YES	1
6	Grace Playground	NO	YES	YES	NO	2
7	Crystal Street Block Association	YES	YES	YES	YES	4
9	PS/IS 155 Schoolyard	NO	NO	YES	NO	1
12	Upon this Rock Community Garden	YES	YES	YES	NO	3
14	Shield of Faith	YES	YES	YES	YES	4
16	East End Community Garden	NO	NO	NO	YES	1
17	Herbal Garden	NO	NO	NO	YES	1
18	Concerned Residents of Barbey Street	NO	NO	NO	YES	1
19	Mw United Orient Grand Lodge	YES	NO	NO	YES	2
21	Floral Vineyard	YES	NO	NO	YES	2
22	Cleveland Street Vegetable Garden	NO	NO	NO	YES	1
23	Manley's Place	YES	NO	NO	NO	1
27	Fulton St. and E. Parkway Greenstreet	NO	NO	YES	NO	1
28	E. New York Av. Greenstreet between Penn./Williams Avs.	NO	NO	NO	YES	1
29	N. Conduit Blvd. Greenstreet between Hemlock St. & Liberty Av.	YES	NO	NO	YES	2
34	E. Parkway Greenstreet between Bushwick Av. & Prospect Pl.	YES	YES	YES	YES	4
35	Jamaica Av. Greenstreet at Penn. Av.	NO	NO	NO	YES	1
Historic Resources						
A	St. Michael's Roman Catholic Church	YES	YES	YES	YES	4
B	Our Lady of Loreto Church Complex	YES	YES	YES	NO	3
C	Holy Trinity Russian Orthodox Church	YES	YES	YES	YES	4
F	Glenmore Av. Presbyterian Church	NO	YES	YES	YES	3
G	Church of the Blessed Sacrament	NO	NO	NO	YES	1

[1] **Note:** Numbers keyed to Figure 6-1

E. DETAILED ANALYSIS OF SHADOW IMPACTS

Shadows Analysis

Per *CEQR Technical Manual* guidelines, shadow analyses were performed for the 27 sunlight-sensitive 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 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. These four representative days indicate the range of shadows over the course of the year. CEQR guidelines define the temporal limits of a shadow analysis period to fall from 1.5 hours after sunrise to 1.5 hours before sunset. As discussed above, the results of the shadows analysis show the incremental difference in shadow impact between the No-Action and With-Action conditions (see Table 6-4).

As shown in Table 6-4, incremental project-generated shadows would reach 25 of the 27 sunlight-sensitive resources identified in the Tier 3 assessment. It is important to note that historic resources were only included in the detailed analysis if their sunlight-sensitive facades were reached by project-generated shadows. Increases in shadow coverage would occur at 12 resources on March 21/September 21; 9 resources on May 6/August 6; 13 resources on June 21; and 19 resources on December 21. Figures 6-2 through 6-19, provided at the end of this chapter, show representative shadow views for the 25 sunlight-sensitive resources of concern on each of the four representative analysis days.

TABLE 6-4
Duration of Shadows on Sunlight Sensitive Resources (Increment Compared to No-Action)

Resource	Analysis Day	March 21/Sept. 21	May 6/August 6	June 21	December 21
		7:36 AM – 4:29 PM	**6:27 AM – 5:18 PM**	**5:57 AM – 6:01 PM**	**8:51 AM – 2:53 PM**
Sperandeo Brothers Playground	Shadow enter-exit time	7:36 – 11:54 AM	6:27 – 9:52 AM 4:35 – 5:18 PM	5:57 – 9:59 AM 4:44 – 6:01 PM	8:51 AM – 2:53 PM
	Incremental shadow duration	4 hours 18 minutes	3 hours 25 minutes 43 minutes	4 hours 2 minutes 1 hour 17 minutes	6 hours 2 minutes
Callahan-Kelly Playground	Shadow enter-exit time	8:45 AM – 4:29 PM	4:51 – 5:18 PM	4:44 – 6:01 PM	8:51 AM – 2:53 PM
	Incremental shadow duration	7 hours 44 minutes	27 minutes	1 hour 17 minutes	6 hours 2 minutes
Howard Playground & Pool	Shadow enter-exit time	--	--	5:57 – 6:19 AM	--
	Incremental shadow duration	--	--	22 minutes	--
City Line Park	Shadow enter-exit time	1:05 – 4:29 PM	1:23 – 5:18 PM	1:42 – 6:01 PM	12:57 – 2:53 PM
	Incremental shadow duration	3 hours 24 minutes	3 hours 55 minutes	4 hours 19 minutes	1 hour 56 minutes
George Walker Jr. Park	Shadow enter-exit time	--	--	--	8:51 – 9:03 AM 9:23 – 9:37 AM
	Incremental shadow duration	--	--	--	12 minutes 14 minutes
Grace Playground	Shadow enter-exit time	--	4:49 – 5:18 PM	4:44 – 6:01 PM	--
	Incremental shadow duration	--	29 minutes	1 hour 17 minutes	--
Crystal St. Block Association	Shadow enter-exit time	9:23 AM – 4:29 PM	--	--	9:10 AM – 2:53 PM
	Incremental shadow duration	7 hours 6 minutes	--	--	5 hours 43 minutes
PS/IS 155 Schoolyard	Shadow enter-exit time	--	--	5:57 – 6:21 AM	--
	Incremental shadow duration	--	--	24 minutes	--
Shield of Faith	Shadow enter-exit time	1:58 – 4:29 PM	3:58 – 5:18 PM	4:26 – 6:01 PM	8:51 – 11:08 AM
	Incremental shadow duration	2 hours 31 minutes	1 hour 20 minutes	1 hour 35 minutes	2 hours 17 minutes
East End Community Garden	Shadow enter-exit time	--	--	--	8:51 – 8:55 AM
	Incremental shadow duration	--	--	--	4 minutes
Herbal Garden	Shadow enter-exit time	--	--	--	9:37 – 10:23 AM
	Incremental shadow duration	--	--	--	46 minutes
Mw United Orient Grand Lodge	Shadow enter-exit time	7:36 – 8:48 AM	--	--	8:51 – 10:05 AM
	Incremental shadow duration	1 hour 12 minutes	--	--	1 hour 14 minutes
Floral Vineyard	Shadow enter-exit time	7:36 – 9:58 AM	--	--	8:51 – 10:07 AM
	Incremental shadow duration	2 hours 22 minutes	--	--	1 hour 16 minutes
Cleveland St. Vegetable Garden	Shadow enter-exit time	--	--	--	9:27 – 11:20 AM
	Incremental shadow duration	--	--	--	1 hour 53 minutes
Manley's Place	Shadow enter-exit time	7:36 – 8:09 AM	--	--	--
	Incremental shadow duration	33 minutes	--	--	--
Fulton St. and E. Parkway Greenstreet	Shadow enter-exit time	--	--	5:57 – 6:15 AM	--
	Incremental shadow duration	--	--	18 minutes	--
E. New York Av. Greenstreet	Shadow enter-exit time	--	--	--	8:51 – 9:39 AM
	Incremental shadow duration	--	--	--	48 minutes
N. Conduit Blvd. Greenstreet	Shadow enter-exit time	1:51 – 4:29 PM	--	--	8:51 AM – 2:53 PM
	Incremental shadow duration	2 hours 38 minutes	--	--	6 hours 2 minutes
E. Parkway Greenstreet	Shadow enter-exit time	7:36 – 11:27 AM 3:12 – 4:29 PM	6:27 – 9:45 AM 2:46 – 5:18 PM	5:57 – 9:00 AM 2:45 – 6:01 PM	8:51 AM – 1:43 PM
	Incremental shadow duration	3 hours 51 minutes 1 hour 17 minutes	3 hours 18 minutes 2 hours 32 minutes	3 hours 3 minutes 3 hours 16 minutes	5 hours 52 minutes
Jamaica Av. Greenstreet	Shadow enter-exit time	--	--	--	8:51 – 9:03 AM
	Incremental shadow duration	--	--	--	12 minutes

TABLE 6-4 (Continued)
Duration of Shadows on Sunlight Sensitive Resources (Increment Compared to No-Action)

Resource	Analysis Day	March 21/Sept. 21	May 6/August 6	June 21	December 21
		7:36 AM – 4:29 PM	6:27 AM – 5:18 PM	5:57 AM – 6:01 PM	8:51 AM – 2:53 PM
St. Michael's Roman Catholic Church	Shadow enter-exit time	--	--	5:16 – 6:01 PM	1:30 – 2:53 PM
	Incremental shadow duration	--	--	45 minutes	1 hour 23 minutes
Our Lady of Loreto Church Complex	Shadow enter-exit time	--	--	5:57 – 6:34 AM	--
	Incremental shadow duration	--	--	37 minutes	--
Holy Trinity Russian Orthodox	Shadow enter-exit time	3:53 – 4:29 PM	4:33 – 5:18 PM	5:06 – 5:11 PM 5:17 – 6:01 PM	10:41 AM – 12:40 PM
	Incremental shadow duration	36 minutes	45 minutes	5 minutes 44 minutes	1 hour 59 minutes
Glenmore Av. Presbyterian Church	Shadow enter-exit time	--	6:27 – 6:39 AM	5:57 – 6:22 AM	8:57 – 9:33 AM
	Incremental shadow duration	--	12 minutes	25 minutes	36 minutes
Church of the Blessed Sacrament	Shadow enter-exit time	--	--	--	9:08 – 9:51 AM 10:38 – 12:47 AM
	Incremental shadow duration	--	--	--	43 minutes 2 hours 9 minutes

Note: All times are Eastern Standard Time; Daylight Savings Time was not accounted for per *CEQR Technical Manual* guidelines.
Table indicates the entry and exit times and total duration of incremental shadow for each sunlight-sensitive resource. All reported entry and exit times for historic resources are for the affected sunlight-sensitive facades only, except Holy Trinity Russian Orthodox Church, where duration represents time that new shadows would fall on sunlight-sensitive stained glass windows, rather than the church façade as a whole.

It should be noted that, per the *CEQR Technical Manual*, all times reported herein are Eastern Standard Time and do not reflect adjustments for daylight savings time that is in effect from mid-March to early November. As such, the times reported in this chapter for March 21/September 21, May 6/August 6, and June 21 need to have one hour added to reflect the Eastern Daylight Saving Time.

Open Space Resources

SPERANDEO BROTHERS PLAYGROUND

Sperandeo Brothers Playground is a 2.78-acre open space located on the east side of Cleveland Street between Atlantic and Liberty Avenues. The northeastern portion of this open space resource functions as a playground with multiple jungle-gyms, bench seating, and trees. Just south of the playground area is a synthetic multi-purpose sports field and running track. Tennis, handball, and basketball courts are located along the Liberty Avenue frontage.

The Proposed Actions would result in new incremental shadows of varying duration and coverage on all four representative analysis days at Sperandeo Brothers Playground. Incremental shadows would last for a total of approximately four hours and 18 minutes (from 7:36 to 11:54 AM) on March 21, approximately four hours and eight minutes (from 6:27 to 9:52 AM and 4:35 to 5:18 PM on May 6), approximately four hours and 19 minutes (from 5:57 to 9:59 AM and 4:44 to 6:01 PM on June 21), and approximately six hours and two minutes (from 8:51 AM to 2:53 PM) on December 21 (see Table 6-4).

On March 21, incremental shadow coverage would generally be limited to small southern and western portions of the open space during the early morning, shortly after sunrise, and late afternoon, shortly before sunset. By 9:30 AM shadow coverage would be hardly discernable and incremental shadows would exit the open space completely by noon (see Figure 6-2). No incremental shadow coverage would reach the playground after 12 PM.

On May 6, incremental shadow coverage would generally be limited to the northeastern area of the open space during the early morning and afternoon hours. By 9 AM shadow coverage would be limited to a small corner of the playground area and incremental shadows would exit the open space by 10 AM (see Figure 6-2). By 4:35 PM incremental shadows would re-enter from the northern and western edges of the open space, gradually shifting

eastward and covering small portions of the playground area as well as the running track and synthetic turf field by 5 PM.

On June 21, incremental shadow coverage during the morning hours would generally be limited to the northeastern area of the open space. By 9:30 AM incremental shadows would be limited to a small corner of the playground area and incremental shadow would exit by 10 AM (see Figure 6-2). By 4:44 PM incremental shadows would re-enter the open space from the northern edge of the open space, gradually shifting south and eastward. By 6 PM substantial areas of the open space including the playground as well as portions of the running track and synthetic turf field and tennis courts would be cast in incremental shadow.

On December 21, incremental shadow coverage would generally be limited to southern portions of the open space, which are comprised of handball, basketball, and tennis courts. At 9 AM incremental shadows would cover a majority of the handball courts as well as portions of the basketball and tennis courts and playground area in the northeastern corner of the park (see Figure 6-2). By 11:30 AM incremental shadows would shift eastward, away from the handball courts but covering a greater portion of the basketball courts. Throughout the afternoon, incremental shadows would continue to shift eastward and by 2:30 PM would cover small portions of the handball, basketball, and tennis courts.

Assessment

On March 21, May 6, and June 21 incremental shadows would generally be limited to portions of the open space that feature active recreational uses such as jungle-gym equipment, handball courts, basketball courts, running track, and synthetic turf field, as well as bench seating and trees. As shadows are not static and move from east to west throughout the day, these amenities would continue to receive some direct sunlight on these three representative analysis days (see Figure 6-2). Additionally, incremental shadows on active recreational uses during the months surrounding the summer solstice when temperatures are warmer would not significantly affect the usability of the open space. Furthermore, the open space would continue to receive adequate sunlight during the growing season (at least the four to six hour minimum specified in the *CEQR Technical Manual*) and vegetation would not be affected.

On December 21, while the affected handball, basketball, and tennis courts would receive sizeable incremental shadow coverage, they would continue to receive some direct sunlight as shadows move from east to west throughout the day. Incremental shadow coverage on December 21, when temperatures would be colder and the use of the active recreational space would not be as high (compared to warmer months), would not affect the utilization or enjoyment of this open space resource. Additionally, bench seating areas would only be temporarily affected by incremental shadows during the early morning hours, and a number of benches would receive direct sunlight throughout the afternoon, an important period of the day for users of this resource during the winter timeframe. Furthermore, any vegetation would not be affected by incremental shadows, as the December 21 analysis day falls outside the plant growing season defined by the *CEQR Technical Manual.* Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the usability of Sperandeo Brothers Playground.

CALLAHAN-KELLY PLAYGROUND

Callahan-Kelly Playground is a 3.90-acre open space bounded by Truxton Street, Fulton Street, and Van Sinderen Avenue. The open space is divided into western and eastern sections by Sackman Street. The western portion contains a playground with multiple jungle-gyms, bench seating, and trees. The eastern portion features basketball courts, a synthetic multi-purpose sports field, running track, and handball courts.

This open space resource would experience incremental shadows of varying duration and coverage on all four representative analysis days. Incremental shadows would last for a total of approximately seven hours and 44 minutes (from 8:45 AM to 4:29 PM) on March 21, approximately 27 minutes (from 4:51 to 5:18 PM) on May 6, approximately one hour and 17 minutes (from 4:44 to 6:01 PM) on June 21, and approximately six hours and two minutes (from 8:51 AM to 2:53 PM) on December 21 (see Table 6-4).

On March 21, incremental shadow coverage would generally be limited to small areas along the southern edge of the open space to the west and east of Sackman Street. At 9:30 AM incremental shadows would be hardly discernable (see Figure 6-3). By 1:30 PM incremental shadows would move further into the open space, covering portions of areas with bench seating and trees. No additional areas of the open space would be affected by incremental shadows by 4:15 PM.

On May 6, incremental shadow coverage would generally be limited to the northern edge of the open space to the west of Sackman Street shortly before sunset. No incremental shadows would enter the open space before 4:51 PM. At 5 PM incremental shadows would cover a small portion of the open space containing trees and paved blacktop (see Figure 6-3).

On June 21, incremental shadow coverage would generally be limited to central and western portions of the open space to the west of Sackman Street shortly before sunset. No incremental shadows would enter the open space before 4:44 PM. By 5:30 PM incremental shadows would cover a moderate area of the open space to the west of Sackman Street, including trees and portions of jungle-gyms and swing sets (see Figure 6-3).

On December 21, incremental shadows would cover sizeable areas of the open space to the west and east of Sackman Street. At 9 AM incremental shadows would cover large portions of the playground and bench seating areas to the west of Sackman Street as well as portions of the basketball courts to the east of Sackman Street (see Figure 6-3). By 11:30 AM incremental shadows would shift eastward, away from the playground but covering a larger portion of the basketball courts as well as portions of the running track and synthetic turf field. Throughout the afternoon incremental shadows would continue to move eastward and by 2:30 PM would cover the eastern portion of the playground and some bench seating areas to the west of Sackman Street as well as the majority of the basketball courts, running track, and synthetic turf field to the east of Sackman Street.

Assessment

On March 21, May 6, and June 21 the areas affected by incremental shadow increases would predominantly include benches and jungle-gym equipment within the playground areas. As shadows are not static and move from east to west throughout the day, there would be a number of benches and play areas that would receive direct sunlight on these three representative analysis days, and the Proposed Actions are not expected to have a significant effect on the utilization or enjoyment of this open space. Furthermore, the open space would continue to receive adequate sunlight during the growing season (at least the four to six hour minimum specified in the *CEQR Technical Manual*) and vegetation would not be affected.

On December 21, while the affected playground, basketball courts, running track, and synthetic turf field would receive substantial incremental shadows, they would continue to receive some direct sunlight as shadows move from east to west throughout the day. Incremental shadow coverage on December 21, when temperatures would be colder and the use of the active recreational space would not be as high (compared to warmer months), would not affect the utilization or enjoyment of this open space resource. Additionally, bench seating areas would only be temporarily affected by incremental shadows during the early morning hours, and a number of benches would receive direct sunlight throughout the afternoon, an important period of the day for users of this resource during the winter timeframe. Furthermore, any vegetation would not be affected by incremental shadows, as the December 21 analysis day falls outside the plant growing season defined by the *CEQR Technical Manual.* Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the usability of Callahan-Kelly Playground.

EASTERN PARKWAY GREENSTREET BETWEEN BUSHWICK AVENUE AND PROSPECT PLACE

This open space resource serves as a median for Eastern Parkway between Bushwick Avenue and Prospect Place. Each block of the greenstreet features approximately six trees, while all other areas are paved.

The Proposed Actions would result in new incremental shadows of varying duration and coverage on all four representative analysis days at the Eastern Parkway Greenstreet. Incremental shadows would last for a total of approximately five hours and eight minutes (from 7:36 to 11:27 AM and 3:12 to 4:29 PM) on March 21,

approximately five hours and 50 minutes (from 6:27 to 9:45 AM and 2:46 to 5:18 PM) on May 6, approximately six hours and 19 minutes (from 5:57 to 9:00 AM and 2:45 to 6:01 PM) on June 21, and five hours and 52 minutes (from 8:51 AM to 2:53 PM) on December 21 (see Table 6-4).

On March 21, incremental shadow coverage during the morning would be limited to the one-block portion of the Eastern Parkway Greenstreet located between Somers Street and Broadway. At 8 AM incremental shadows would cover a majority of this portion of the greenstreet (see Figure 6-3). Throughout the morning incremental shadows would shift north and eastward before exiting this portion of the greenstreet at 11:27 AM. By 3:15 PM incremental shadows would enter a separate one-block portion of the greenstreet located to the south between Somers and Fulton Streets. By 4:15 PM the majority of this portion of the greenstreet would be cast in incremental shadow.

On May 6, incremental shadow coverage during the morning would be limited to the one-block portion of the Eastern Parkway Greenstreet located between Somers Street and Broadway. At 9 AM incremental shadows would cover a majority of this portion of the greenstreet (see Figure 6-3). Throughout the morning incremental shadows would shift north and eastward before exiting this portion of the greenstreet at 9:45 AM. By 3 PM incremental shadows would enter a separate one-block portion of the greenstreet located to the south between Somers and Fulton Streets. Throughout the afternoon, incremental shadows would shift eastward and a separate triangular portion of the greenstreet located to the east at the intersection of Eastern Parkway and Truxton Street would be affected.

Similar to the March 21 and May 6 analysis days, on June 21 incremental shadow coverage during the morning would be limited to the one-block portion of the Eastern Parkway Greenstreet located between Somers Street and Broadway. At 8:30 AM incremental shadows would cover a majority of this portion of the greenstreet (see Figure 6-3). Throughout the morning incremental shadows would shift north and eastward before exiting this portion of the greenstreet at 9 AM. By 3:30 PM incremental shadows would enter a separate one-block portion of the greenstreet located to the south between Somers and Fulton Streets. Throughout the afternoon, incremental shadows would shift eastward and a separate triangular portion of the greenstreet located to the east at the intersection of Eastern Parkway and Truxton Street would be affected.

On December 21 incremental shadow coverage during the morning would cover three portions of the Eastern Parkway Greenstreet, including the one-block portion between Somers Street and Broadway, the one block portion between Somers and Fulton Streets, and the triangular area at the intersection of Eastern Parkway and Truxton Street. By 9 AM varying portions of each of these areas would be cast in incremental shadow (see Figure 6-3). Throughout the morning, incremental shadows would shift north and eastward and by 11:30 AM only the one-block northern portion of the greenstreet between Somers Street and Broadway would be cast in incremental shadow.

Assessment

While all of the greenstreet's affected areas are comprised of trees, the open space would still receive adequate sunlight during the growing season (at least the four to six hours specified in the *CEQR Technical Manual*), and vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Eastern Parkway Greenstreet.

HOWARD PLAYGROUND AND POOL

The Howard Playground and Pool is a 1.21-acre open space located on the south side of East New York Avenue at the intersection of St. Mark's Avenue. This open space features outdoor pools, basketball and handball courts, a playground area, and trees.

The shadows analysis determined that the duration and coverage of incremental shadows on Howard Playground and Pool would be limited. The Proposed Actions would result in new incremental shadows for approximately 22 minutes shortly after sunrise, from 5:57 to 6:19 AM, on June 21 (see Figure 6-4). There would be no incremental shadows cast on the playground and pool on the other three representative analysis days. The incremental shadows would cover a very small portion of the area on the southern side of the open space that would exit by

6:19 AM, before the primary hours of utilization and enjoyment. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the usability of Howard Playground and Pool.

CITY LINE PARK

City Line Park is a 3.55-acre irregularly-shaped open space generally bounded by Atlantic Avenue, Conduit Boulevard, Fountain Avenue, and Wells Street. The bulk of the open space features a full size baseball field with lighting equipment for use during dusk and nighttime games. The baseball field is oriented from southwest (home plate) to northeast (centerfield) with benches and dugouts on either side of home plate and bullpens in the northwestern and southeastern portions of the ball field. Just to the east and south of the baseball field is a paved multi-purpose blacktop area used primarily for baseball, soccer, and basketball. As detailed in Chapter 5, "Open Space," as part of the East New York Community Plan, DPR is proposing to convert the existing asphalt play area at City Line Park to an active recreation space/facility that would allow for greater and more varied usage of the space. Further south are basketball and handball courts, a playground with multiple jungle-gyms and bench seating, and a small lawn area.

This open space resource would experience incremental shadows of varying duration and coverage on all four representative analysis days. Incremental shadows would last for a total of approximately three hours and 24 minutes (from 1:05 to 4:29 PM) on March 21, approximately three hours and 55 minutes (from 1:23 to 5:18 PM) on May 6, approximately four hours and 19 minutes (from 1:42 to 6:01 PM) on June 21, and approximately one hour and 56 minutes (from 12:57 to 2:53 PM) on December 21 (see Table 6-4).

On March 21, incremental shadow coverage would generally be limited to the northwestern corner of the park during the afternoon and early evening. No incremental shadows would enter the open space before 1:05 PM. By 1:30 PM incremental shadows would cover a small portion of mostly foul territory along the baseball diamond's left field line (see Figure 6-5). By 4:15 PM incremental shadows would move further into the open space, covering larger portions of left field and the left field bullpen.

On May 6, incremental shadow coverage would generally be limited to the northwestern and central areas of the park during the late afternoon and early evening. No incremental shadows would enter the open space before 1:23 PM. By 2 PM incremental shadows would cover a small portion of mostly foul territory along the baseball diamond's left field line (see Figure 6-5). By 5 PM incremental shadows would move further into the open space, covering larger portions of left field, the left field bullpen, and portions of the infield (shortstop).

On June 21, incremental shadow coverage would generally be limited to the northwestern and central areas of the park during the late afternoon and early evening. No incremental shadows would enter the open space before 1:42 PM. By 3:30 PM incremental shadows would cover a small portion of the baseball field's left field area (see Figure 6-5). By 6 PM incremental shadows would move further into the open space, covering the majority of the baseball field as well as a small portion of the multi-purpose paved blacktop areas further east.

On December 21, incremental shadow coverage would generally be limited to the northwestern corner of the park during the early afternoon. No incremental shadows would enter the open space before 12:57 PM. At 1:30 PM incremental shadows would cover a hardly discernable portion of mostly foul territory along the baseball diamond's left field line (see Figure 6-5). By 2:30 PM incremental shadows would move further into the open space, covering small portions of left field and the left field bullpen.

Assessment

The incremental shadows that could be generated by the Proposed Actions would not adversely affect City Line Park. The baseball field would continue to receive direct sunlight throughout the day on each representative analysis day. During the June 21 analysis day, which showed the most incremental shadows later in the day, the baseball field could be illuminated as needed during dusk and nighttime games by the overhead lighting equipment surrounding the field. Furthermore, the open space would continue to receive adequate sunlight during the growing season (at least the four to six hour minimum specified in the *CEQR Technical Manual*) and

vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact City Line Park.

GEORGE WALKER JR. PARK

George Walker Jr. Park is a 0.59-acre open space bounded by Vermont and Wyona Streets between Jamaica Avenue and Fulton Street. The western portion of this open space features a basketball court and playground with jungle-gym equipment while the eastern portion features handball courts and a paved plaza with bench seating and trees.

The shadows analysis determined that the duration and coverage of incremental shadows on George Walker Jr. Park would be limited. The Proposed Actions would result in incremental shadows on small portions of the western and central areas of the park for a total of approximately 26 minutes on December 21, including 12 minutes shortly after sunrise, from 8:51 to 9:03 AM, and 14 minutes from 9:23 to 9:37 AM (see Figure 6-6). As the park would only experience incremental shadow coverage on the December 21 analysis day, which falls outside the plant growing season as defined by the *CEQR Technical Manual*, vegetation would not be affected. Furthermore, the park is predominantly paved and the short duration of incremental shadows is not anticipated to have a significant effect on its utilization or enjoyment. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact George Walker Jr. Park.

EAST NEW YORK AVENUE GREENSTREET BETWEEN PENNSYLVANIA/WILLIAMS AVENUES

This open space resource serves as a median for East New York Avenue between Pennsylvania and Williams Avenues. The greenstreet features a number of trees and shrubs.

This open space resource would experience incremental shadow coverage during the December 21 analysis day. Incremental shadows would cover central portions of the greenstreet for approximately 48 minutes shortly after sunrise from 8:51 to 2:53 PM (see Figure 6-6). As the greenstreet would only experience incremental shadow coverage on the December 21 analysis day, which falls outside the plant growing season as defined by the *CEQR Technical Manual*, vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the East New York Avenue Greenstreet.

JAMAICA AVENUE GREENSTREET AT PENNSYLVANIA AVENUE

The Jamaica Avenue Greenstreet is located at the intersection of the Jackie Robinson Parkway, Pennsylvania Avenue, and Jamaica Avenue. The greenstreet is divided into four areas including two small planted triangles to the south and two larger grassy areas that feature trees to the north.

The shadows analysis determined that the duration and coverage of incremental shadows on the Jamaica Avenue Greenstreet would be limited. Incremental shadows would cover a very small southern portion of the greenstreet for approximately 12 minutes shortly after sunrise on December 21 (see Figure 6-6). As the greenstreet would only experience incremental shadow coverage on the December 21 analysis day, which falls outside the plant growing season as defined by the *CEQR Technical Manual*, vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Jamaica Avenue Greenstreet.

GRACE PLAYGROUND

Grace Playground is a 2.74-acre open space generally bounded by Pitkin Avenue, Vermont Street, New Jersey Avenue, and Belmont Avenue. The northern portion of this open space features a playground with multiple jungle-gyms, a swing set, benches, and trees. Just to the south of the playground are small lawn areas and a paved plaza. The southeastern corner of the park features a baseball field oriented from southeast (home plate) to northeast (centerfield). The southwestern portions of the open space along Belmont Avenue feature basketball and handball courts.

This open space resource would only experience incremental shadow coverage during the May 6 and June 21 analysis days. On May 6, incremental shadows would cover a small northern portion of the open space containing trees and bench seating for approximately 29 minutes, from 4:49 to 5:18 PM (see Figure 6-7). On June 21, incremental shadows would cover a slightly larger northern area of the open space including trees and portions of jungle-gyms and swing sets for approximately one hour and 17 minutes, from 4:44 to 6:01 PM (see Figure 6-7).

Assessment

The incremental shadows that could be generated by the Proposed Actions would not adversely affect Grace Playground. While a portion of the playground would be cast in incremental shadow, the duration would be short and would not affect the utilization or enjoyment of the equipment. Additionally, there would be play equipment within the open space that would still receive direct sunlight throughout the day. Incremental shadows would only enter the playground during the late afternoon during the months surrounding the summer solstice when temperatures are warmer, and not being able to receive direct sunlight would not significantly affect the usability of the equipment. Lastly, the open space would continue to receive adequate sunlight for tree growth (at least the four to six hour minimum specified in the *CEQR Technical Manual*) and vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact Grace Playground.

CRYSTAL STREET BLOCK ASSOCIATION

The Crystal Street Block Association is a 0.34-acre community garden located at the corner of Wells and Crystal Streets. The western half of the garden mainly features raised planting beds while the eastern half features trees, grassy lawn areas, and some seating areas.

This open space resource would experience incremental shadows of varying duration and coverage during the March 21 and December 21 analysis days. There would be no incremental shadows cast on the community garden on the other two representative analysis days. On March 21, incremental shadows would cover small southern and western portions of the open space containing planting beds, trees, and grassy areas for approximately seven hours and six minutes, from 9:23 AM to 4:29 PM (see Figure 6-8). On December 21, incremental shadows would cover larger northern and central areas of the open space including planting beds, trees, and grassy areas for approximately five hours and 43 minutes, from 9:10 AM to 2:53 PM (see Figure 6-8). From 2:29 to 2:53 PM incremental shadows would result in a complete loss of sunlight at the community garden. However, as the December 21 analysis day falls outside of the growing season, and the community garden would only experience small incremental shadows on March 21 while the majority of the garden would continue to receive adequate direct sunlight (at least the four to six hour minimum specified in the *CEQR Technical Manual*), vegetation would not be affected. During the December 21 analysis day, incremental shadows would temporarily affect seating areas within the open space, which are typically utilized less during the winter months. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Crystal Street Block Association.

PS/IS 155 SCHOOLYARD

The PS/IS 155 Schoolyard is located along Herkimer Street just west of Eastern Parkway. The schoolyard is divided into two areas, one on each side of the school building. The eastern schoolyard functions as a playground with a jungle-gym and blacktop games. The western portion of the schoolyard features a basketball court as well as blacktop games.

The shadows analysis determined that the duration and coverage of incremental shadows on the PS/IS 155 Schoolyard would be limited. The Proposed Actions would result in new incremental shadows on the schoolyard for approximately 24 minutes shortly after sunrise on June 21 (see Figure 6-9). There would be no incremental shadows cast on the schoolyard on the other three representative analysis days. As incremental shadows would exit the schoolyard by 6:21 AM, before the primary hours of utilization and enjoyment, and the affected area is paved blacktop that does not feature any trees or benches, the effects of shadow coverage on both users and vegetation would be essentially the same with or without the Proposed Actions. Therefore, the incremental

shadows that could result from the Proposed Actions are not anticipated to adversely impact the PS/IS 155 Schoolyard.

FULTON STREET AND EASTERN PARKWAY GREENSTREET

The Fulton Street and Eastern Parkway Greenstreet is bounded by Fulton Street, Eastern Parkway, and Truxton Street. The greenstreet is divided into western and eastern portions by a vehicle turnaround lane. The western portion of the greenstreet is planted with trees and shrubs while the eastern portion serves as a paved plaza with seating, trees, and shrubs.

The shadows analysis determined that the duration and coverage of incremental shadows on the Fulton Street and Eastern Parkway Greenstreet would be limited. The Proposed Actions would result in new incremental shadows on the western-most portion of the greenstreet for approximately 18 minutes shortly after sunrise on June 21 (see Figure 6-9). There would be no incremental shadows cast on the greenstreet on the other three representative analysis days or where seating areas are present. While the affected area is comprised of trees and shrubs, the greenstreet would still receive adequate sunlight during the growing season (at least the four to six hours specified in the *CEQR Technical Manual*), and vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Fulton Street and Eastern Parkway Greenstreet.

SHIELD OF FAITH

Shield of Faith is an approximately 0.17-acre community garden located on Montauk Avenue just north of Liberty Avenue. The northern half of the garden mainly features raised planting beds while the southern half features trees, grassy lawn areas, seating areas, and a toolshed.

This open space resource would experience incremental shadows of varying duration and coverage on all four representative analysis days. Incremental shadows would last for a total of approximately two hours and 31 minutes (from 1:58 to 4:29 PM) on March 21, approximately one hour and 20 minutes (from 3:58 to 5:18 PM) on May 6, approximately one hour and 35 minutes (from 4:26 to 6:01 PM) on June 21, and approximately two hours and 17 minutes (from 8:51 to 11:08 AM) on December 21 (see Table 6-4).

On March 21, shadow coverage would generally be limited to the northern edge of the open space during the late afternoon. No incremental shadows would enter the open space before 1:50 PM. By 4 PM incremental shadows would cover a horizontal area along the northern edge of the community garden, which includes planting beds (see Figure 6-10).

On May 6, incremental shadows would cover most areas of the open space during the late afternoon. No incremental shadows would enter the open space before 3:58 PM. By 5 PM incremental shadows would cover a western area of the community garden that includes planting beds, trees, and seating areas (see Figure 6-10).

On June 21, incremental shadows would cover most areas of the open space during the late afternoon. No incremental shadows would enter the open space before 4:26 PM. By 5:45 PM incremental shadows would cover western and central areas of the community garden that include planting beds, trees, and seating areas (see Figure 6-10).

On December 21, shadow coverage would generally be limited to small central and southern portions of the community garden during the late morning. Throughout the morning, incremental shadows would move southward and by 11 AM would be limited to a horizontal area along the southern edge of the open space (see Figure 6-10).

Assessment

On the March 21, May 6, and June 21 representative analysis days, the garden would receive adequate sunlight (at least the four to six hour minimum specified in the *CEQR Technical Manual*) and vegetation would not be affected.

During the growing season, incremental shadows would not enter the community garden on any day until 1:58 PM. As shadows are not static and would move from east to west throughout the day, portions of the community garden would continue to receive direct sunlight after 1:58 PM and throughout the late afternoon on each of these representative analysis days. Additionally, seating areas would only be temporarily affected by incremental shadow coverage during the late afternoon.

On December 21, which falls outside the plant growing season defined by the *CEQR Technical Manual*, vegetation would not be affected. Seating areas, which are typically utilized less during the winter months, would only be temporarily affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Shield of Faith.

EAST END COMMUNITY GARDEN

The East End Community Garden is an approximately 0.16-acre community garden located on Glenmore Avenue at Van Siclen Avenue. The open space mainly features raised planting beds but also accommodates a toolshed and seating areas.

This open space resource would experience incremental shadow coverage during the December 21 analysis day. Incremental shadows would cover a hardly discernable northeastern portion of the community garden for approximately 4 minutes shortly after sunrise (see Figure 6-11). Given the short duration of incremental shadows (a duration of less than 10 minutes is generally not considered significant per *CEQR Technical Manual* guidelines), seating areas within the open space would only be temporarily affected. Furthermore, as the community garden would only experience incremental shadow coverage on the December 21 analysis day, which falls outside the plant growing season as defined by the *CEQR Technical Manual*, vegetation would not be affected. Therefore, the Proposed Actions would not result in significant adverse shadow impacts on the East End Community Garden.

HERBAL GARDEN

Herbal Garden is an approximately 0.23-acre community garden located on the southeast corner of Glenmore and Schenck Avenues. The northern portion of the open space mainly features raised planting beds. The southern portion features a toolshed, gazebo, seating areas, and trees.

The shadows analysis determined that the duration and coverage of incremental shadows on the Herbal Garden would be limited. The Proposed Actions would result in new incremental shadows on a small southern portion of the community garden for approximately 46 minutes, from 9:37 to 10:23 AM, on December 21 (see Figure 6-11). Given the short duration of incremental shadows, seating areas within the open space would only be temporarily affected. Furthermore, as the garden would only experience incremental shadow coverage on the December 21 analysis day, which falls outside the plant growing season as defined by the *CEQR Technical Manual*, vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Herbal Garden.

MW UNITED ORIENT GRAND LODGE

The Mw United Orient Grand Lodge is an approximately 0.19-acre community garden with frontage on Barbey and Jerome Streets between Glenmore and Pitkin Avenues. The western portion of the garden features seating areas and trees. The eastern portion mainly features raised planting beds.

This open space resource would experience incremental shadow coverage during the March 21 and December 21 analysis days. There would be no incremental shadows cast on this open space resource on the other two representative analysis days. On March 21, incremental shadows would cover small central and eastern portions of the community garden containing trees and planting beds for approximately one hour and 12 minutes, from 7:36 to 8:48 AM (see Figure 6-11). On December 21, incremental shadows would cover a small eastern portion containing planting beds for approximately one hour and 14 minutes, from 8:51 to 10:05 AM (see Figure 6-11).

Assessment

Mw United Orient Grand Lodge would continue to receive direct sunlight on the majority of the community garden and the portions receiving incremental shadows would be short in duration. The garden would receive at least four to six hours of direct sunlight during the growing season and vegetation would not be affected. Furthermore, seating areas within the open space would only be temporarily affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Mw United Orient Grand Lodge as a result of the Proposed Actions.

FLORAL VINEYARD

Floral Vineyard is an approximately 0.11-acre community garden located on the northwest corner of Cleveland Street and Pitkin Avenue. The garden features raised planting beds but also accommodates a toolshed and seating areas and trees.

This open space resource would experience incremental shadow coverage during the March 21 and December 21 analysis days. The Proposed Actions would result in new incremental shadow coverage for approximately two hours and 22 minutes (from 7:36 to 9:58 AM) on March 21 and approximately one hour and 16 minutes (from 8:51 to 10:07 AM) on December 21. There would be no incremental shadows cast on the open space on the other two representative analysis days.

On March 21, shadow coverage would generally be limited to central and southern portions of the community garden. By 9:30 AM the majority of the community garden would receive direct sunlight, with all incremental shadow coverage exiting before 10 AM (see Figure 6-12).

On December 21, shadow coverage would generally be limited to eastern and northern portions of the community garden. By 10 AM the majority of the community garden would receive direct sunlight (see Figure 6-12).

Assessment

The garden would receive adequate sunlight during the March 21 analysis period (at least the four to six hour minimum specified in the *CEQR Technical Manual*) and vegetation would not be affected. During the December 21 analysis period, seating areas, which are typically utilized less during the colder winter months, would only be temporarily affected. Furthermore, vegetation would not be affected, as the December 21 analysis day falls outside the plant growing season defined by the *CEQR Technical Manual*. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Floral Vineyard garden.

CLEVELAND STREET VEGETABLE GARDEN

The Cleveland Street Vegetable Garden is an approximately 0.09-acre community garden located on the eastern side of Cleveland Street between Glenmore and Pitkin Avenues. The garden is generally comprised of raised planting beds. Two small toolsheds are located on the southern half of the garden.

This open space resource would experience incremental shadow coverage during the December 21 analysis day. The Proposed Actions would result in new incremental shadows on small western and eastern portions of the garden for approximately one hour and 53 minutes, from 9:27 to 11:20 AM (see Figure 6-12). From 9:39 to 10:07 AM incremental shadows would result in a complete loss of sunlight at the open space. As utilization of the garden is generally lower during the winter months, and no picnic tables or benches are present, incremental shadows are not expected to have a significant effect on the utilization or enjoyment of this open space resource. Furthermore, as the garden would only experience incremental shadow coverage on the December 21 analysis day, which falls outside the plant growing season as defined by the *CEQR Technical Manual*, vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Cleveland Street Vegetable Garden.

MANLEY'S PLACE

Manley's Place is an approximately 0.30-acre community garden located on the northwestern corner of Montauk and Pitkin Avenues. The western half of the garden features walking paths, trees, benches, raised planting beds, and a gazebo. The eastern half of the garden features raised planting beds, bushes, seating areas, and trees.

This open space resource would experience incremental shadow coverage during the March 21 analysis day. Incremental shadows would cover a small eastern portion of the open space resource for approximately 33 minutes shortly after sunrise, from 7:36 to 8:09 AM (see Figure 6-13). Seating areas within the open space would only be temporarily affected and while the affected area is comprised of trees, bushes, and plantings, the open space would still receive adequate sunlight during the growing season (at least the four to six hours specified in the *CEQR Technical Manual*), and vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to adversely impact the Manley's Place.

NORTH CONDUIT BOULEVARD GREENSTREET BETWEEN HEMLOCK STREET AND LIBERTY AVENUE

This open space resource serves as a median for North Conduit Boulevard between Hemlock Street and Liberty Avenue. The greenstreet features large grassy areas, informal dirt pathways, and a number of trees and shrubs.

This open space resource would experience incremental shadow coverage during the March 21 and December 21 analysis days. There would be no incremental shadows cast on this open space resource on the other two representative analysis days. On March 21, incremental shadows would cover northern and central areas of the greenstreet for approximately two hours and 38 minutes, from 1:51 to 4:29 PM (see Figure 6-14). On December 21, incremental shadows would cover sizeable northern and western areas of the greenstreet, lasting for approximately six hours and two minutes, from 8:51 AM to 2:53 PM (see Figure 6-14). While the affected areas are comprised of trees, shrubs, and grassy areas, the open space would still receive adequate sunlight during the growing season (at least the four to six hours specified in the *CEQR Technical Manual*), and vegetation would not be affected. Therefore, the incremental shadows that could result from the Proposed Actions are not anticipated to cause significant adverse impacts to the North Conduit Boulevard Greenstreet.

Historic Resources

ST. MICHAEL'S ROMAN CATHOLIC CHURCH

The shadows analysis determined that the duration and coverage of incremental shadows on St. Michael's Roman Catholic Church would be limited and would not affect portions of the building with sunlight sensitive resources. The Proposed Actions would result in new incremental shadows on this resource on two representative analysis days, with durations ranging from 45 minutes to one hour and 23 minutes during the early to late afternoon hours (see Figure 6-15). While this resource includes a rose window on its western façade and large stained glass windows on the northern and southern facades, incremental shadows would be limited to the lower portions of each façade and would not have the potential to affect any of the church's sunlight-sensitive features. Therefore, the Proposed Actions would not result in significant adverse shadow impacts on St. Michael's Roman Catholic Church.

OUR LADY OF LORETO CHURCH COMPLEX

The shadows analysis determined that the duration and coverage of incremental shadows on Our Lady of Loreto Church would be limited. The Proposed Actions would result in 37 minutes of new incremental shadows on this resource on the June 21 analysis day (see Figure 6-16). There would be no incremental shadows cast on this historic resource on the other three representative analysis days. While this resource features stained glass windows on its northern and southern facades, incremental shadows would only affect the eastern façade and would exit this resource completely by 6:34 AM on June 21, which is well before the operating hours of this facility. Therefore, the incremental shadows as a result of the Proposed Actions would not adversely affect the church's functions or character, nor hamper public enjoyment of its key architectural features.

HOLY TRINITY RUSSIAN ORTHODOX CHURCH

The Holy Trinity Russian Orthodox Church is built in a style typical of Russian Orthodox Churches and features a square base structure with an octagonal pillar and dome rising from the church's center. The eastern and western facades of the church are symmetrical and each feature a total of two rectangular stained glass windows. Two small, rounded stained glass windows are located on the southern façade. The clerestory level features sixteen stained glass windows, with two located on each face of the octagonal pillar (see Figure 6-17). Incremental shadows on sunlight-sensitive features of the Holy Trinity Russian Orthodox Church would occur on all four representative analysis days, with durations ranging from 36 minutes to one hour and 59 minutes. As shown in Table 6-5 below and Figure 6-17, on the March 21, May 6, and June 21 analysis days, shadow coverage would be limited to the lower levels of the church's western and southern façades. On these days, incremental shadows would cover a maximum of two stained glass windows at any one time. On the December 21 analysis day, incremental shadows would reach sunlight-sensitive features on both the clerestory and lower level of the church's western and southern facades. At any given time between 10:41 and 12:40 PM on December 21, incremental shadows would cover parts of anywhere from one to eight stained glass windows.

TABLE 6-5
Duration of Shadows on Stained Glass Windows of Holy Trinity Russian Orthodox Church

Window Grouping[1]	Analysis Day	March 21/Sept. 21	May 6/August 6	June 21	December 21
		7:36 AM – 4:29 PM	6:27 AM – 5:18 PM	5:57 AM – 6:01 PM	8:51 AM – 2:53 PM
1	Shadow enter-exit time	3:53 – 4:29 PM	4:33 – 5:18 PM	5:17 – 6:01 PM	11:15 – 11:54 AM
	Incremental shadow duration	36 minutes	45 minutes	44 minutes	39 minutes
2	Shadow enter-exit time	--	--	5:06 – 5:11 PM	10:41 – 12:40 PM
	Incremental shadow duration	--	--	5 minutes	1 hour 59 minutes
3	Shadow enter-exit time	--	--	--	8:53 – 9:44 AM
	Incremental shadow duration	--	--	--	51 minutes

[1] Window numbers keyed to Figure 6-17
Note: All times are Eastern Standard Time; Daylight Savings Time was not accounted for per *CEQR Technical Manual* guidelines. Duration represents time that new shadows would fall on sunlight-sensitive stained glass windows, rather than the church façade as a whole.

As project-generated incremental shadows would reach a maximum of eight of the church's twenty-two stained glass windows at any one time, incremental shadows would not result in the complete elimination of direct sunlight on all sunlight-sensitive features of this historic resource. However, as these incremental shadows may have the potential to affect the public's enjoyment of this feature, albeit for a brief duration of approximately 36 minutes on March 21, 45 minutes on May 6, 49 total minutes on June 21, and one hour and 59 minutes on December 21, this is being considered a significant adverse shadow impact. Measures to mitigate this impact (e.g., special lighting features) will be considered between the DEIS and FEIS. Absent the identification and implementation of feasible and practicable measures, the Proposed Actions could have an unmitigated significant adverse shadows impact on the Holy Trinity Russian Orthodox Church.

GLENMORE AVENUE PRESBYTERIAN CHURCH

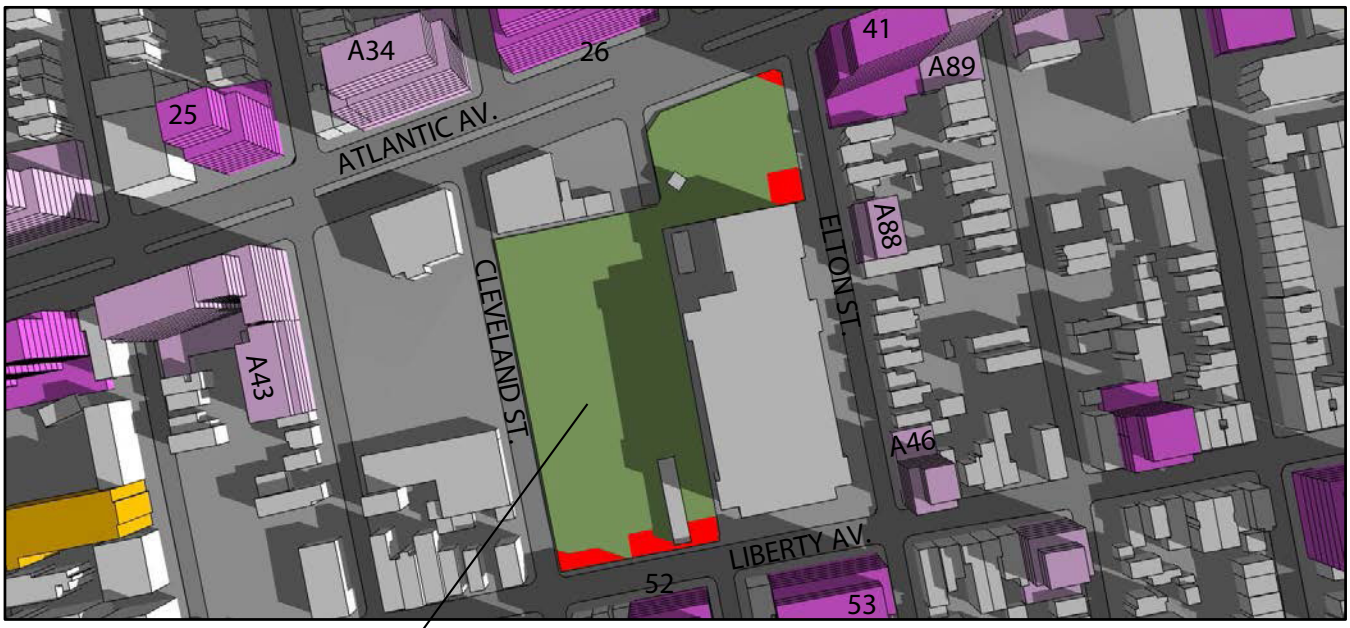
The shadows analysis determined that the duration and coverage of incremental shadows on the Glenmore Avenue Presbyterian Church would be limited. The Proposed Actions would result in new incremental shadows on this resource on three of the four representative analysis days, with durations ranging from 12 minutes to 36 minutes during the early morning hours shortly after sunrise (see Figure 6-18). While this resource features stained glass windows on each of its facades, incremental shadows would exit this resource completely by 6:39 AM on May 6, 6:22 AM on June 21, and 9:33 AM on December 21, which is generally before the operating hours of this facility. The brief duration of incremental shadows cast on this resource in the early morning hours would not adversely affect the church's functions or character, nor hamper public enjoyment of its key architectural features.

CHURCH OF THE BLESSED SACRAMENT

This historic resource would experience incremental shadow coverage during the December 21 analysis day. Incremental shadows would cover small portions of the base of the church for a total duration of two hours and 51

minutes (see Figure 6-19). As incremental shadow coverage would be limited to small areas of the lower portions of the southern façade that do not feature any sunlight-sensitive elements, there would be no potential to affect any of the church's sunlight sensitive features. Therefore, the Proposed Actions would not result in significant adverse shadow impacts on the Church of the Blessed Sacrament.

Figure 6-2
Sperandeo Brothers Playground
Incremental Shadows on March 21/September 21



Sperandeo Brothers Playground

8:00 AM



Sperandeo Brothers Playground

9:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-2
Sperandeo Brothers Playground
Incremental Shadows on March 21/September 21



11:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-2
Sperandeo Brothers Playground
Incremental Shadows on May 6/August 6



7:00 AM



9:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-2
Sperandeo Brothers Playground
Incremental Shadows on May 6/August 6



5:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-2
Sperandeo Brothers Playground
Incremental Shadows on June 21



6:00 AM



8:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-2
Sperandeo Brothers Playground
Incremental Shadows on June 21



Sperandeo Brothers Playground

9:30 AM



Sperandeo Brothers Playground

6:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-2
Sperandeo Brothers Playground
Incremental Shadows on December 21



Sperandeo Brothers Playground

9:00 AM

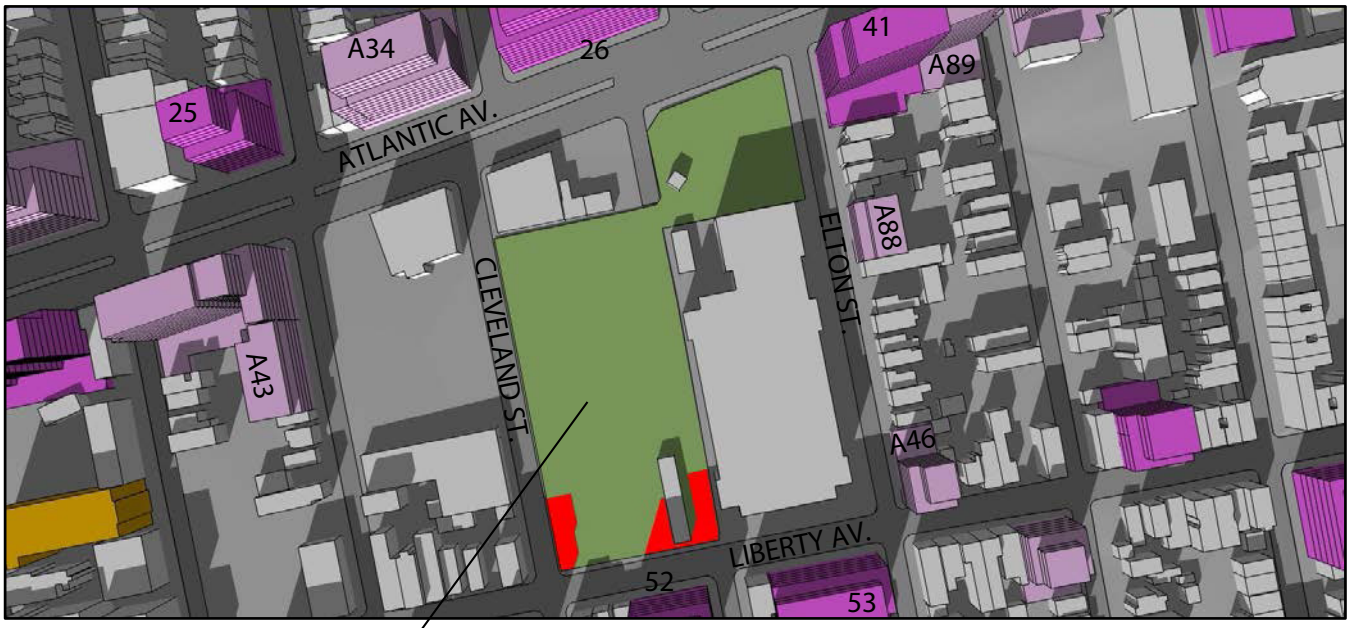


Sperandeo Brothers Playground

11:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-2
Sperandeo Brothers Playground
Incremental Shadows on December 21



Sperandeo Brothers Playground

1:00 PM

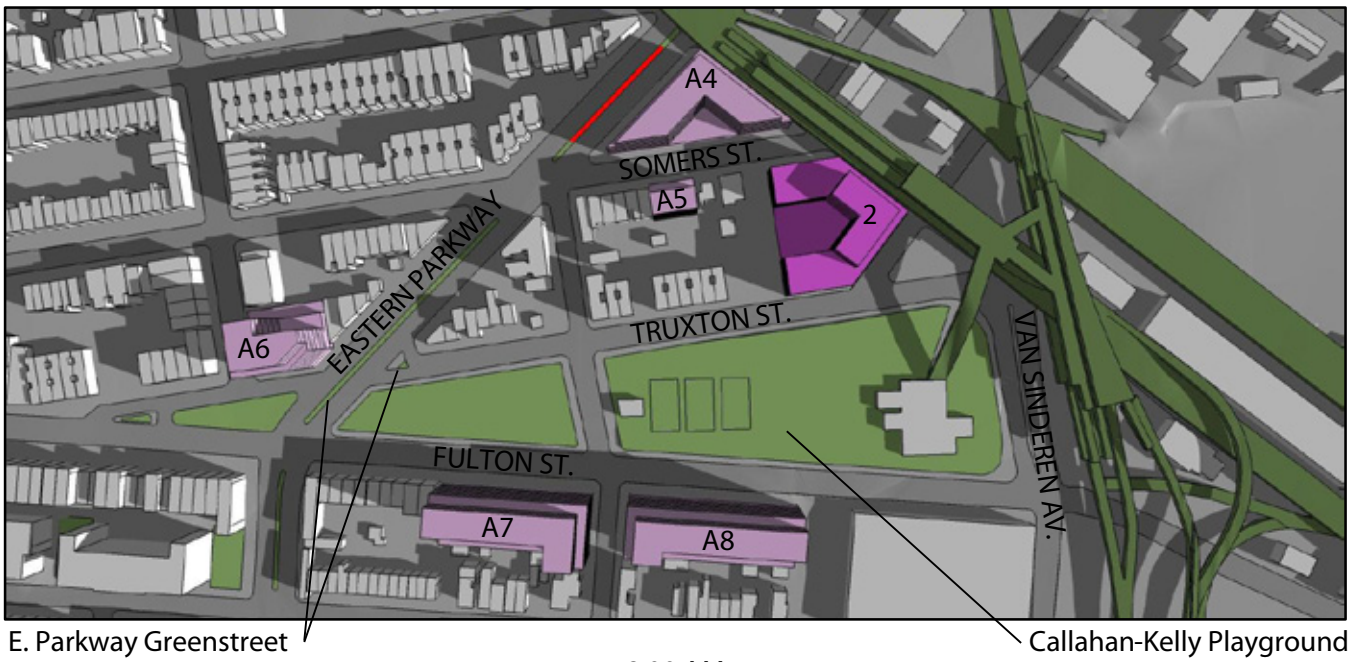


Sperandeo Brothers Playground

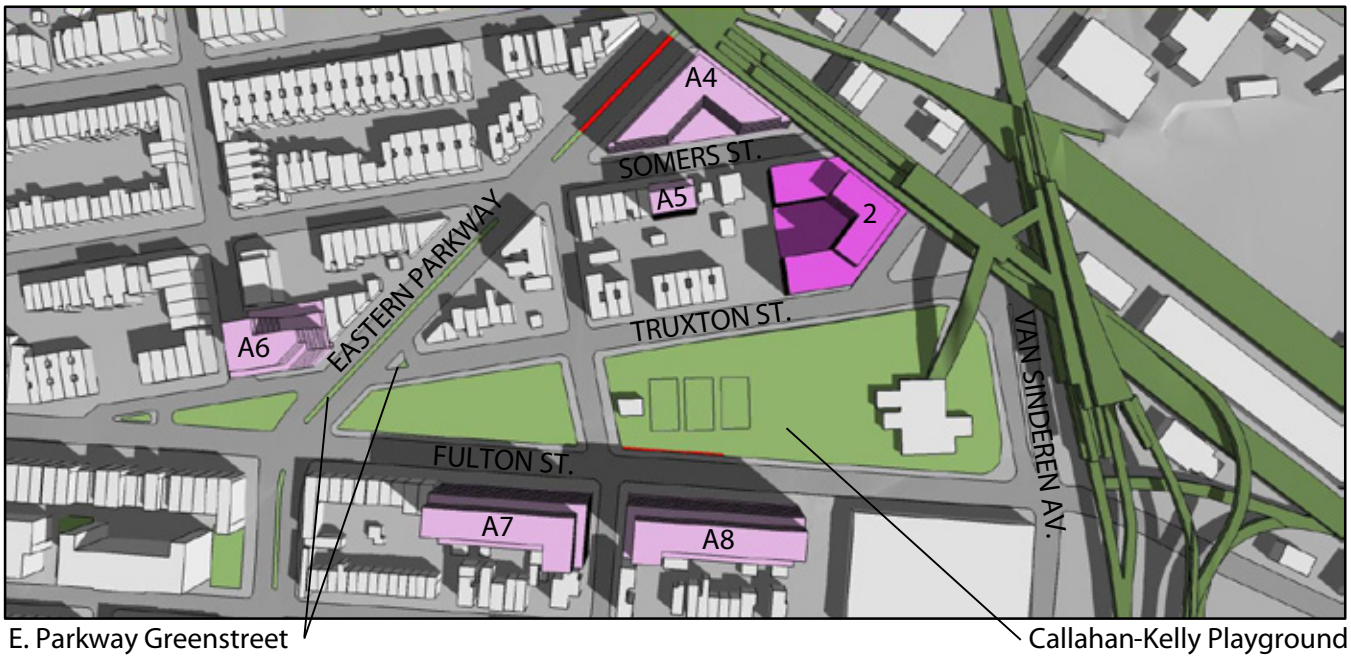
2:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet
Incremental Shadows on March 21/September 21



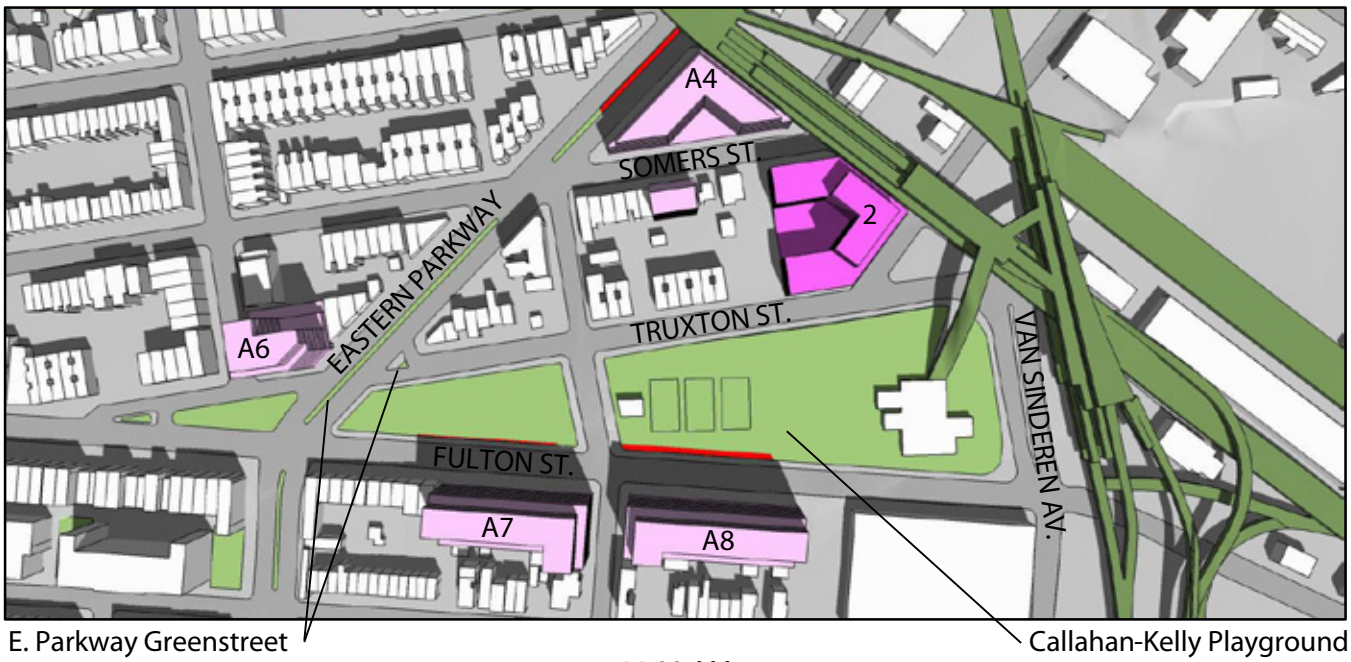
8:00 AM



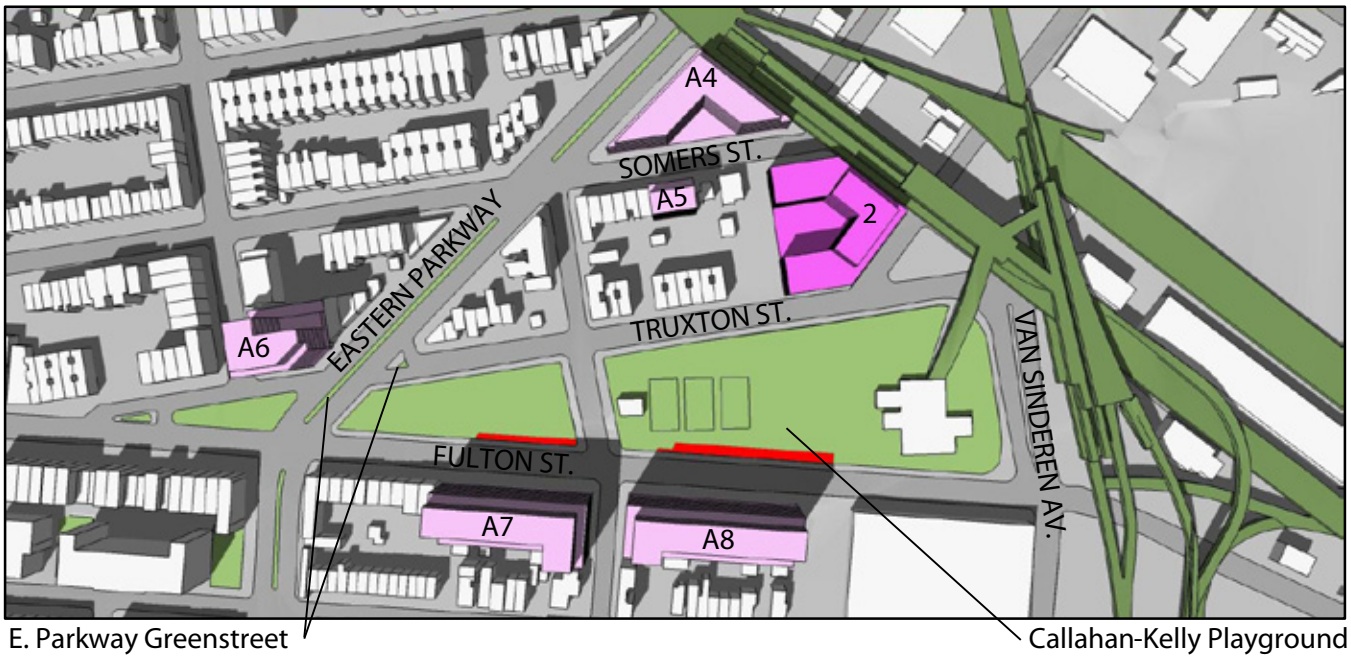
9:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet Incremental Shadows on March 21/September 21



11:00 AM



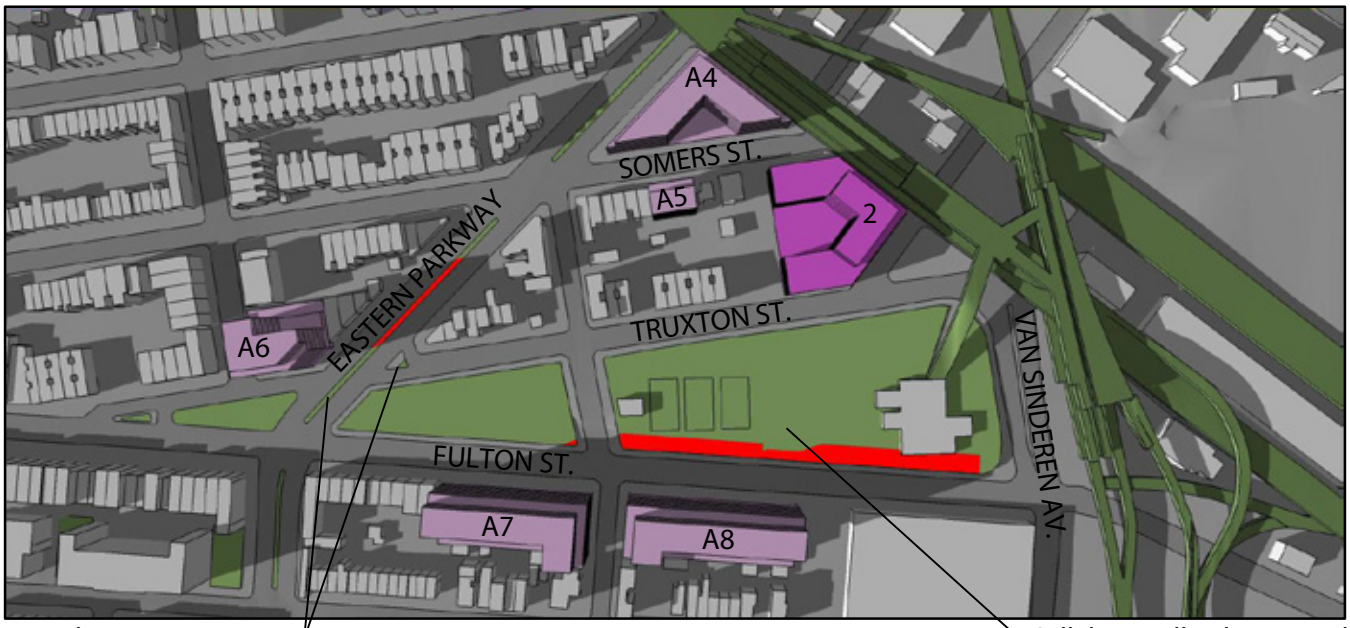
1:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet Incremental Shadows on March 21/September 21



3:15 PM



4:15 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet Incremental Shadows on May 6/August 6



7:00 AM



9:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet Incremental Shadows on May 6/August 6



3:00 PM



4:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet
Incremental Shadows on May 6/August 6



5:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet Incremental Shadows on June 21



6:30 AM



8:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet Incremental Shadows on June 21



3:30 PM



5:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet Incremental Shadows on December 21



9:00 AM



11:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-3
Callahan-Kelly Playground and E. Parkway Greenstreet Incremental Shadows on December 21



1:00 PM



2:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-4
Howard Playground and Pool
Incremental Shadows on June 21



6:15 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-5
City Line Park
Incremental Shadows on March 21/September 21



1:30 PM



3:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-5
City Line Park
Incremental Shadows on March 21/September 21



4:15 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-5
City Line Park
Incremental Shadows on May 6/August 6



2:00 PM



3:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-5
City Line Park
Incremental Shadows on May 6/August 6



5:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-5
City Line Park
Incremental Shadows on June 21



2:00 PM



3:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-5
City Line Park
Incremental Shadows on June 21



6:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-5
City Line Park
Incremental Shadows on December 21



1:30 PM



2:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

George Walker Jr. Park, E. New York Av. Greenstreet, and Jamaica Av. Greenstreet
Incremental Shadows on December 21



9:00 AM



9:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-7
Grace Playground
Incremental Shadows on May 6/August 6



5:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-7
Grace Playground
Incremental Shadows on June 21



5:00 PM



6:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-8
Crystal Street Block Association
Incremental Shadows on March 21/September 21



10:00 AM



12:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-8
Crystal Street Block Association
Incremental Shadows on March 21/September 21



2:30 PM



4:15 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-8
Crystal Street Block Association
Incremental Shadows on December 21



9:30 AM



11:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-8
Crystal Street Block Association
Incremental Shadows on December 21



1:00 PM



2:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-9

PS/IS 155 Open Space and Fulton St. Greenstreet Incremental Shadows on June 21



Figure 6-10
Shield of Faith
Incremental Shadows on March 21/September 21



2:30 PM



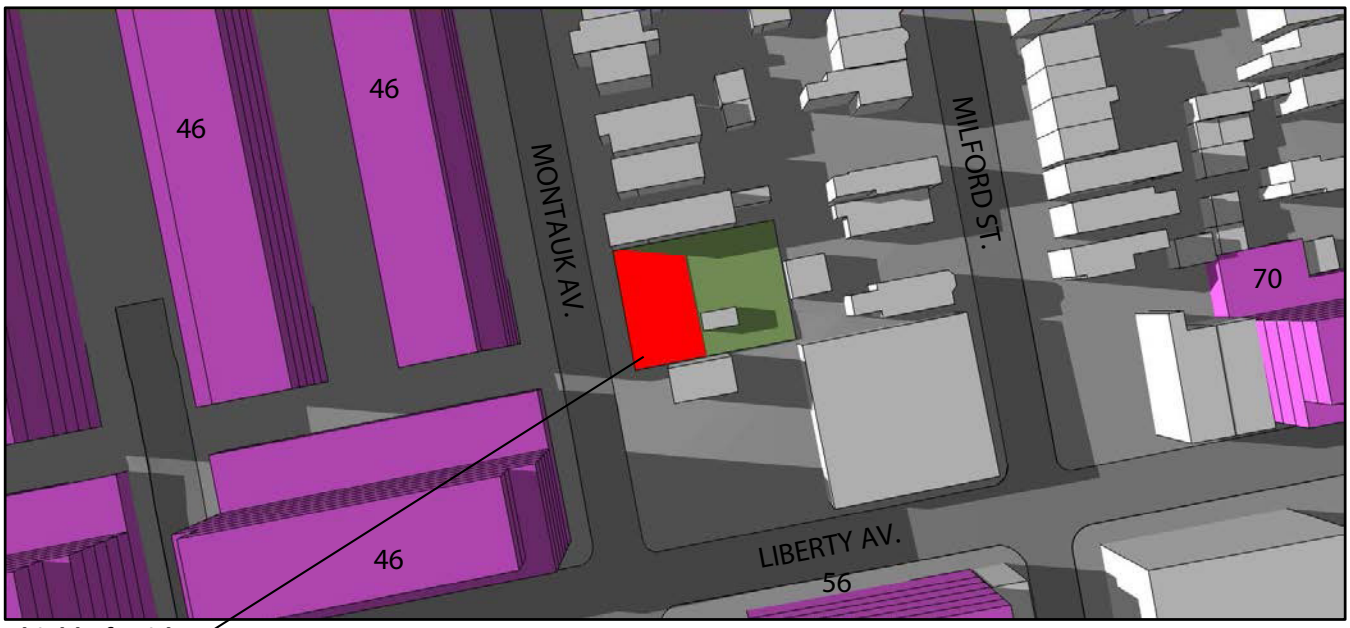
4:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-10
Shield of Faith
Incremental Shadows on May 6/August 6



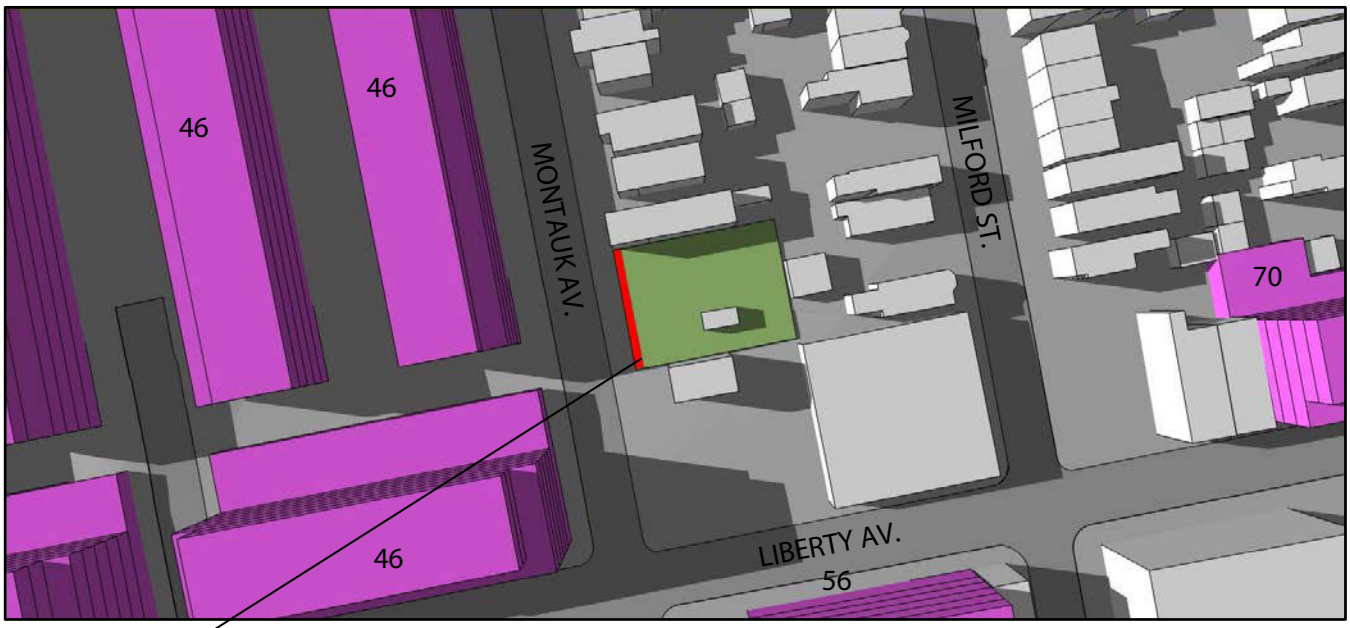
4:15 PM



5:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-10
Shield of Faith
Incremental Shadows on June 21



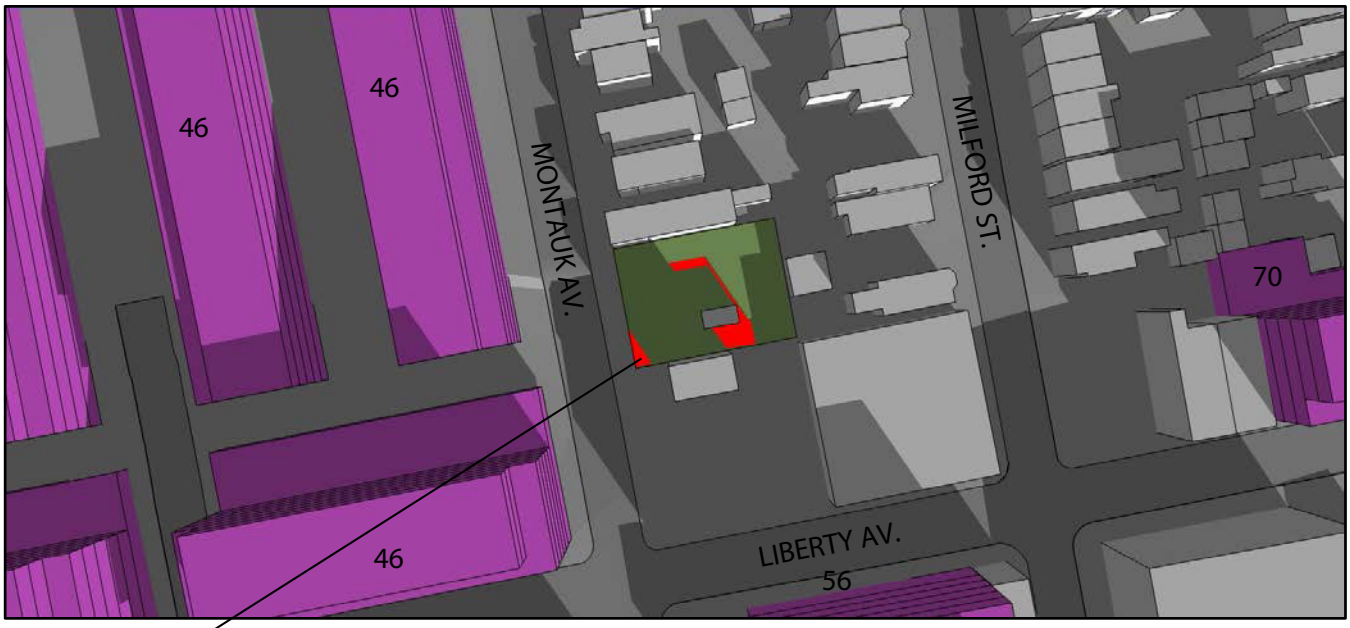
4:45 PM



5:45 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-10
Shield of Faith
Incremental Shadows on December 21



9:30 AM



11:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

East New York Rezoning Proposal **Figure 6-11**

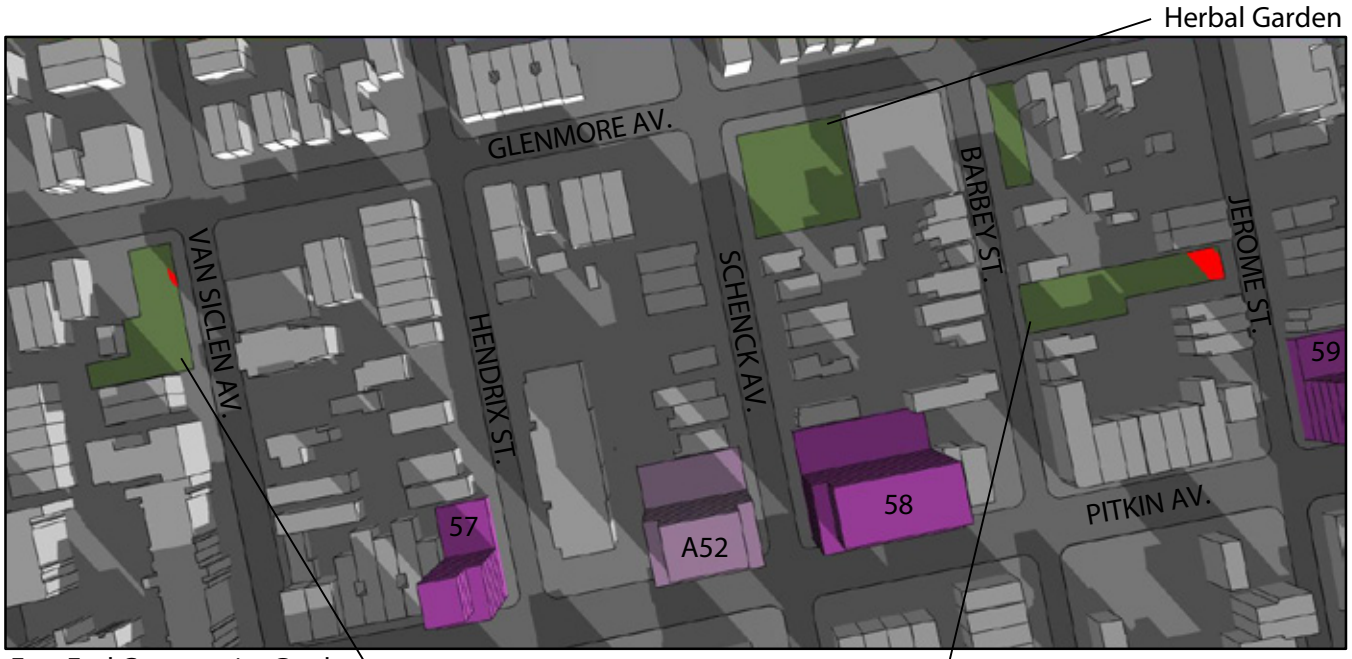
East End Community Garden, Herbal Garden, Mw United Orient Grand Lodge
Incremental Shadows on March 21/September 21



8:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

East End Community Garden, Herbal Garden, Mw United Orient Grand Lodge
Incremental Shadows on December 21



8:53 AM



9:45 AM

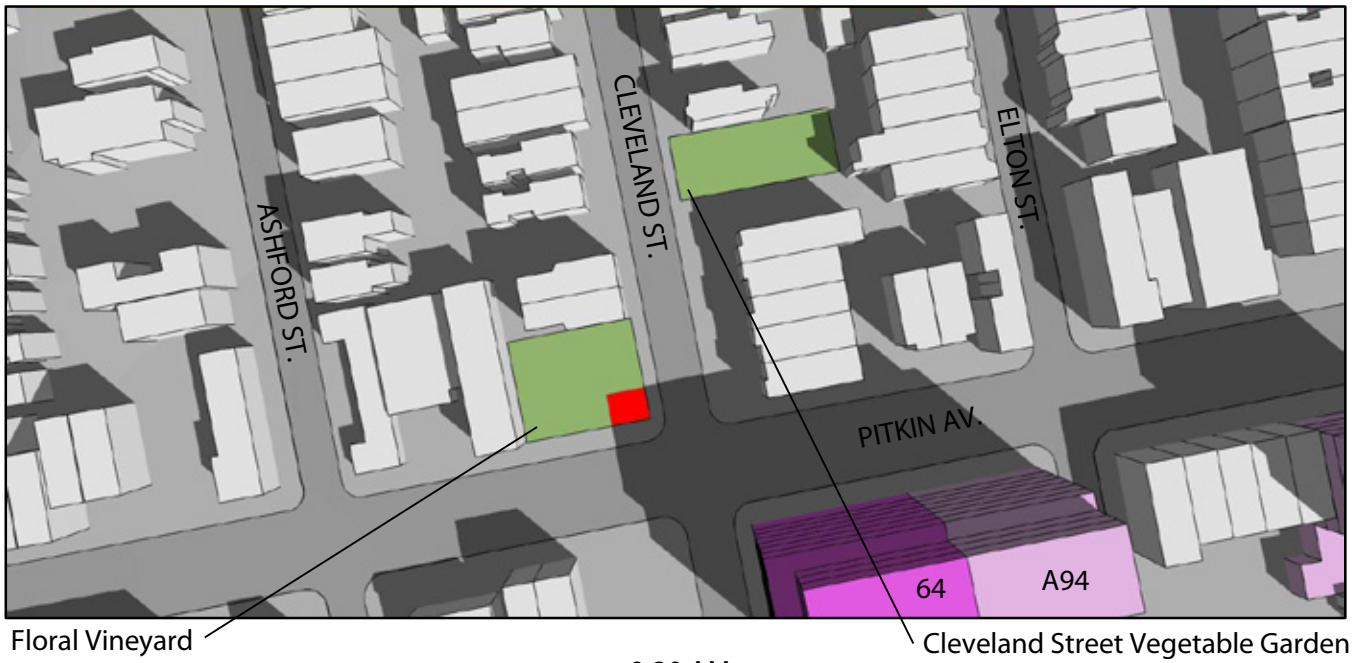
Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-12

Floral Vineyard and Cleveland Street Vegetable Garden
Incremental Shadows on March 21/September 21



8:00 AM



9:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-12
Floral Vineyard and Cleveland Street Vegetable Garden
Incremental Shadows on December 21



9:00 AM



10:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-13
Manley's Place
Incremental Shadows on March 21/September 21



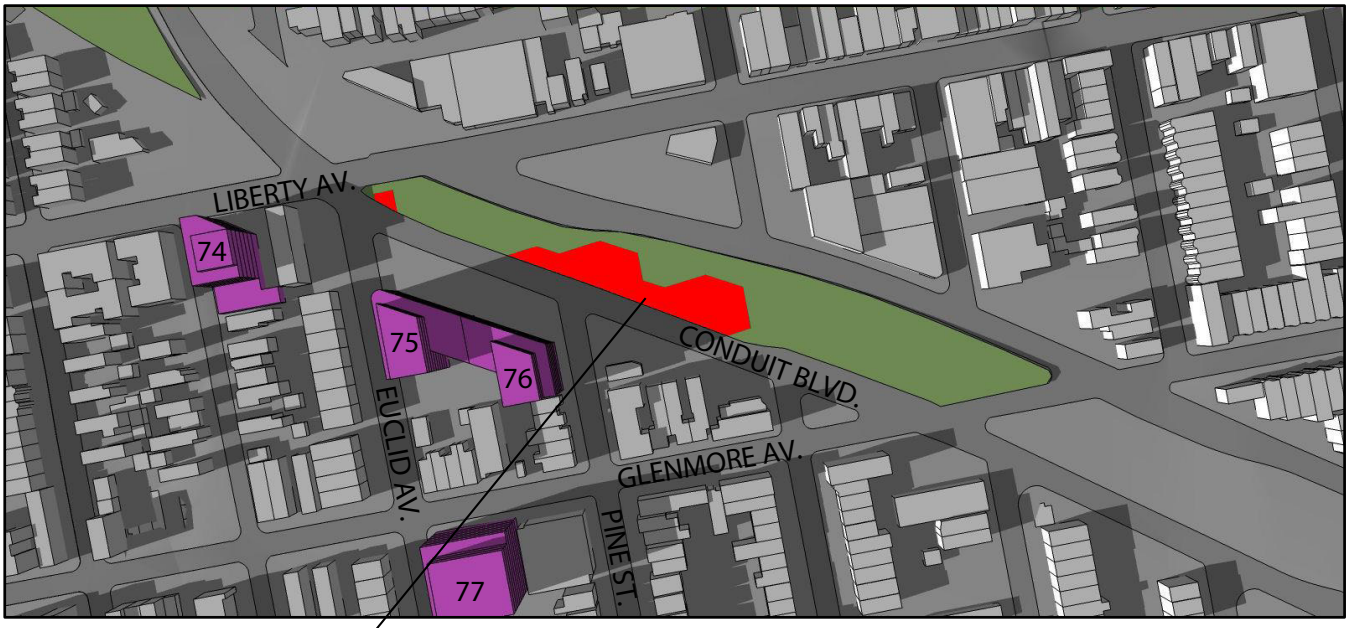
8:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-14
N. Conduit Blvd. Greenstreet
Incremental Shadows on March 21/September 21



2:30 PM



4:15 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-14
N. Conduit Blvd. Greenstreet
Incremental Shadows on December 21



9:00 AM



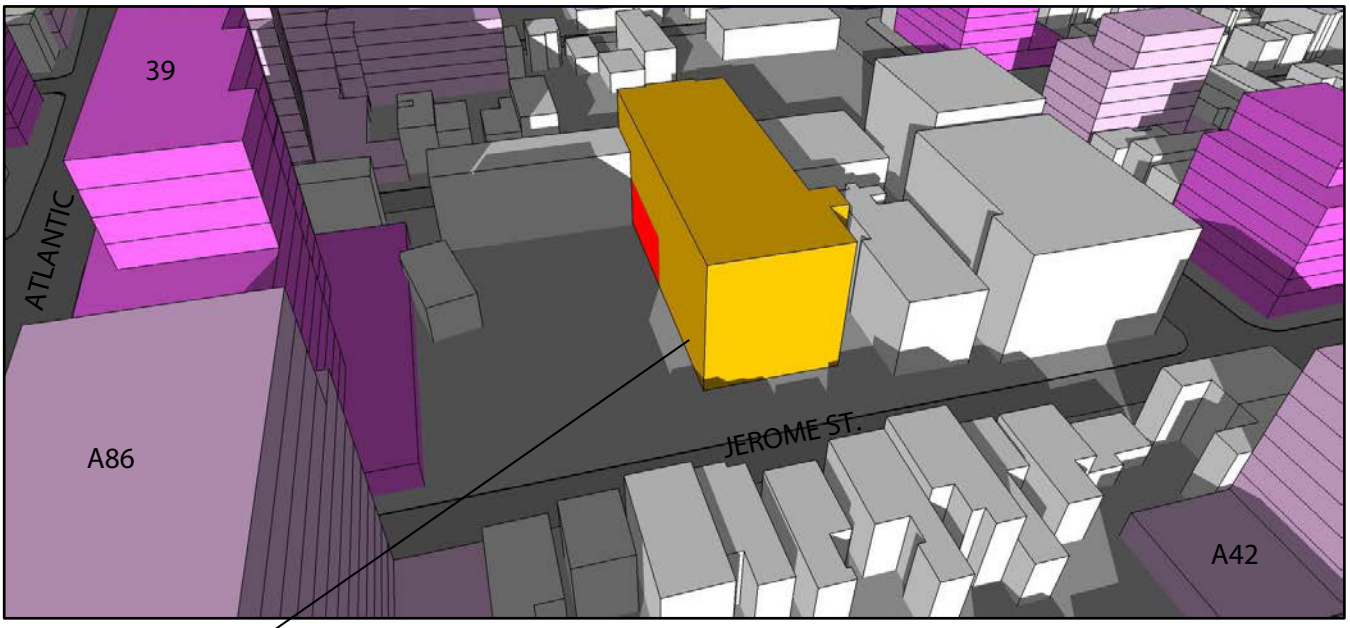
11:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-14
N. Conduit Blvd. Greenstreet
Incremental Shadows on December 21



Figure 6-15
St. Michael's Roman Catholic Church
Incremental Shadows on June 21

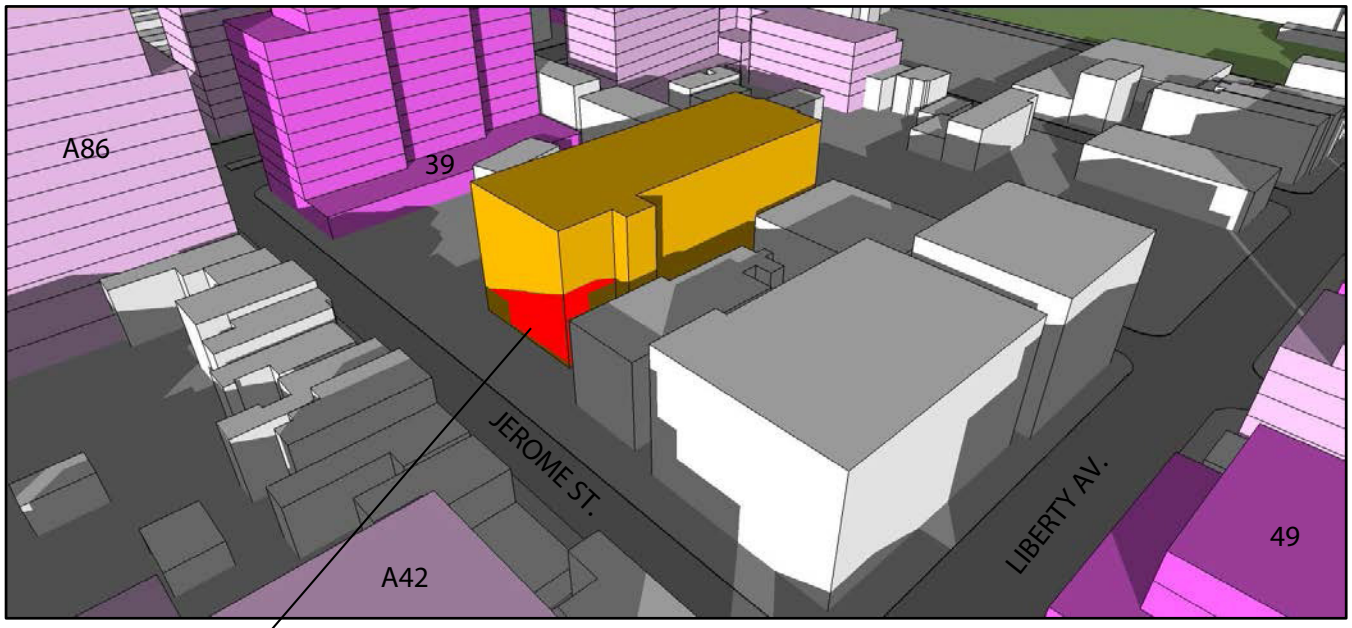


5:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-15

St. Michael's Roman Catholic Church
Incremental Shadows on December 21



2:45 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-15
St. Michael's Roman Catholic Church
Site Photos



View of western facade



Aerial view of southern facade

Figure 6-16
Our Lady of Loreto Church Complex
Incremental Shadows on June 21



6:15 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-16
Our Lady of Loreto Church Complex
Site Photos

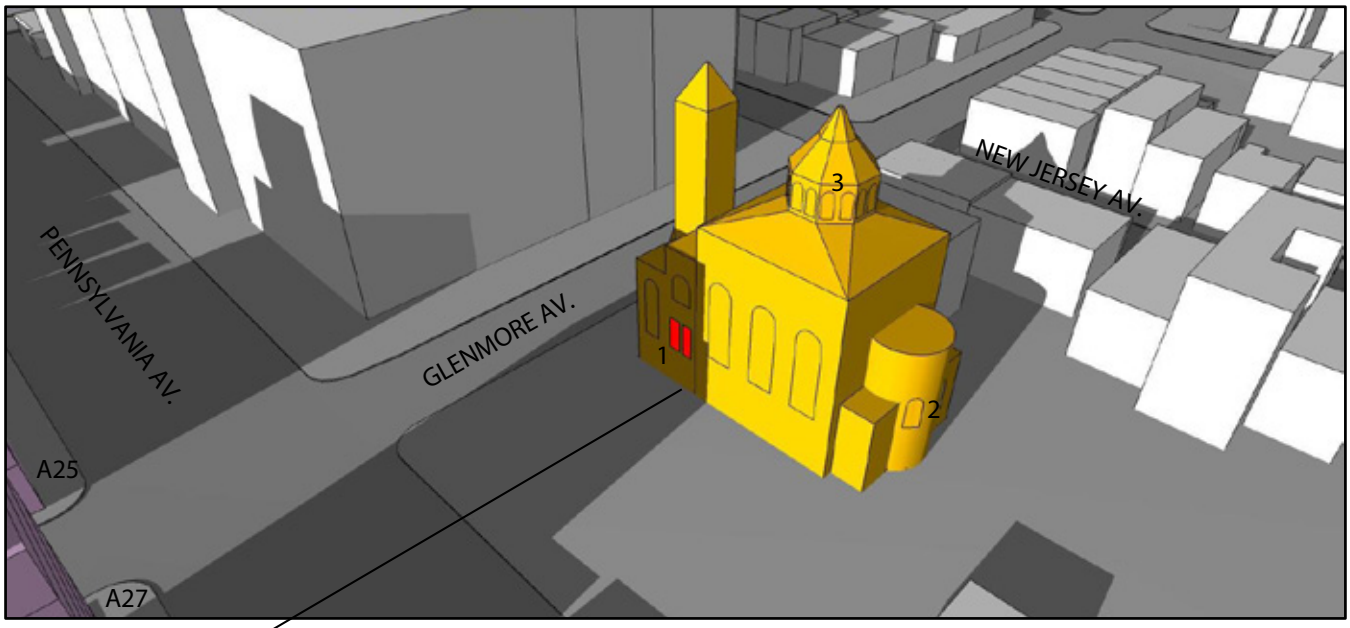


View of eastern facade



Aerial view of southern facade

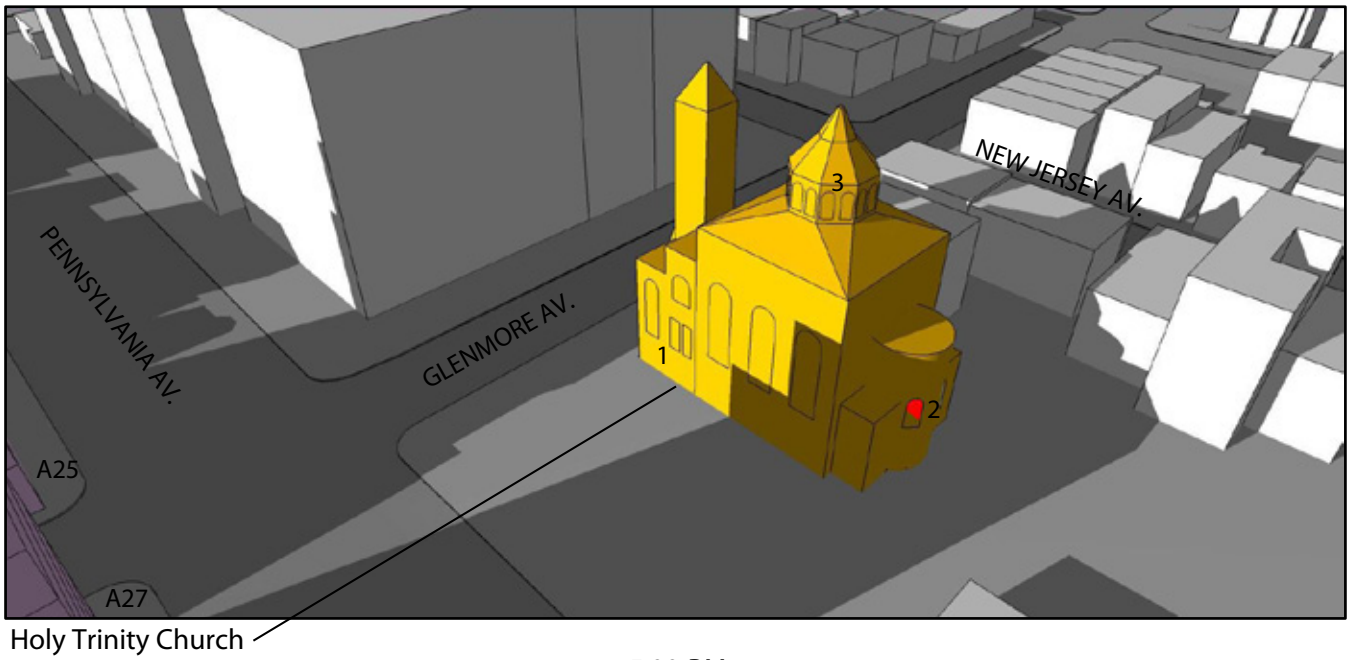
Figure 6-17
Holy Trinity Russian Orthodox Church
Incremental Shadows on March 21/September 21



4:15 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

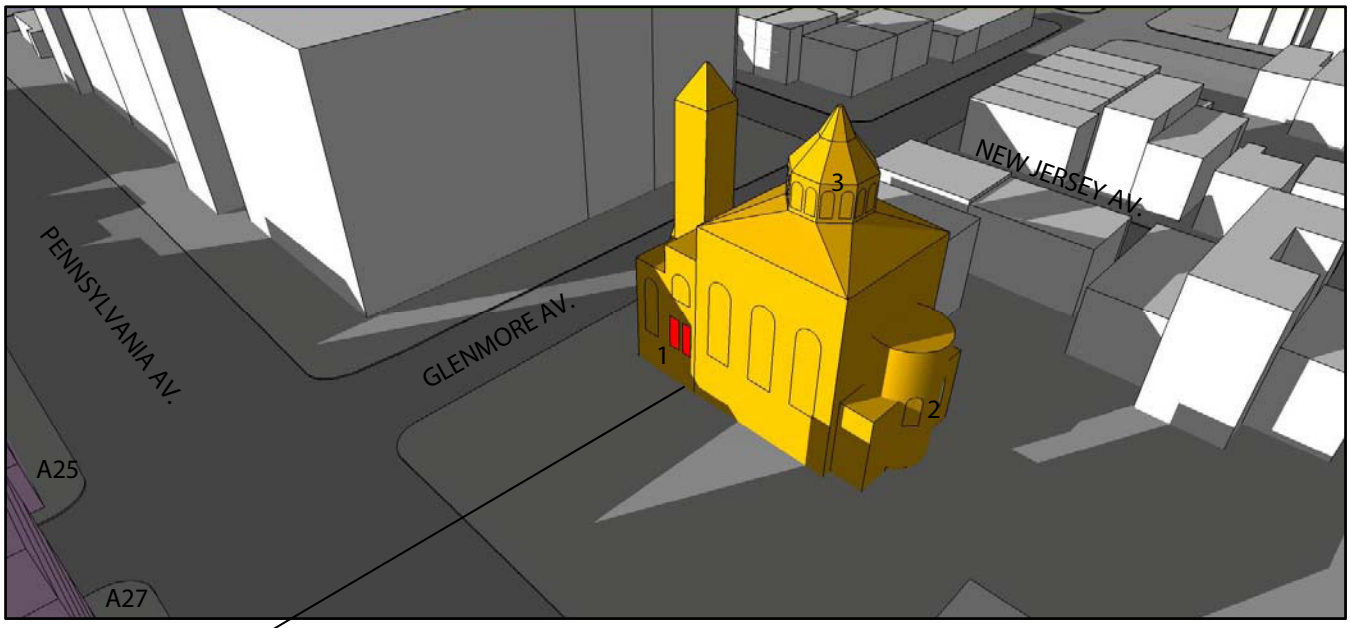
Figure 6-17
Holy Trinity Russian Orthodox Church
Incremental Shadows on May 6/August 6



5:00 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-17
Holy Trinity Russian Orthodox Church
Incremental Shadows on June 21



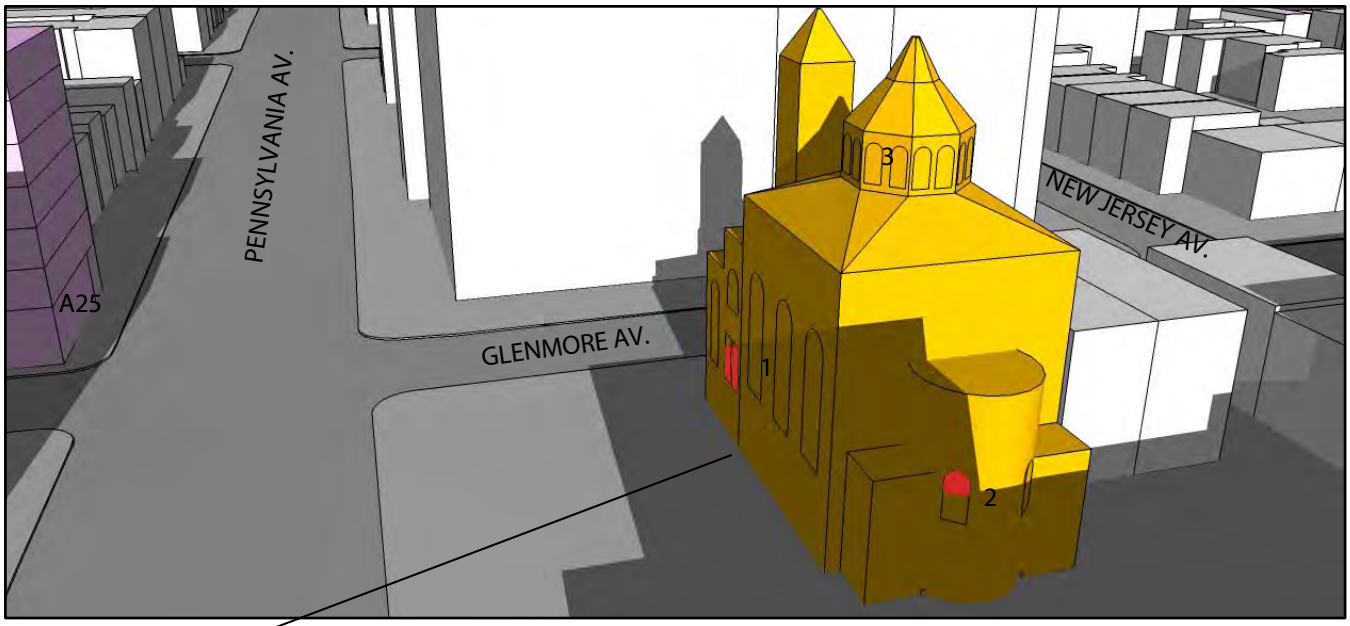
5:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-17
Holy Trinity Russian Orthodox Church
Incremental Shadows on December 21



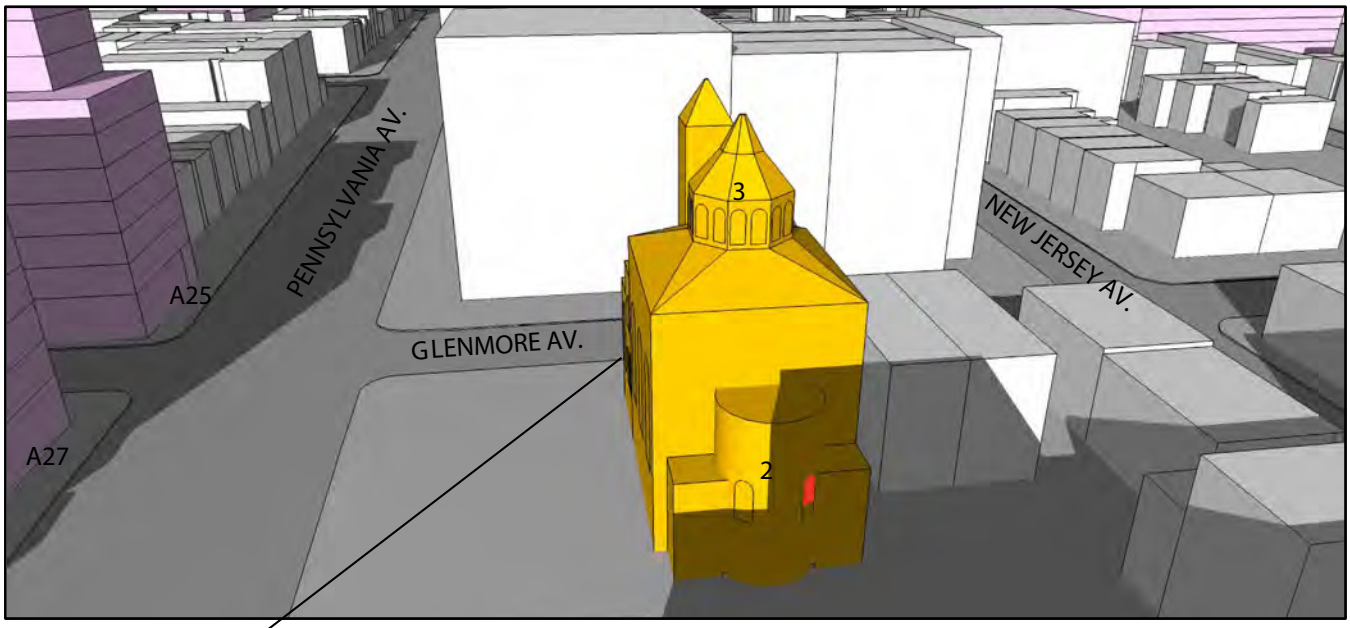
9:00 AM



11:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

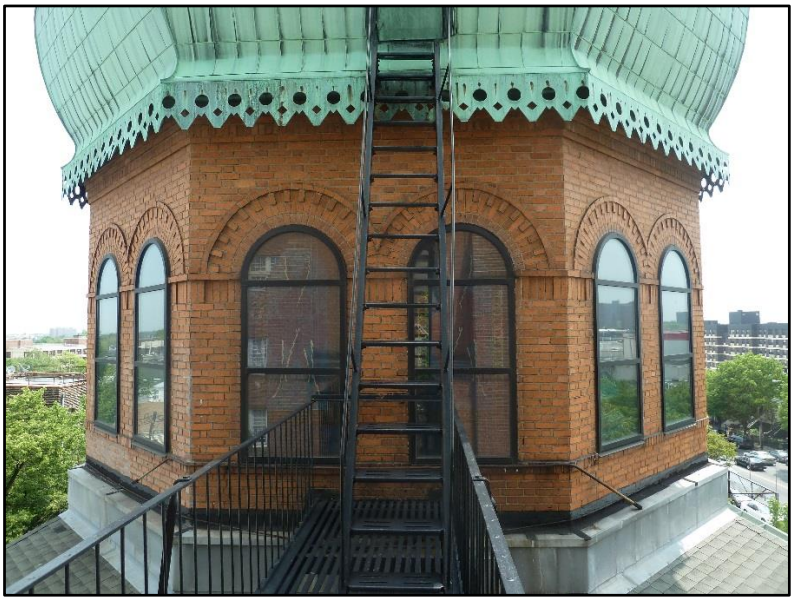
Figure 6-17
Holy Trinity Russian Orthodox Church
Incremental Shadows on December 21



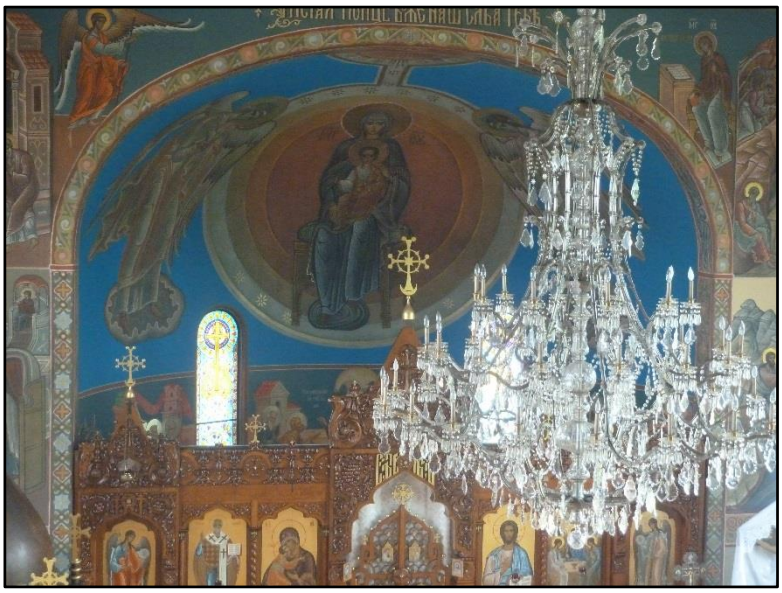
12:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-17
Holy Trinity Russian Orthodox Church
Site Photos



View of clerestory stained glass windows



Interior view of stained glass windows on southern facade



View of stained glass windows on western facade

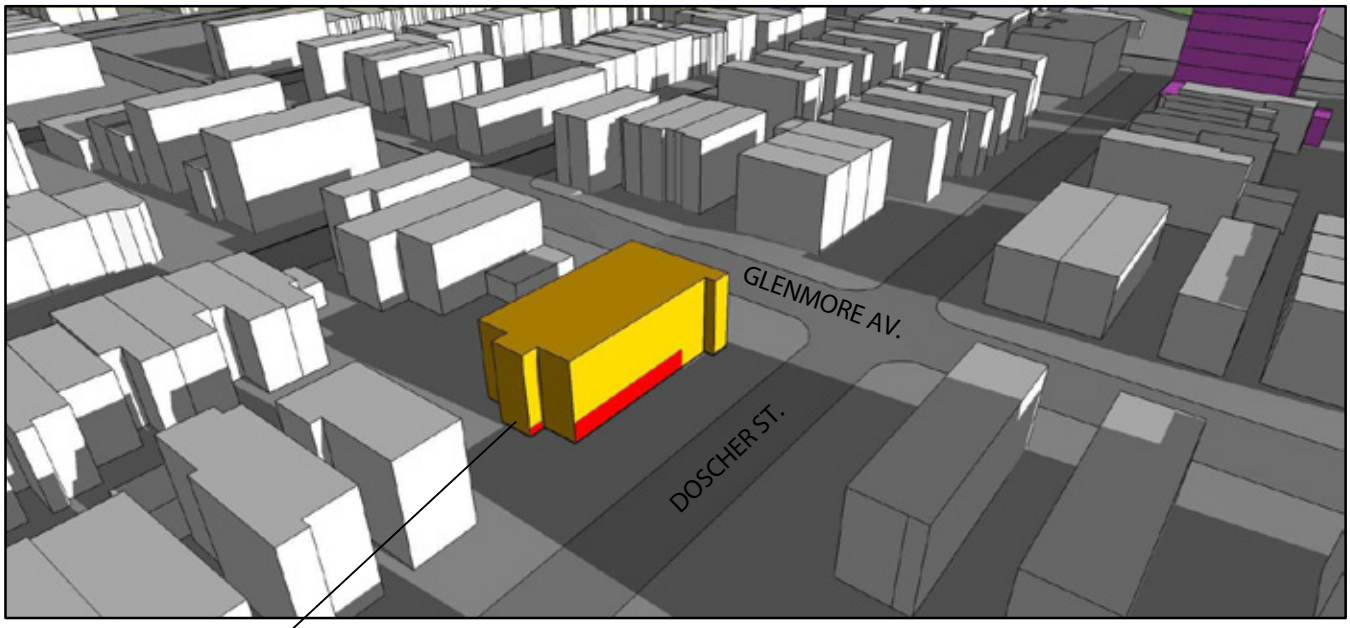
Figure 6-18
Glenmore Av. Presbyterian Church
Incremental Shadows on May 6/August 6



6:30 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

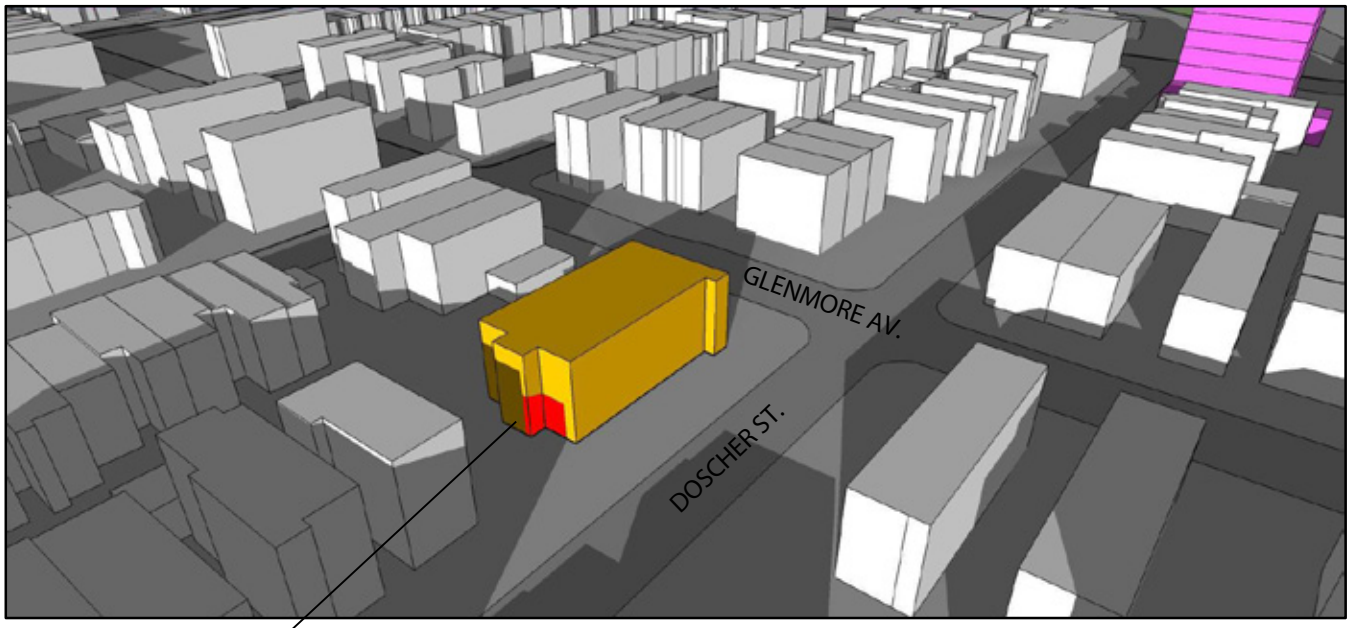
Figure 6-18
Glenmore Av. Presbyterian Church
Incremental Shadows on June 21



6:15 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-18
Glenmore Av. Presbyterian Church
Incremental Shadows on December 21



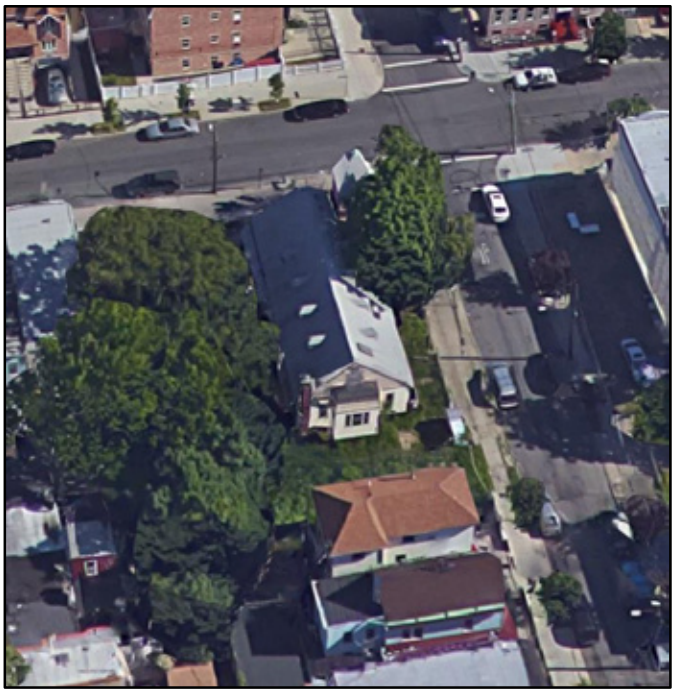
9:15 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-18
Glenmore Av. Presbyterian Church
Site Photos



View of northern facade



View of southern facade

Figure 6-19
Church of the Blessed Sacrament
Incremental Shadows on December 21



9:30 AM



11:00 AM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-19
Church of the Blessed Sacrament
Incremental Shadows on December 21



12:30 PM

Projected Development
Potential Development
Open Space
Historic Resource
Incremental Shadow

Figure 6-19
Church of the Blessed Sacrament
Site Photos



View of eastern facade



View of southern facade