Chapter 6: Shadows

A. INTRODUCTION

The proposed action would result in two residential towers along Amsterdam Avenue at the western end of the block, and academic and dormitory buildings surrounding a central plaza on the remainder of the block. Tall buildings would be located on both ends of the superblock facing, or near, the avenues, and midblock on the south side of West 62nd Street. Shadows are an issue because of the height and setback modifications required to create the proposed building forms. Shadows also affect the surrounding open spaces, including Frank Damrosch Park (Damrosch Park) on the Lincoln Center for the Performing Arts campus, located directly north across West 62nd Street from Fordham.

The analysis in this chapter compares two build conditions—the Phase I (2014) development and the Phase II (2032) full development—to a baseline in which private residential development in three buildings on Amsterdam Avenue and West 62nd Street (rather than two buildings on Amsterdam Avenue) would be the only change to the campus from current conditions. See Figures 6-1 and 6-2 for axonometric diagrams of the proposed full development, and Figure 6-3 for an axonometric diagram of the No Action baseline condition; Figure 6-2 illustrates a potential alternative building configuration on Sites 3 and 3a that was analyzed for shadow effects as well.[1]

The purpose of a shadows analysis is to identify incremental shadows on sun-sensitive resources, including publicly accessible open spaces, historic resources with significant sunlight-sensitive features, and important natural features. The extent and duration of such shadows on sun-sensitive resources are described, and the effects of those shadows on uses and vegetation, or on sunlight-sensitive architectural features, are assessed. Impact criteria used in the analysis are based on the *New York City Environmental Quality Review (CEQR) Technical Manual*.

For proposed building heights, this shadows analysis conservatively uses the maximum envelope allowable under the Master Plan for each site, rather than the heights given in the Illustrative Plan (see Chapter 1, "Project Description"). Under no circumstances would every building be built to the maximum envelope, as the total new development on the project site cannot exceed 2,375,093 zoning square feet. Therefore, shadows cast by buildings in the Illustrative Plan would less than the shadows described below which are based on the maximum potential envelopes.

CONCLUSIONS

In 2014, the Phase I development would cast between five and seven hours of new shadow on Damrosch Park throughout the year. However, the extent of the new shadow would be small for much of this period, primarily affecting areas near the southern edge of the park or areas on the western side of the space around the bandshell. Most of the vegetation and seating areas are on

[1] All figures can be found at the end of this chapter.

the eastern side of the park and would continue to get sun for much of the day during the spring, summer and fall, and for a portion of the day in winter. The London plane trees in the long planter along the West 62nd Street sidewalk would receive less direct sunlight, but the majority of these trees would continue to receive six hours or more of direct sun through the late spring and summer, so it is likely their overall viability would not be substantially affected. Therefore, Damrosch Park would not experience a significant adverse impact with the Phase I development.

The playground at P.S. 191, located directly across Amsterdam Avenue from the Fordham campus, would receive between three hours and 45 minutes and five hours of incremental shadow from Phase I development in the morning during the spring, summer and fall months, a fairly substantial duration of new shadow. For much of this duration, the incremental shadow would be limited in size, and sunlight would continue to reach parts of the open space. Additionally, there would be times during periods of incremental shadow when sunlight would reach other portions of the space that would otherwise be shaded by the buildings of the no action scenario. Because the playground is paved and used almost entirely for active recreation, the new shadows would not have as much effect as they would on vegetated open space used for passive recreation. While the incremental shadows could reduce the attractiveness of the playground for its users and cause an adverse impact, the impact would not be considered significant because the playground is used for active recreation.

No other sun-sensitive resources would receive substantial new shadow as a result of the proposed action, and no significant adverse impacts would occur in 2014.

With the completion of Phase II development in 2032, incremental shadows from the proposed action would not be large enough or last long enough to cause significant adverse impacts to most sun-sensitive resources in the area, including St. Luke's-Roosevelt Hospital Entrance Plaza, West 59th Street Recreation Center, Amsterdam Houses Playground, West End Towers Park, Samuel N. Bennerson Playground, James Felt Plaza, Martin Luther King Jr. High School Plaza, Alice Tully Hall/Julliard Plaza, Richard Tucker Park, the Broadway Malls, Dante Park, The Beaumont Plaza, and Central Park. The proposed action would cast between two and three and a quarter hours of incremental shadow on the plaza belonging to the Regent residential building in the late afternoon of the late spring and summer analysis days. Despite the duration, the actual extent of incremental shadow remains small, and its impact would not significantly affect the vegetation or use of this space.

Phase II development would add areas of new shadow to Damrosch Park on the March 21/September 21 and the December 21 analysis days. The additional areas of incremental shadow would fall in the late morning and early afternoon from Sites 1 and 6, affecting primarily the seating areas and vegetation on the eastern side of the park. The additional development in Phase II would not impact Damrosch Park on the May 6/August 6 or June 21 analysis days. Overall, the full 2032 buildout of the proposed action would substantially reduce sunlight to Damrosch Park in the fall, winter and early spring, resulting in a significant adverse impact to the use of this space for passive recreation. The health of the London plane trees and maples of the park might also be affected in the spring. The most critical time for these trees to receive sunlight is during the most active growth periods in the spring and summer. As these shade trees begin to leaf out in April, the limited period of available sunlight during the early to mid-spring may adversely affect the health and lifespan of these trees. There is no way of predicting with full certainty the severity of this impact, but the loss of direct sunlight would place additional stress on trees already suffering from restricted root zones (in the case of the maples) and other stresses typical of trees in dense urban settings, as evidenced by prominent browning of the

edges of the leaves visible on a fall 2008 site visit. See Chapter 21, "Mitigation," for additional discussion of potential mitigation.

In 2032 with the full buildout, incremental shadow would fall on various sections of Lincoln Center Plaza throughout the year, with durations ranging from three to four hours depending on season. These durations would be attributed in large part to proposed buildings on the eastern end of the Fordham campus casting new shadow on the planned seating and landscaped area (the "Grove") between the David H. Koch New York State (Koch) Theater and Columbus Avenue. Phase II development would add approximately four hours of new shadow on this part of the Lincoln Center open space in the spring, summer and fall, and nearly two hours in the winter, and would therefore cause a significant adverse impact to this space. See Chapter 21, "Mitigation," for discussion of mitigation measures that would address this impact. The main plaza area around the fountain and the north plaza west of Avery Fisher Hall would receive between one and two hours of new shadow in the spring, summer, and fall seasons, generally in the late afternoon, and less than an hour in December. While the incremental shadow from the proposed action would reduce the amount of sunlight during these periods on the main and north plazas, the duration and extent would not be substantial enough to cause a significant adverse impact to these spaces.

Representatives of the New York City Department of Parks and Recreation (DPR) and Fordham University have been meeting and are continuing to discuss potential mitigation measures for significant adverse shadow impact on Damrosch Park that is projected with full development of Phase II. Representatives of Lincoln Center have advised that they do not wish to address the issue of plant sensitivity at the Grove at this time, because of the long period of time that will elapse until construction of Phase II. If Fordham, DPR, and Lincoln Center do not ultimately reach agreement on implementation of mitigation measures, the increase in shadows would be considered an unavoidable significant adverse impact on Damrosch Park and the Grove.

Between 7:05 AM and 8:45 AM on June 21, incremental shadow would fall across some of the clerestory windows on the north façade of the Church of Saint Paul the Apostle located immediately south of the Fordham campus across West 60th Street. The total duration of incremental shadow would be an hour and 40 minutes. For about 40 minutes of this period, incremental shadow would remove the remaining sunlight from the windows. Considering that services may be occurring at this time of day, the project-generated shadow would be considered a significant adverse impact on the north windows of the church on the June 21 analysis day. On the May 6/August 6 analysis day the impact would not be significant—only 18 minutes of incremental shadow. Further, on the other two analysis days there would not be any incremental shadow. See Chapter 21, "Mitigation," and Chapter 23, "Unavoidable Impacts," for additional discussion of this impact.

B. METHODOLOGY

Following the guidelines of the *CEQR Technical Manual*, a shadows assessment is appropriate when the project site is adjacent to a public open space, a historic resource with a significant sun-sensitive feature, or an important natural feature. The Fordham campus is near a number of public open spaces and one sun-sensitive historic resource. To identify potential impacts, CEQR focuses on uses and users of the open space, landscaping and vegetation, and features or details that are both sunlight-dependent and make such historic resources significant. Based on *CEQR Technical Manual* methodology, this analysis considers shadows on four representative days of the year: March 21 and September 21, the equinoxes; May 6/August 6, the midpoint between the

equinoxes and summer solstice; June 21, the summer solstice and the day on which shadows are the shortest; and December 21, the winter solstice.

The CEQR methodology does not consider shadows and incremental increases in shadows within 1½ hours of sunrise or sunset to be considered significant. Therefore, the analysis period is between 1½ hours after sunrise and 1½ hours before sunset. Additionally, CEQR does not consider shadows on City streets, sidewalks, and other buildings to be significant.

According to the *CEQR Technical Manual*, a significant shadow impact may occur when there is:

- Substantial reduction in sunlight where a sensitive use is already subject to substandard sunlight (i.e., less than the minimum time necessary for survival);
- Reduction in sunlight available to a sensitive use from more to less than the minimum time necessary for its survival;
- Substantial reduction in sunlight to a sun-sensitive use or feature; and
- Substantial reduction in the usability of the open space.

Consideration of these four criteria forms the basis for the determination of shadow impacts. Shadows cast on open spaces that are part of a proposed project or action are not considered impacts of an action because without the action, the open space would not exist.

The shadow diagrams and analysis presented below were developed using building envelope and topographical information obtained from EarthData International and updated by AKRF. Shadows were modeled using the solar rendering capabilities of MicroStation V8 software.

C. SCREENING ANALYSIS

A screening analysis was performed to determine which open spaces or sunlight-sensitive architectural resources could be affected by project shadows at any time of year. Using the heights and forms of the maximum building envelopes, the full extent of the area that could be shaded by the project was calculated for each of the analysis days and delineated on a street map. In coordination with the open space and historic analyses, open spaces and historic resources were denoted on the map. All sun-sensitive resources that fell fully or partially within the perimeter representing the maximum shadow lengths were included in the more detailed analysis below (see Figure 6-4 and Table 6-1).

D. RESOURCES OF CONCERN

All the open spaces and historic resources in Table 6-1 were included in the three-dimensional solar study. The detailed analysis showed that some of these resources did not receive any incremental shadow at any time of year, due to the presence of intervening structures already casting shadow on those resources during the times when project shadow would fall there.

OPEN SPACES

There is currently a **raised plaza on the Fordham campus**. It has well-maintained lawns, trees, flowers, sculptures, and benches, and functions as a campus green. Fordham allows public access via stairways near the corner of Columbus Avenue and West 60th Street, and in the midblock on West 62nd Street. The proposed action would reconfigure and improve this open

Table 6-1
Sunlight-Sensitive Resources Within the Maximum Shadow Length Area

Map ID	Resource Name
1	Hudson River
2	Riverside Park South
3	West End Towers Park
4	James Felt Plaza
5	Martin Luther King Jr. High School Plaza
6	Samuel N. Bennerson Playground
7	Amsterdam Houses Playground
8	P.S. 191 (Amsterdam School) Playground
9	West 59th Street Recreation Center
10	200 West 60th Street - Concerto
11	555 West 57th Street - BMW
12	St. Luke's-Roosevelt Hospital Entrance Plaza
13	St. Paul the Apostle Church
14	Fordham University Plaza
15	Damrosch Park
16	Lincoln Center Plaza
17	Alice Tully Hall / Julliard Plaza
18	145 West 67th Street – Tower 67
19	Broadway Malls
20	Richard Tucker Park
21	Dante Park
22	One Lincoln Plaza
23	Harmony Atrium
24	1886 Broadway – 30 Lincoln Plaza
25	44 West 62nd Street – Lincoln Plaza Towers
26	45 West 60th Street - Regent
27	30 West 61st Street - Beaumont
28	One Central Park West – Trump Int'l Hotel
29	Central Park (open space and historic resource)
30	2025 Broadway – Nevada Towers
31	1991 Broadway – Bel Canto
32	130 West 67th Street – Toulaine
33	Two Lincoln Square
34	10 West 66th Street

Notes: Map ID numbers correspond to Figure 6-4
Sources: AKRF, Inc. 2007

space as the heart of the campus quadrangle, and make it accessible via large stairways on Columbus Avenue and West 62nd Street. In addition, during the interim stages of its Master Plan, Fordham would create a street-level landscaped area at the southeast corner of the Fordham superblock, east of the raised campus plaza. This **interim plaza** would be open to the public. The shadows analysis assesses project-generated shadows on these Fordham spaces for

informational purposes only and would not consider any such shadows to be impacts of the project, since the reconfigured plaza and the interim plaza would not exist without the proposed actions. There is also an existing tennis court at the southwest corner of the superblock, used largely by Fordham students and staff, which will be removed for construction of a residential tower in the future with or without the proposed action.

Southwest of the Fordham campus the **West 59th Street Recreation Center** is located midblock between West 59th and West 60th Streets and Amsterdam and West End Avenues. The recreation center has indoor and outdoor amenities with a fence separating two pools—a shallow kiddie pool is located on the southern portion of the open space, and the adult pool is to the north. These outdoor pools are in poor condition and are not open to the public at this time. Benches and picnic tables are at the boundaries of both.

West of Fordham, across Amsterdam Avenue, is the playground at **P.S. 191 Amsterdam School** (P.S. 191 playground). The approximately 2-acre open space is largely paved and has basketball courts and a jungle gym and benches in the northern section.

The **Amsterdam Houses** contain a section of playground, located midblock just south of the line of West 62nd Street. This open space contains play equipment flanked by groups of benches on the west and east sides.

The 0.8-acre **Samuel N. Bennerson Playground** is located on the south side of West 65th Street between Amsterdam and West End Avenues. It contains playground equipment, swings, basketball courts, trees, plantings, and seating. Benches are located throughout the open space along paths between the active resources.

West End Towers Park is located on West End Avenue between West 63rd and West 64th Streets. The eastern half contains children's play equipment in a fenced off playground, and the western half features attractive landscaping, walking paths, lawns, trees, and sculptures.

James Felt Plaza is located on the north side of West 64th Street between Amsterdam and West End Avenues. This open space contains seating, plantings, and a children's playground reserved for tenants of 240 West 64th Street. The western section of the plaza contains a stage with three rows of stadium seating. The gated eastern portion belongs to a private day care center.

Martin Luther King Jr. High School Plaza on Amsterdam Avenue between West 65th and West 66th Streets is a raised concrete plaza space with several benches in its center.

Damrosch Park is directly north of Fordham on the southwest corner of Lincoln Center for the Performing Arts. It is a 2.4-acre passive space that has trees, plantings, benches, and a band shell, but no lawns (see Figure 5-3, Chapter 5, "Open Space" for a detailed plan of the park). For much of the year, the western half of the space is occupied by a tent structure, which hosts various events. From October to January, the Big Apple Circus occupies a tent in the park. From March though the end of May and in September to early October, private events are held in the tents (see Figure 5-5, Chapter 5, "Open Space" for a photograph of an event tent in the park). In June, July and August the tent is down for Lincoln Center Out of Doors and other outdoor events.

The Lincoln Center complex contains a number of distinct spaces collectively referred to as **Lincoln Center Plaza**. These spaces are currently being renovated, and all spaces are expected to be completed by 2010. Josie Robertson Plaza is at the main entrance to Lincoln Center. A major gathering place, it is flanked by the Koch Theater to the south, the Metropolitan Opera House to the west, and Avery Fisher Hall to the north. There is a central fountain, and the plaza

itself is used an entertainment venue in good weather. The North Plaza located along West 65th Street will be rearranged under a recently approved renovation plan for Lincoln Center. The plaza will have a new restaurant (including a lawn-covered roof) along the south side of West 65th Street. The reflecting pool in the center of the plaza will be increased in length, with the Henry Moore sculpture remaining. South of the reflecting pool a new grove of trees pruned to make a protective canopy will replace the series of tree planters that were part of the original plaza. Benches will run along the sides of the grove and there will be moveable seating between the trees. The trees will be London Plane. The promenade along Columbus Avenue will feature a new widened grand stair from Josie Robertson Plaza to the level of the Columbus Avenue sidewalk. There will be landscaped areas north and south of the grand stair, and a seating area with benches (the Grove) just north of 62nd Street next to the Koch Theater. The trees in the Grove will be quaking aspen, honey locust, dawn redwood and sweetgum.

Alice Tully Hall/Juilliard Plaza is located on the west side of Broadway between West 65th and West 66th Streets. Planned renovations would expand the building and reduce the size of the plaza. A cantilevered canopy over the Alice Tully Hall entrance would shade most of the remaining plaza. There will be a stair/bleacher-like structure that rises away from Tully's new entrance up towards the corner of 65th and Broadway, with seating available to the public. There will be no new plantings.

Richard Tucker Park is a small 0.1-acre triangular open space at the intersection of Columbus Avenue, Broadway, and West 65th Street. It is paved and contains a statue, plantings, trees, some seating, and a subway entrance.

The **Broadway Malls** are planted medians in the midst of six lanes of moving traffic. Benches are located at the crosswalks of West 62nd through West 65th Streets.

Dante Park is a triangular open space on the south side of the intersection of Broadway, Columbus Avenue, and West 63rd Street. The open space has a statue at the north end and trees and plantings located in an enclosed area. There are benches along the Columbus Avenue and Broadway sidewalks.

Directly east of Fordham at the southeast corner of Columbus Avenue and West 61st Street is an open space belonging to **The Regent**. While the 0.2-acre open space is gated, it has abundant vegetation and seating and is open to the public during daylight hours. Adjacent to the Regent's plaza, there is a plaza belonging to **The Beaumont**, another residential building to the east on West 61st Street. This plaza contains trees, landscaping and benches.

The **St. Luke's-Roosevelt Hospital entrance plaza** functions essentially as an outdoor waiting room. It is surrounded by a metal fence and is entered from the covered drop-off driveway. It contains benches, ivy, shrubs, grass and trees.

The southwest corner of **Central Park** (an LPC and S/NR listed scenic landmark as well as publicly-accessible open space) was included in the detailed analysis. This area includes trees and other vegetation, walkways, roads, ballfields, and playgrounds.

SUN-SENSITIVE HISTORIC RESOURCES

As noted above, **Central Park** is an LPC and S/NR listed scenic landmark, and its vegetation is shadow-sensitive.

St. Paul the Apostle Church (LPC-eligible, S/NR-listed) is located on the south side of West 60th Street along Columbus Avenue (see Figure 7-6, in Chapter 7, "Historic Resources"). This

church has clerestory stained glass windows on its north wall facing Fordham University and one northwest facing window in the apse. The stained glass windows are considered sun-sensitive features and were analyzed for potential shadow impacts. Other than the open spaces at Lincoln Center, described above, there are no additional sun-sensitive historic resources near the project site that would be affected by shadows from the proposed action.

The Lincoln Center for the Performing Arts Historic District (S/NR-eligible) is located between West 66th and 62nd Streets, Amsterdam Avenue, Broadway, and Columbus Avenue. It does not contain any shadow-sensitive features other than the public plazas and park described above under the Open Spaces heading.

RESOURCES THAT WOULD NOT EXPERIENCE INCREMENTAL SHADOW

The Hudson River and Riverside Park South, far to the northwest of the project site, did not receive project shadows on December 21 due to the Riverside South buildings and other intervening buildings. The public plaza and playground behind the Concerto residential building (200 West 60th Street) is fully shaded in the early mornings of the summer months by the intervening Concerto building itself. The residential plaza at 145 West 67th Street is fully shaded by intervening buildings on December 21 when project shadows would otherwise briefly be able to reach it at around 1:00 PM. The plazas east of the project site at One Lincoln Plaza, the Harmony Atrium (a covered plaza), The residential plazas at 30 Lincoln Plaza and the Lincoln Plaza Towers are fully shaded in the late afternoons by tall intervening buildings. Lincoln Plaza Towers also features extra sidewalk along Columbus Avenue containing three concrete planters, but this cannot be considered a sun-sensitive open space. The very small section of the plaza at the Trump International Hotel that could be reached by project shadows is already shaded by intervening buildings late on the June 21 analysis day.

The plaza at the Nevada Towers was conservatively included in the detailed analysis because it lies at the far northern edge of the maximum shadow length resulting from the screening analysis. The detailed analysis revealed that project shadow would not be long enough to reach this space. The Bel Canto public space is inside the building; its large glass windows face east onto Broadway and away from the Fordham campus, and could not be affected by the proposed project. The residential plaza at the Toulaine is located five blocks north of the project site on the north side of its building. With the Toulaine building intervening between this plaza and the Fordham campus, project shadow would never reach this space.

There are several parts to the Two Lincoln Square space. There is a paved area under the overhang of the building along Columbus Avenue. The overhang protects the passerby from rain year around and in the summer from the heat of the sun. The space currently has moveable planters adjacent to the building. No other amenities are currently provided. If any project shadow were to reach this plaza, it would be similar to the shadow created by the building overhang which is a part of the character of this space. The enclosed former plaza area inside the building is occupied by a branch of the Folk Art Museum. Lighting on the art work is artificial.

No incremental shadow would reach the residential plaza at 10 West 66th Street, as the space is located on the north side of its building five blocks northwest of the project site.

The resources that did not receive any incremental shadow are not presented in the incremental shadow duration tables and assessment of shadow effects in Sections E and F, below.

E. ASSESSMENT OF INCREMENTAL SHADOWS—2014

Three new residential towers will be built in the future without the proposed action, estimated at 265, 285, and 395 feet tall. The planned locations are the northwest corner of the superblock at Amsterdam Avenue and West 62nd Street, the south side of West 61st Street at Amsterdam Avenue, and the midblock along West 62nd Street, respectively (see Figure 6-3).

The initial phase of the proposed action would create new development along Amsterdam Avenue and on West 62nd Street. The building envelope for the residential apartment building on the northwest corner of the superblock (Site 4) would rise 661 feet above curb level, and the envelope for the residential building on the southwest corner (Site 3) would rise to 573 feet with an adjacent dormitory building (Site 3a) up to 293 feet (with the alternative stacked option for Sites 3 and 3a, the envelope heights would be 600 feet and 187 feet respectively). The envelope for the new academic building in the midblock on West 62nd Street (Site 5) would be 319 feet tall.

SHADOWS BY SEASON

This section briefly reviews the shadows that would be cast by the proposed action on each analysis day. Incremental shadow durations on all affected resources are presented in Table 6-2. All figures can be found at the end of the chapter. For certain analysis times, additional larger-scale diagrams focusing on Damrosch Park are provided with an "A" suffix on the figure number. For example, Figure 6-6 is the generalized view of the study area, and Figure 6-6A is the "zoomed in" view of Damrosch Park.

MARCH 21/SEPTEMBER 21 — 8:36 AM TO 5:29 PM EDT (FIGURES 6-5 TO 6-8)

In the morning hours on the March/September analysis day, the proposed residential towers and dormitory along Amsterdam Avenue (Sites 3 and 3a) would cast incremental shadows to the west on the playground at P.S. 191 and on the Amsterdam Houses playground, and very briefly on the West 59th Street Recreation Center. Beginning at 10:45 AM, the academic dormitory buildings at Sites 5 and 5a and the north residential tower (Site 4) would cast shadows northward on portions of Damrosch Park, and would continue to add shadow onto this park until the end of the analysis day. For about 30 minutes around noon Site 4 would cast shadow onto Samuel N. Bennerson Playground. Afternoon shadows from the proposed buildings along West 62nd Street would reach Lincoln Center Plaza (both the north plaza and the main plaza) and in the late afternoon shadow from Site 4 would reach the Broadway Malls, Alice Tully Hall/Julliard Plaza, and Richard Tucker Park each for 15 minutes or less, and Dante Park for about 30 minutes.

The proposed action would not cast any additional shadows on West End Towers Park, James Felt Plaza, Martin Luther King Jr. High School Plaza, or Fordham University Plaza.

MAY 6/AUGUST 6 — 7:27 AM TO 6:18 PM EDT (FIGURES 6-9 TO 6-11)

On the morning of the May 6/August 6 analysis day, the proposed buildings along Amsterdam Avenue would cast incremental shadows southwest and west on the West 59th Street Recreation Center, the P.S. 191 playground, and the Amsterdam Houses playground. Afternoon shadows would fall on Damrosch Park mostly from Sites 5 and 5a and the north residential tower. Late afternoon shadows from the north residential tower would reach the main plaza area of Lincoln Center Plaza.

Table 6-2
Incremental Shadow Durations—2014

Resource	March 21 / Sept. 21 8:36 AM-5:29 PM EDT	May 6 / Aug. 6 7:27 AM-6:18 PM EDT	June 21 6:57 AM-7:01 PM EDT	December 21 8:51 AM-2:53 PM EST
West 59th Street Recreation Center	8:45 AM – 9:00 AM Total: 15m	8:30 AM – 10:00 AM[1] Total: 1h 30m	7:30 AM – 8:15 AM 9:45 AM – 10:45 AM Total: 1h 45m Stacked option: 7:30 AM – 8:15 AM 9:30 AM – 10:45 AM Total: 2h	–
P.S. 191 Amsterdam School Playground[2]	9:00 AM – 12:45 PM Total: 3h 45m	7:27 AM – 7:45 AM 8:15 AM – 12:45 PM Total: 4h 48m	6:57 AM – 7:45 PM 9:00 AM – 12:45 PM Total: 4h 3m	–
Amsterdam Houses Playground	9:15 AM – 10:30 AM 11:45 AM – 11:50 AM Total: 1h 20m Stacked option: 9:15 AM – 10:30 AM 11:30 AM – 12:00 PM Total: 1h 45m	10:00 AM – 11:00 AM Total: 1h	–	–
Samuel N. Bennerson Playground	11:45 AM – 12:15 PM Total: 30m	–	–	9:15 AM – 9:30 AM 10:15 AM – 12:00 PM Total: 2h[3]
West End Towers Park	–	–	–	9:45 AM – 10:15 AM Total: 30m
James Felt Plaza	–	–	–	10:15 AM – 11:45 AM Total: 1h 30m
Martin Luther King Jr. High School Plaza	–	–	–	1:00 PM – 1:30 PM Total: 30m
Damrosch Park[2]	10:45 AM – 5:29 PM Total: 6h 44m	12:30 PM – 6:18 PM Total: 5h 48m	12:45 PM – 7:01 PM Total: 6h 16m	9:00 AM – 9:45 AM 10:30 AM – 2:53 PM Total: 5h 8m
Lincoln Center Plaza	3:15 PM – 4:45 PM 5:00 PM – 5:29 PM Total: 1h 59m[2]	3:45 PM – 5:30 PM Total: 1h 45m	3:45 PM – 5:00 PM Total: 1h 15m	2:15 PM – 2:53 PM Total: 38m
Alice Tully Hall / Julliard Plaza	4:15 PM – 4:30 PM Total: 15m	–	–	–
Richard Tucker Park	4:30 PM – 4:35 PM Total: 5m	–	–	–
Broadway Malls	4:30 PM – 4:45 PM Total: 15m	5:00 PM – 6:15 PM Total: 1h 15m	5:30 PM – 6:00 PM 6:30 PM – 7:01 PM Total: 1h 1m	–
Dante Park	5:00 PM – 5:29 PM Total: 29m	5:00 PM – 6:15 PM Total: 1h 15m	5:15 PM – 6:00 PM Total: 45m	–

Notes:
EST—Eastern Standard Time; EDT—Eastern Daylight Time
[1] From 8:15 AM to 8:45 AM portions of the space would experience a reduction in shadow, in comparison to the No Action Scenario.
[2] At times, areas of the space would receive sunlight under the proposed action that would be covered by incremental shadow in the No Action Scenario.
[3] From 10:00 AM to 10:15 AM the playground would experience increased sunlight in comparison to the No Action Scenario.
Source:
AKRF, Inc. determined using 3D building and topological data from EarthData International, with the Solar Study function in MicroStation V8.

Late afternoon shadows from the proposed buildings would fall in a northeast to east direction, reaching the Broadway Malls and Dante Park. In the afternoon, incremental shadow would fall on Fordham's own open space.

The proposed action would not increase the shadows on Samuel N. Bennerson Playground, West End Towers Park, James Felt Plaza, Martin Luther King Jr. High School Plaza, Alice Tully Hall/Julliard Plaza, or Richard Tucker Park on this analysis day.

JUNE 21 — 6:57 AM TO 7:01 PM EDT (FIGURES 6-12 TO 6-14)

On the summer solstice, incremental shadows from the proposed buildings along Amsterdam Avenue would reach the West 59th Street Recreation Center and the P.S. 191 playground during the morning hours. Afternoon shadows from the proposed buildings on West 62nd Street (mostly the north residential tower) would fall on Damrosch Park, and a very small extent along the southern edge of Lincoln Center Plaza.

Late afternoon shadows from the proposed buildings would fall on the Broadway Malls and Dante Park. Fordham's plaza would receive incremental shadows from the Sites 5 and 5a buildings during the morning and from Sites 3 and 3a in the mid- to late day.

The proposed action would not cast shadows on the Amsterdam Houses playground, Samuel N. Bennerson Playground, West End Towers Park, James Felt Plaza, Martin Luther King Jr. High School Plaza, Alice Tully Hall/Julliard Plaza, or Richard Tucker Park on the June 21 analysis day.

DECEMBER 21 — 8:51 AM TO 2:53 PM EST (FIGURES 6-15 TO 6-17)

In the mid- to late morning, the residential towers and the dormitory on Amsterdam Avenue would cast shadows to the northwest, reaching Samuel N. Bennerson Playground, West End Towers Park, and James Felt Plaza. In the early afternoon the north residential tower and the Sites 5 and 5a buildings would cast shadows to the north, reaching a section of Martin Luther King Jr. High School Plaza for 30 minutes, and in the mid-afternoon these shadows would move eastward across portions of Lincoln Center Plaza (both plaza areas). The Law School and the north residential tower would cast shadows on varying sections of Damrosch Park through most of the analysis day.

The proposed action would not change shadows on the West 59th Street Recreation Center, the playground at P.S. 191, Amsterdam Houses playground, Alice Tully Hall/Julliard Plaza, Richard Tucker Park, the Broadway Malls, Dante Park, or Fordham University Plaza on the December 21 analysis day.

EFFECTS ON SUN-SENSITIVE RESOURCES

The Phase I development would cast between five and seven hours of new shadow on Damrosch Park throughout the year. However, the extent of the new shadow would be small for much of this period, primarily affecting areas near the southern edge of the park or areas on the western side of the space around the bandshell. Most of the vegetation and seating areas are on the eastern side of the park and would continue to get sun for much of the day during the spring, summer and fall, and for a portion of the day in winter. Therefore, Damrosch Park would not experience a significant adverse impact with the Phase I development.

Those resources receiving a total of 30 minutes or less of incremental shadow due to the proposed action include the West End Tower Playground, Martin Luther King Jr. High School Plaza, Alice Tully Hall/Julliard Plaza, and Richard Tucker Park. Shadow increments from the proposed buildings lasting 30 minutes or less would not result in significant adverse impacts to these resources and are not discussed in detail below.

An assessment of project-generated shadows on the reconfigured Fordham campus plaza is included at the end of the section for informational purposes.

WEST 59TH STREET RECREATION CENTER

The West 59th Street Recreation Center would receive morning incremental shadows in the spring, summer and fall. On March 21 and September 21 the duration would only be 15 minutes and would occur on the north end of the space. On May 6 and August 6, there would be a reduction in shadow, in comparison to the No Action condition, from 8:15 AM to 8:30 AM (8:00 AM to 8:30 AM under the stacked 3 and 3a option). From 8:30 AM to 8:45 AM there would be incremental shadow as well as areas of reduced shadow, and then from 8:45 AM to 10:00 AM only incremental shadow, falling primarily on the north end (see Figure 6-9). On the June analysis day, the recreation center would receive incremental shadow from Site 4 for 45 minutes early in the morning, and from Site 3 for an hour later in the morning (see Figure 6-12).

The proposed action would not affect shadows on the West 59th Street Recreation Center on the December analysis day.

From May through August the space would experience between an hour and a half and an hour and 45 minutes of project shadow in the morning. The extent of the new shadow would be small for most of the duration. Therefore, a significant adverse impact would not occur.

P.S. 191 AMSTERDAM SCHOOL PLAYGROUND

The P.S. 191 playground would receive incremental shadow in the morning during the spring, summer and fall, but not the December 21 analysis day.

On March 21 and September 21, the south residential tower and dormitory would cast new shadow on the playground for three hours and 45 minutes beginning at 9:00 AM. At 10:00 AM portions of the paved court area would receive incremental shadow while other portions would see increased sunlight, relative to the No Action scenario (see Figure 6-5). From 11:45 AM to 12:45 PM incremental shadow would be off the paved courts and limited to the jungle gym area in the northeast section.

On May 6 and August 6, the northern residential tower at Site 4 would cast a small area of new shadow in the northeast corner from 7:27 AM to 7:45 AM. From 8:15 AM to 9:15 AM the southern tower at Site 3 would shade a small area of the paved courts. Between 9:15 AM and 11:45 AM large areas of the playground would be shaded by Sites 3 and 3a, although portions of the space would also experience a reduction in shadow in comparison to the No Action Scenario (see Figure 6-9). From 11:45 AM to 12:45 PM new shadow would be limited to the jungle gym area in the northeast section.

On June 21, Site 4 would cast a small area of new shadow from 6:57 AM to 7:45 AM, primarily in the northeast corner. Incremental shadow from Sites 3 and 3a would begin to fall on the southern portion of the open space at 9:00 AM. At 10:00 AM nearly a third of the space would experience new shadow, while some portions would experience an increase in sunlight relative to the No Action scenario (see Figure 6-12). An hour later incremental shadow would still shade nearly a third of the space, with a very small area of increased sunlight. The incremental shadow would begin to decrease after noon and would exit at 12:45 PM.

The P.S. 191 playground would receive between three hours and 45 minutes and four hours and 48 minutes of incremental shadow during the spring, summer and fall seasons. At certain times

during these durations, incremental shadow would fall on some areas of the playground while other areas would experience increased sunlight, in comparison to the No Action condition. The playground is devoted to active recreation uses, and does not contain any areas of turf or vegetation, and would not experience a significant adverse impact as a result of the proposed action.

AMSTERDAM HOUSES PLAYGROUND

Incremental shadows from the north residential tower would reach the Amsterdam Houses playground in the early to mid-morning hours during the spring and late summer, but the proposed action would not affect shadows on the Amsterdam Houses open space on the June 21 or December 21 analysis days.

On March 21 and September 21, incremental shadow cast by the tower at Site 4 would move across the playground between 9:15 AM and 10:30 AM, covering nearly the entire space between 9:45 AM and 10:00 AM (see Figure 6-5). A very small area of new shadow from Site 3 would briefly fall on the southeastern corner of the space between 11:45 AM and 11:50 AM, though with the stacked 3 and 3a option the taller Site 3 tower would cast a larger shadow, lasting for 30 minutes rather than five. On May 6 and August 6, when Site 4's shadow would be shorter and would pass across only the eastern portion of the space, between 10:00 AM and 11:00 AM (see Figure 6-9). The space is primarily devoted to active recreation and the limited extent and duration of incremental shadow would not result in a significant adverse impact.

SAMUEL N. BENNERSON PLAYGROUND

Incremental shadows from the residential towers of the proposed action would reach Samuel N. Bennerson Playground on the March 21/September 21 and December 21 analysis days. On March 21 and September 21 shadow cast by Site 4 would move across the southeastern section of the space between 11:45 AM and 12:15 PM. On December 21, when shadows are longer but move more quickly, Site 4's shadow would move across the northern and eastern parts of the playground between 9:15 AM and 9:30 AM. Between 10:00 AM and 10:15 AM there would be increased sunlight on the playground, because at this time shadow cast by the No Action scenario would move across the space (see Figure 6-15). From 10:15 AM to 12:00 PM the shadow from Site 3 would move west to east across the full length of the playground, covering about half of the space at its greatest extent at 11:30 AM. Portions of the playground would continue to get sun throughout the day after 9:00 AM, and the limited extent and duration of incremental shadows on the playground in the fall, winter and early spring would not result in a significant adverse impact.

The proposed action would not affect shadows on the Samuel N. Bennerson Playground on the May 6/August 6 or June 21 analysis days.

JAMES FELT PLAZA

The proposed action would only cast shadows on James Felt Plaza on the December 21 analysis day. The residential towers would cast incremental shadows on the plaza for a little over an hour. At 10:15 AM, the north residential tower would cast the first incremental shadow on the southern portion of the plaza. For about 15 minutes around 10:45 AM the plaza would be fully shaded by a combination of existing and incremental shadow. By 11:00 AM, the incremental shadow would have moved north to cover the northeastern half of the open space, but some sunlight would fall on the southwestern section. Shortly after 11:00 AM, the northern tower's shadow would exit, but

incremental shadow from the south residential tower would begin to fall on the open space. The last incremental shadow would begin to move off the open space at 11:45 AM.

The proposed action would not affect shadows on James Felt Plaza during the other three analysis days, and the limited extent and duration of project-generated shadow in the winter would not result in a significant adverse impact.

FRANK DAMROSCH PARK

Located directly north of the project site, Damrosch Park would receive incremental shadows from the proposed action throughout the year. Figure 5-3 in Chapter 5, "Open Space," depicts a detailed plan of the park and its features; all shadow diagrams in this chapter also show the layout and major features of the park.

Along the West 62nd Street sidewalk west of the parking lot ramp, there is a large planter with London plane trees. The eastern half of the park features London plane trees in the grid of large planters, and also a dense bosque of maples southwest of the grid; both of these tree species require a minimum of six hours of direct sunlight per day during the growing season (between April and October). Without the proposed action, the large planter of London planes along West 62nd Street would experience about three to four hours of direct sunlight on the March 21/September 21 analysis day, and more than six hours on the May 6/August 6 and June 21 analysis days. The bosque and planters on the east side of the park would receive between three and six hours of sun on March 21/September 21 (different areas would experience different durations of sunlight) and more than six hours of sunlight on the late spring and summer analysis days.

With the first phase of the proposed Master Plan, on March 21 and September 21, incremental shadow from Site 5 would move onto the southwestern corner of the park at 10:45 AM. This shadow would expand eastward into the space under the bandshell. At 12:00 PM the eastern half of the park would continue to be in sun, as would the northwestern quarter, with the southwestern quarter shaded by both No Build and incremental shadow (see Figure 6-6 and 6-6A). At 1:00 PM baseline shadow would cover much of the southwest quarter of the park, and incremental shadow would cover an additional section just east of the baseline shadow, while the north and far east parts of the space would continue to be in sun. A small area near the bandshell would receive sunlight under the proposed action that would be shaded by the No Action scenario. Just after 1:00 PM shadow cast by the proposed tower at Site 4 would move onto the western edge of the park. At 2:00 PM about half the park would be covered by baseline shadow, while smaller areas would be shaded by Sites 5 and 4 (see Figure 6-7 and 6-7A). The north and east portions of the park, which feature planters, seating ledges and trees, would continue to be in sun at this time. After 2:30 PM, Site 3 would begin adding small amounts of incremental shadow to the park. As the afternoon progresses, shadows would become longer, and after 4:00 PM existing and No Action shadows fall across most of the space and incremental shadows on Damrosch Park would be very small (see Figure 6-8 and 6-8A), and would remain so until the end of the analysis period at 5:29 PM.

The London plane trees and shrubbery in the large planter along West 62nd Street would get two hours of direct sun in the late morning with the initial phase of the Master Plan. Shadows on the maples, London plane trees, and shrubs in the eastern half of the park would be similar in the Build scenario to shadows in the No Action condition; incremental shadow would enter the southern part of the maple bosque about 30 minutes earlier, but would shade less area in the northern part, as the Site 5 building would be shorter than the No Action building at that site.

Shadows are shorter at midday on May 6 and August 6 than on the March 21 and September 21. The first incremental shadow would reach the park later in the day in May than in March. Since the analysis period is also longer, incremental shadows would remain on the open space for a longer period. At 12:30 PM, Sites 5 and 4 would begin casting incremental shadow on the southwest corner of the open space. The shadows would move east and at 2:00 PM Site 4 would cast incremental shadow across much of the western quarter of the park around the bandshell while Site 5 would shade a section in the southeastern part of the park (see Figure 6-10 and 6-10A). The shadows would move east through the afternoon; incremental shadow from Site 4 would move across the northern sections of the park. After 5:00 incremental shadow would begin to decrease considerably as baseline shadows lengthen (see Figure 6-11 and 6-11A). A small incremental shadow would remain on the southern edge of the open space at the end of the analysis day.

On May 6 and August 6, the trees and shrubbery throughout the park would continue to experience six hours or more of direct sunlight with the first phase of the proposed action. The large planter along the south border of the park on the west side would receive about 30 minutes less of sunlight, for a total of about six hours of direct sun. The bosque and planters on the east side of the park would experience about an hour and a half of new shadows as compared with baseline shadow, but would still experience more than six hours of direct sunlight.

On June 21 shadows would follow a similar pattern as on May 6 and August 6. At 12:45 PM incremental shadow from Site 4 would enter the southwest corner of Damrosch Park. By 2:00 PM, this shadow would cover a portion of the park around the band shell while Site 5 would cast a small incremental shadow in the southeastern area of the park (see Figure 6-13 and 6-13A). The shadows would lengthen through the afternoon, and by 4:00 PM incremental shadow from Site 4 would stretch northeast across the park. After 5:30 the incremental shadow would begin to decrease in size as baseline shadows stretch across the park (see Figure 6-14 and 6-14A), and by 6:00 only a small incremental shadow would remain. A very small increment would still be on the southeast corner of the park at the end of the analysis period at 7:01 PM.

The trees and shrubbery throughout the park would experience more than six hours of sunlight with the first phase of the proposed action on June 21.

On December 21, incremental shadows would fall on Damrosch Park for most of the analysis day. The Law School building at Site 5 would begin to cast incremental shadow at 9:00 AM, covering the southwest corner of the park. This increment would exit at 9:45 AM as long baseline shadow from existing buildings to the southeast move across the southwestern portion of the park (see Figure 6-15 and 6-15A), but would reappear again at 10:30 AM. Around noon, the proposed Law School at Site 5 would cast shadow falling north across the center of the park; much of the eastern half of the park where most of the planters and seating are located would continue to be in sun (see Figure 6-16 and 6-16A). After 1:30 PM, the increment would decrease in size, as baseline shadow extends across large sections of the park. However, incremental shadows from the Law School building and, after 1:30 PM, the north residential tower at Site 4 would remove small sections of sunlight from the park until the end of the analysis period at 2:53 PM (see Figure 6-17 and 6-17A).

The proposed action would cast incremental shadow on portions of Damrosch Park for long durations in all seasons. During the fall, winter and spring the paved western portion of the park is occupied by a tent in which private events take place including art shows, dinners, and other entertainment. On the May/August and June analysis days, large areas of the park would remain in sunlight for much of the day despite the new shadows, and use of the open space would not be

affected during these seasons. The vegetation throughout the park would experience a reduction in direct sunlight but the majority of the trees and shrubs would still get a total of six hours or more in May through August.

On March 21 and September 21, northern and eastern areas of the park would continue to receive sunlight for most of the analysis day, but project-generated shadows would remove areas of sunlight from the eastern half of the park (where vegetation and seating ledges are available year-round) in the early afternoon. The trees and shrubbery in various sections of the park would experience a reduction in extent and duration of direct sunlight on the March/September day. The London plane trees along West 62nd Street would receive less direct sunlight, but most of these trees would continue to receive six hours or more of direct sun through the late spring and summer, so it is likely that their overall viability would not be substantially affected. In December and January, when shadows are longest, incremental shadows would remove sunlight from the already heavily-shadowed park. However, the western half of the space where most of the incremental shadow would fall is occupied by the tent of the Big Apple Circus at this time of year. The eastern side of the park would continue to receive areas of sun until near the end of the analysis period, and the park would not experience a significant adverse impact with Phase I development.

LINCOLN CENTER PLAZA

The proposed buildings would cast incremental shadow on the three Lincoln Center Plaza spaces in all seasons.

On March 21 and September 21, incremental shadow cast by Site 4 would move across the north plaza between 3:15 PM and 4:45 PM (see Figure 6-8), removing most of the remaining sunlight from 3:45 PM to 4:00 PM. Site 5 would cast incremental shadow on a portion of the main (i.e. Josie Robertson) plaza from 4:00 PM to 4:30 PM, while another portion of the main plaza would receive additional sunlight relative to the No Action scenario (see Figure 6-8). Incremental shadow from Site 4 would move onto the main plaza at 5:00 PM and remain until the end of the analysis day at 5:29 PM.

On May 6 and August 6, incremental shadow from Site 4 would enter the main plaza at 3:45 PM, move across the central fountain area over the ensuing hour and 15 minutes, and then shrink rapidly off the space after 5:00 PM. From 5:00 PM until 5:30 PM, small areas of incremental shadow would fall on the Grove, at the northwest corner of West 62nd Street and Columbus Avenue (see Figure 6-11).

On June 21, a small area of incremental shadow would move across the southern edge of the main plaza from 3:45 PM to 5:00 PM.

On December 21, incremental shadow from Site 5 would fall northward through both sections of Lincoln Center Plaza from 2:15 PM until the end of the analysis period at 2:53 PM, removing much of the remaining sunlight during this time (see Figure 6-17).

The limited extent of new shadows cast by the proposed project in the late afternoons throughout the year would not cause a substantial enough reduction in sunlight to result in a significant adverse impact.

BROADWAY MALLS

The Broadway Malls would receive incremental shadows in the late afternoon in the spring, summer and fall. The proposed action would not affect shadows on the Broadway Malls on December 21. On March 21 and September 21, incremental shadow from Site 4 would fall on a section of the malls adjacent to Alice Tully Hall from 4:30 PM until 4:45 PM (see Figure 6-8). On May 6 and August 6, incremental shadow from Site 4 would fall on the section of the malls adjacent to Dante Park from 5:00 PM to 6:15 PM (see Figure 6-11). On June 21, Site 4 would cast incremental shadow on a portion of the malls next to Dante Park from 5:30 PM to 6:00 PM (see Figure 6-14). Site 3 would cast incremental shadow on very small portions of the malls between West 61st and 63rd Streets from 6:30 PM to 7:01 PM.

The limited extent and duration of incremental shadow on the malls would not cause a significant adverse impact.

DANTE PARK

Similarly to the Broadway Malls, Dante Park would receive incremental shadows in the late afternoon in the spring, summer and fall, all from the proposed residential tower at Site 4. The proposed action would not affect shadows on Dante Park on December 21.

On March 21 and September 21, incremental shadow would fall on the park from 5:00 PM until 5:29 PM. On May 6 and August 6, incremental shadow would move north to south across the park from 5:00 PM until 6:15 PM, covering large portions of the space for much of this time (see Figure 6-11). On June 21, incremental shadow would fall on the park for 45 minutes, from 5:15 PM to 6:00 PM (see Figure 6-14).

The proposed action would not affect shadows on Dante Park on the December analysis day, and the limited extent and duration of incremental shadows in the spring, summer and fall would not cause a significant adverse impact.

FORDHAM UNIVERSITY PLAZA

Project-generated shadows that would fall on the reconfigured campus plaza were assessed for informational purposes only; any such shadows would not be considered impacts of the project, because a project cannot cause an impact to itself.

Site 3 would cast areas of new shadow on Fordham's own plaza during the late spring and summer; no project-generated shadow would occur during the March/September and December analysis days.

On May 6 and August 6, Site 3 and 3a would cast small areas of shadow on Fordham University's plaza from 3:15 PM until 6:00 PM (see Figure 6-11). New shadow would enter at 3:00 PM rather than 3:15 PM under the stacked 3 and 3a option. On June 21, small areas of shadow would be cast by Site 3 and 3a from 3:00 PM to 7:01 PM (see Figure 6-14). Under the stacked 3 and 3a option, new shadow would enter 15 minutes earlier at 2:45 PM. After 6:15 PM there would be areas of additional sunlight relative to the No Action condition.

INTERIM PLAZA

No project-generated shadow would fall far enough to the southeast to reach the interim plaza at any time of year.

F. ASSESSMENT OF SHADOW INCREMENTS—2032

When fully developed, the proposed action would cast additional shadows beyond those described above, with the full Phase II development anticipated to be complete in 2032. The additional shadows in 2032 would fall mostly on the resources to the north and east of the project site due to the location of the planned additional buildings, which would be located along Columbus Avenue and on West 62nd Street between Columbus Avenue and the Site 5 building that would be constructed during Phase I.

An academic/dormitory building up to 342 feet tall would be located on Site 6, to the east of Site 5. Two academic buildings along Columbus Avenue would have dormitory towers with maximum envelopes reaching 383 feet on the northeast corner and 468 feet on the southeast corner. The full build-out for the proposed action is being compared to the same three residential buildings in the future without the proposed action, as no further development would be anticipated without discretionary land use or funding approvals.

SHADOWS BY SEASON

Incremental shadow durations for the full build-out are presented in Table 6-3. Five additional resources would be affected by project shadows in 2032 that would not have been affected in 2014 and were thus not listed in Table 6-2. However, the analysis showed that open spaces to the west and northwest of the Fordham campus would not receive any additional incremental shadow durations beyond those described for 2014, with two minor exceptions on the March/September analysis day only. For certain analysis times, additional larger-scale diagrams focusing on Damrosch Park are provided with an "A" suffix on the figure number.

MARCH 21/SEPTEMBER 21—8:36 AM TO 5:29 PM EDT (FIGURES 6-18 TO 6-22)

In the morning hours on the March/September analysis day, the proposed residential towers and dormitory along Amsterdam Avenue (Sites 3 and 3a) would cast incremental shadows to the west on the playground at P.S. 191 and on the Amsterdam Houses playground, and very briefly on the West 59th Street Recreation Center. Beginning at 10:45 AM, the Sites 5 and 5a buildings and the north residential tower (Site 4) would cast shadows northward on portions of Damrosch Park, and would continue to add shadow onto this park until the end of the analysis day. In Phase II of development, Sites 1 and 6 would add additional shadow to Damrosch Park in the late morning and early afternoon. For about 30 minutes around noon Site 4 would cast shadow onto Samuel N. Bennerson Playground. Afternoon shadows from the buildings along West 62nd Street would reach Lincoln Center Plaza (the north plaza, the main plaza, and the Grove at varying times). In the late afternoon shadow from Site 4 would reach the Broadway Malls, Alice Tully Hall/Julliard Plaza, and Richard Tucker Park each for 15 minutes or less, and Dante Park for about 30 minutes. Shadow from Sites 1 and 6 in the Phase II development would cast additional periods of incremental shadow on the Broadway Malls and Dante Park, as well as on the plaza at the Regent late in the afternoon for 45 minutes. With the reconfiguration of Fordham's own plaza and the addition of new buildings around it, incremental shadow would fall on the Fordham plaza for most of the analysis day.

The proposed action would not cast any incremental shadows on St. Luke's-Roosevelt Hospital plaza, St. Paul the Apostle Church, West End Towers Park, James Felt Plaza, Martin Luther King Jr. High School Plaza, or the Beaumont Plaza, or Central Park.

Table 6-3
Incremental Shadow Durations—2032

Resource	March 21 / Sept. 21 8:36 AM-5:29 PM EDT	May 6 / Aug. 6 7:27 AM-6:18 PM EDT	June 21 6:57 AM-7:01 PM EDT	December 21 8:51 AM-2:53 PM EST
St. Paul the Apostle Church – north facade	–	7:27 AM – 7:45 AM Total:18m	7:05 AM – 8:45 AM Total: 1h 40m	–
St. Luke's-Roosevelt Hospital Entrance Plaza	–	–	7:15 AM – 7:30 AM 7:55 AM – 8:05 AM Total: 25m	–
West 59th Street Recreation Center*	8:45 AM – 9:00 AM Total: 15m	8:30 AM – 10:00 AM Total: 1h 30m	7:30 AM – 8:15 AM 9:45 AM – 10:45 AM Total: 1h 45m Stacked option: 7:30 AM – 8:15 AM 9:30 AM – 10:45 AM Total: 2h	–
P.S. 191 Amsterdam School	8:36 AM – 12:45 PM Total: 4h 9m	7:27 AM – 7:45 AM 8:15 AM – 12:45 PM Total: 4h 48m	6:57 AM – 7:45 PM 9:00 AM – 12:45 PM Total: 4h 3m	–
Amsterdam Houses Playground*	9:15 AM – 10:30 AM 11:45 AM – 11:50 AM Total: 1h 20m Stacked option: 9:15 AM – 10:30 AM 11:30 AM – 12:00 PM Total: 1h 45m	10:00 AM – 11:00 AM Total: 1h	–	–
Samuel N. Bennerson Playground*	11:45 AM – 12:15 PM Total: 30m	–	–	9:15 AM – 9:30 AM 10:15 AM – 12:00 PM Total: 2h
West End Towers Park*	–	–	–	9:45 AM – 10:15 AM Total: 30m
James Felt Plaza*	–	–	–	10:15 AM – 11:45 AM Total: 1h 30m
Martin Luther King Jr. High School Plaza*	–	–	–	1:00 PM – 1:30 PM Total: 30m
Damrosch Park	10:45 AM – 5:29 PM Total: 6h 44m	12:30 PM – 6:18 PM Total: 5h 48m	12:30 PM – 7:01 PM Total: 6h 31m	**9:00 AM – 2:53 PM Total: 5h 53m**
Lincoln Center Plaza	1:30 PM – 5:29 PM Total: 3h 59m	1:15 PM – 5:30 PM Total: 4h 15m	1:15 PM – 5:00 PM Total: 3h 45m	**11:45 AM – 2:53 PM Total: 3h 8m**
Alice Tully Hall/Julliard Plaza*	4:15 PM – 4:30 PM Total: 15m	–	–	–
Richard Tucker Park	4:30 PM – 4:35 PM Total: 5m	–	–	2:00 PM – 2:45 PM Total: 45m
Broadway Malls	3:45 PM – 4:00 PM 4:35 PM – 5:29 PM Total: 1h 9m	5:00 PM – 6:15 PM Total: 1h 15m	5:15 PM – 7:01 PM Total: 1h 46m	2:00 PM – 2:53 PM Total: 53m
Dante Park	4:15 PM – 5:29 PM Total: 1h 14m	5:00 PM – 6:15 PM Total: 1h 15m	5:15 PM – 6:00 PM Total: 45m	2:45 PM – 2:53 PM Total: 8m
The Regent	4:45 PM – 5:29 PM Total: 44m	3:30 PM – 4:45 PM 5:30 PM – 6:18 PM Total: 2h 3m	3:15 PM – 6:30 PM Total: 3h 15m	–
The Beaumont	–	4:15 PM to 4:45 PM 6:00 PM – 6:18 PM Total: 48m	4:00 PM – 4:45 PM 5:30 PM – 6:30 PM Total: 1h 45m	–
Central Park	–	–	6:45 PM – 7:01 PM Total: 16m	–

Notes:
EST—Eastern Standard Time; EDT—Eastern Daylight Time
* Incremental shadows from the proposed project would be the same in 2032 as in 2014.
Source:
AKRF, Inc. determined using 3D building and topological data from Fugro EarthData, Inc. with the Solar Study function in MicroStation V8.

MAY 6/AUGUST 6—7:27 AM TO 6:18 PM EDT (FIGURES 6-23 TO 6-26)

Early in the morning of the May 6/August 6 analysis day, Site 2 would cast shadow to the southwest, adding about 30 minutes of new incremental shadow onto the north façade of St. Paul the Apostle Church. During mid-morning, the proposed buildings along Amsterdam Avenue would cast incremental shadows southwest and west on the West 59th Street Recreation Center, the P.S. 191 playground, and the Amsterdam Houses playground. No additional incremental shadow would be cast by Phase II development on these resources on this analysis day. Afternoon shadows would fall on Damrosch Park mostly from Sites 4 and 5 as in Phase I, with a small additional incremental shadow cast by Site 6. Sites 1 and 6 would cast new incremental shadows on the Grove at the corner of West 62nd Street and Columbus Avenue in the afternoon. Late afternoon shadows from Site 4 would reach the main plaza area of Lincoln Center Plaza.

Late afternoon shadows from the proposed buildings would fall in a northeast to east direction, reaching the Broadway Malls and Dante Park, with no new shadows on these resources from Phase II buildings. However, new incremental shadow would fall on the Regent and Beaumont plazas in the late afternoon. New incremental shadow would fall on the Fordham University plaza from the Phase II buildings during the morning and early afternoon, and from the residential towers in the afternoon as in Phase I.

The proposed action would not cast incremental shadows on St. Luke's-Roosevelt Hospital plaza, Samuel N. Bennerson Playground, West End Towers Park, James Felt Plaza, Martin Luther King Jr. High School Plaza, Alice Tully Hall/Julliard Plaza, Richard Tucker Park or Central Park on this analysis day.

JUNE 21—6:57 AM TO 7:01 PM EDT (FIGURES 6-27 TO 6-31)

Early in the morning on June 21, new incremental shadows would reach St. Luke's-Roosevelt Hospital plaza and the north façade of St. Paul the Apostle Church. In the mid-morning, incremental shadow from the proposed buildings along Amsterdam Avenue would reach the West 59th Street Recreation Center and the P.S. 191 playground during the morning hours. No new incremental shadow from Phase II development would reach these resources. Afternoon shadows from the proposed buildings on West 62nd Street (mostly Site 4) would fall on Damrosch Park, and a small extent on portions of Lincoln Center Plaza.

Late afternoon shadows from the proposed buildings would fall on the Broadway Malls and Dante Park as in Phase I, with new incremental shadows from Phase II buildings falling on the Broadway Malls, the Regent and Beaumont plazas, and briefly on an area of Central Park late in the afternoon. Fordham's plaza would receive incremental shadows for most of the day.

The proposed action would not cast shadows on the Amsterdam Houses playground, Samuel N. Bennerson Playground, West End Towers Park, James Felt Plaza, Martin Luther King Jr. High School Plaza, Alice Tully Hall/Julliard Plaza, or Richard Tucker Park on the June 21 analysis day.

DECEMBER 21—8:51 AM TO 2:53 PM EST (FIGURES 6-32 TO 6-35)

In the mid- to late morning, the residential towers and the dormitory on Amsterdam Avenue would cast shadows to the northwest, reaching Samuel N. Bennerson Playground, West End Towers Park, and James Felt Plaza. In the early afternoon the north residential tower and the Site 5 building would cast shadows to the north, reaching a section of Martin Luther King Jr. High School Plaza for 30 minutes. Phase II development would not add new incremental shadow duration to any of these resources. From 11:45 AM until the end of the day shadows incremental

shadow would move across portions of Lincoln Center Plaza. Sites 4, 5, 5a and 6 would cast shadows on varying sections of Damrosch Park through most of the analysis day. Phase II development would add incremental shadow to Fordham University Plaza in the middle of the day and early afternoon. Phase II development would also add incremental shadow in mid-afternoon to Richard Tucker Park, Broadway Malls and Dante Park.

The proposed action would not cast incremental shadows on St. Luke's-Roosevelt Hospital plaza, St. Paul the Apostle Church, the West 59th Street Recreation Center, the playground at P.S. 191, Amsterdam Houses playground, Alice Tully Hall/Julliard Plaza, the Regent or Beaumont plazas, or Central Park on the December 21 analysis day.

EFFECTS ON SUN-SENSITIVE RESOURCES

Similar to the Phase I development, Phase II development would cast between five and seven hours of new shadow on Damrosch Park throughout the year. However, the Phase II buildings on the eastern side of the campus block would cast additional areas of shadow on Damrosch Park in the late morning and around noon on the March 21/September 21 and December 21 analysis days. Overall, the extent and duration of additional shadow would be substantial enough to cause a significant adverse impact on the March 21/September 21 and December 21 analysis days. Phase II development would also add several hours of afternoon shadow on the Grove during the spring, summer and fall, causing a significant adverse impact to that Lincoln Center Plaza space. The proposed residential and academic building at Site 2 would cast an hour and 45 minutes of incremental shadow on the clerestory stained-glass windows along the north facade and on the northwest facing window apse of the Church of Saint Paul the Apostle early on June 21 mornings, causing a significant adverse shadow impact to this historic resource.

Those resources receiving a total of approximately 30 minutes or less of incremental shadow due to the proposed action in 2032 include the St. Luke's-Roosevelt Hospital plaza, West End Tower Playground, Martin Luther King Jr. High School Plaza, Alice Tully Hall/Julliard Plaza, and Central Park. Shadow increments from the proposed buildings lasting 30 minutes or less would not result in significant adverse impacts to these resources and are not discussed in detail below.

Additional incremental shadows beyond those anticipated with Phase I development (described above for 2014) are detailed below. Incremental shadows would not increase over those previously described for 2014 for the West 59th Street Recreation Center, Amsterdam Houses Playground, Samuel N. Bennerson Playground, and James Felt Plaza.

An assessment of project-generated shadows on the reconfigured Fordham campus plaza is included at the end of the section for informational purposes.

ST. PAUL THE APOSTLE CHURCH

This large, Gothic Revival Church is located south of the Fordham campus across West 60th Street. The proposed academic and dormitory building at West 60th Street and Columbus Avenue (Site 2) would cast shadows to the southwest on the north façade of St. Paul the Apostle Church and its stained glass windows during the early morning hours of the May 6/August 6 and June 21 analysis days. On May 6 and August 6, the incremental shadows would fall on the façade from the start of the analysis period at 7:27 AM and would leave the last window at 7:45 AM (see Figure 6-23). On June 21, incremental shadows would fall on the windows of the north façade and a portion of the easternmost window on the apse from 7:05 AM to 8:45 AM.

The north façade windows of the church would not receive any incremental shadow from the buildings of the proposed action on the March/September or December analysis days.

Shadows move quickly in a clockwise direction this early on the June 21 morning, and incremental as well as existing shadow would pass from east to west across the north façade. From 7:05 AM to 7:45 AM incremental shadow would fall across between two and three windows at the western end of the façade; the three to four windows on the east end of the north façade would be shaded by existing buildings during this time, leaving only the middle window in direct sunlight. From 7:45 AM to 8:25 AM the eastern five windows would be in existing shadow, and the two westernmost windows would be in incremental shadow, so no sunlight would reach the windows for these 40 minutes (see Figure 6-27). By 8:30 AM, as shadows continue to shorten and move towards the north, only the westernmost window and part of an apse window would be in incremental shadow, and two windows would be in direct sunlight. Incremental shadow would exit the westernmost window at 8:45 AM, while existing shadows also continue to move off the windows. From 9:00 AM to 11:00 AM sunlight would fall on the north windows as well as the east (front) windows. After 11:00 AM the sun moves into the southern half of the sky and no longer shines directly on the north facade.

On the morning of June 21, incremental shadow would remove the remaining sunlight on the north façade of the church for 40 minutes; for an additional 30 minutes of this period only one window would receive direct sunlight. The incremental shadow would be considered a significant adverse impact on the north windows of the church and apse on the June 21 analysis day. On the May 6/August 6 analysis day the impact would be less substantial and on the other two analysis days there would not be any shadow impact as sunlight does not fall directly on the north façade in those seasons. See Chapter 21, "Mitigation," and Chapter 23, "Unavoidable Impacts," for additional discussion of this impact.

P.S. 191 AMSTERDAM SCHOOL PLAYGROUND

The P.S. 191 Playground would receive 24 minutes of additional incremental shadow early on the March 21/September 21 analysis day, covering a very small area. No other new incremental shadow would occur as a result of Phase II development, and no significant adverse impact would occur.

FRANK DAMROSCH PARK

Phase II development would add areas of new shadow to Damrosch Park on the March 21/September 21 and the December 21 analysis days. The additional areas of incremental shadow would fall in the late morning and early afternoon from Sites 1 and 6, affecting primarily the seating areas and vegetation on the eastern side of the park. Figure 6-19 and 6-19A depicts Damrosch Park on March 21/September 21 at noon without the event tent, while Figure 6-20 and 6-20A shows the park with the event tent, since the tent is typically up in both March and September. On December 21, Sites 1 and 6 would add areas of new shadow as well as 45 minutes of new duration in the late morning (see Figures 6-32, 6-32A, 6-33, 6-33A, 6-34, and 6-34A). Figure 6-32 shows the park at 10:00 AM without the Big Apple Circus tent, while Figure 6-33 shows the park with the tent up, as would be expected at this time of year.

The additional development in Phase II would not impact Damrosch Park on the May 6/August 6 or June 21 analysis days. It would, however, add incremental shadow to the eastern side of the park on March 21/September 21 and December 21. On March 21/September 21, Sites 1 and 6

would cast additional incremental shadows from 11:00 AM to 1:30 PM on the southern half of the maple bosque and the planters around the parking garage ramp.

Overall, the full 2032 buildout of the proposed action would substantially reduce sunlight to Damrosch Park in the fall, winter and early spring, resulting in a significant adverse impact to the use of this space. The health of the London plane trees and maples of the park might also be affected in the spring. The most critical time for these trees to receive sunlight is during the most active growth periods in the spring and summer. As these shade trees begin to leaf out in April, the limited period of available sunlight during the early to mid-spring may adversely affect the health and lifespan of these trees. There is no way of predicting with full certainty the severity of this impact, but the loss of direct sunlight would place additional stress on trees already suffering from restricted root zones (in the case of the maples) and other stresses typical of trees in dense urban settings, as evidenced by prominent browning of the edges of the leaves visible on a fall 2008 site visit. As stated above, representatives of DPR and Fordham University have been meeting and are continuing to discuss potential mitigation measures for the significant adverse shadow impact on Damrosch Park that is projected with full development of Phase II. Representatives of Lincoln Center have advised that they do not wish to address the issue of plant sensitivity at the Grove at this time, because of the long period of time that will elapse until construction of Phase II. If Fordham, DPR, and Lincoln Center do not ultimately reach agreement on implementation of mitigation measures, the increase in shadows would be considered an unavoidable significant adverse impact on Damrosch Park and the Grove. See Chapter 21, "Mitigation," for additional discussion of potential mitigation.

LINCOLN CENTER PLAZA

Sites 1 and 6 would cast additional new shadows on Lincoln Center Plaza throughout the year, including long durations of incremental shadow on the Grove between the Koch Theater and Columbus Avenue. During the March/September, May/August, and June analysis days, incremental shadow would enter the southwestern corner of the Grove at approximately 1:15 PM and move across the space, finally exiting between 5:00 PM and 5:30 PM. Existing shadow from the Koch Theater would begin to spread across the space by mid-afternoon, which means that the incremental shadow would affect a smaller and smaller area in the latter part of the afternoon, but would continue to remove much or all of the remaining sunlight. See Figures 6-21, 6-22, 6-25, 6-26, and 6-29 depicting incremental shadow on the Lincoln Center spaces on the spring, summer and fall analysis days.

On the December analysis day, additional incremental shadows would move across the main and north sections of Lincoln Center Plaza from approximately noon until 2:00 PM, and across portions of the Grove from 12:45 PM to 2:53 PM (see Figures 6-34 and 6-35).

The planned Grove between the Koch Theater and Columbus Avenue north of West 62nd Street would already experience several hours of shadow in the mornings from existing buildings to the east across Columbus Avenue, as well as late-afternoon shadow from the existing Koch Theater. The trees would likely only receive direct sunlight from approximately 11:30 AM to 3:30 PM on the May 6/August 6 analysis day, which is representative of conditions during much of the growing season. Given that the tree species currently planned for the Grove are not shade tolerant, their survival could be endangered in the future even without the proposed actions. Phase II development would add approximately four hours of new shadow on the Grove in the spring, summer and fall, and nearly two hours in the winter, and would therefore cause a

significant adverse impact to this space. See Chapter 21, "Mitigation," for discussion of mitigation measures to address this impact.

THE REGENT AND BEAUMONT PLAZAS

The proposed buildings along Columbus Avenue (Sites 1 and 2) would cast shadow on the Regent plaza in the late afternoon during the spring, summer and fall, and on the adjacent Beaumont plaza in the late spring and summer. On March 21 and September 21, incremental shadow would fall on a very small part of the northwest corner of the Regents plaza for just under 45 minutes at the end of the analysis period (4:45 PM to 5:29 PM). On May 6 and August 6, incremental shadow from Site 2 would fall on the Regent plaza from 3:30 PM to 4:45 PM, and then again from 5:30 PM to 6:18 PM (see Figure 6-26). On June 21 incremental shadow from Site 2 would fall on portions of the Regent plaza from 3:15 PM until 6:30 PM, after which shadows from existing buildings would completely cover the space. Incremental shadow would also fall on a small section of the Beaumont plaza from 4:00 PM to 4:45 PM and 5:30 PM to 6:30 PM. At times during these affected periods, the incremental shadow would remove much or all remaining sunlight from these plazas (see Figure 6-30). After 6:30 PM, all shadow on the plazas would be from existing buildings (see Figure 6-31).

Phase II development would not increase the shadow on the plazas in December.

The late-afternoon incremental shadow in the late spring and summer, lasting up to three and a quarter hours on June 21, could reduce the attractiveness of Regent plaza at these times. However, the actual extent of incremental shadow remains small, and its impact would not significantly affect the vegetation or use of this space.

BROADWAY MALLS

Phase II development would add new shadow to sections of the Broadway Malls on March 21 and September 21, June 21 and December 21; no new shadows would occur on May 6 and August 6.

On March 21 and September 21, Site 1 would add 15 minutes of new shadow to a section of the Malls in late afternoon, and Site 6 would add about 45 minutes of new shadow at the end of the day. On June 21, about an hour and 15 minutes of new shadow would occur on the Malls, as shadows reach further west and southwest late in the day. New extents would be small, particularly after 6:00 PM (see Figure 6-31). On December 21, Sites 1 and 2 would cast new incremental shadow onto small sections of the Malls from 2:00 PM until the end of the analysis day at 2:53 PM (see Figure 6-35). Given the limited extent and duration of incremental shadow, no significant adverse impacts would occur.

DANTE PARK

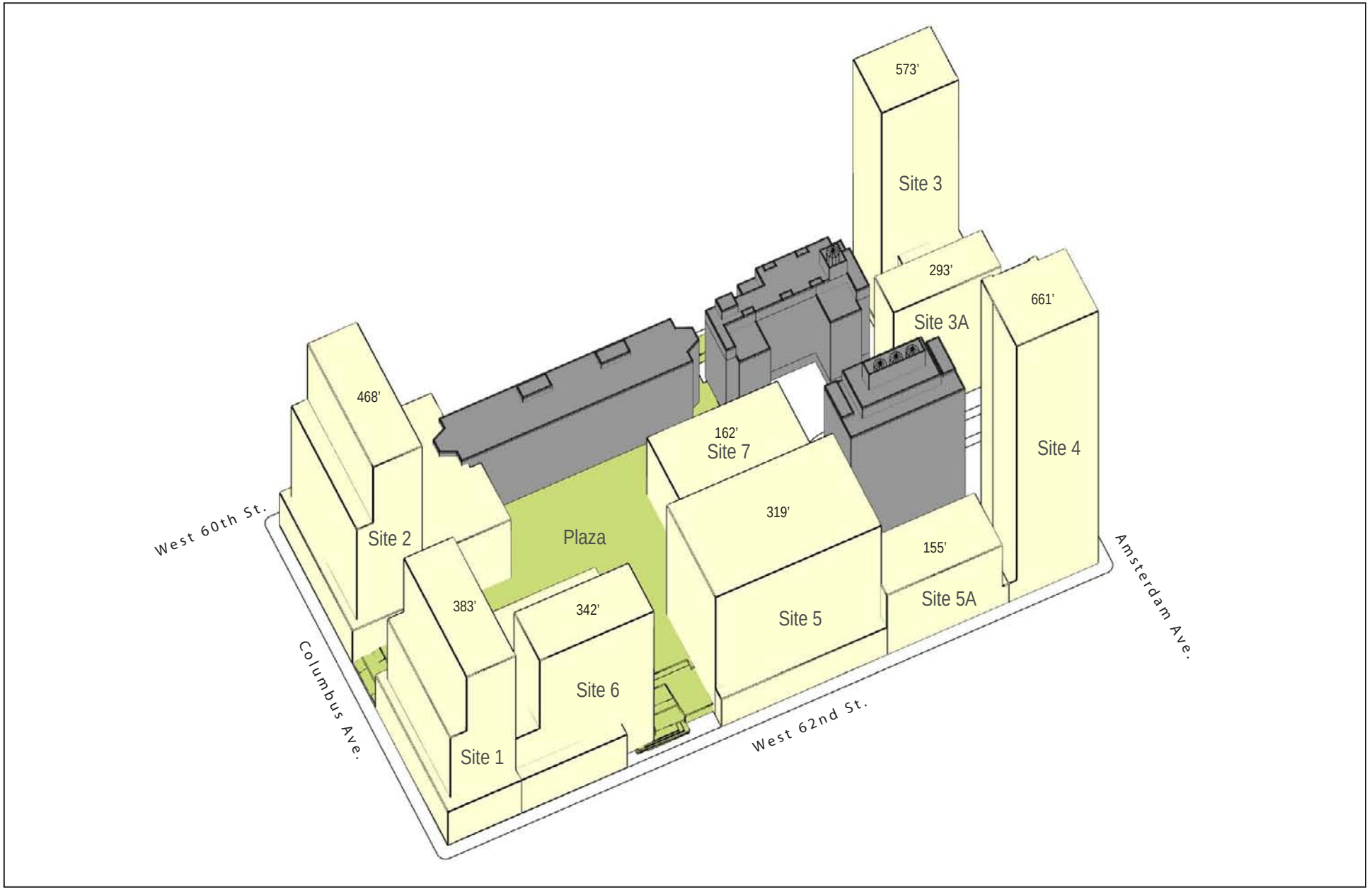
Additional incremental shadow from Site 6 would add 45 minutes of incremental shadow on March 21 and September 21, so that incremental shadow would enter the park at 4:15 PM instead of 5:00 PM (compare Figure 6-22 to 6-8). No additional shadow would fall on the park from Phase II development on the May/August and June analysis days. On December 21, new incremental shadow would move onto the park for the last eight minutes of the analysis day. Phase II development would not add a substantial extent or duration of new shadow to Dante Park on any analysis day, and would therefore not cause a significant adverse impact.

FORDHAM UNIVERSITY PLAZA

Project-generated shadows that would fall on the reconfigured campus plaza were assessed for informational purposes only; any such shadows would not be considered impacts of the project, because a project cannot cause an impact to itself.

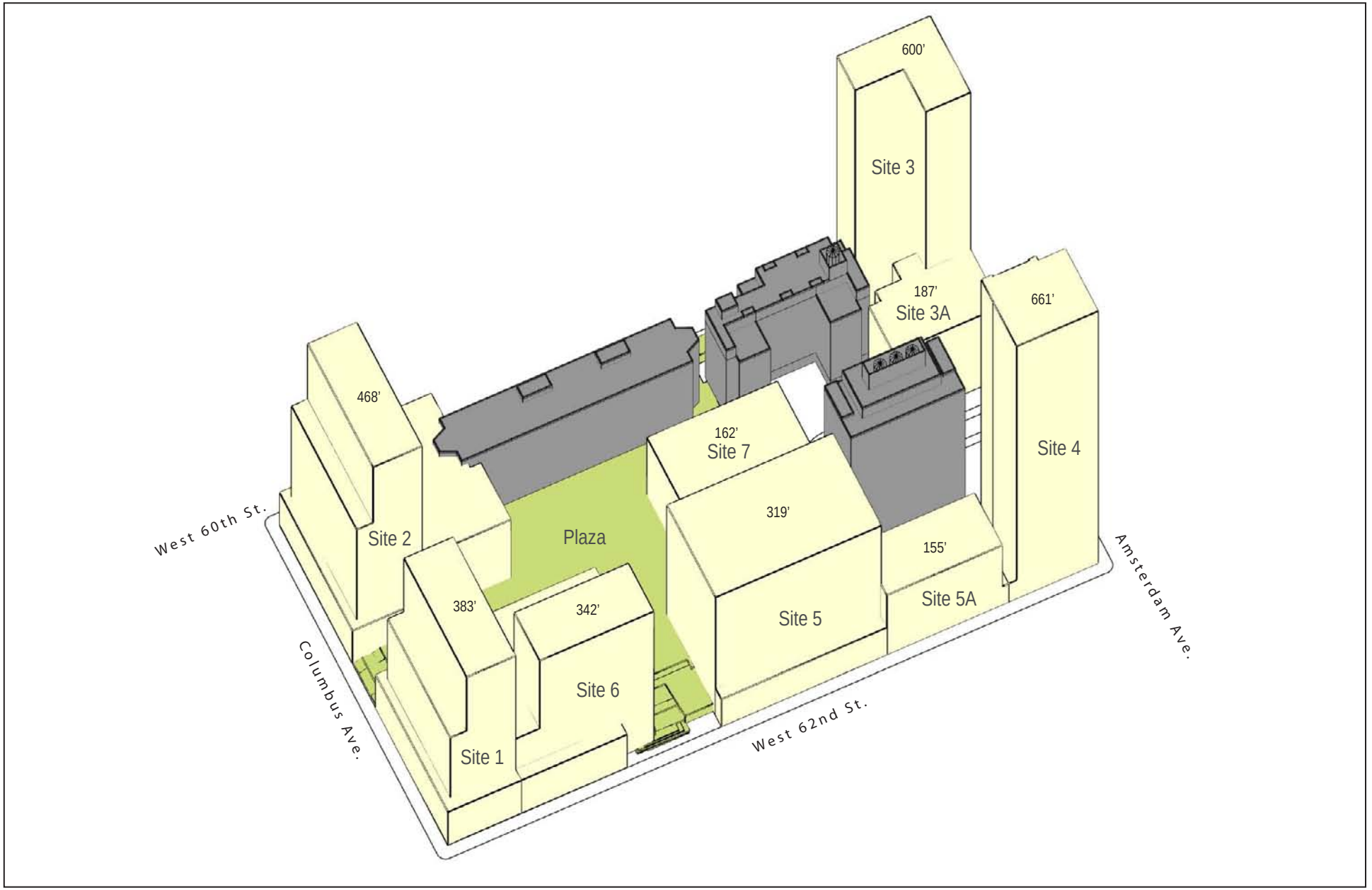
The redesigned Fordham University plaza would receive additional shadows from the surrounding Phase II buildings during much of the day throughout the year.

During March 21 and September 21, new shadows from the Phase II buildings would begin to fall on the plaza at the start of the analysis period, 8:36 AM, and last until 4:30 PM (see Figures 6-18 to 6-22). On May 6 and August 6, shadow from Phase II buildings on the east side of the plaza would begin to fall on Fordham University plaza at the start of the analysis period, 7:27 AM, and would remain until 3:15 PM (see Figures 6-24 and 6-25). As in Phase I, Sites 3 and 3a would cast shadow from mid-afternoon until nearly the end of the analysis day (see Figure 6-26). On June 21, due to additional new shadow from Phase II buildings throughout the morning and early afternoon, shadow from the proposed buildings would fall on portions of the plaza the entire analysis day (see Figures 6-28 to 6-31). On both the May/August and June analysis days the plaza would experience a good deal of sunlight in the middle of the day despite the long durations of project-generated shadows. On December 21, small areas of shadow cast by Phase II buildings—primarily Site 2—would cast areas of new shadow in the late morning and early afternoon; while small in extent, the new shadow would remove most or all the remaining sunlight from the plaza at these times (see Figures 6-32 to 6-34). At most other times of the December 21 day, the plaza is covered in existing shadow (see Figure 6-35). ✷



Note: Building heights measured from lowest applicable curb level for each site.

Figure 6-1
Proposed Campus Master Plan
Phase II (2032) - Maximum Building Envelopes

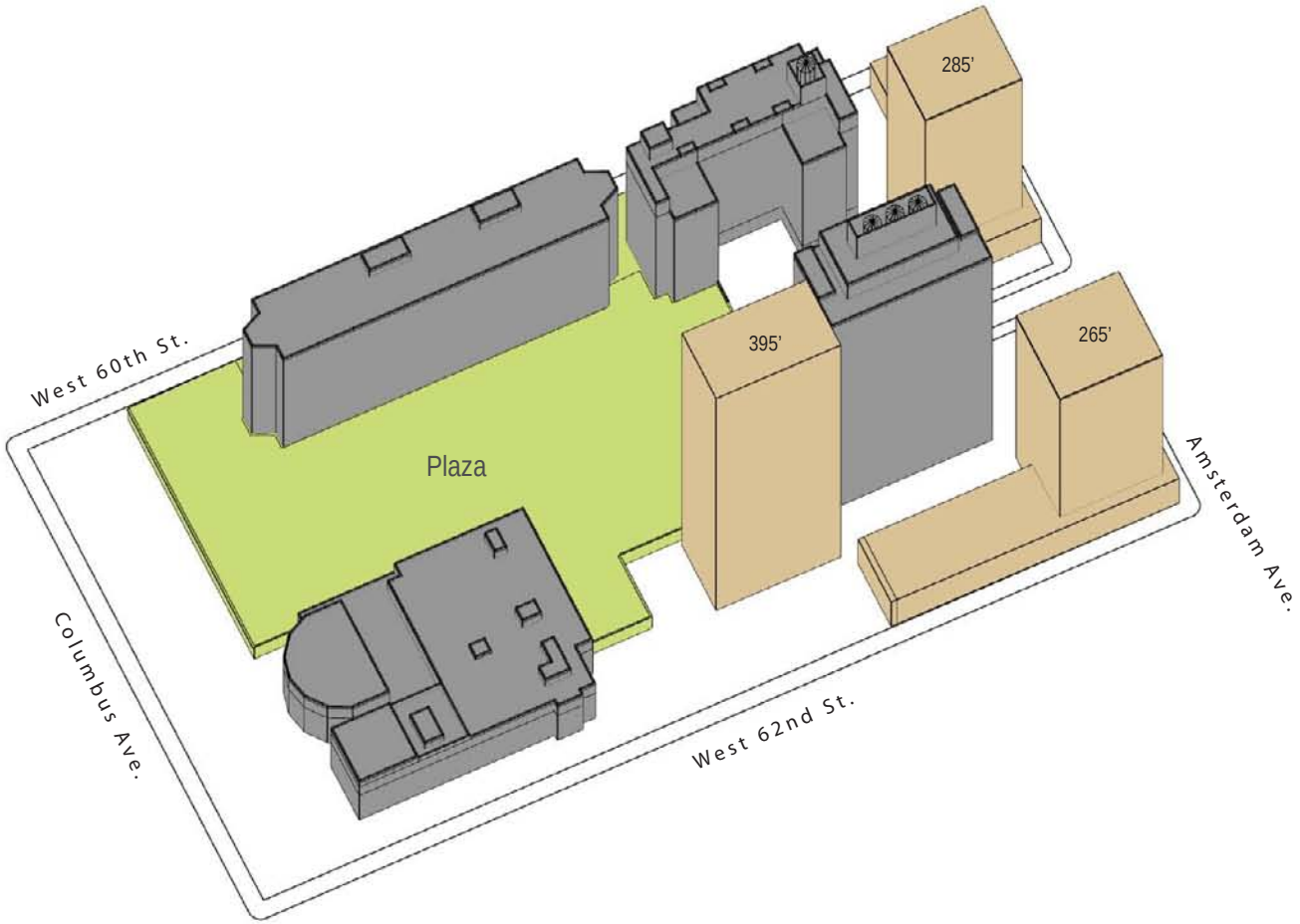


Note: Building heights measured from lowest applicable curb level for each site.

Figure 6-2

Proposed Campus Master Plan

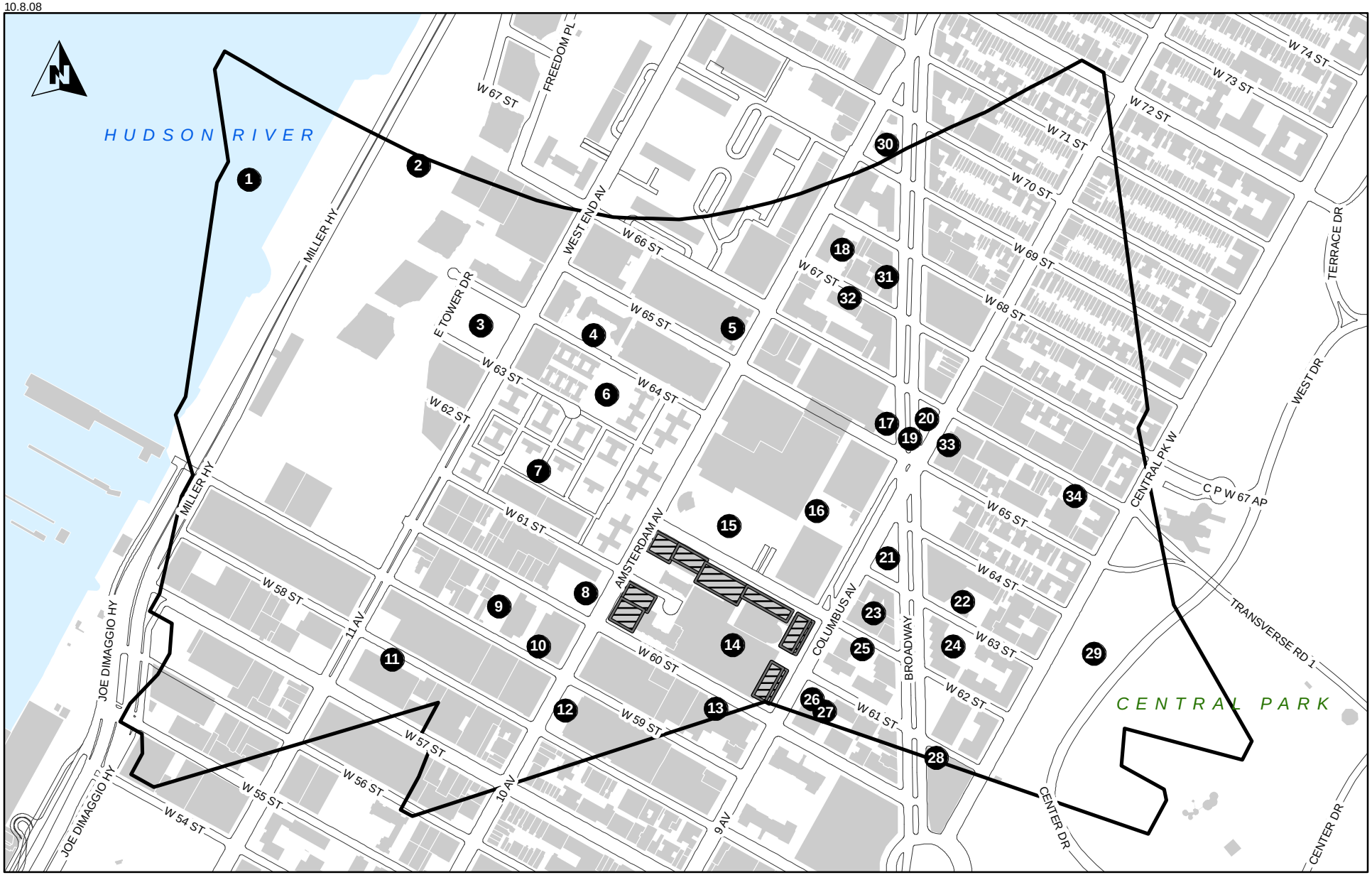
Phase II with Stacked 3+3A Option (2014) - Maximum Building Envelopes



Note: Building heights measured from lowest applicable curb level for each site.

Figure 6-3
Fordham Campus Plan
No Action Condition

10.8.08



Perimeter Showing Longest Possible Shadow Length Cast by Proposed Buildings Throughout Year

Shadow-Sensitive Resources within Perimeter (see Table 6-1 for Number Key)

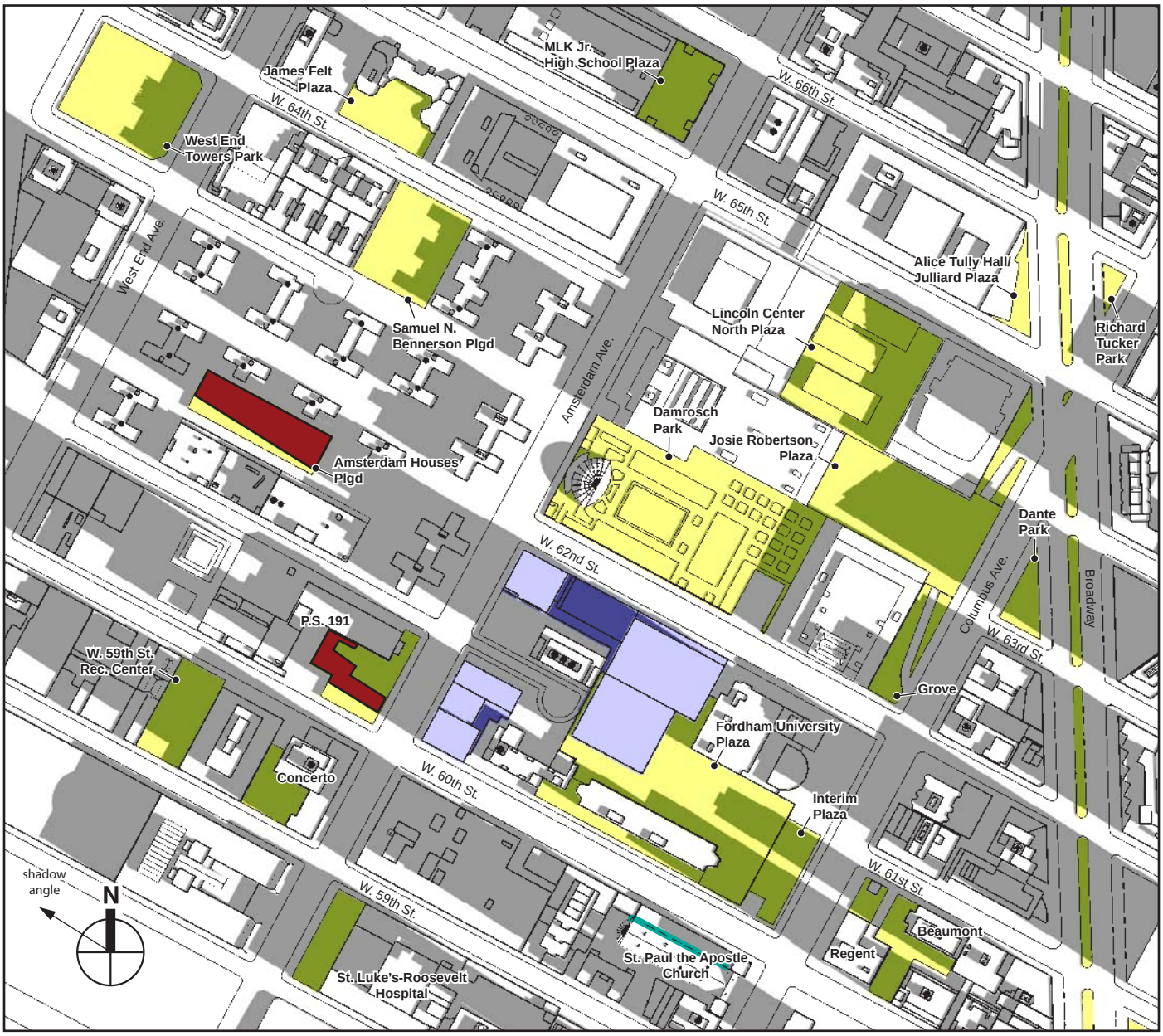
Proposed Building Envelopes Used in Screening Analysis (see Fig. 6-1 for Heights)

Feet
0 250 500 750 1,000

Figure 6-4
Screening Analysis

FORDHAM LINCOLN CENTER

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-5

Shadows - Phase I

March 21 / Sept. 21 - 10:00 AM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-6

Shadows - Phase I

March 21 / Sept. 21 - 12:00 PM EDT

3.4.08

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-6A

Damrosch Park - Shadows - Phase I

March 21/Sept. 21 - 12:00 PM EDT

Figure 6-7
Shadows - Phase I
March 21 / Sept. 21 - 2:00 PM EDT

3.4.08

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

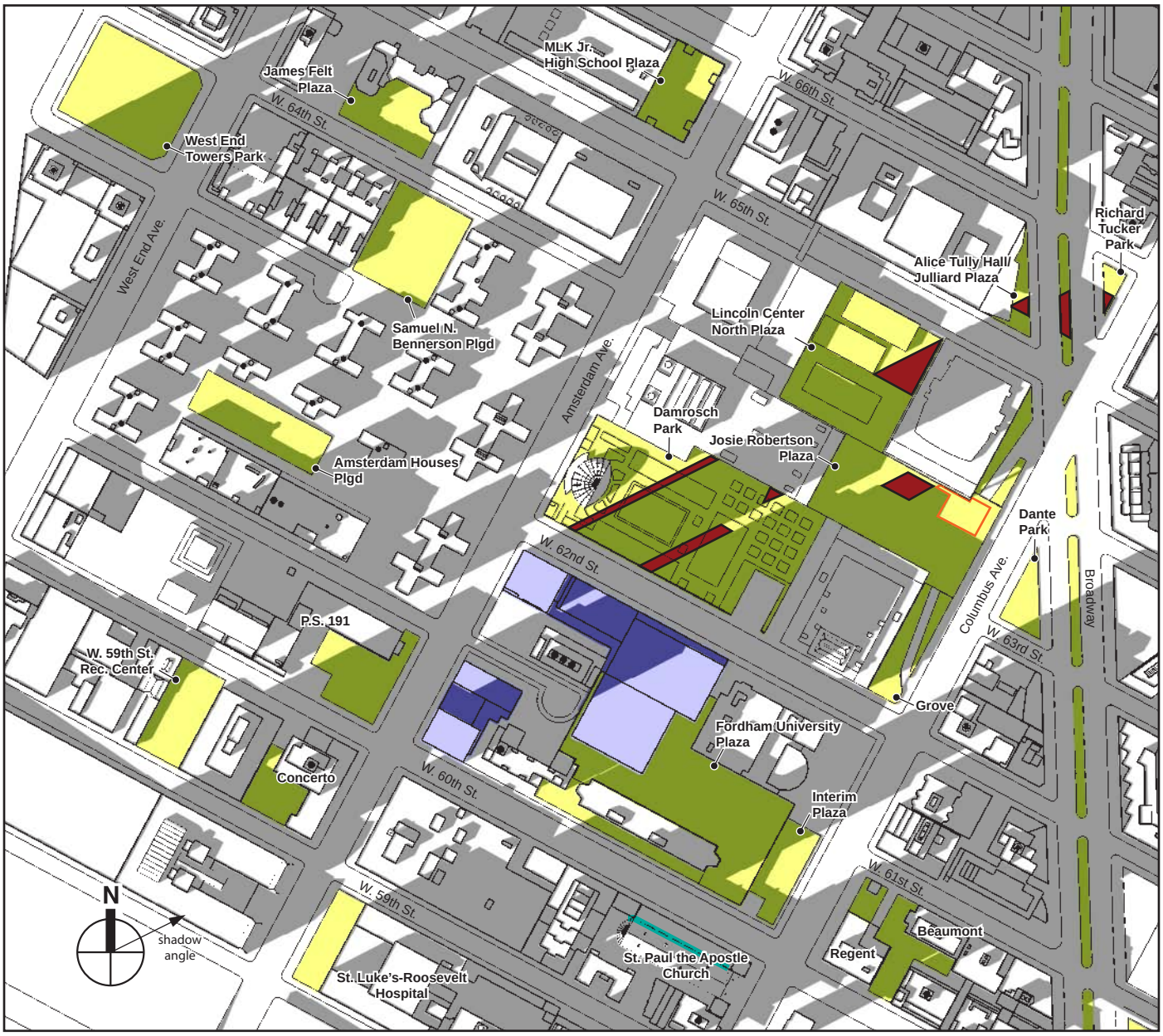
Tree

Figure 6-7A

Damrosch Park - Shadows - Phase I

March 21/Sept. 21 - 2:00 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

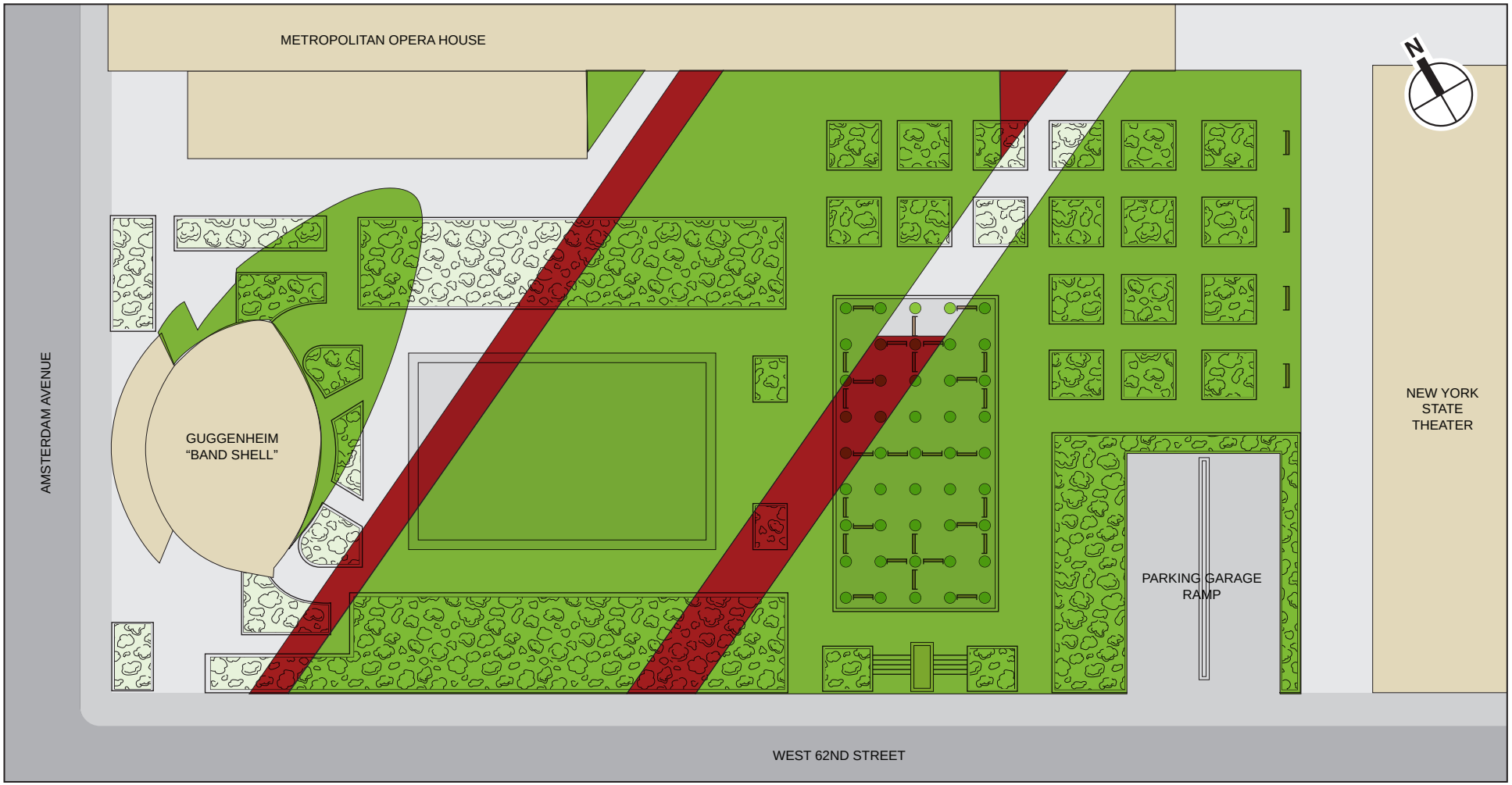
SCALE

Figure 6-8

Shadows - Phase I

March 21 / Sept. 21 - 4:30 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-8A

Damrosch Park - Shadows - Phase I

March 21/Sept. 21 - 4:30 PM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-9

Shadows - Phase I

May 6 / August 6 - 10:00 AM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

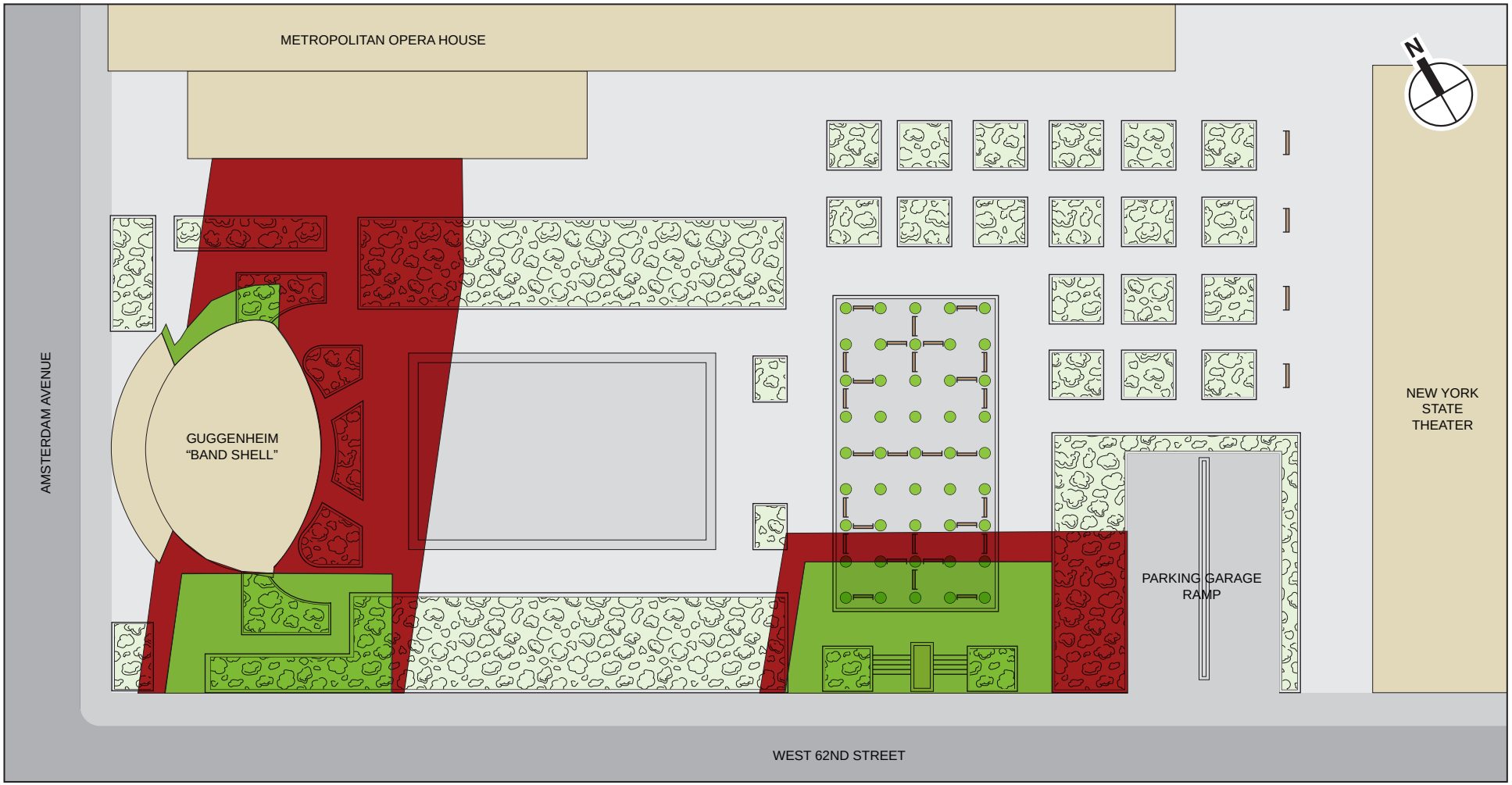
SCALE

Figure 6-10

Shadows - Phase I

May 6 / August 6 - 2:00 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

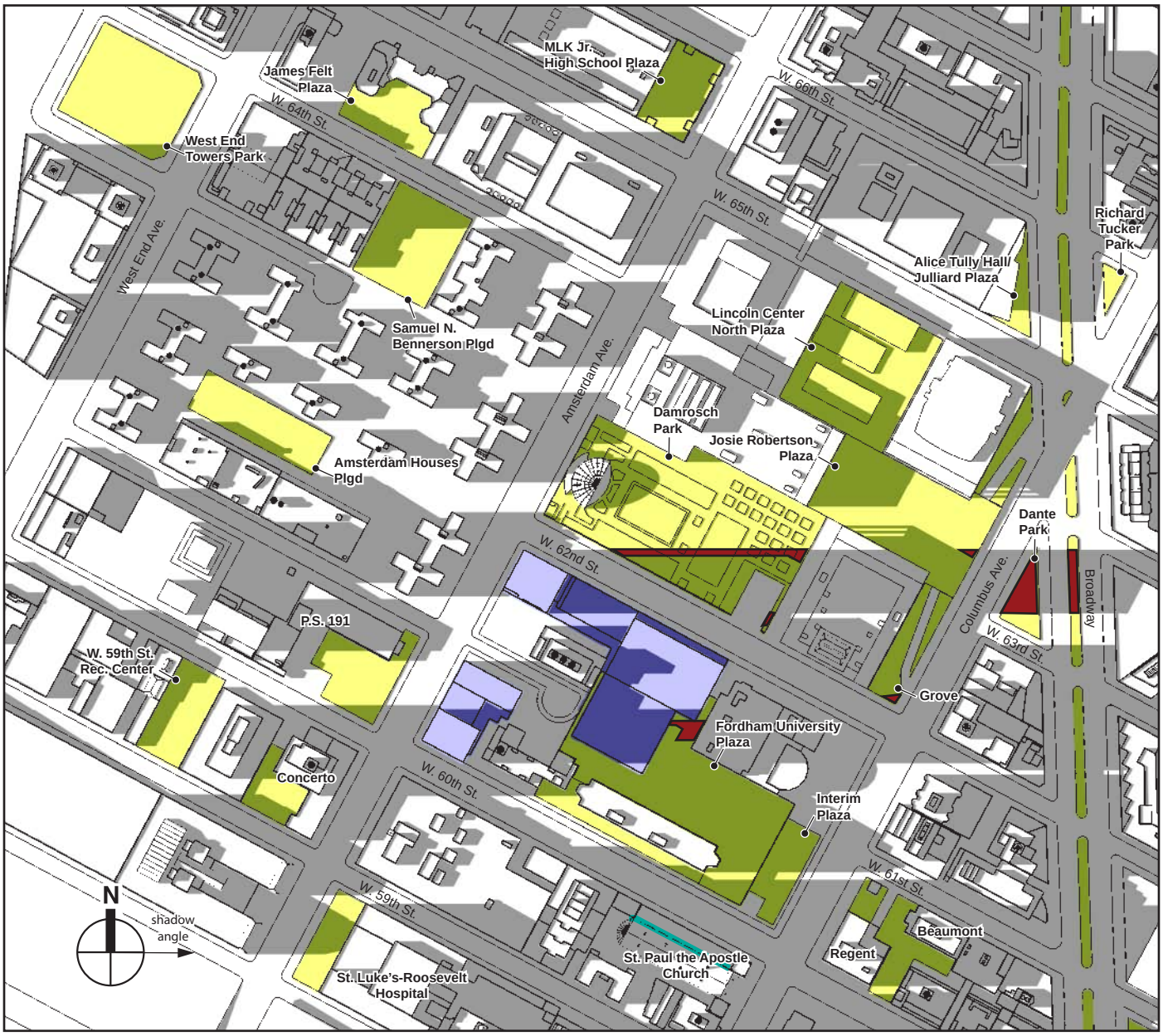
Tree

Figure 6-10A

Damrosch Park - Shadows - Phase I

May 6/August 6 - 2:00 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

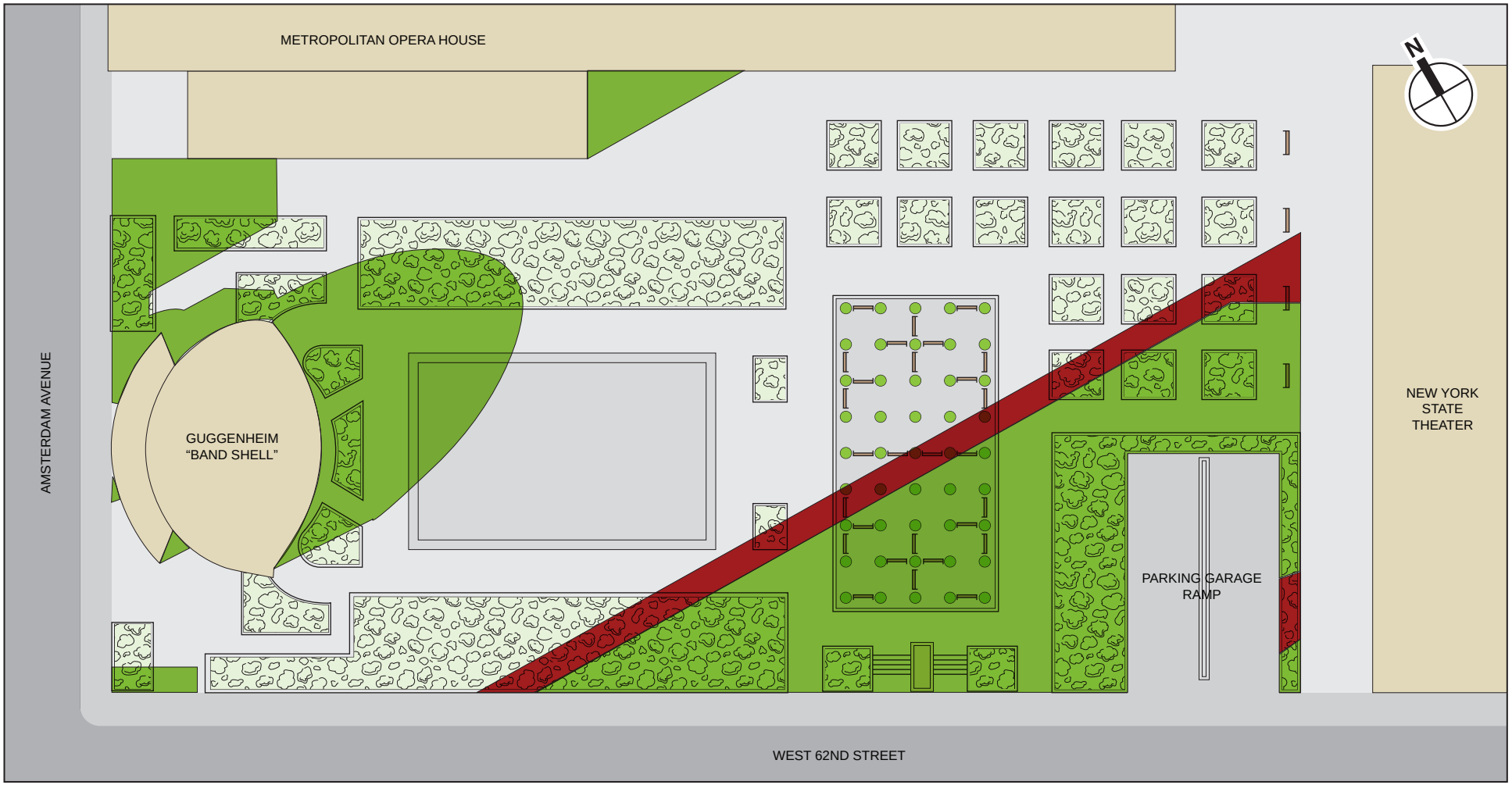
SCALE

Figure 6-11

Shadows - Phase I

May 6 / August 6 - 5:30 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-11A

Damrosch Park - Shadows - Phase I

May 6/August 6 - 5:30 PM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-12

Shadows - Phase I

June 21 - 10:00 AM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-13

Shadows - Phase I

June 21 - 2:00 PM EDT

3.4.08

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

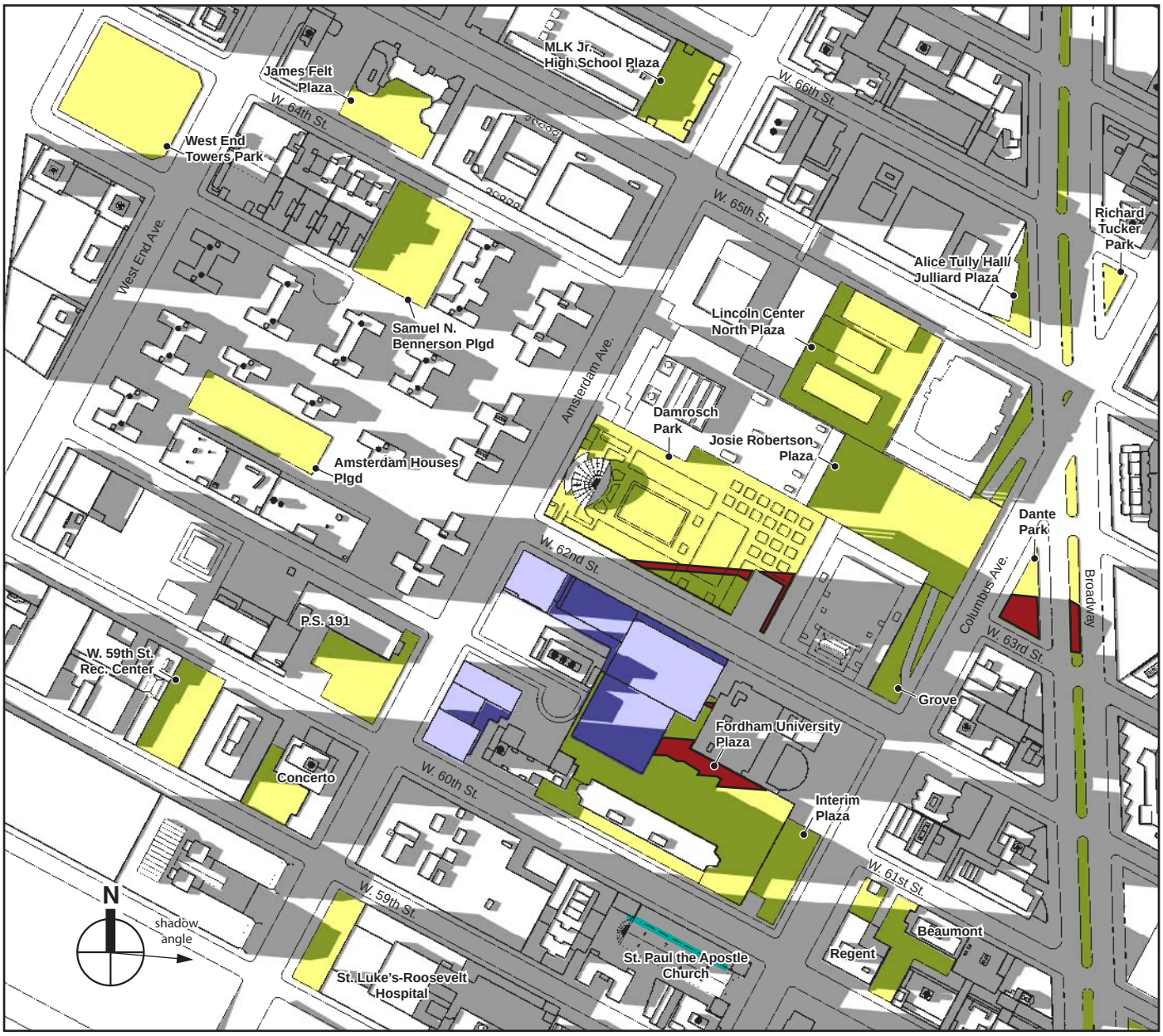
Tree

Figure 6-13A

Damrosch Park - Shadows - Phase I

June 21 - 2:00 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

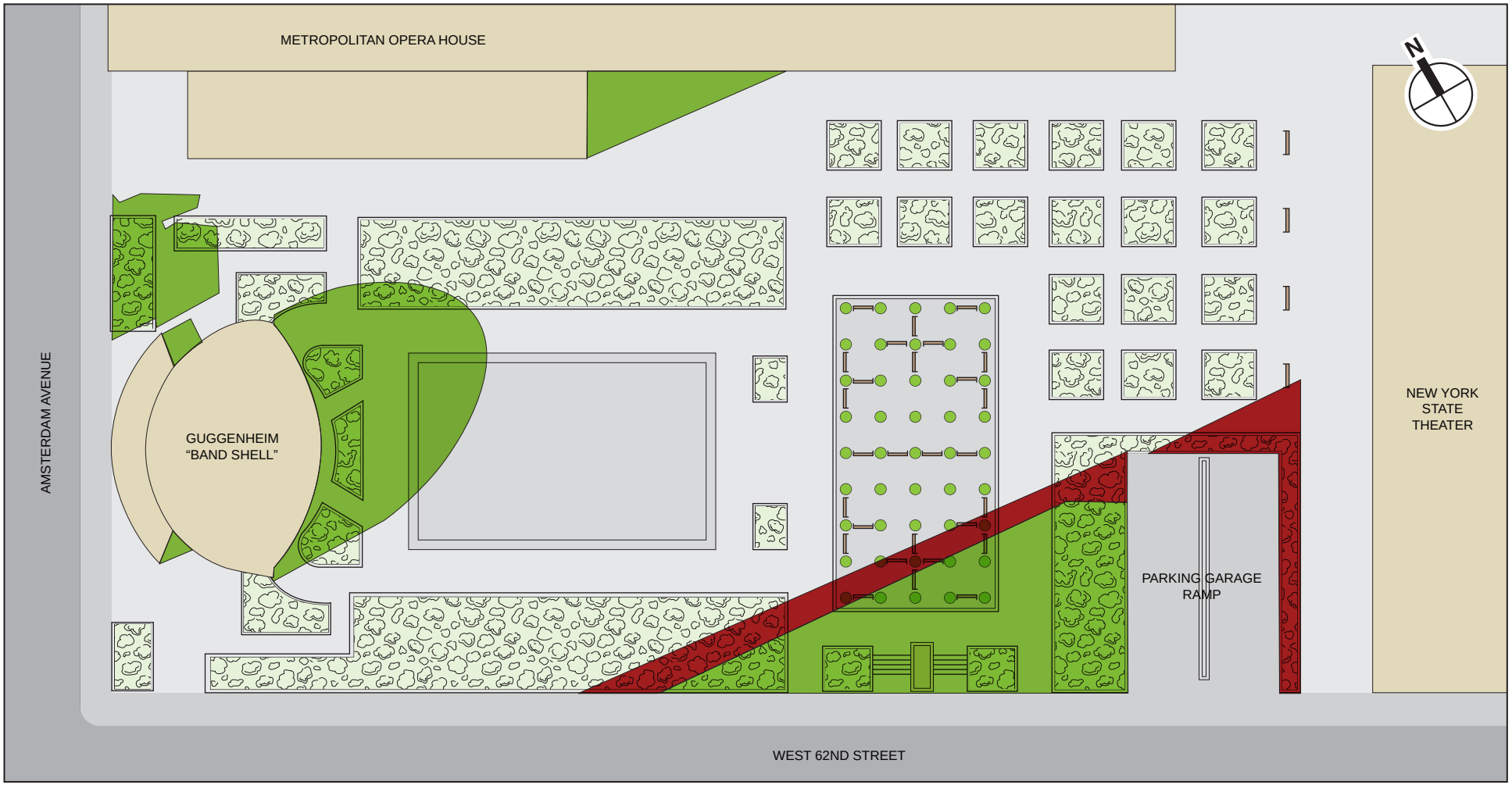
SCALE

Figure 6-14

Shadows - Phase I

June 21 - 5:30 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

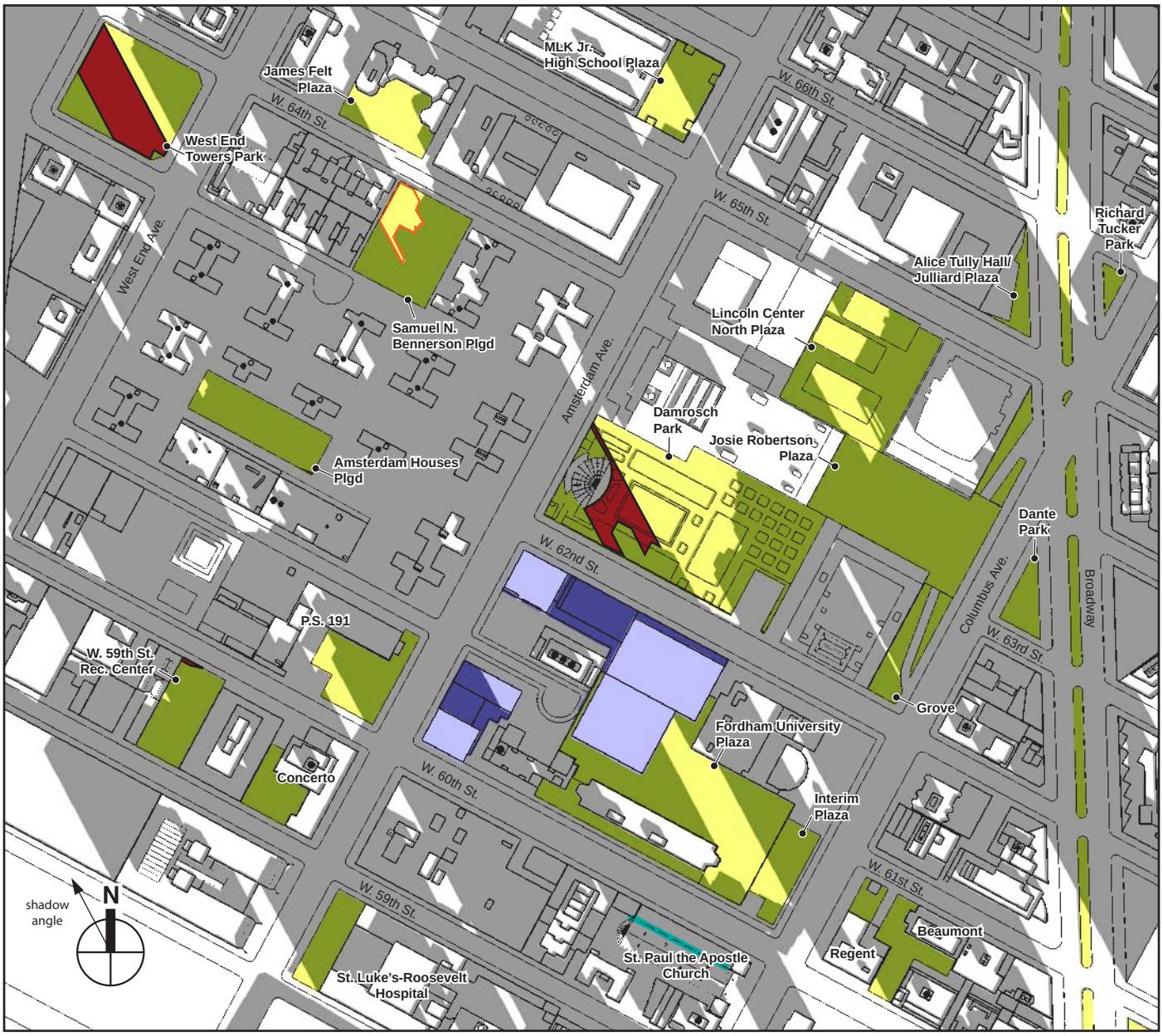
Tree

Figure 6-14A

Damrosch Park - Shadows - Phase I

June 21 - 5:30 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-15

Shadows - Phase I

December 21 - 10:00 AM EST

3.4.08

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-15A

Damrosch Park - Shadows - Phase I

December 21 - 10:00 AM EST

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

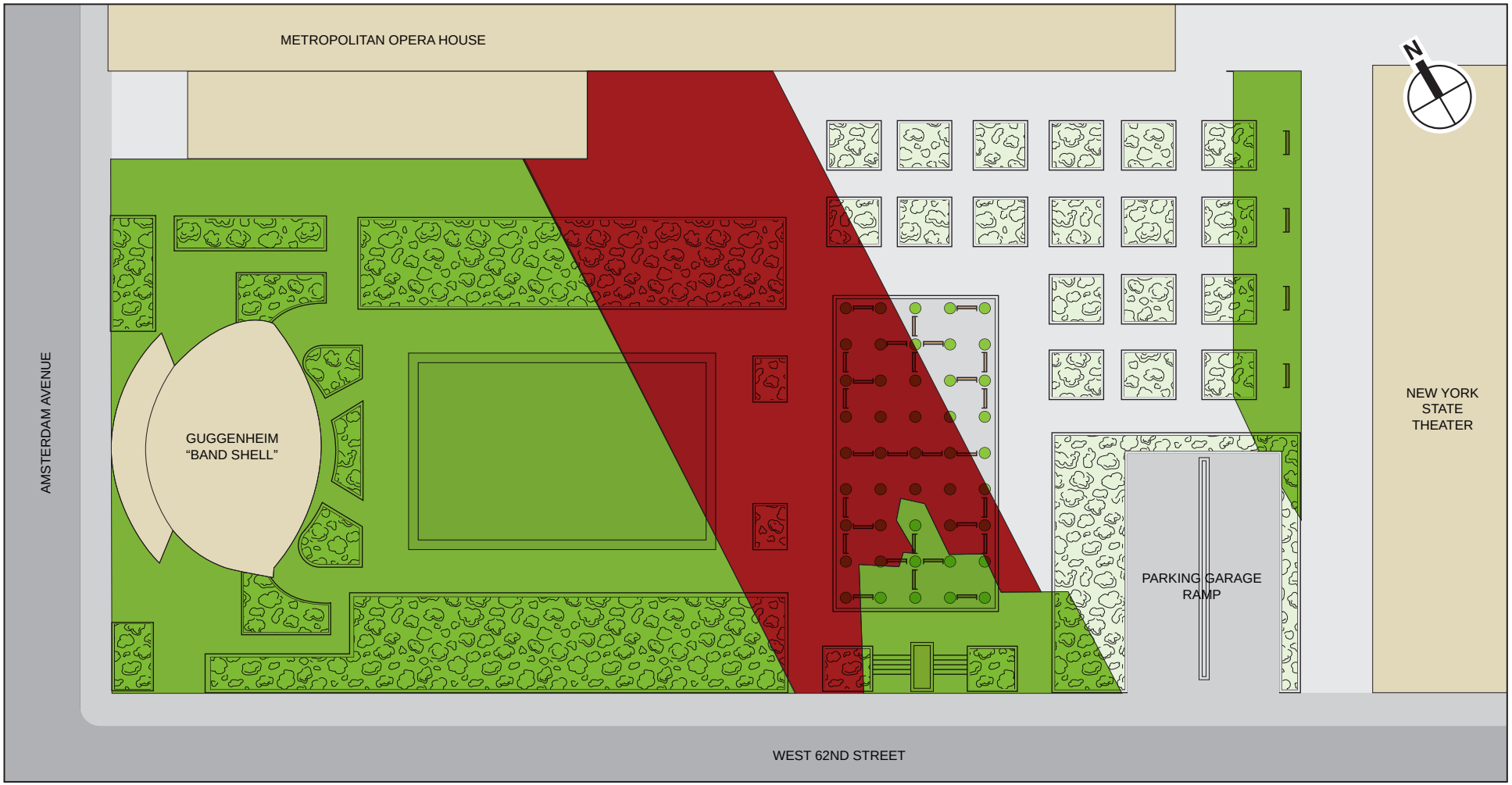
SCALE

Figure 6-16

Shadows - Phase I

December 21 - 12:00 PM EST

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-16A

Damrosch Park - Shadows - Phase I

December 21 - 12:00 PM EST

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

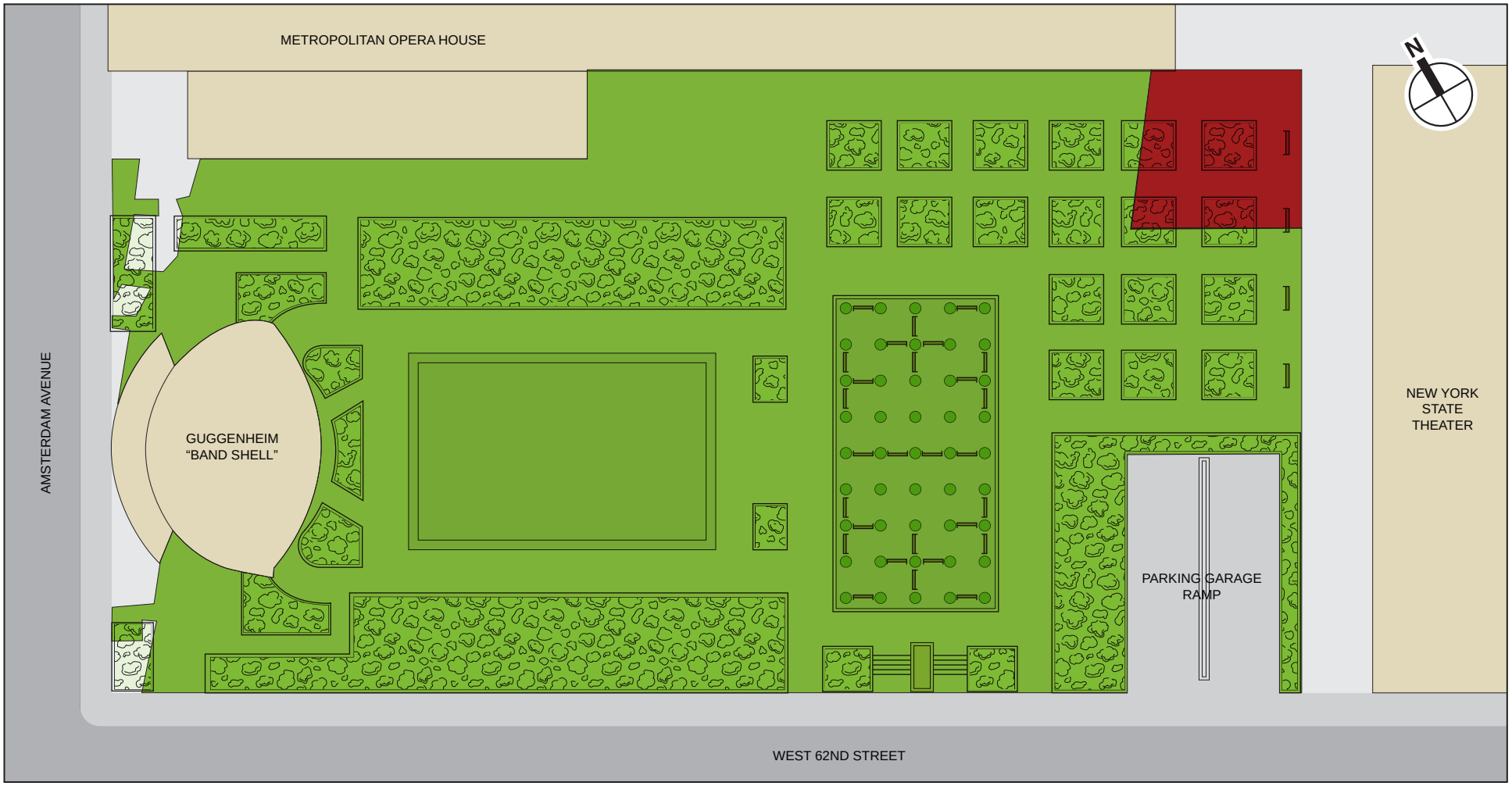
SCALE

Figure 6-17

Shadows - Phase I

December 21 - 2:30 PM EST

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

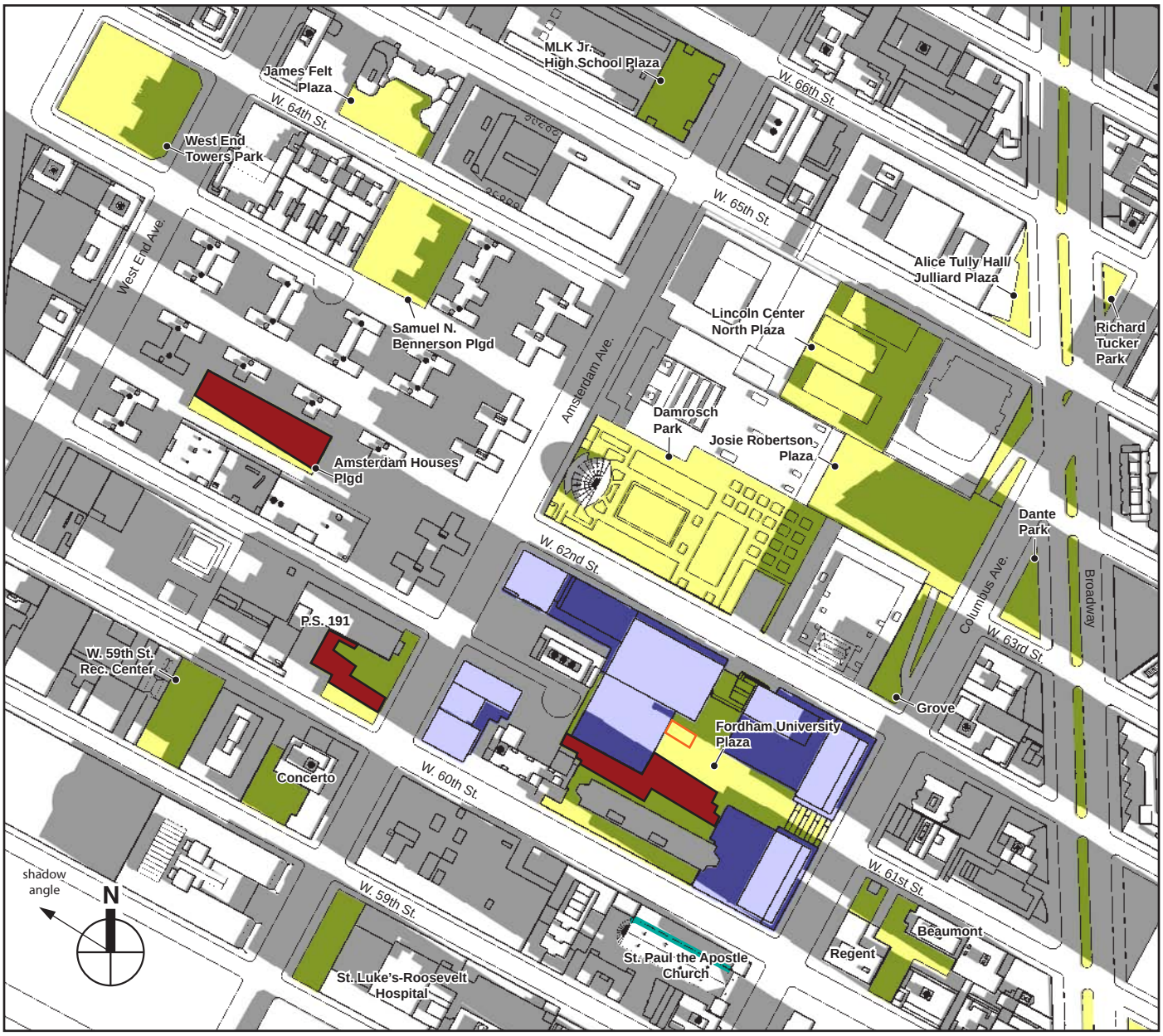
Tree

Figure 6-17A

Damrosch Park - Shadows - Phase I

December 21 - 2:30 PM EST

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-18

Shadows - Phase II

March 21 / Sept. 21 - 10:00 AM EDT

Figure 6-19
Shadows - Phase II
March 21 / Sept. 21 - 12:00 PM EDT

3.4.08

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-19A

Damrosch Park - Shadows - Phase II

March 21/Sept. 21 - 12:00 PM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

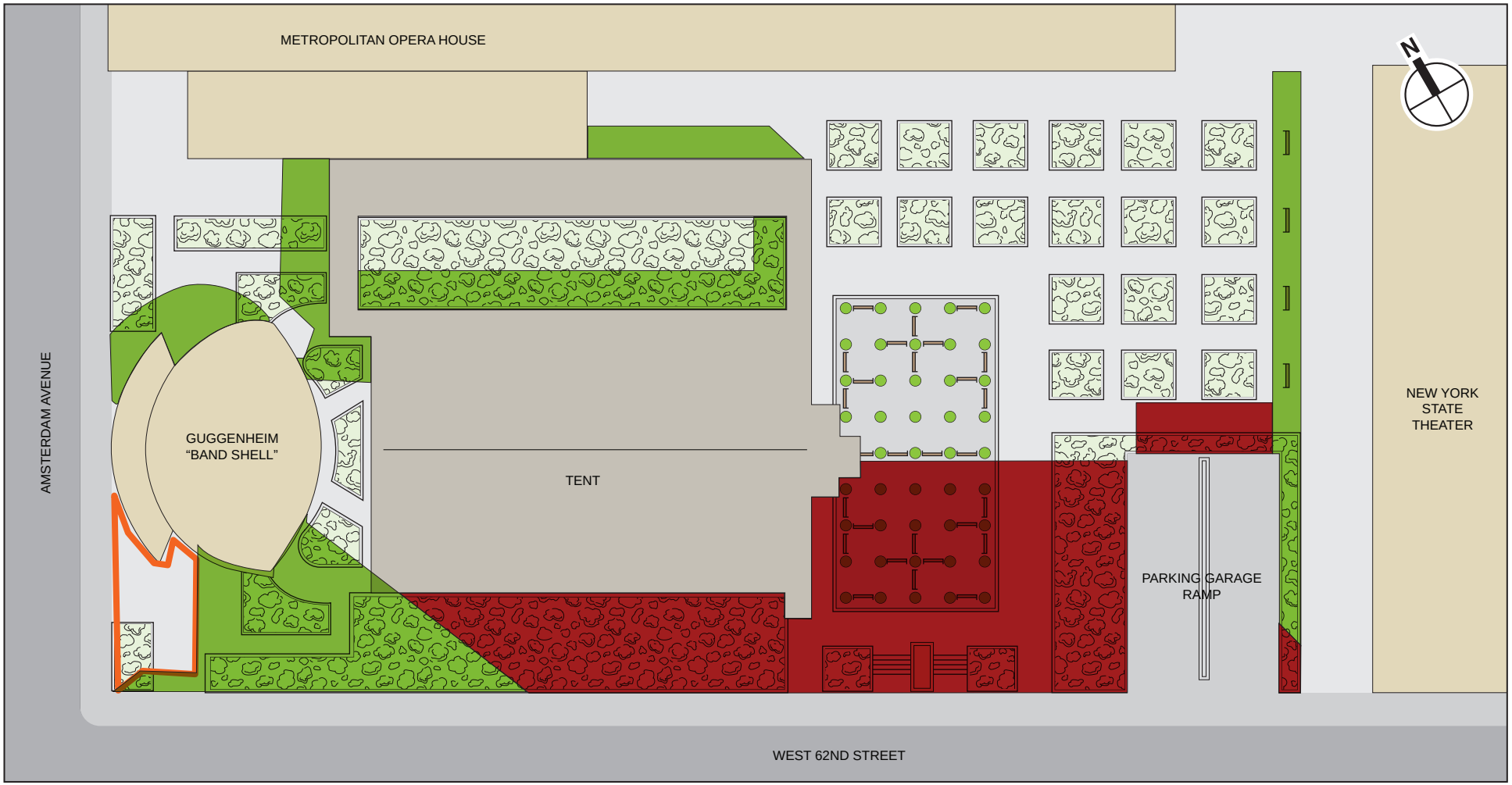
SCALE

Figure 6-20

Shadows - Phase II

March 21 / Sept. 21 - 12:00 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Approximate area occupied by tents

Planted area and trees

Seating

Tree

Figure 6-20A

Damrosch Park - Shadows - Phase II

March 21/Sept. 21 - 12:00 PM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-21

Shadows - Phase II

March 21 / Sept. 21 - 2:00 PM EDT

3.4.08

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

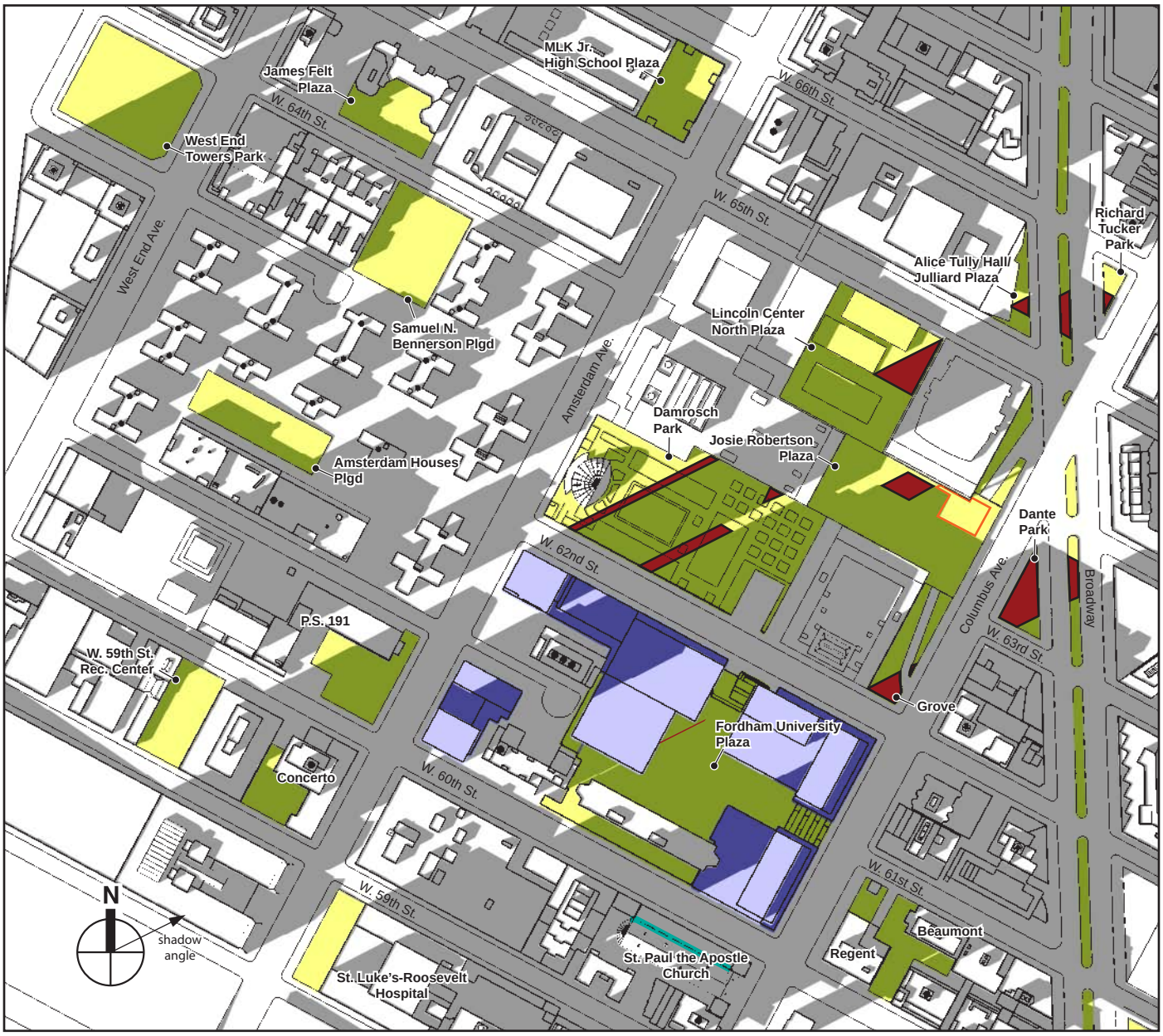
Tree

Figure 6-21A

Damrosch Park - Shadows - Phase II

March 21/Sept. 21 - 2:00 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

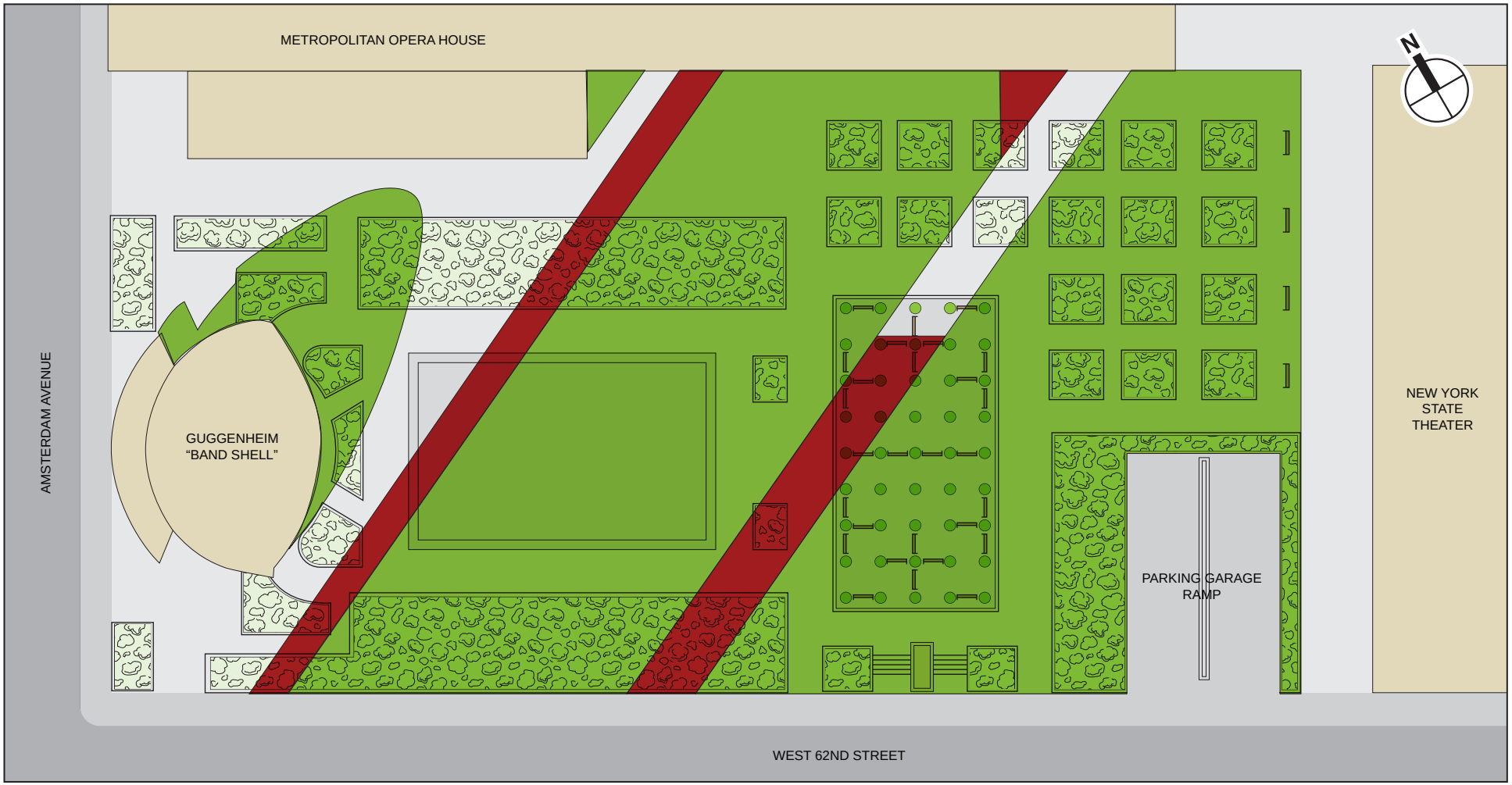
SCALE

Figure 6-22

Shadows - Phase II

March 21 / Sept. 21 - 4:30 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

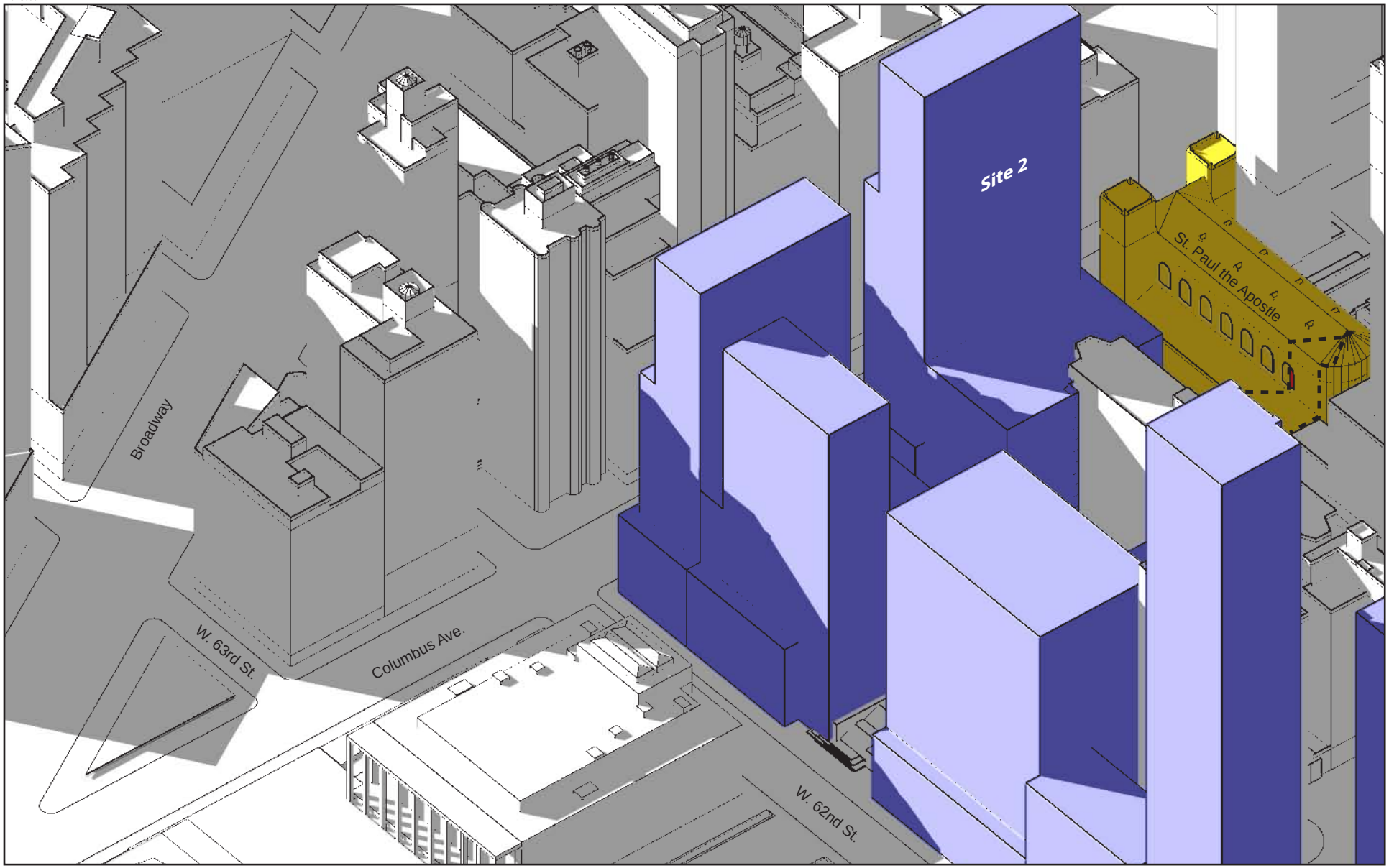
Tree

Figure 6-22A

Damrosch Park - Shadows - Phase II

March 21/Sept. 21 - 4:30 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

St. Paul the Apostle Church

Shadow on Church

Incremental Shadow from Proposed Site 2 on Church

Incremental Shadow on Church Facade Windows

Other Shadow

Figure 6-23

Shadows - Phase II

May 6 / August 6 - 7:45 AM EDT

View Southeast

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-24

Shadows - Phase II

May 6 / August 6 - 10:00 AM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

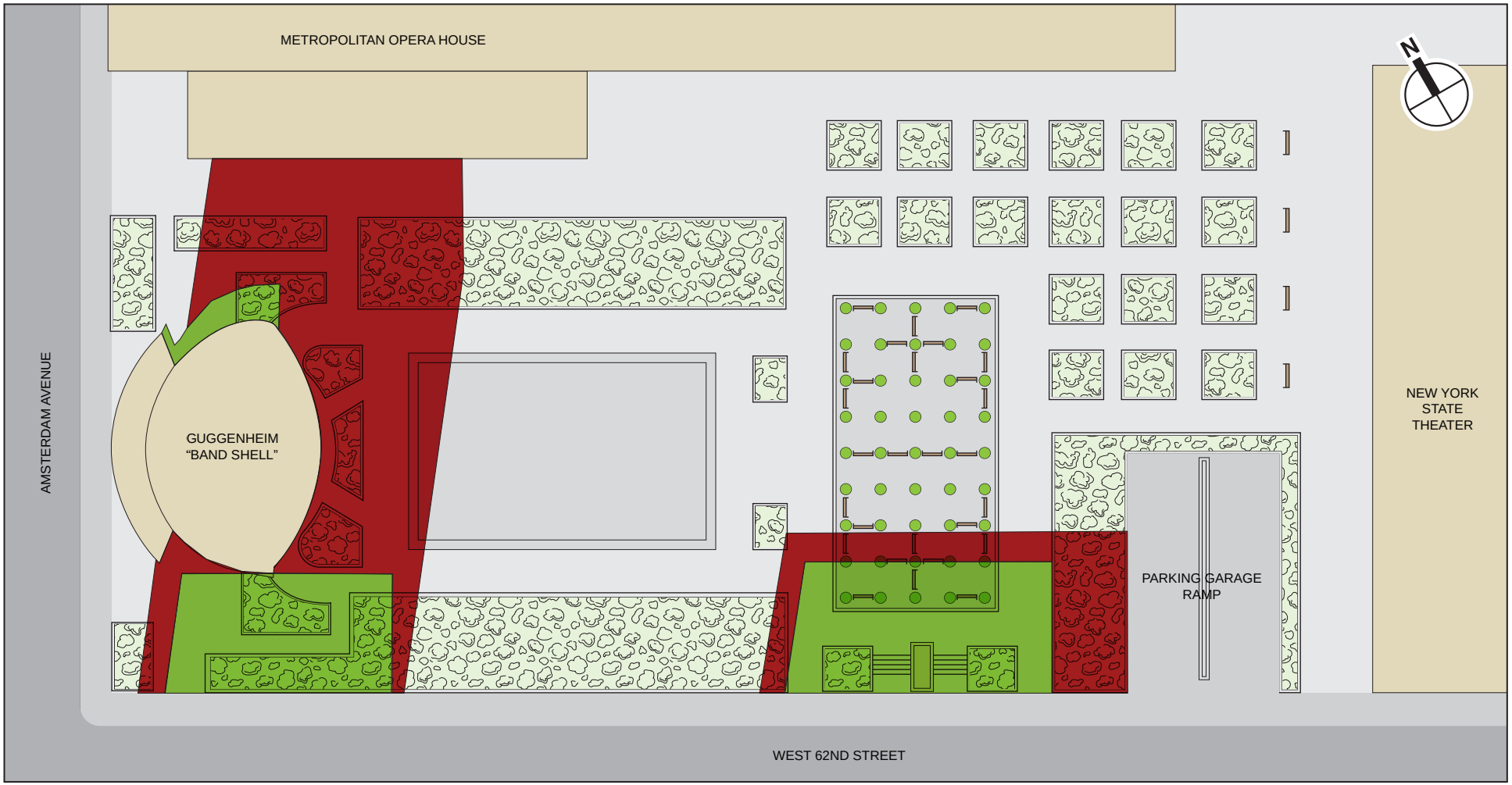
SCALE

Figure 6-25

Shadows - Phase II

May 6 / August 6 - 2:00 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

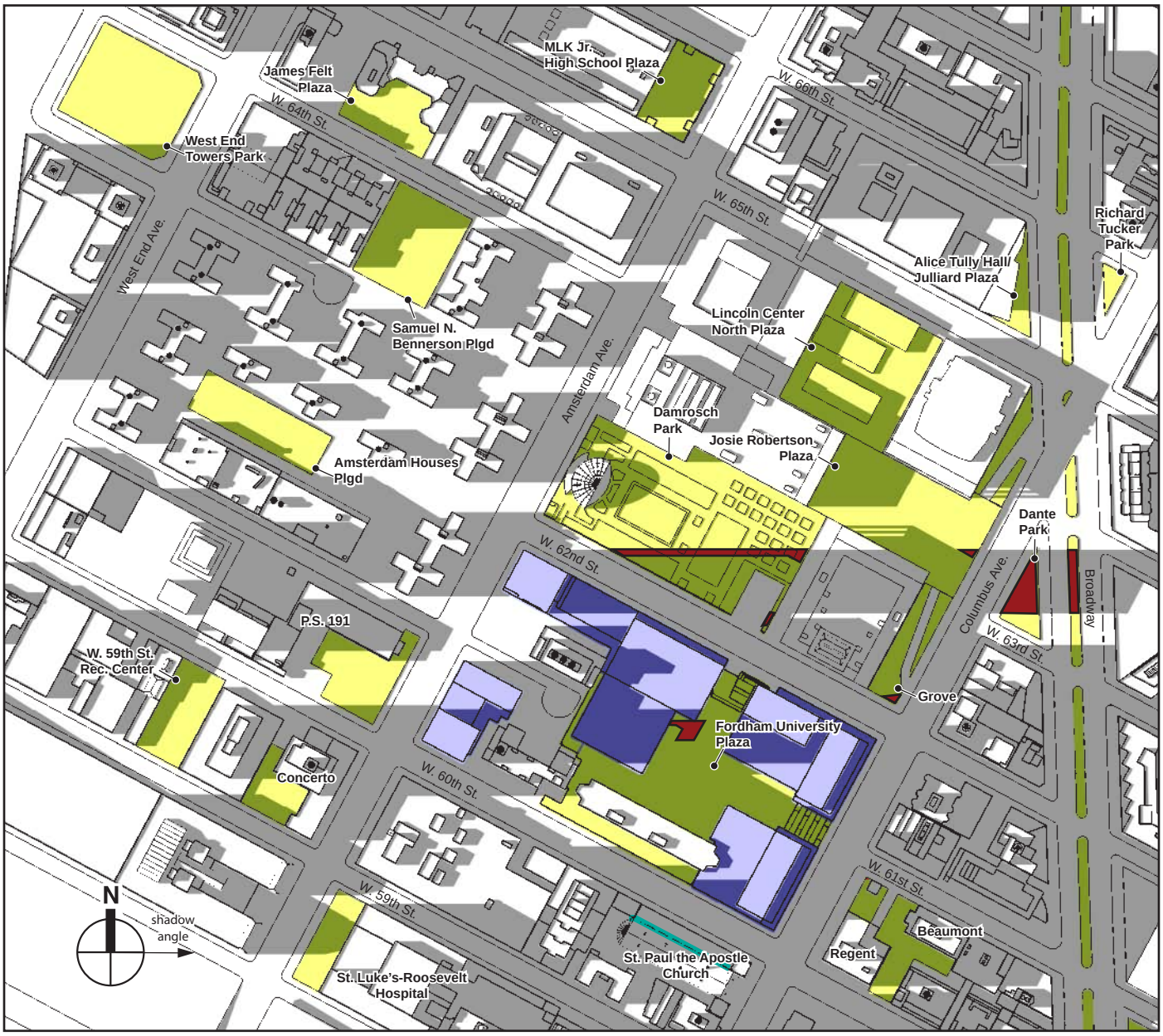
Tree

Figure 6-25A

Damrosch Park - Shadows - Phase II

May 6/August 6 - 2:00 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

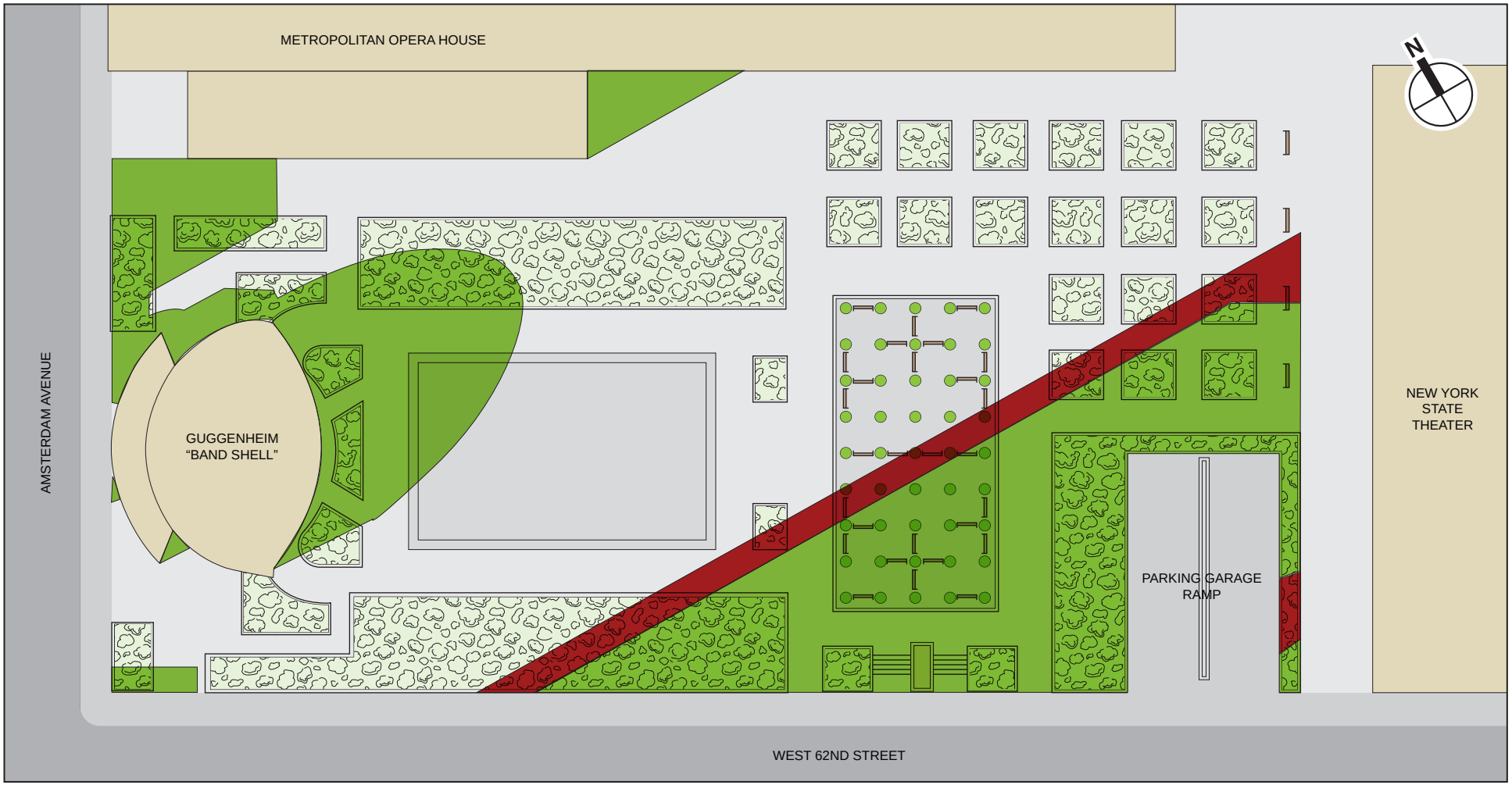
SCALE

Figure 6-26

Shadows - Phase II

May 6 / August 6 - 5:30 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

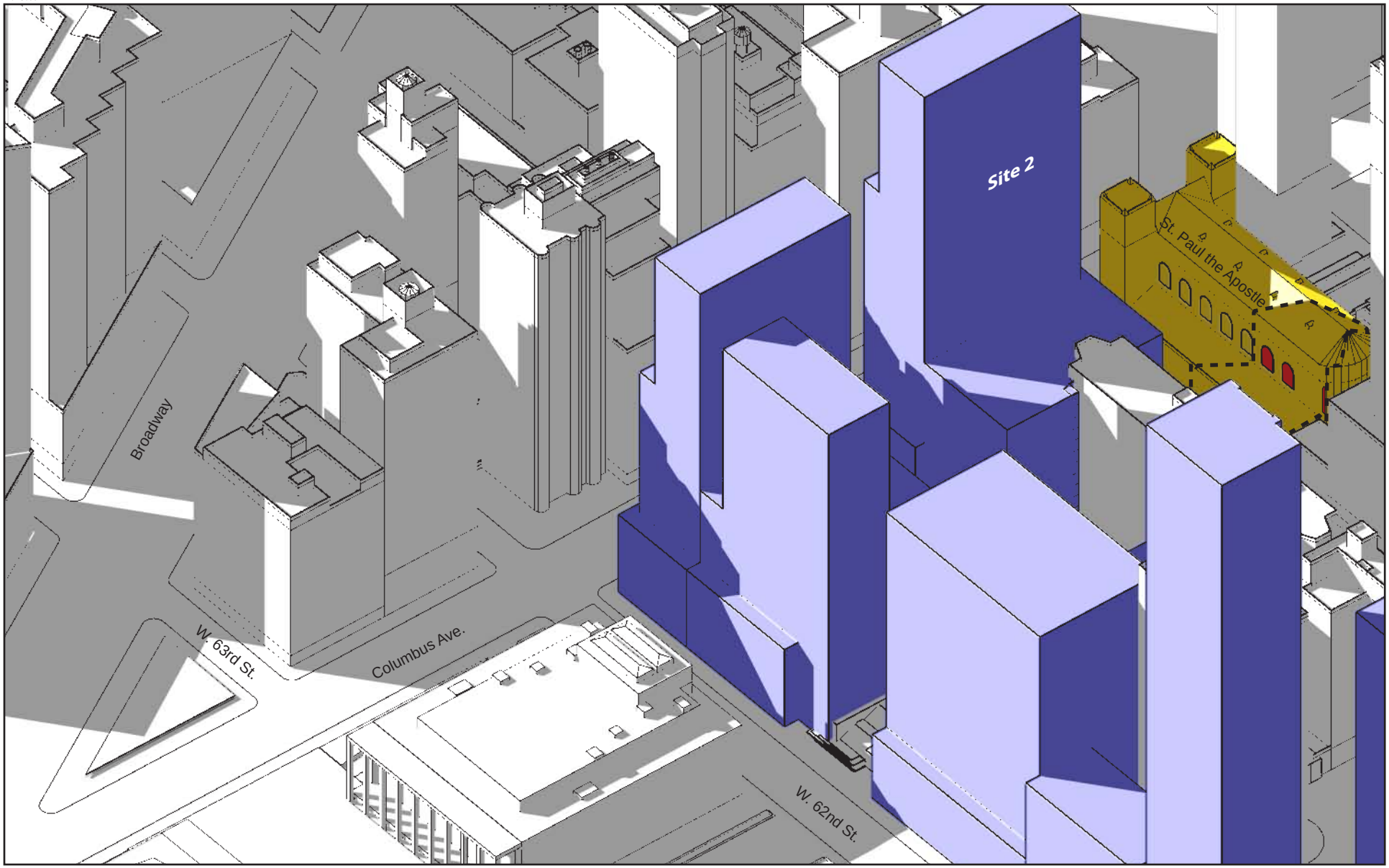
Tree

Figure 6-26A

Damrosch Park - Shadows - Phase II

May 6/August 6 - 5:30 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

St. Paul the Apostle Church

Shadow on Church

Incremental Shadow from Proposed Site 2 on Church

Incremental Shadow on Church Facade Windows

Other Shadow

Figure 6-27

Shadows - Phase II

June 21 - 8:00 AM EDT

View Southeast

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Reduction in Shadow on Open Space

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-28

Shadows - Phase II

June 21 - 10:00 AM EDT

1.23.09

Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

SCALE

Figure 6-29

Shadows - Phase II

June 21 - 2:00 PM EDT

3.4.08

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

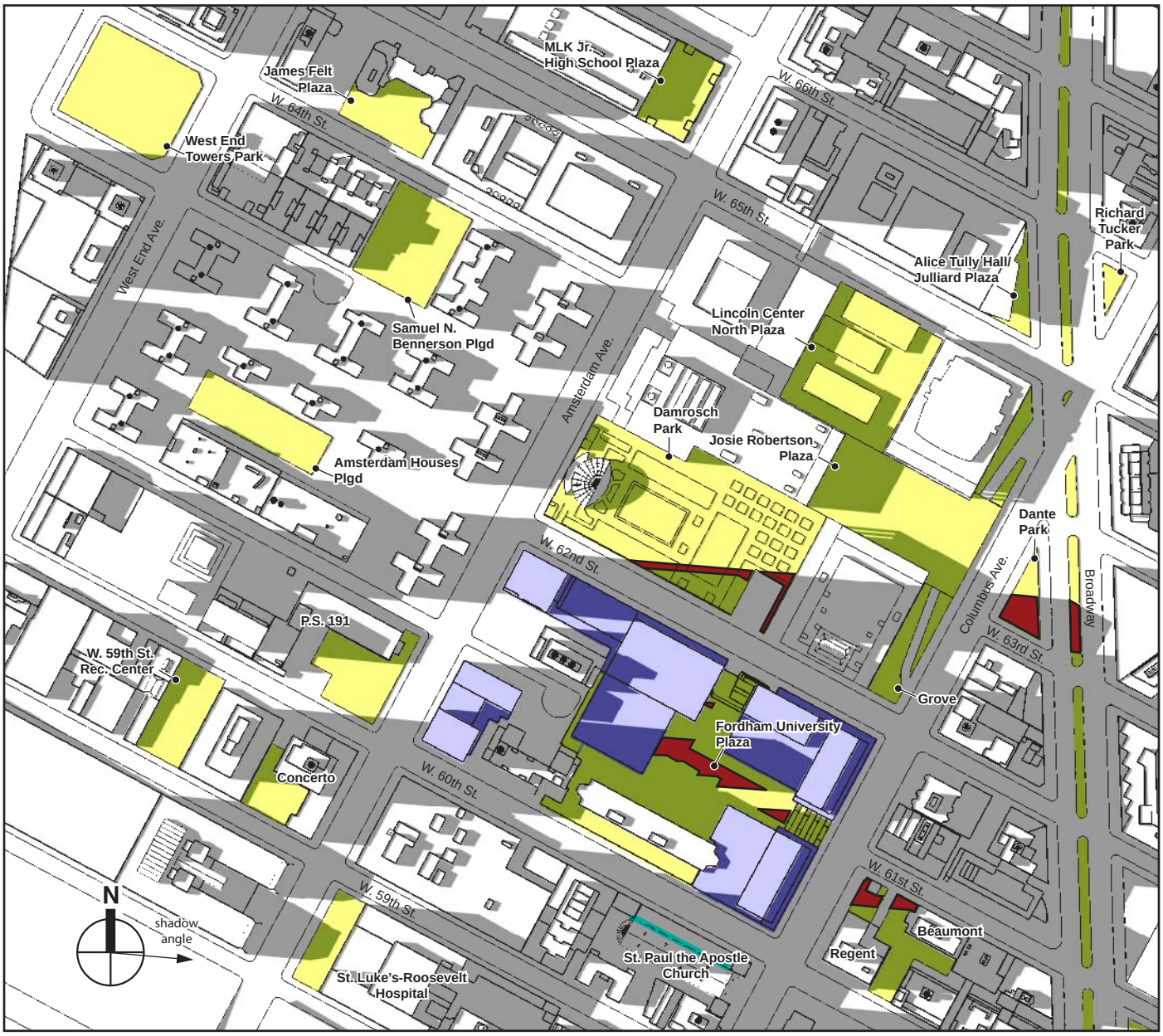
Tree

Figure 6-29A

Damrosch Park - Shadows - Phase II

June 21 - 2:00 PM EDT

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

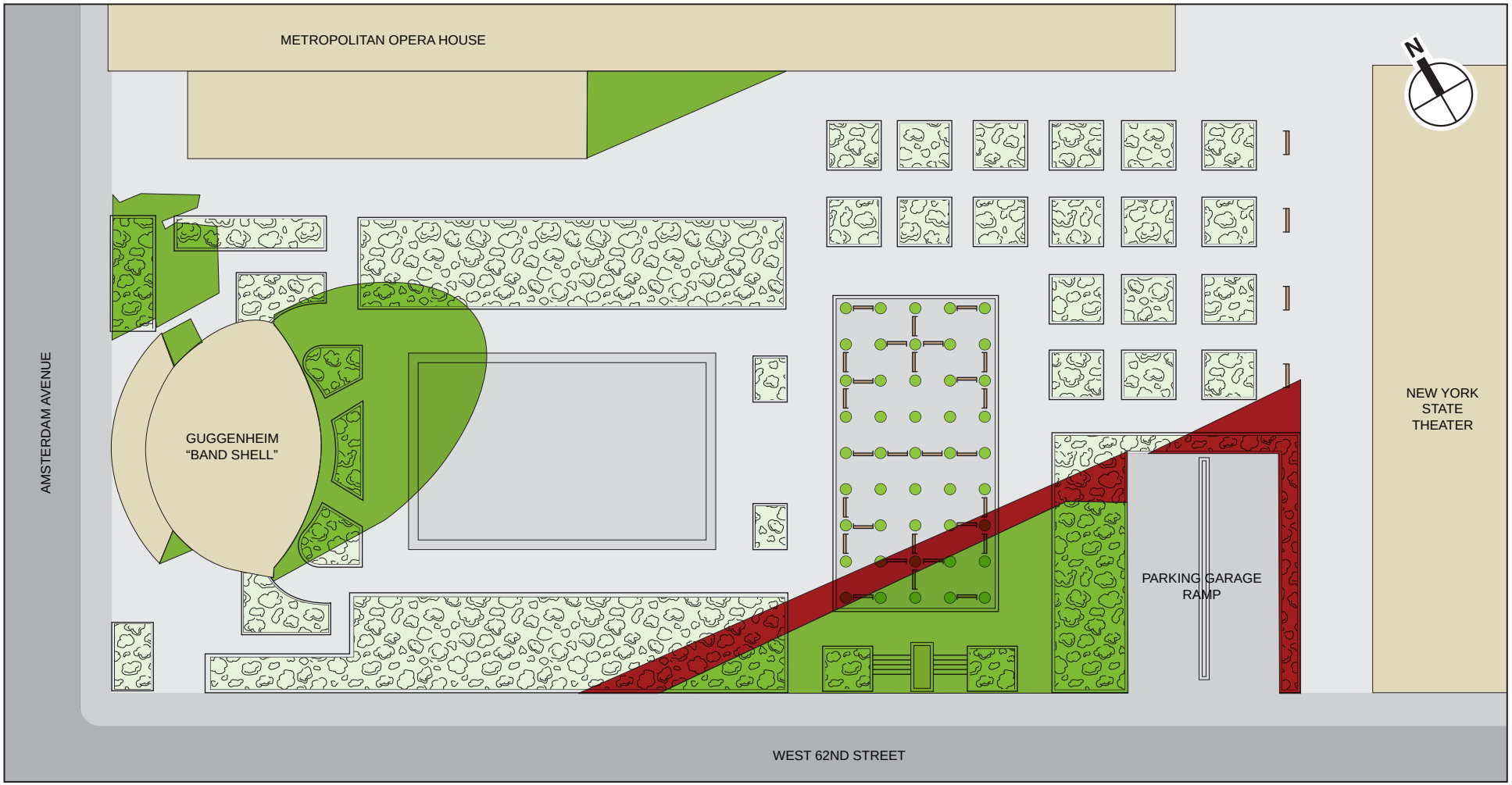
SCALE

Figure 6-30

Shadows - Phase II

June 21 - 5:30 PM EDT

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-30A

Damrosch Park - Shadows - Phase II

June 21 - 5:30 PM EDT

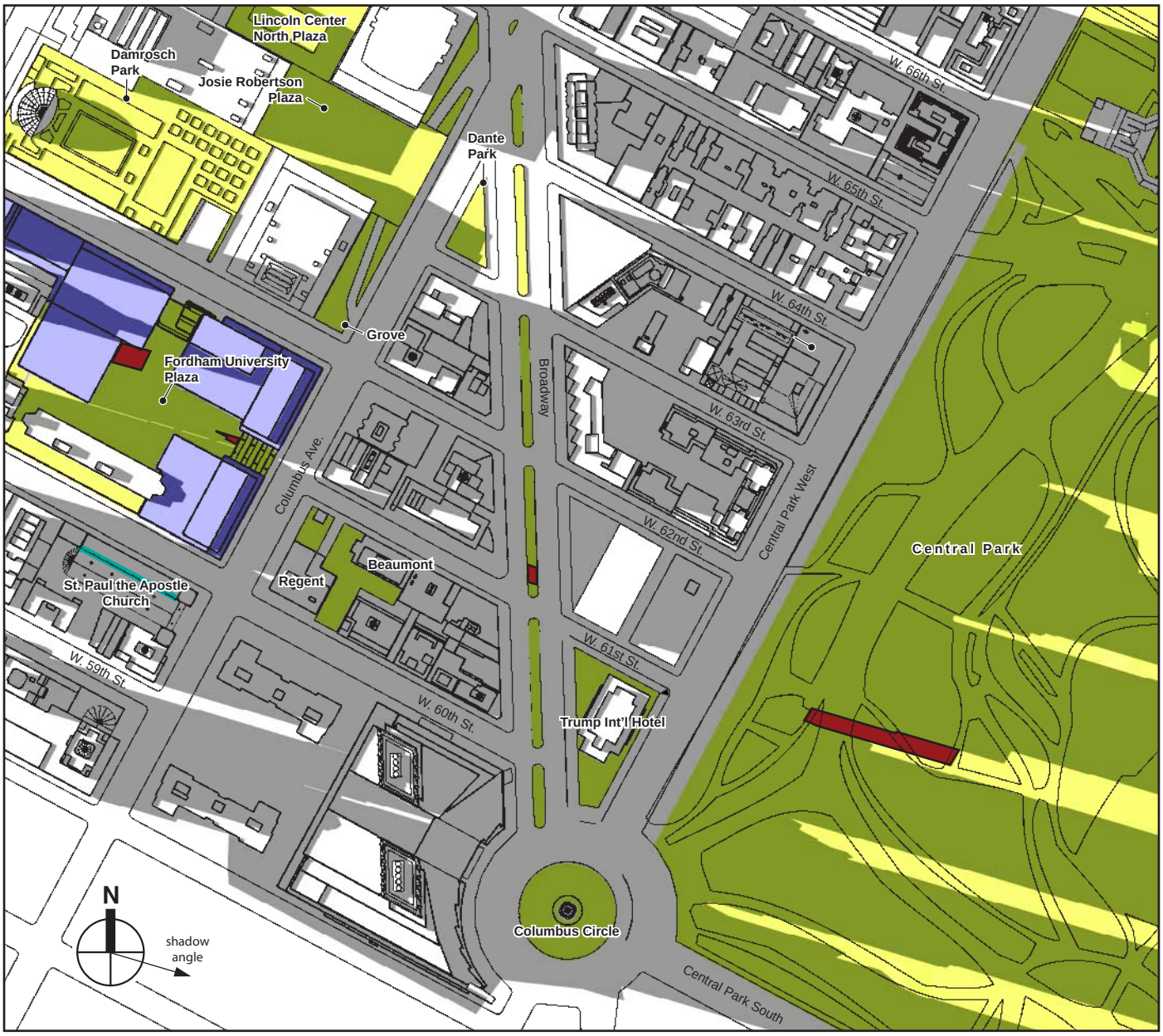


Figure 6-31
Shadows - Phase II
June 21 - 6:45 PM EDT

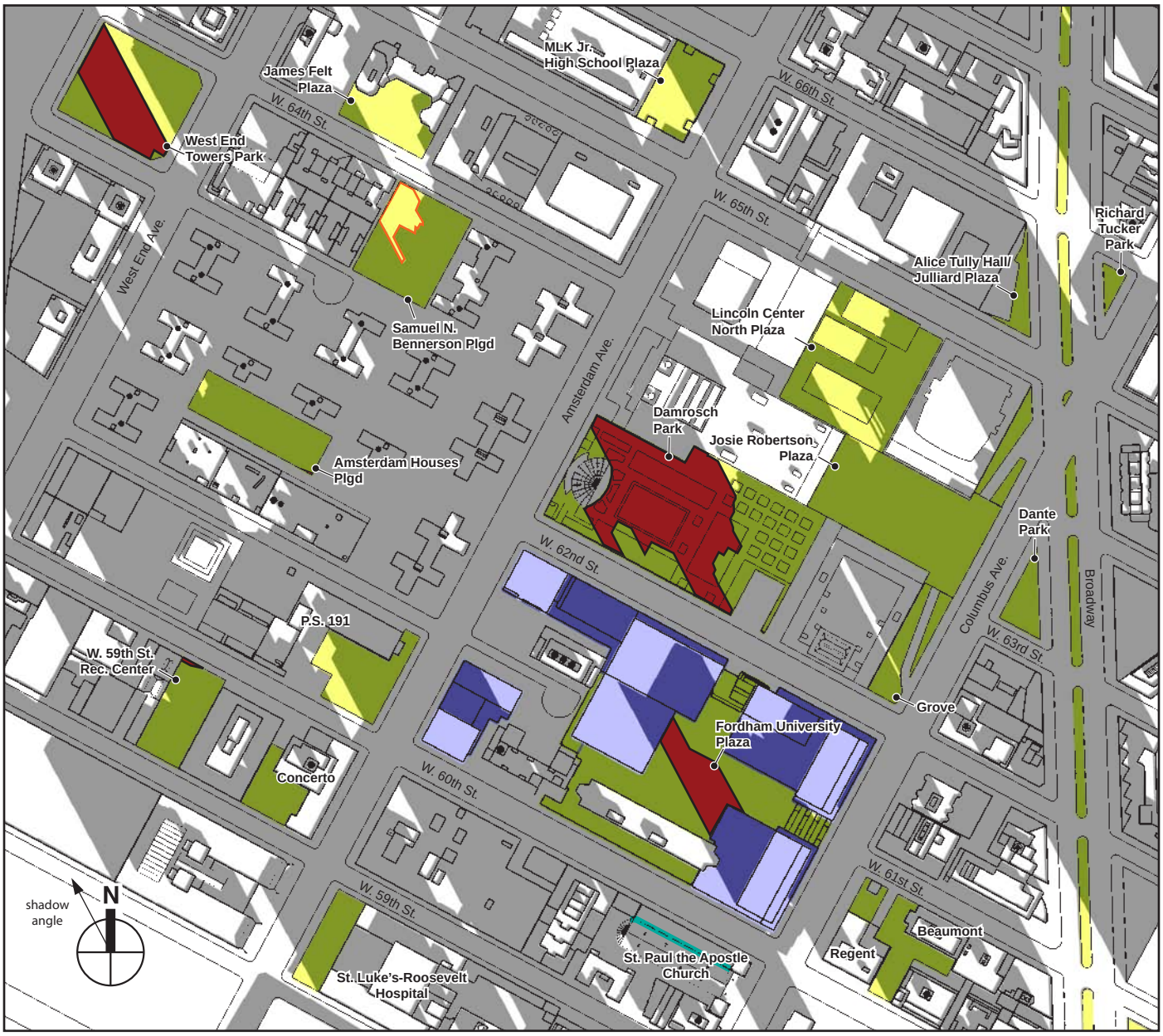
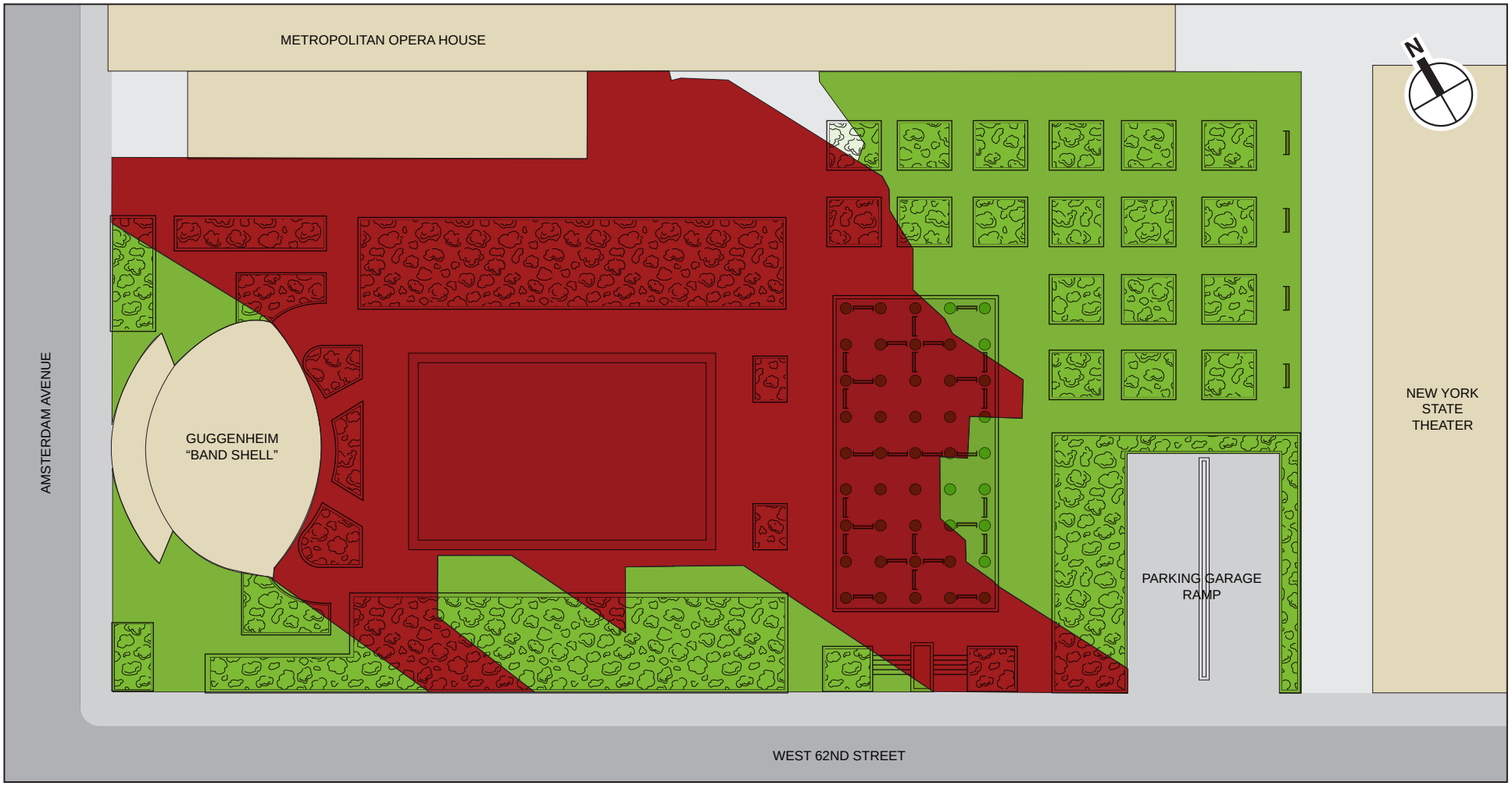


Figure 6-32
Shadows - Phase II
December 21 - 10:00 AM EST

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-32A

Damrosch Park - Shadows - Phase II

December 21 - 10:00 AM EST

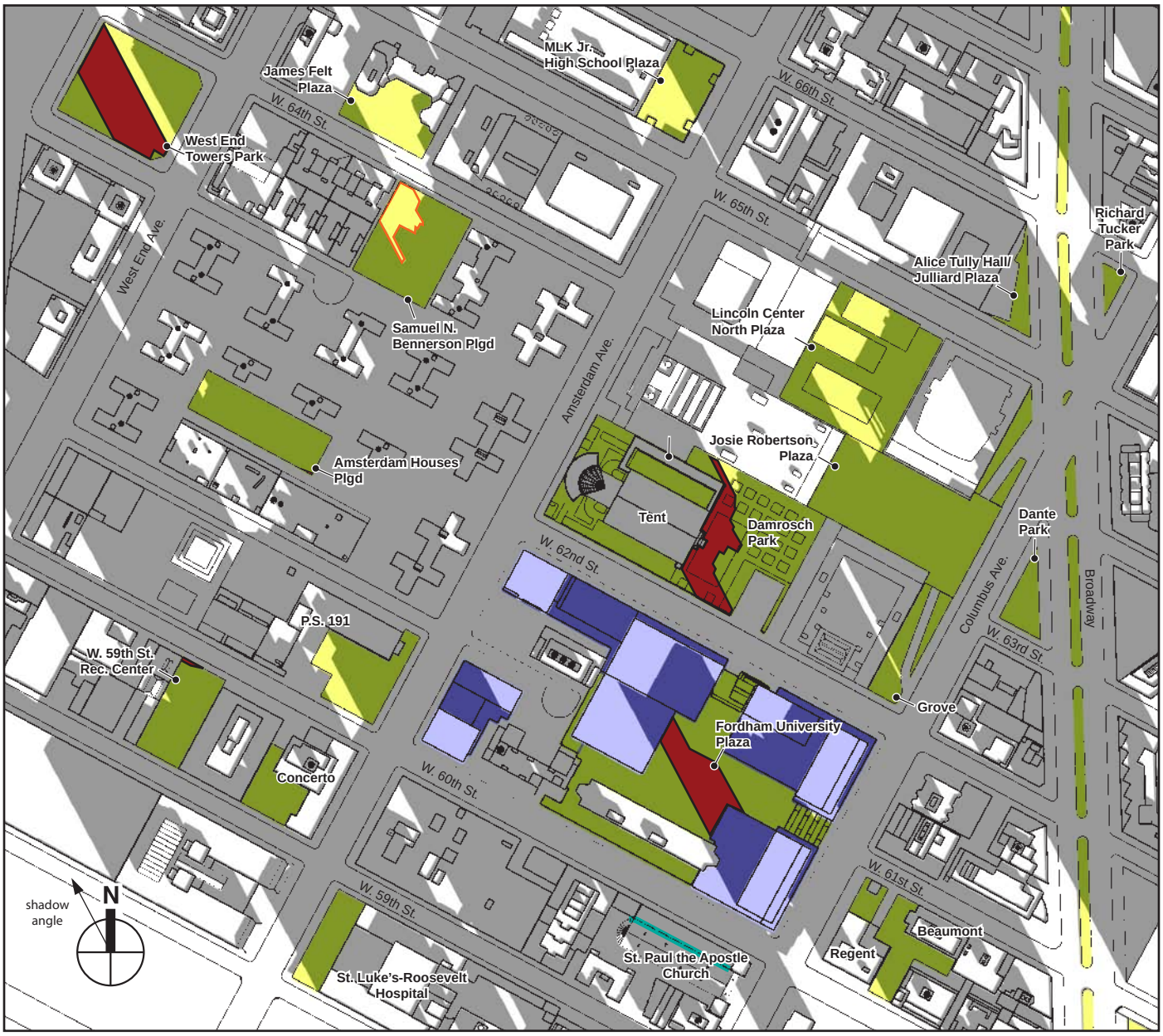


Figure 6-33
Shadows - Phase II
December 21 - 10:00 AM EST

3.4.08

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Approximate area occupied by tents

Planted area and trees

Seating

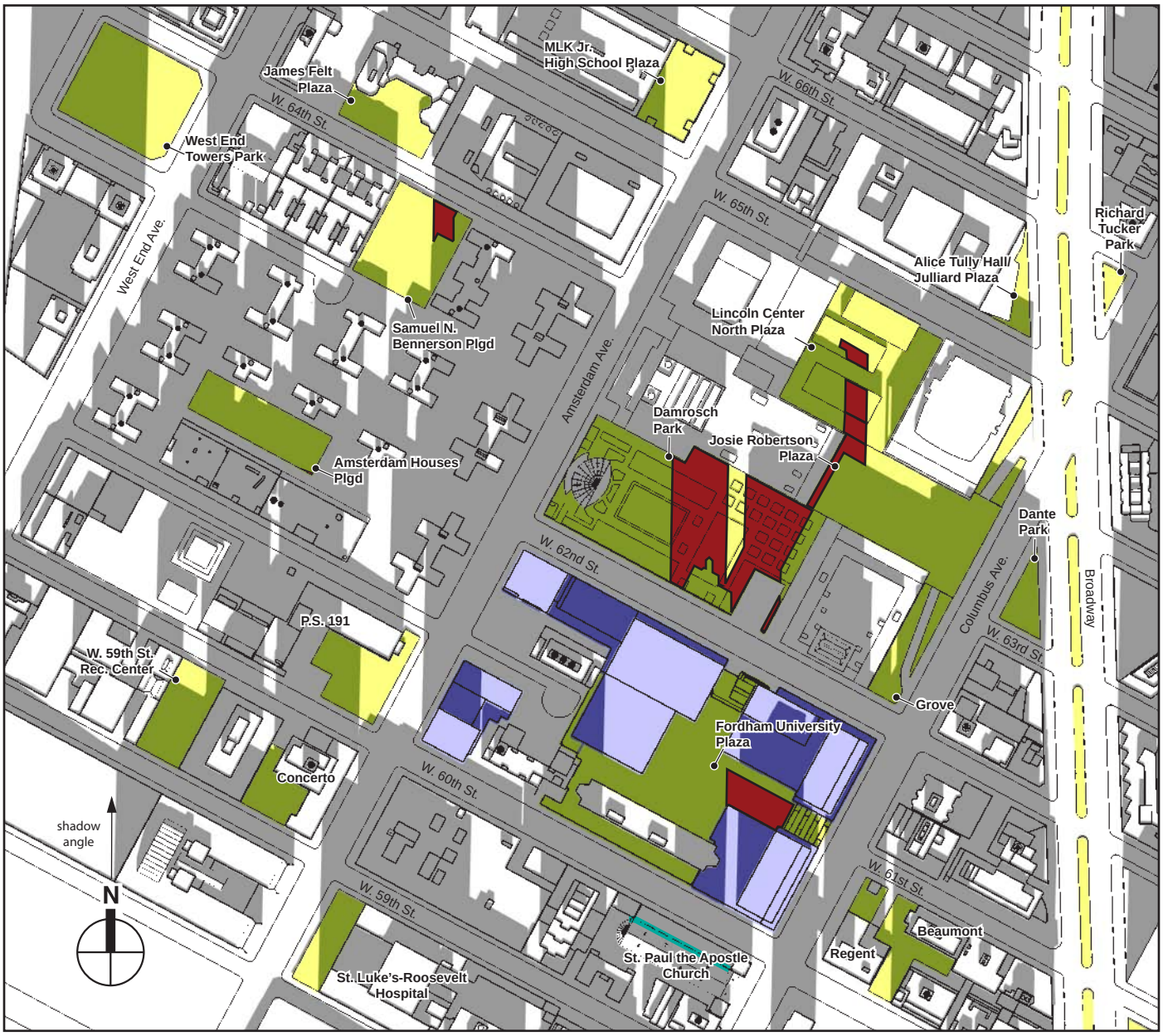
Tree

Figure 6-33A

Damrosch Park - Shadows - Phase II

December 21 - 10:00 AM EST

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

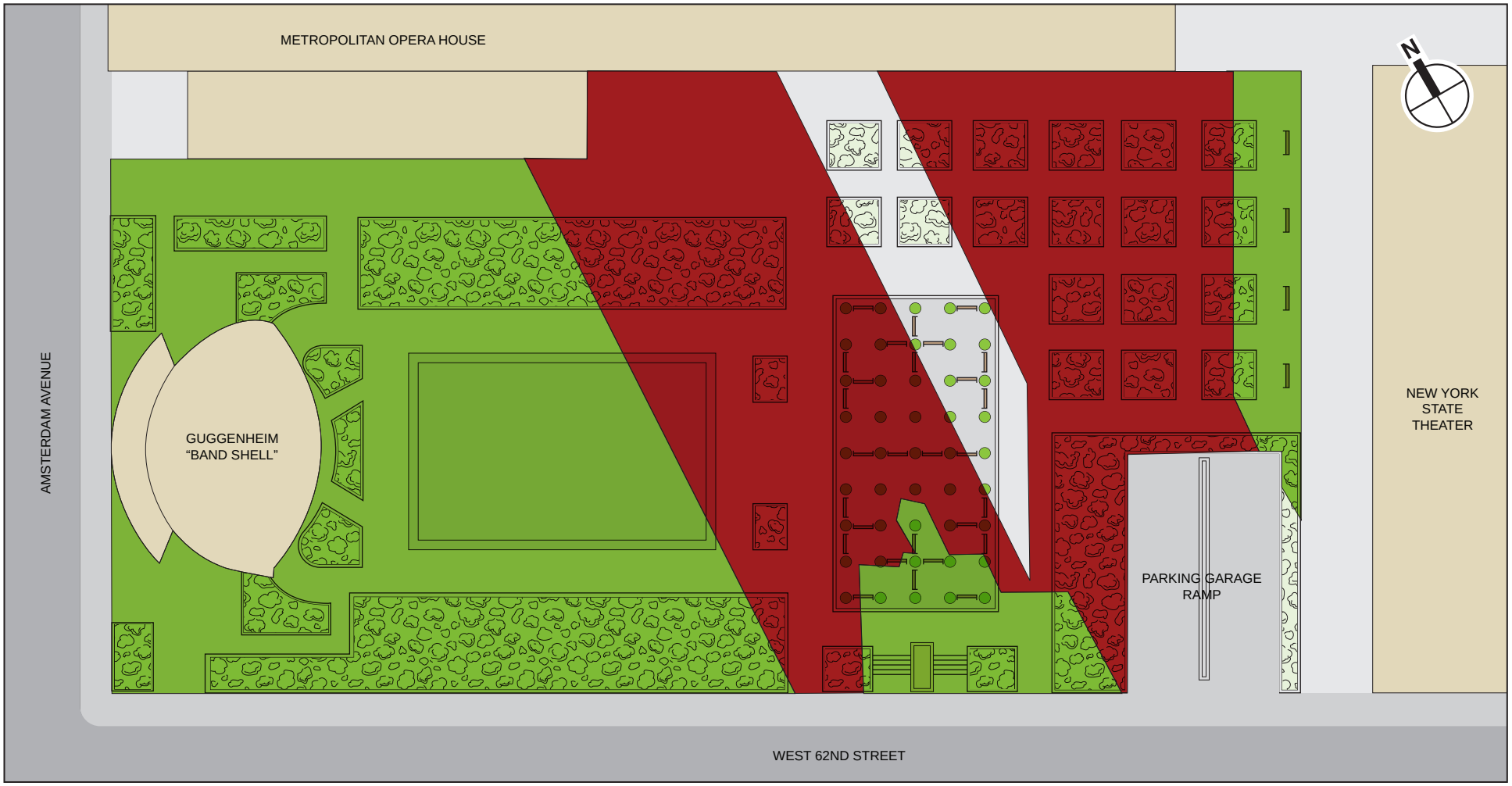
SCALE

Figure 6-34

Shadows - Phase II

December 21 - 12:00 PM EST

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

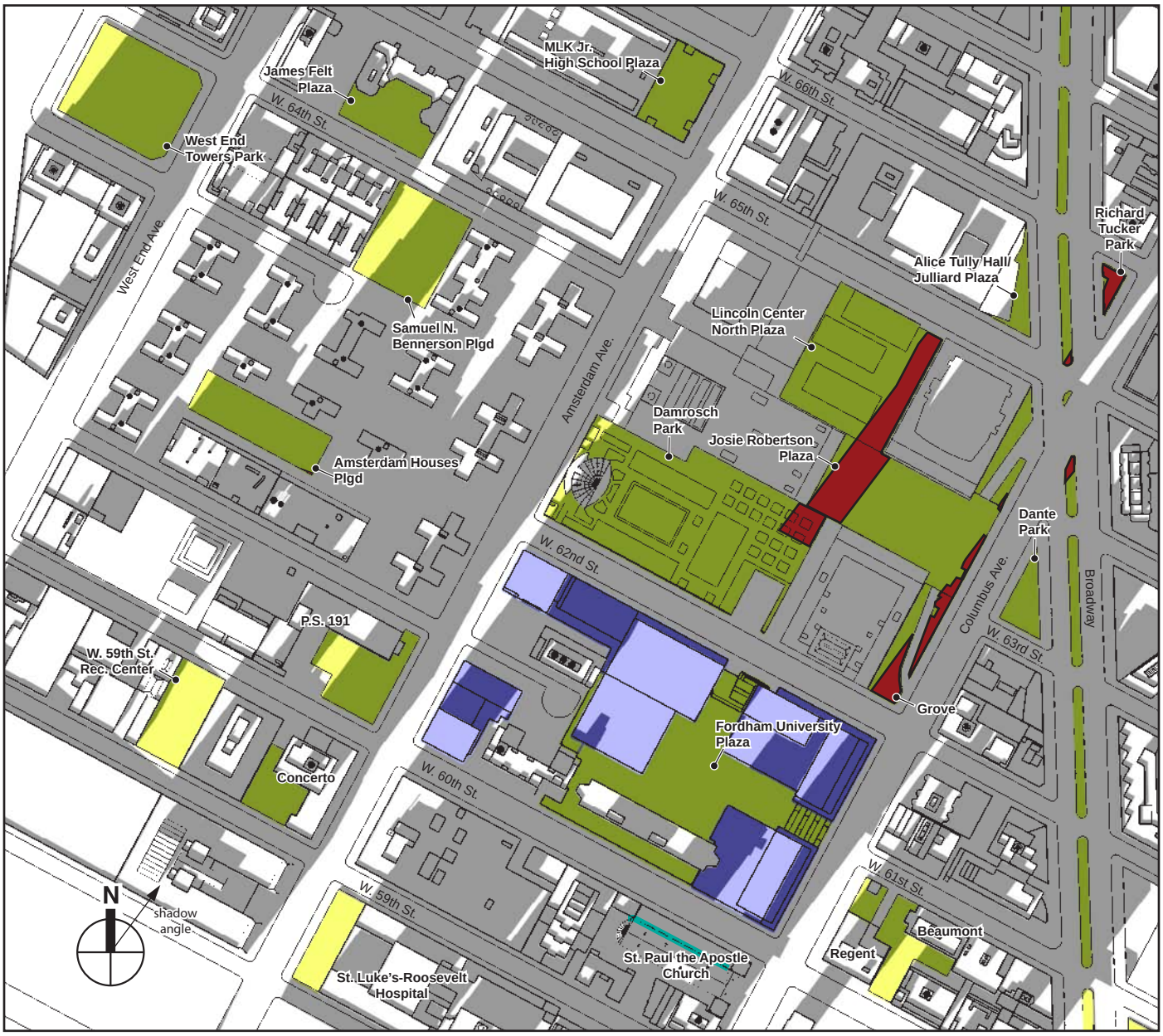
Tree

Figure 6-34A

Damrosch Park - Shadows - Phase II

December 21 - 12:00 PM EST

1.23.09



Proposed Buildings (Maximum Envelopes)

Publicly-Accessible Open Space

Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Other Shadow

Historic Church's Facade with Stained-Glass Windows Facing Project Site

0 200 400 FEET

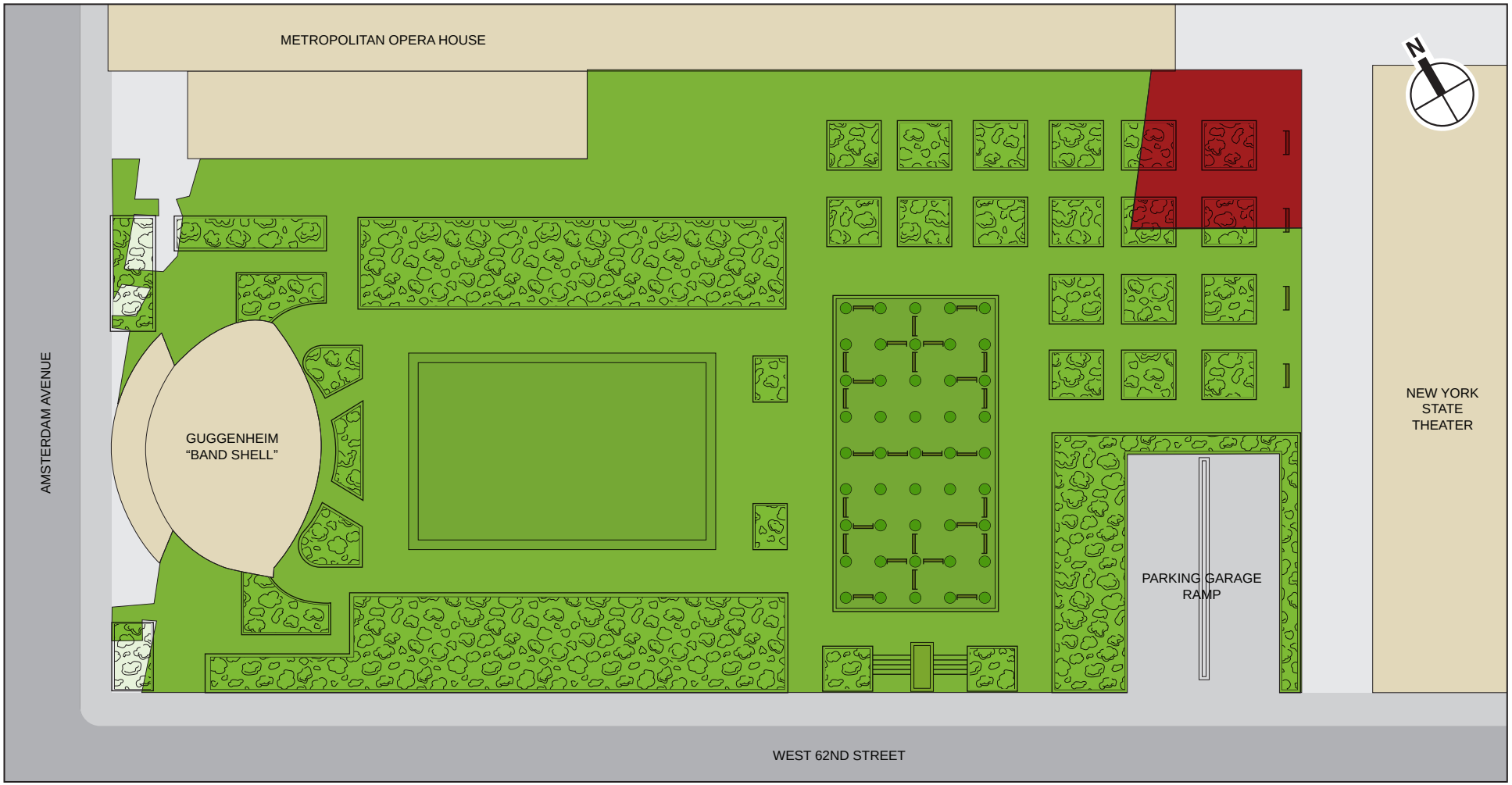
SCALE

Figure 6-35

Shadows - Phase II

December 21 - 2:30 PM EST

3.4.08



Existing and No Action Shadow on Open Space

Incremental Shadow on Open Space

Reduction in Shadow on Open Space

Planted area and trees

Seating

Tree

Figure 6-35A

Damrosch Park - Shadows - Phase II

December 21 - 2:30 PM EST