6

Shadows

A shadow is defined in the 2014 *CEQR Technical Manual* as the condition that results when a building or other built structure blocks the sunlight that would otherwise directly reach a certain area, space, or feature. The purpose of this chapter is to assess whether and the extent to which new structures may cast shadows on sunlight sensitive publicly accessible resources or other resources of concern such as natural resources.

Introduction

According to the *CEQR Technical Manual*, a shadows assessment is required for proposed actions that would result in new structures greater than 50 feet in height or located adjacent to, or across the street from, a sunlight-sensitive resource. Such resources include publicly-accessible open spaces, important sunlight-sensitive natural features, or historic resources with sun-sensitive features. A significant adverse shadow impact occurs when the incremental shadow added by a proposed project falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight exposure, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources.

The introduction of a CPC special permit for new hotels in M1 districts could result in shifting hotel development from M1 districts to other locations where they will continue to be permitted as-of-right, but would not otherwise change any rules regulating development in these locations. Thus the possible effects of a shift in some hotel development from M1 districts in the future No-Action and With-Action conditions will be considered by means of a prototypical analysis. The shadow assessment will be performed for each of the seven prototypical sites as defined and described in **Chapter 1**, "**Project Description**" to identify the possible effects of shifting from one use (such as a residential or different commercial use) in the No-Action condition to a commercial hotel use in the With-Action condition.

Principal Conclusions

Analyses conducted on the prototypical sites to assess shadows as they pertain to the shift from non-hotel use (i.e., a residential or different commercial use) in the No-Action condition to commercial hotel use in the With-Action condition conclude that there would be no significant incremental shadows on sunlight sensitive resources. However, because the location and height of any future hotels developed outside M1 zones, as resulting from the proposed action, is not known, the proposed action could result in shadows cast on sunlight-sensitive resources.

Screening Threshold

As stated previously, a shadow assessment is required only if the project would either (a) result in new structures (or additions to existing structures including the addition of rooftop mechanical equipment) of 50 feet or more or (b) be located adjacent to, or across the street from, a sunlight-sensitive resource. However, where a project's height increase is ten feet or less and it is located adjacent to, or across the street from, a sunlight-sensitive open space resource, which is not a designated New York City Landmark or listed on the State/National Registers of Historic Places or eligible for these programs, the lead agency may determine, in consultation with the New York City Department of Parks and Recreation (DPR), whether a shadow assessment is required in that case.

Table 6-1 Building Height, Existing Conditions vs. With-Action Condition

Prototypical Site	Existing Conditions (ft)	With-Action Condition (ft)	Increment (ft)
Area 1 – Manhattan Below 59th Street	46	355	+309
Area 2 – Long Island City	16, 28	75	+59
Area 3 – Jamaica	17, 29, 0	125, 125, 155	+108, +96, +155
Area 4 – South Slope	11	30	+19
Area 5 – Downtown Brooklyn	28	195	+167
Area 6 – Brownsville	14, 36	85	+71
Area 7 - Williamsburg	19 - 22	55	+36

As shown in **Table 6-1**, five of the prototypical sites would result in an increment of 50 feet or more between the Existing and With-Action conditions. Therefore, further analysis was conducted for the Manhattan, Long Island City, Jamaica, Downtown Brooklyn and Brownsville prototypical sites.

Shadow Assessment

As depicted in the Tier 1 and Tier 2 screenings (see "**Appendix A.4, Shadows**"), there are no resources of concern located within the shadow sweeps of the South Slope, Brownsville and Williamsburg prototypical sites. Therefore, further analysis was not warranted for these sites. Sunlight-sensitive resources were identified within the shadow study areas of the Manhattan, Long Island City, Jamaica and Downtown Brooklyn prototypical sites, and as such, further analysis was conducted.

Tier 3 Screening Results

Manhattan Prototypical Site

The results of the Tier 3 analysis are illustrated in **Figure 6-1** to **Figure 6-4**, which show a representative sample of the shadows that could be cast by the hotel at the Manhattan Prototypical Site. Resources that would be affected by shadows from the site include:

Park Avenue Viaduct: The Tier 3 results indicate that in the absence of intervening structures, shadows from the prototypical site could fall on the Park Avenue Viaduct during the beginning of the December 21 analysis day from 9:45 AM to 10:50 AM (1 hour, 5 minutes). These shadows would be relatively short in duration and would occur during winter mornings, when utilization of the viaduct by bicyclists and pedestrians would be relatively low. As such, these shadows are not expected to compromise the public's use and enjoyment of this resource.

Pershing Square Building: In the absence of intervening structures, shadows from the prototypical site would reach the Pershing Square Building at 10:00 AM and

would remain on the resource until 11:37 AM (1 hour, 37 minutes) on the December 21 analysis day. Although these shadows would be relatively long in duration, they would be relatively low in coverage. In addition, the Pershing Square Building does not contain sunlight-sensitive architectural features, such as stained-glass windows, that depend on direct sunlight for enjoyment by the public

Bowery Savings Bank Building: In the absence of intervening structures, shadows from the prototypical site would cover portions of the Bower Savings Bank Building for a relatively long duration of 1 hour and 50 minutes (10:35 AM to 12:25 PM) on the December 21 analysis day. However, the building does not contain sunlight-sensitive architectural features, and these shadows would cover relatively small portions of the building.

Chanin Building: Shadows from the prototypical site could reach a portion of the Chaning Building at 11:10 AM and would be entirely off the resource at 1:10 PM (2 hours) on the December 21 analysis day. These shadows would be long in duration. However, they would fall on relatively small portions of the building, and thus, are not expected to compromise the public's use and enjoyment of this resource.

Chrysler Building: The Tier 3 results indicate that in the absence of intervening buildings, shadows from the prototypical site would fall on the Chrysler Building for approximately 1 hour and 18 minutes (1:20 PM to 2:38 PM) on the December 21 analysis day. These shadows would be relatively short-lived and low in coverage.

Socony-Mobil Building: The Tier 3 indicates that the hotel at the Manhattan Prototypical Site could cast shadows on the Mobil Building on two of the representative analysis days.

- On the December 21 analysis day, shadows from the prototypical site would reach the resource at 1:10 PM until the end of the analysis period at 2:53 pm (1 hour, 43 minutes).
- On the March/September analysis day, shadows would fall on the building from 2:15 to 4:15 PM (2 hours).

Overall, the shadows would be long in duration but would fall on relatively small portions of the building's southern façade.

Jonathan W. Allen Stable: As depicted in the Tier 3 results, the Jonathan W. Allen Stable could receive shadows from the prototypical site on two of the analysis days.

- On the May/August analysis day, shadows from the prototypical site could reach the building at 4:30 PM and could cover a significant portion of the building by the end of the analysis day at 5:18 PM (1 hour, 48 minutes).
- On the June 21 analysis day, shadows would cover portions of the building from 4:05 PM to the end of the analysis day at 6:01 PM (1 hour, 56 minutes).

Shadows from the site would fall on sizable portions of the building for long durations on both analysis days. However, the resource does not contain sunlight-sensitive architectural features that would receive shadows from the prototypical site as shadows would not fall directly on the front façade of the building.

Joseph Raphael De Lamar House: Shadows from the prototypical site could fall on the eastern façade of the Joseph Rafael De Lamar House in the beginning of the May/September analysis day from 6:27 AM to 6:30 AM (3 minutes). These shadows would be very brief in nature.

Middleton S. and Emilie Neilson Burrill House: In the absence of intervening structures, shadows from the prototypical site would fall on the eastern façade of the Middleton S. and Emilie Neilson Burrill House at the beginning of the May/September analysis day from 6:27 AM to 6:55 AM (28 minutes). These shadows would be short in duration.

Union League Club: The Tier 3 screening indicates that shadows from the prototypical site could portions of the Union League Club at the beginning of the June 21 analysis day from 5:57 AM to 6:20 AM (23 minutes). These shadows would be relatively short in duration.

Park Avenue Median: In the absence of intervening buildings would fall on portions of the Park Avenue median on two of the representative analysis days.

- On the May/September analysis day, shadows from the site would cover portions of the median from the beginning of the analysis day at 6:27 AM to 7:45 AM (1 hour, 18 minutes).
- On the June 21 analysis day, shadows would fall on the resource from the beginning of the analysis day at 5:57 AM to 7:00 AM (1 hour, 3 minutes).

Overall, the shadows would be relatively short in duration and would cover relatively small portions of the median and would occur during the early hours of the day, when utilization of the resource would be lowest.

Figure 6-1 Tier 3 December Analysis Day – Manhattan Prototypical Site

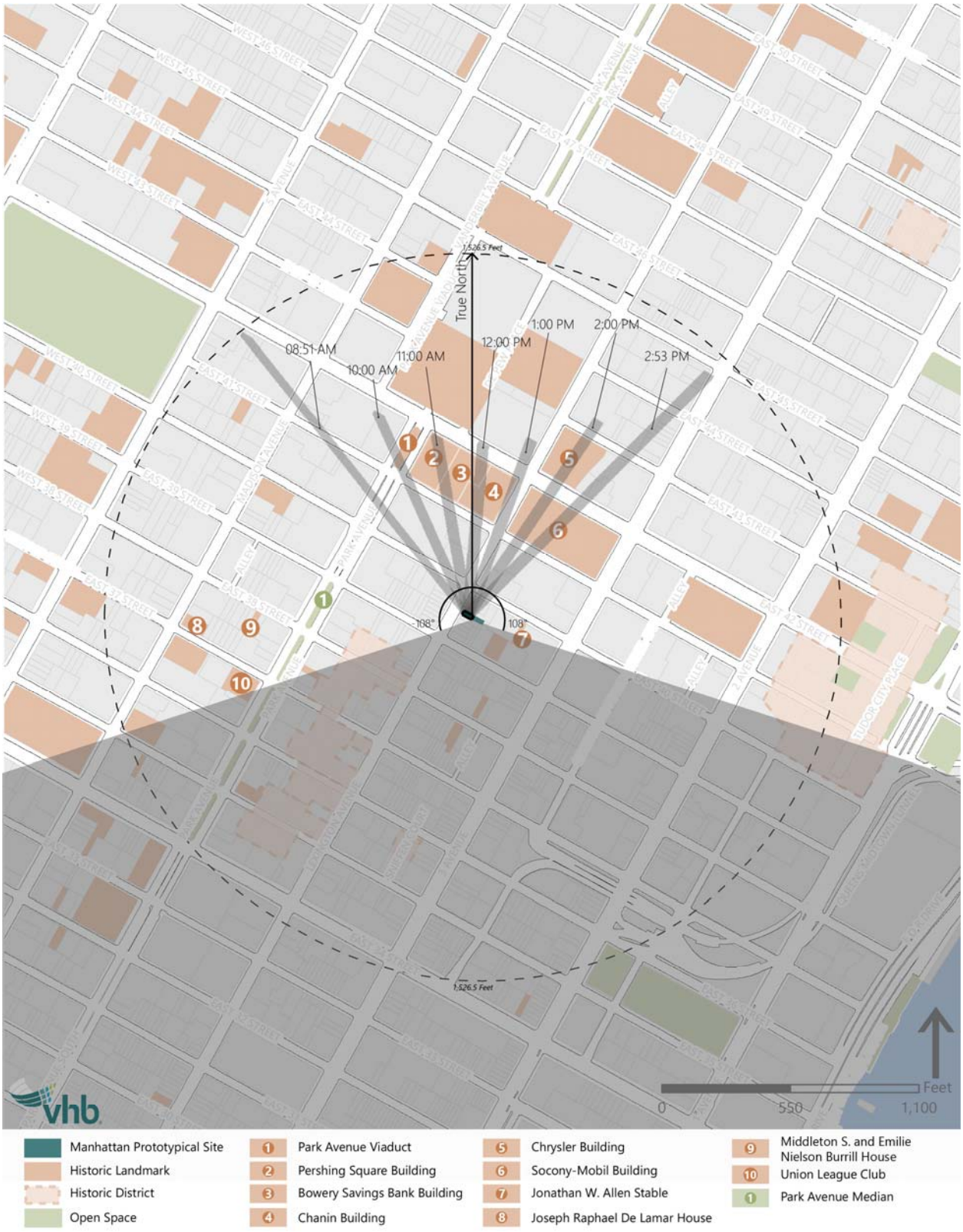


Figure 6-2 Tier 3 March Analysis Day – Manhattan Prototypical Site

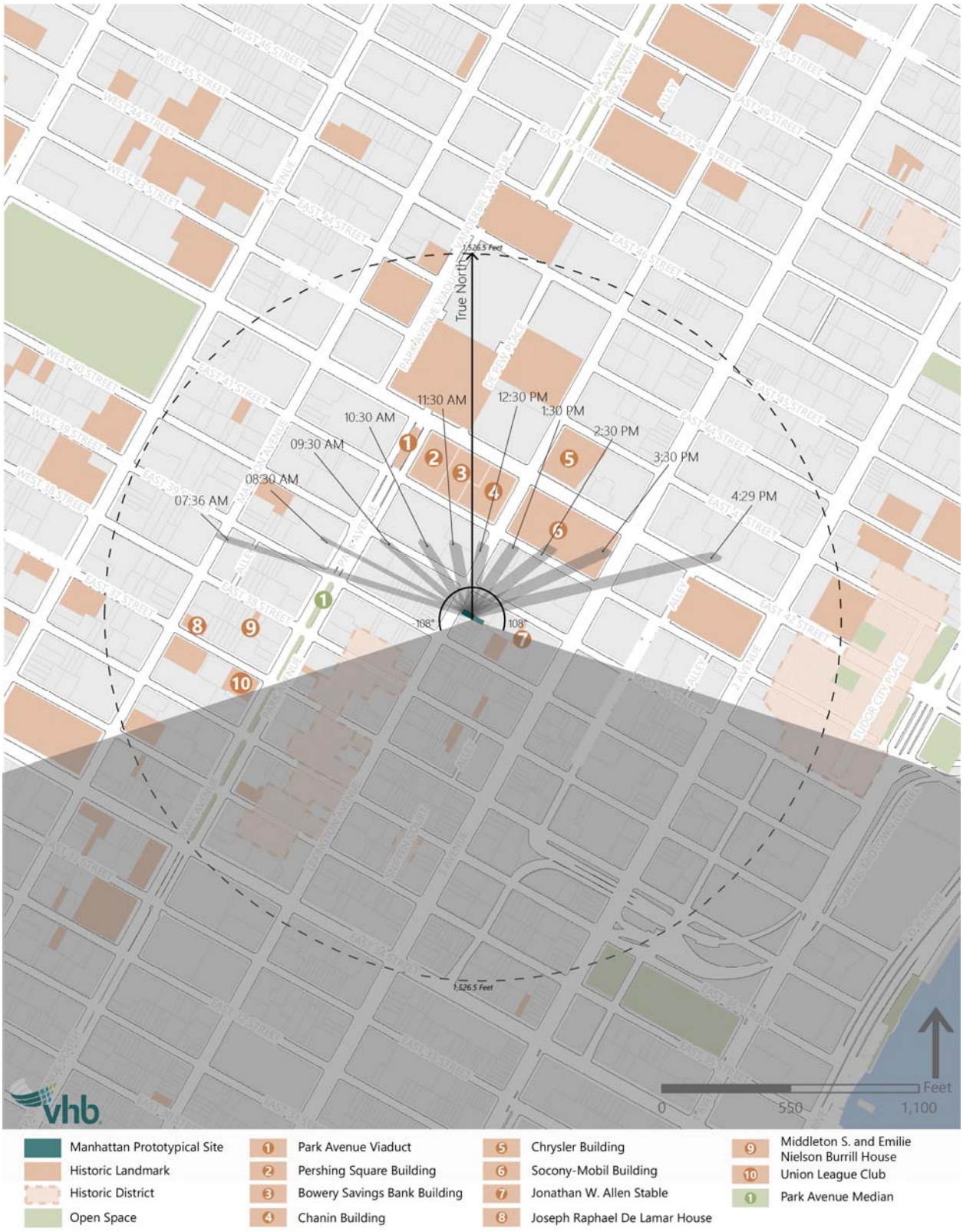


Figure 6-3 Tier 3 May Analysis Day – Manhattan Prototypical Site

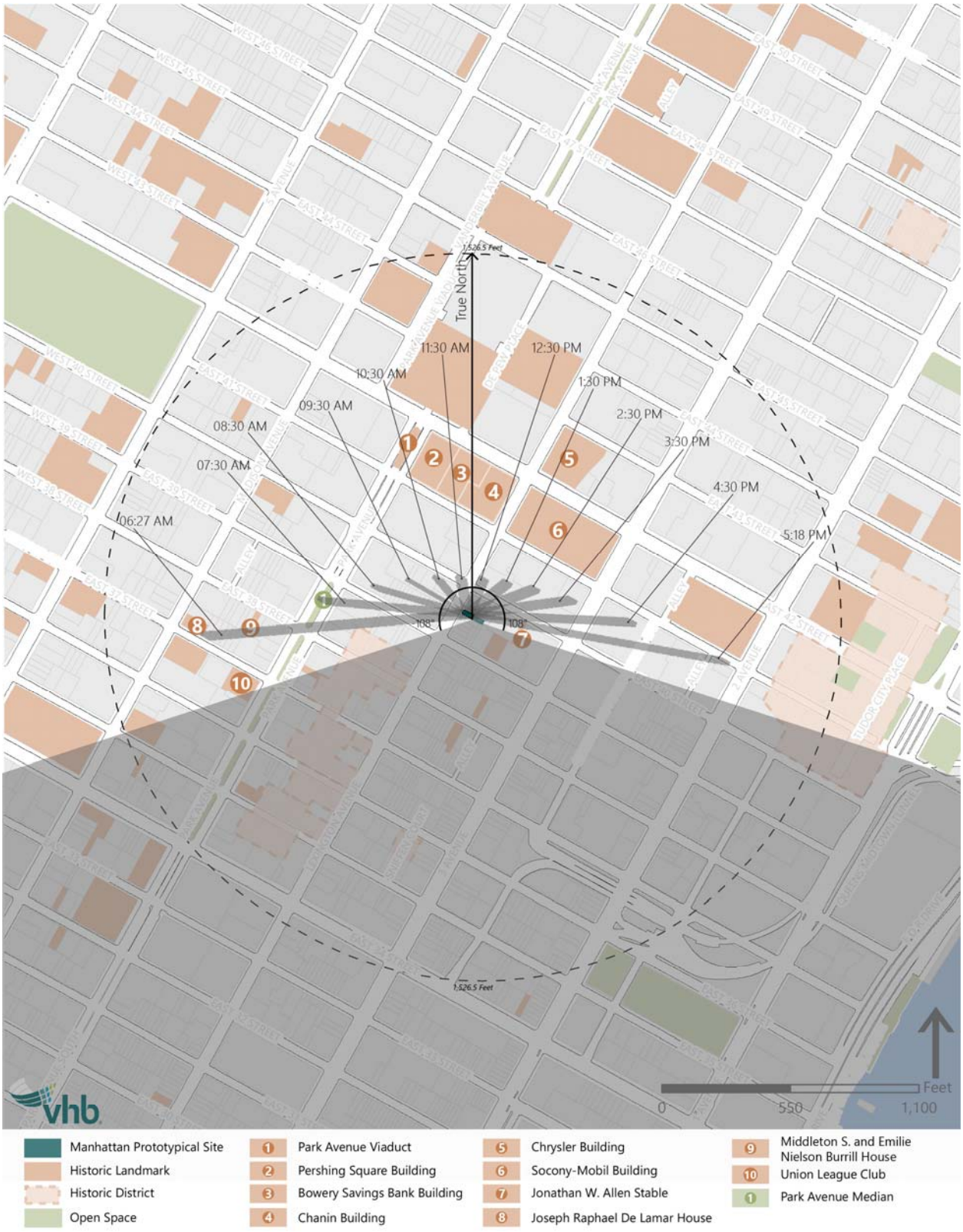
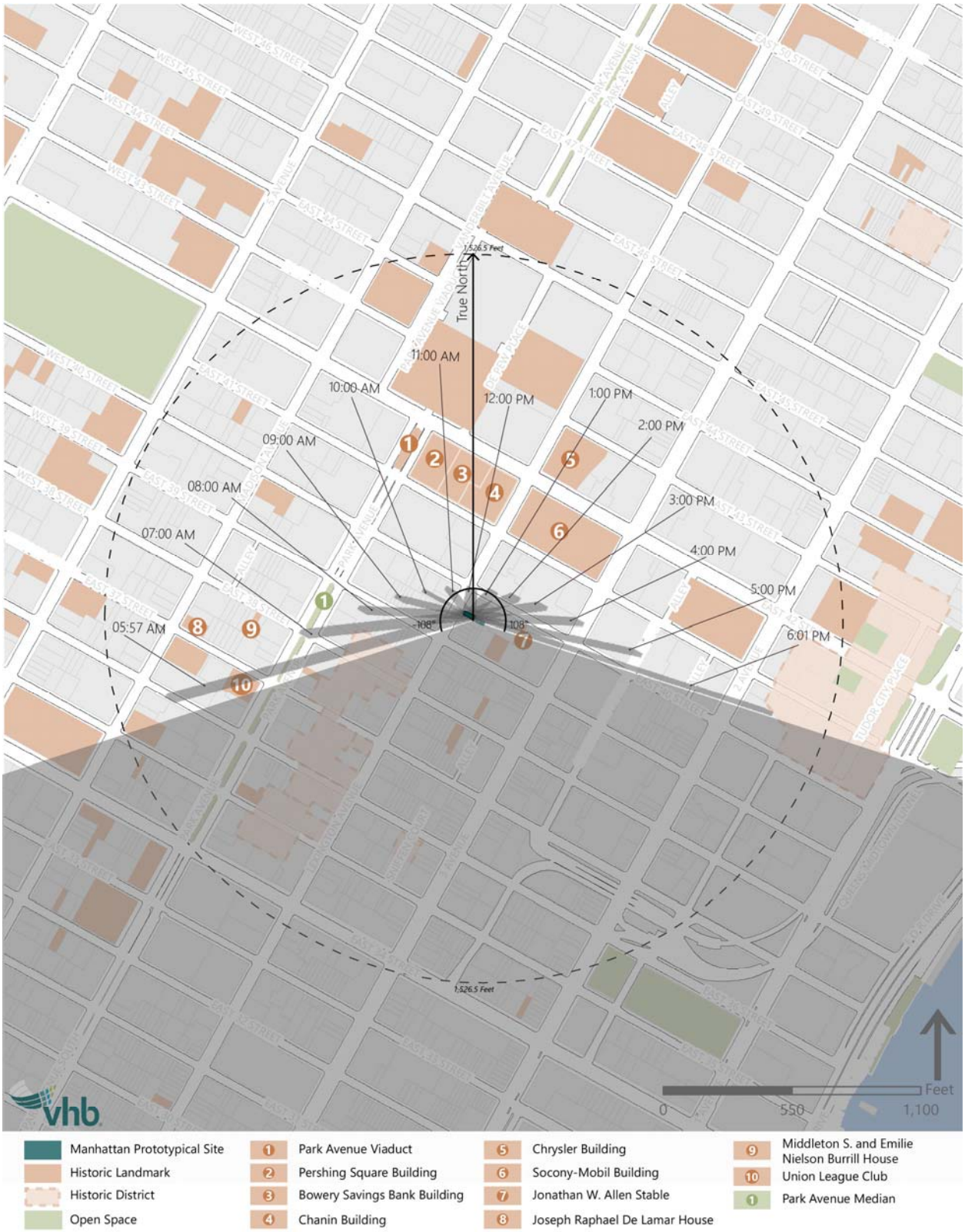


Figure 6-4 Tier 3 June Analysis Day – Manhattan Prototypical Site



Long Island City Prototypical Site

As depicted in **Figures 6-5** to **6-8**, shadows cast from the prototypical cast could fall on two resources within the shadow screening radius. These resources include:

***27 Street Greenstreet*:** In the absence of intervening structures, shadows from the prototypical site would fall on the Greenstreet located at the intersection of 27 Street, Hunter Street and 48 Road (27 Street Greenstreet) on the June 21 analysis day (**Figures 6-5** to **6-8**). Shadows from the site would occur at the very beginning of the analysis day from 5:57 AM to 6:25 AM (28 minutes). This duration is considered very brief in nature and would cover a relatively small portion of the playground. In addition, the shadows are projected to fall in the early morning, when utilization of this open space would be lowest, such that the public's use and enjoyment of this resource would not be compromised.

42 Road Greenstreet: The Tier 3 screening indicates that in the absence of intervening structures, the hotel at the Long Island Prototypical Site could cast shadows on the Greenstreet located at the intersection of 28 Street, Hunter Street and 42 Road (42 Road Greenstreet) on three of the representative analysis days (**Figures 6-9** to **6-12**).

- On the March/September analysis day, shadows from the prototypical site could reach the northern portion of the Greenstreet sometime after 3:30 PM and would remain on the resource up to the end of the analysis day at 4:29 PM (59 minutes).
- On the May/August analysis day, shadows from the prototypical site would cover the Greenstreet by 4:30 PM and would remain until the end of the analysis day at 5:18 PM (48 minutes).
- On the June analysis day, shadows from the site would cover the Greenstreet by 5:00 PM until the end of the analysis day at 6:01 PM (1 hour, 1 minute).

Overall, the shadows would be short-lived and would occur at the end of each analysis day.

Figure 6-5 Tier 3 December Analysis Day – Long Island City Prototypical Site

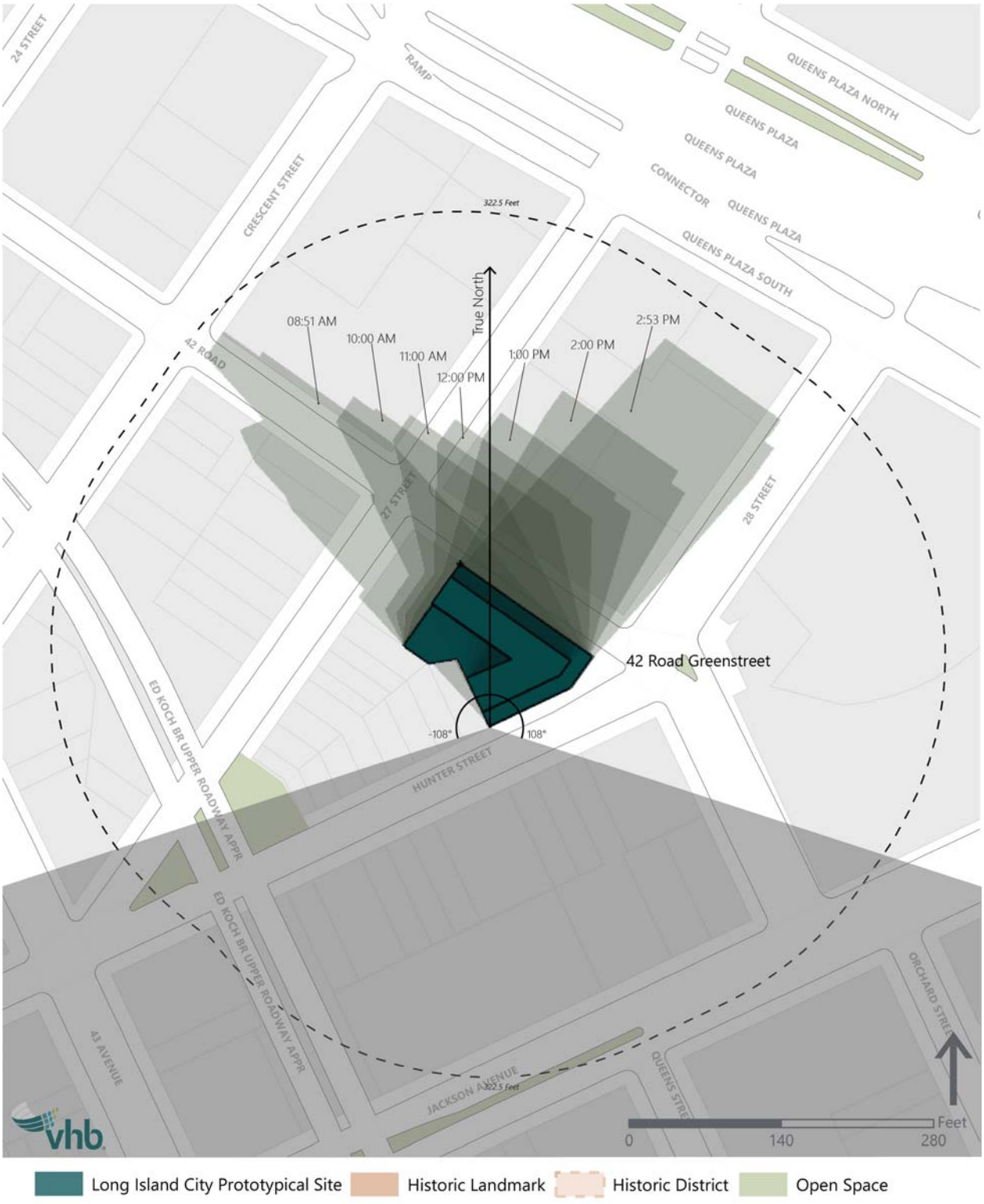


Figure 6-6 Tier 3 March Analysis Day – Long Island City Prototypical Site

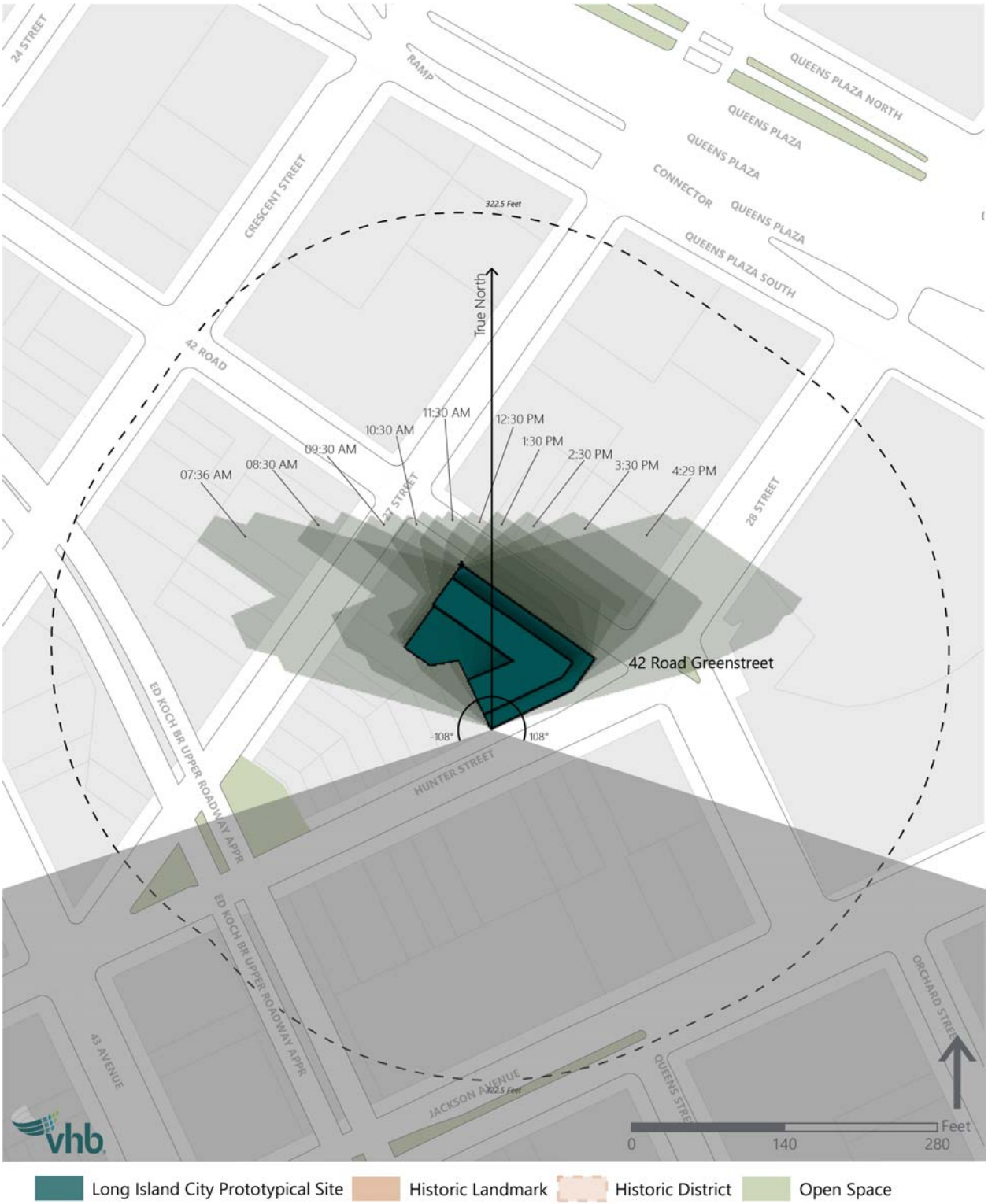


Figure 6-7 Tier 3 May Analysis Day – Long Island City Prototypical Site

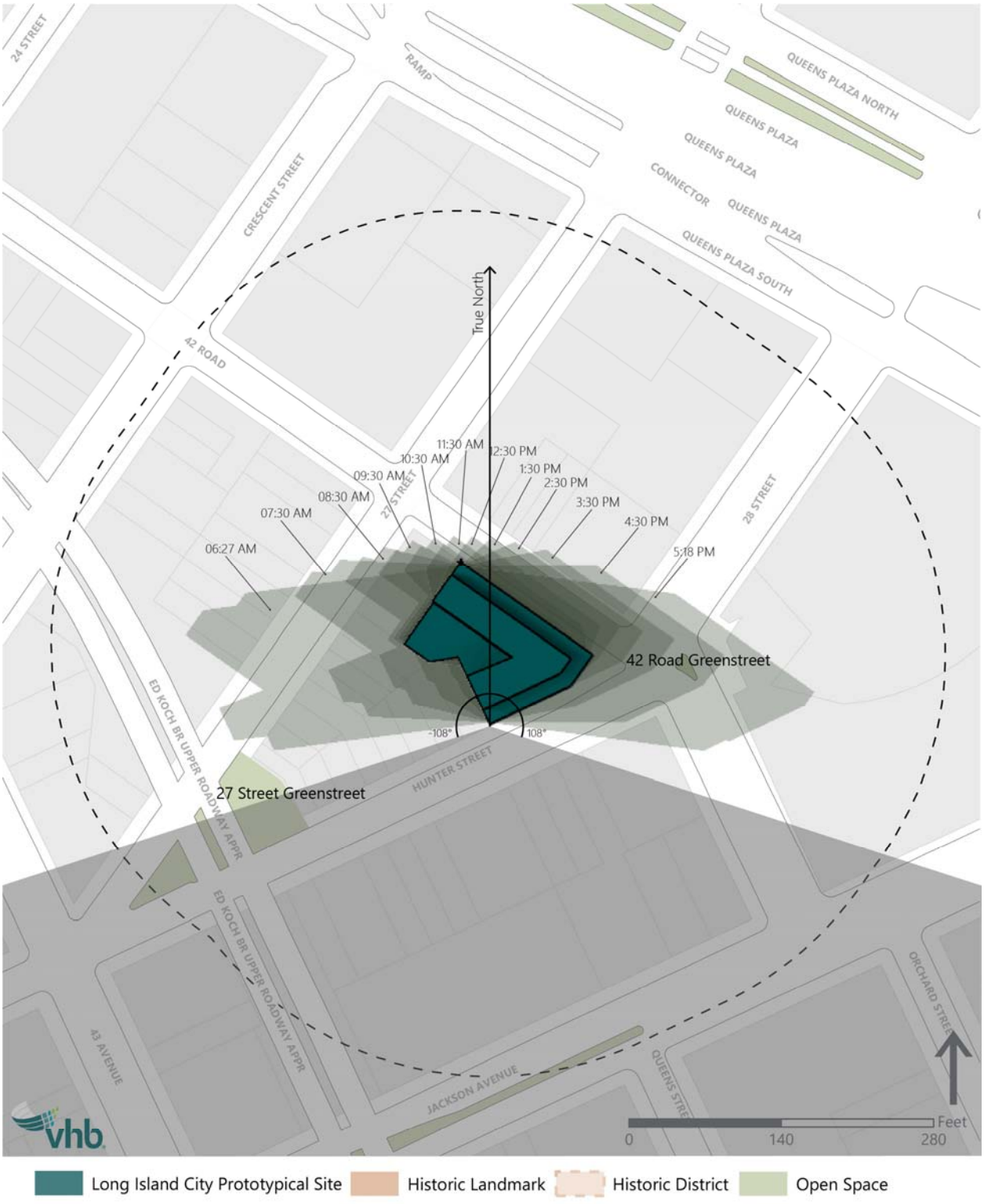
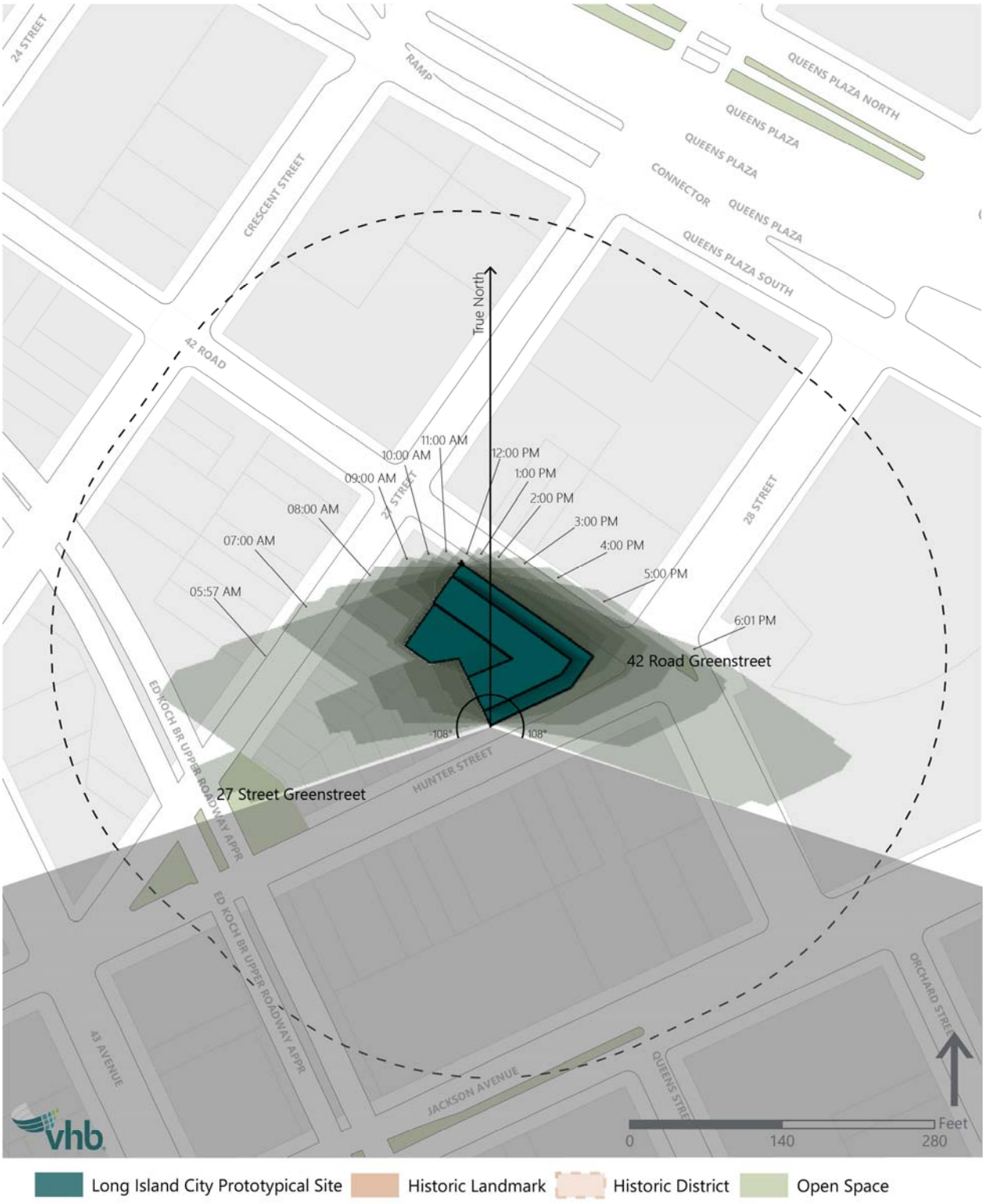


Figure 6-8 Tier 3 June Analysis Day – Long Island City Prototypical Site



Jamaica Prototypical Sites

The Tier 3 screening indicates that there are three resources that could be affected by shadows from the prototypical site (**Figure 6-8** to **Figure 6-12**). These resources are:

Archer Avenue Greenstreet: The Tier 3 results indicate that shadows cast by the prototype would not fall on the Greenstreet located at the corner of 146th Street and Archer Avenue (Archer Avenue Greenstreet) at any of the representative analysis days. As such, further analysis is not warranted for this resource.

North Fork Bank: In the absence of intervening structures, shadows from the prototypical site would not cover the North Fork Bank during any of the representative analysis days. Therefore, no further analysis is needed for this resource.

Rufus King Park: In the absence of intervening structures, shadows from the prototypical site would cover a portion of Rufus King Park for approximately 10 minutes (2:43 PM to 2:53 PM) on the December 21 analysis day. However, these shadows would be brief in nature and would cover a very small portion of the open space.

Figure 6-9 Tier 3 December Analysis Day – Jamaica Prototypical Sites

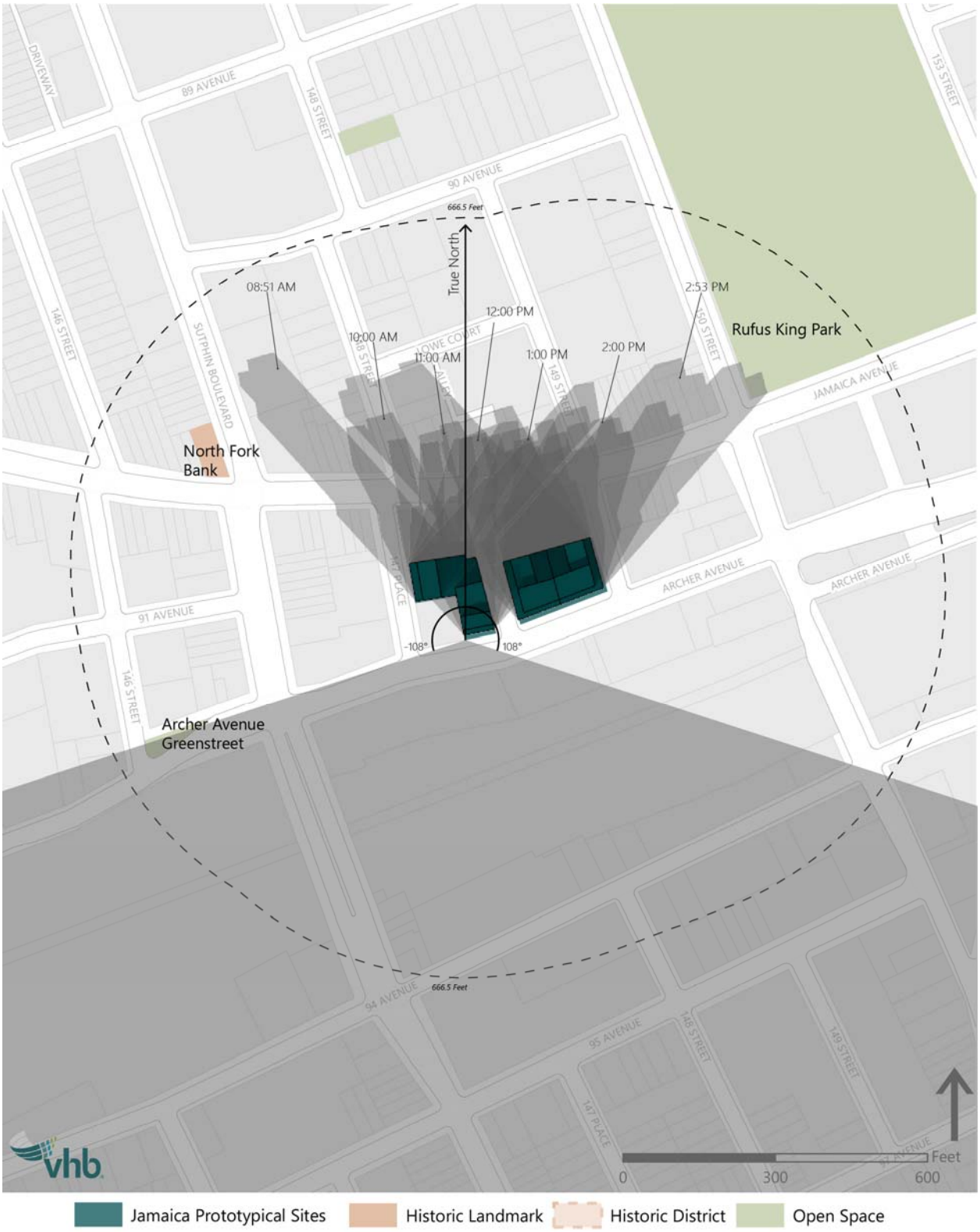


Figure 6-10 March Analysis Day – Jamaica Prototypical Sites

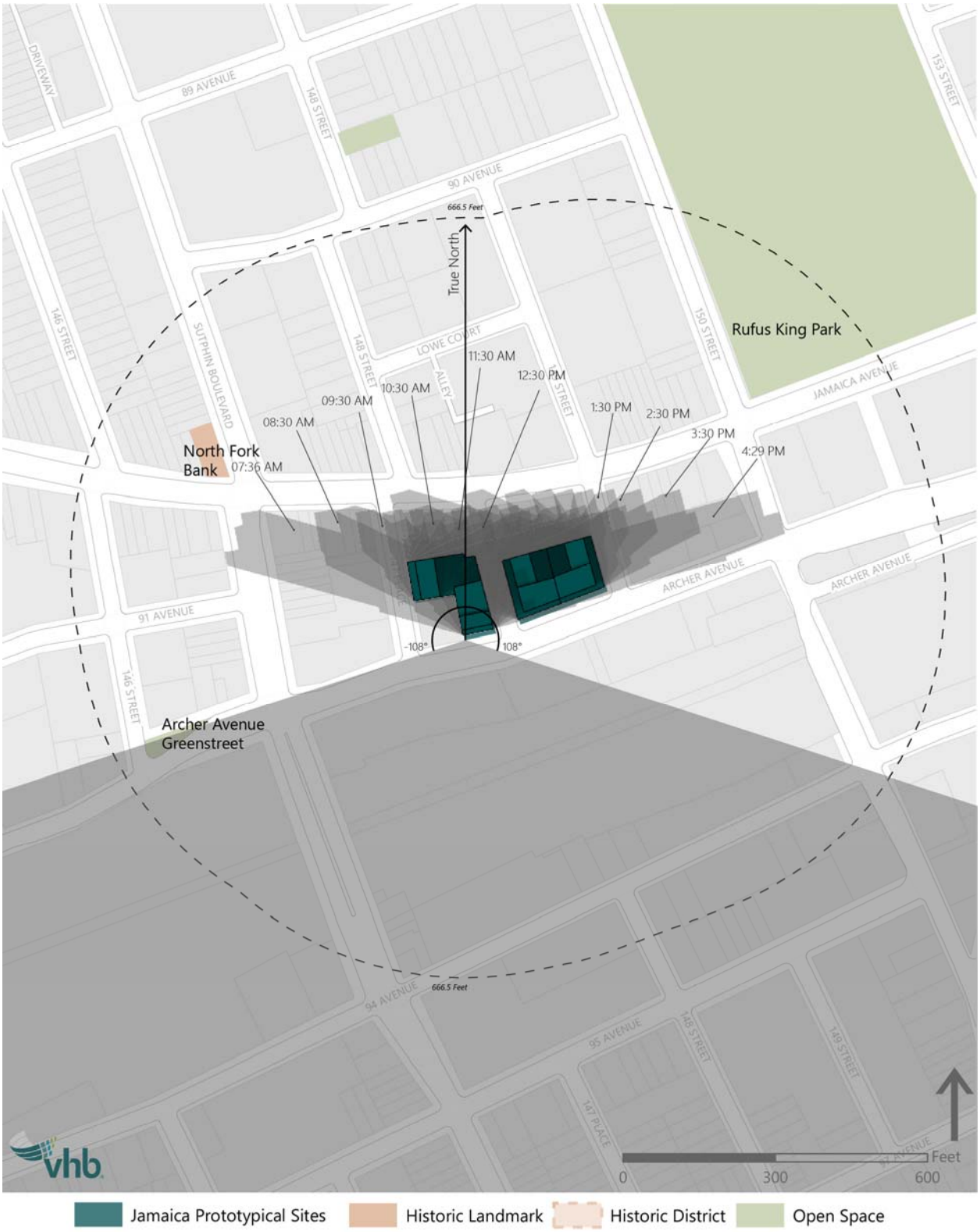


Figure 6-11 May Analysis Day – Jamaica Prototypical Sites

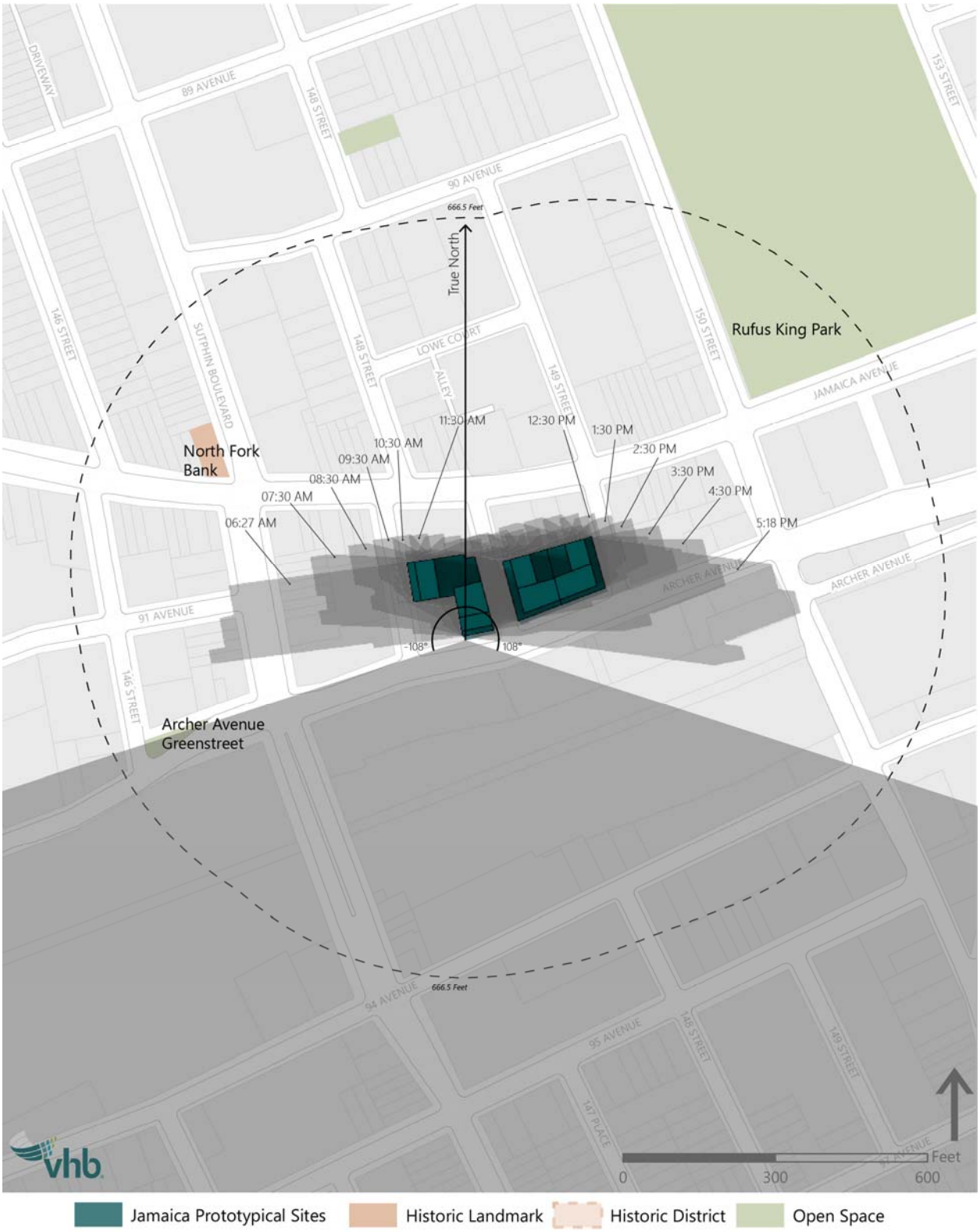
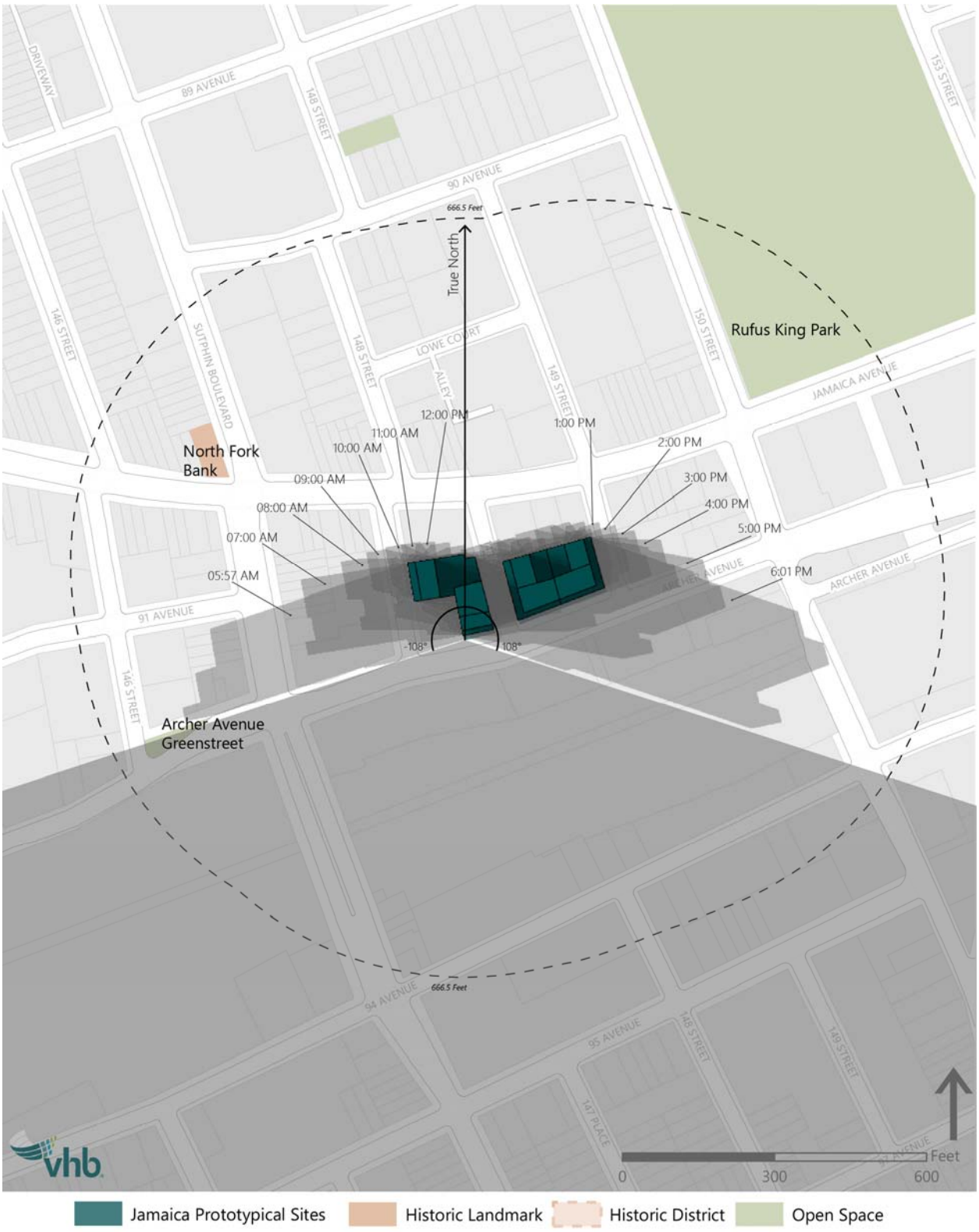


Figure 6-12 June Analysis Day – Jamaica Prototypical Sites



Downtown Brooklyn Prototypical Site

The results of the Tier 3 analysis are illustrated in **Figure 6-13** to **Figure 6-16**, which show a representative sample of the shadows that could be cast by the hotel at the Downtown Brooklyn Prototypical Site. Resources that would be affected by shadows from the site include:

A.I. Namm & Son Department Store: The Tier 3 results indicate that shadows cast by the prototype would not fall on the A.I. Namm & Son Department Store at any of the representative analysis days. As such, further analysis is not warranted for this resource.

Dime Savings Bank: In the absence of intervening structures, shadows from the prototypical site would reach the Dime Savings Bank at 9:05 AM and would be completely off the resource at 11:55 AM (1 hour, 37 minutes) on the December 21 analysis day. However, these shadows would be cast on a relatively small portion of the resource.

University Place: In the absence of intervening structures, shadows from the prototypical site would cover a portion of University Place for approximately 1 hour (1:25 PM to 2:25 PM) on the December 21 analysis day. These shadows would be relatively short-lived and cover a small portion of the open space. In addition, these shadows would occur in the winter, when utilization of the park would be lower than it would during warmer weather.

Figure 6-13 Tier 3 December Analysis Day – Downtown Brooklyn Prototypical Site

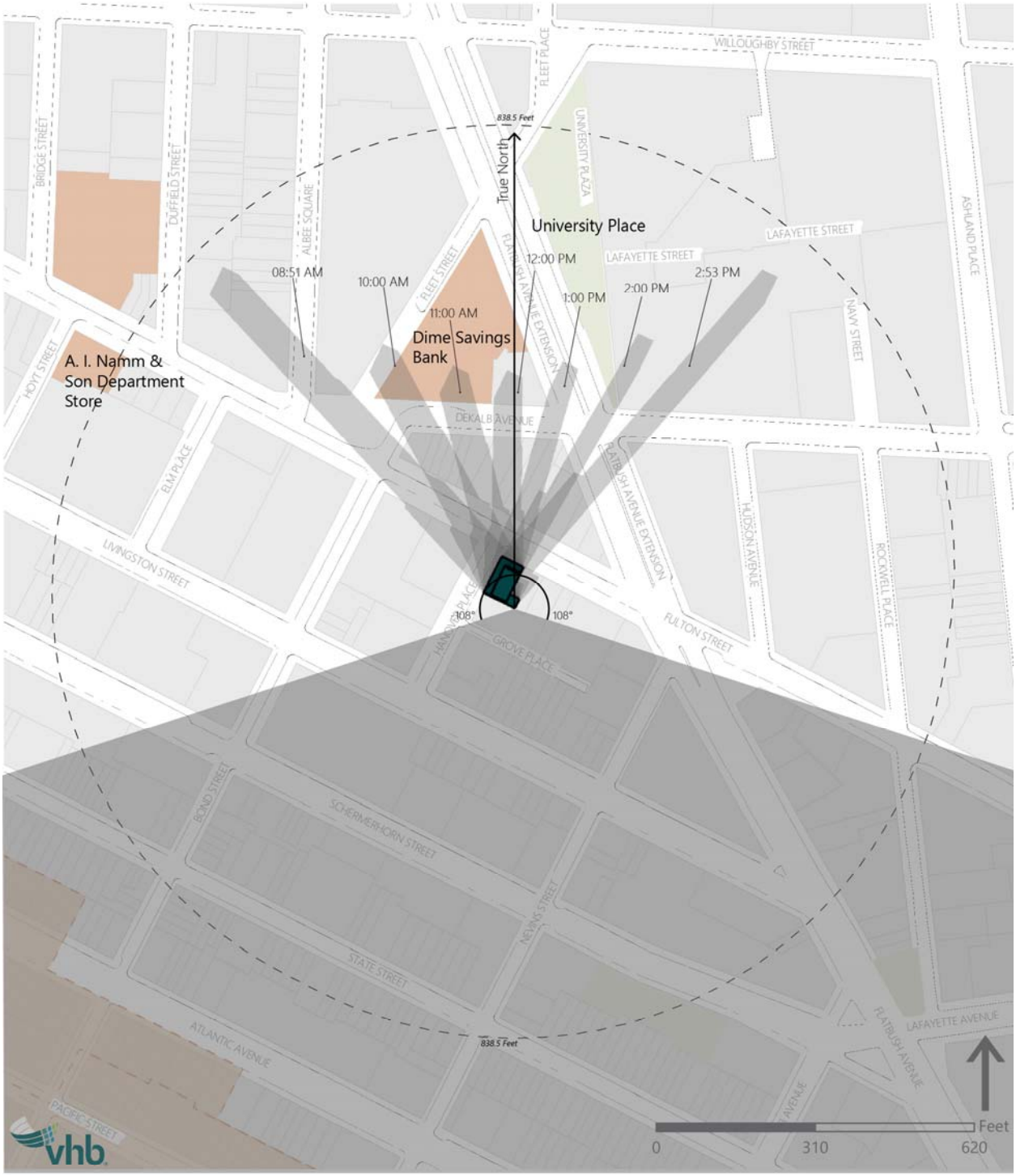


Figure 6-14 Tier 3 March Analysis Day – Downtown Brooklyn Prototypical Site

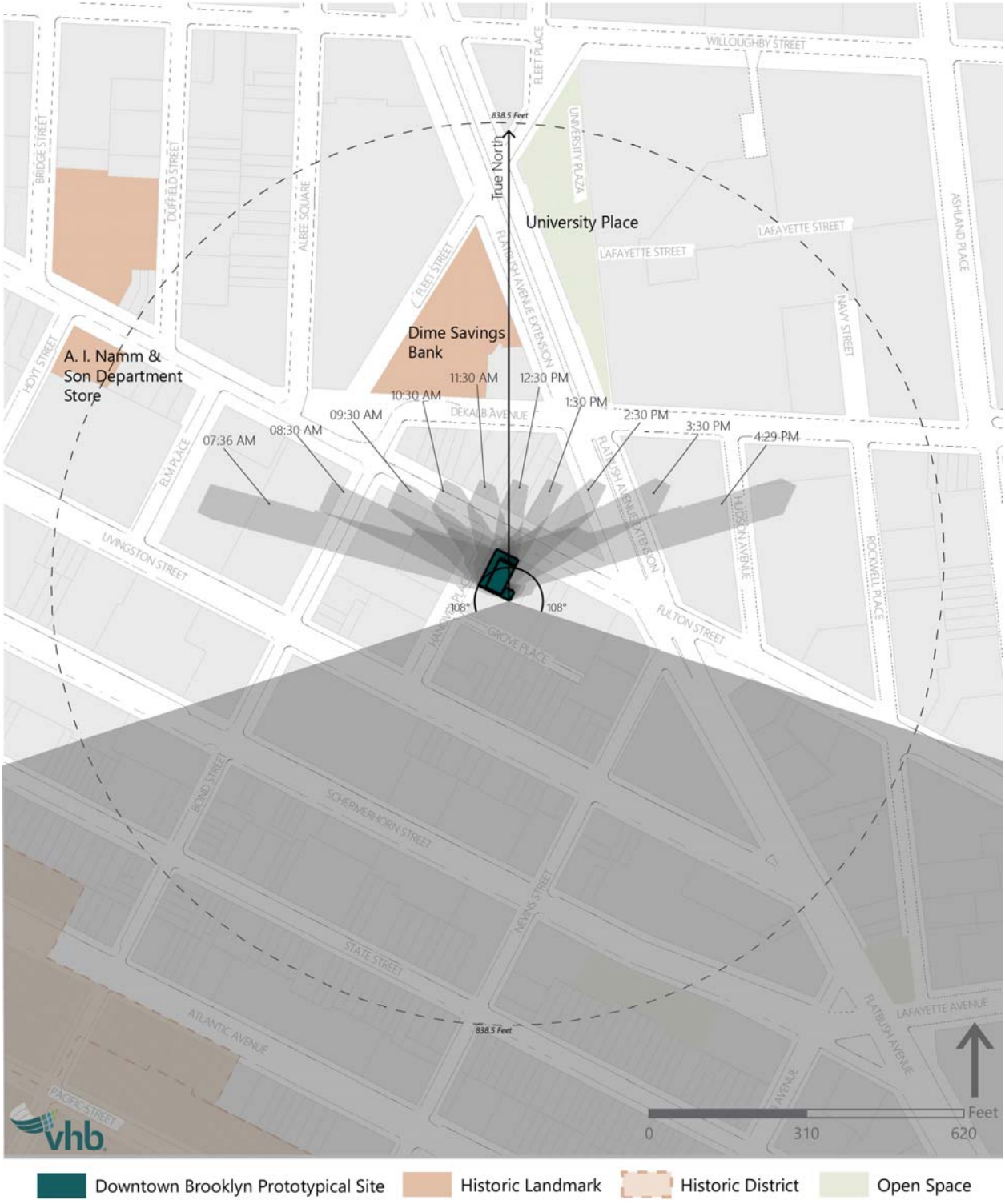


Figure 6-15 Tier 3 May Analysis Day – Downtown Brooklyn Prototypical Site

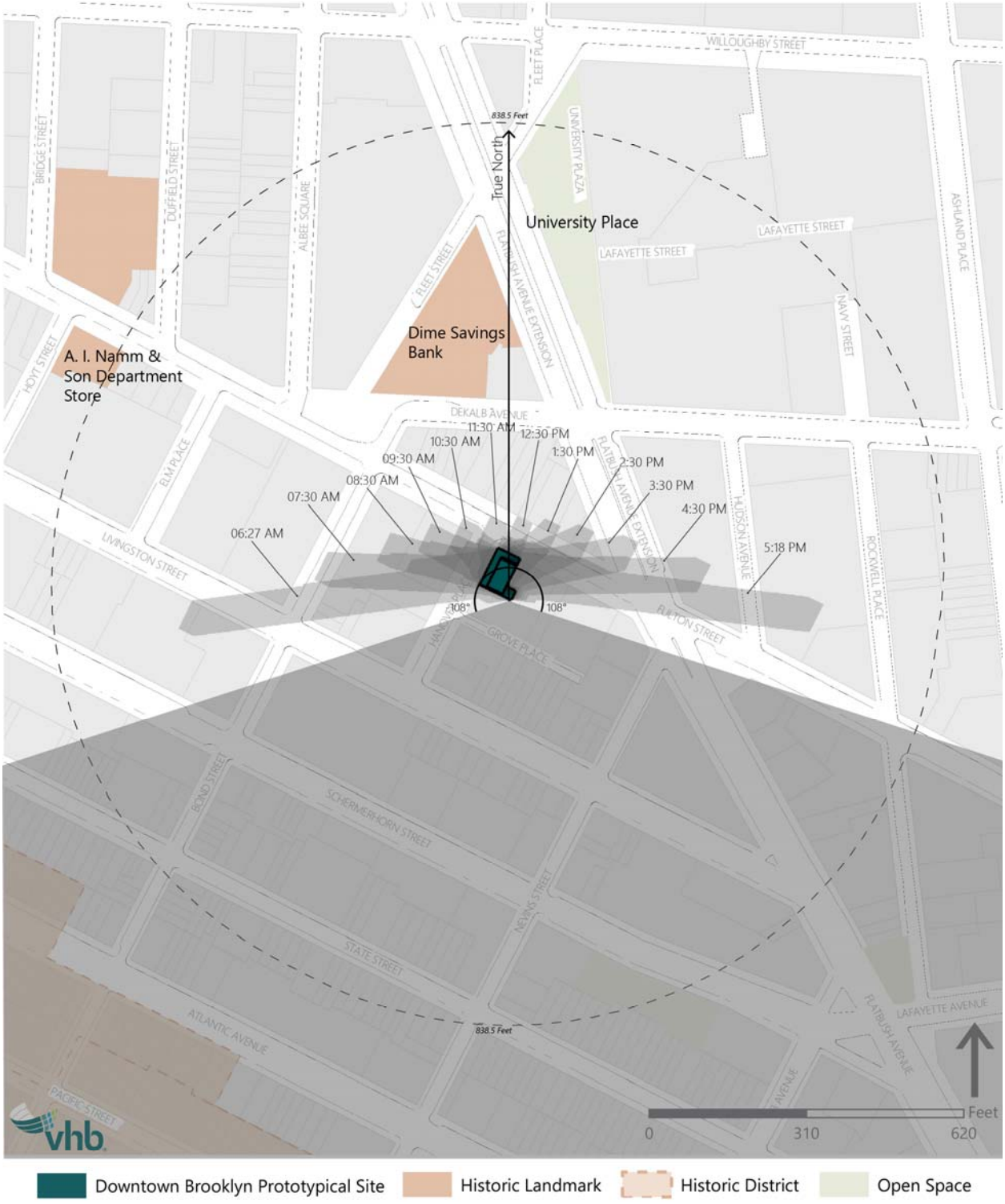
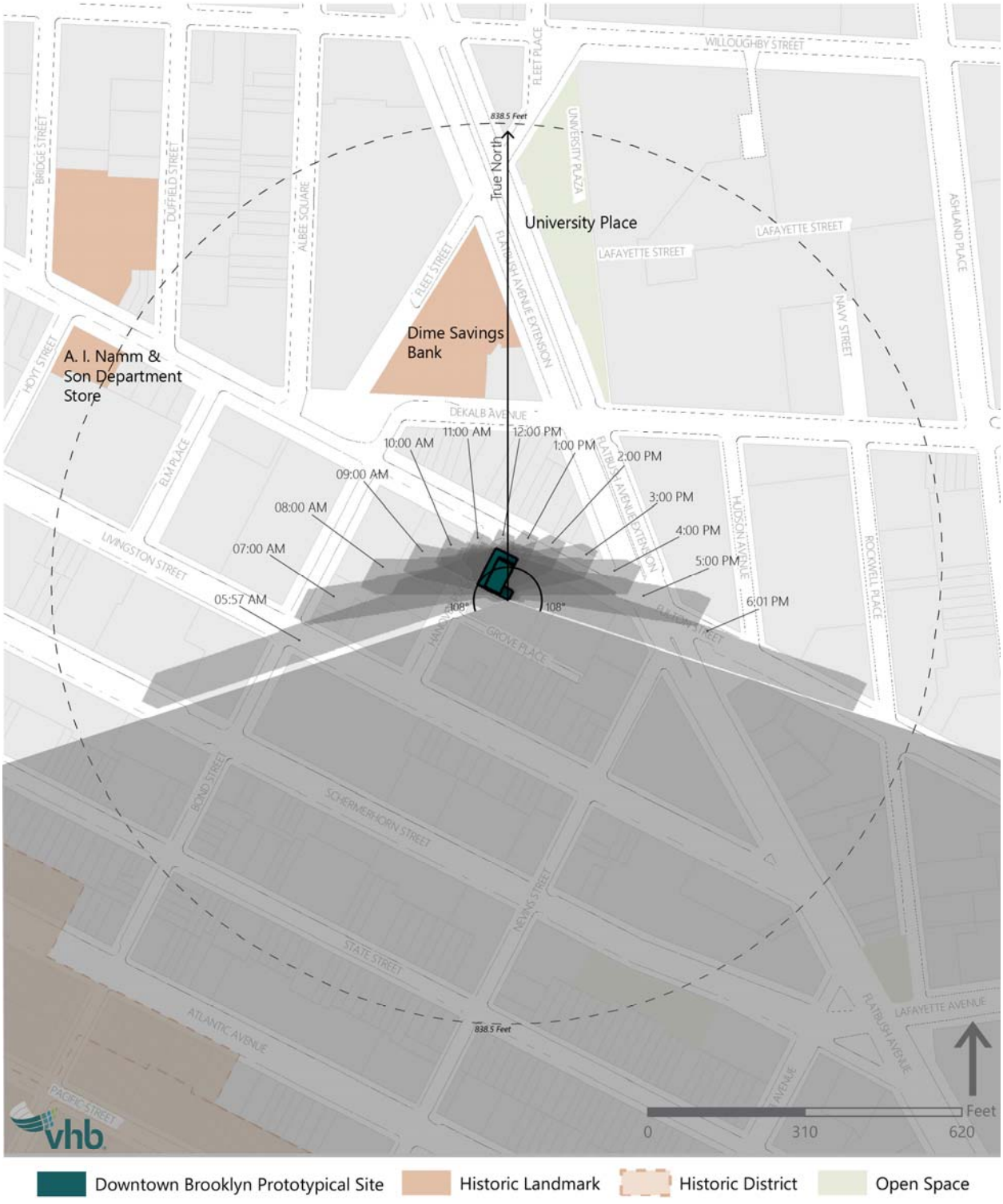


Figure 6-16 Tier 3 June Analysis Day – Downtown Brooklyn Prototypical Site



Detailed Assessment

The Tier 3 screening results indicated that shadows from the Manhattan, Long Island City, Jamaica and Downtown Brooklyn prototypical sites had the potential to reach some of the identified sunlight-sensitive resources within their respective shadow sweeps. A detailed analysis was conducted for these prototypical sites to provide a more conservative assessment of the possible effects of the proposed action.

As shown in **Table 6-2**, the With-Action building heights for the Long Island City, Jamaica and Downtown Brooklyn prototypical sites would be lower than the No-Action heights for these sites. The bulk forms for these sites under the proposed action would be smaller than the No-Action forms.

Table 6-2 Building Height, No-Action vs. With-Action

Prototypical Site	No-Action Condition (ft)	With-Action Condition (ft)	Increment (ft)
Area 1 – Manhattan Below 59th Street	46	355	+309
Area 2 – Long Island City	105	75	-30
Area 3 – Jamaica	145, 135, 230	125, 125, 155	-20, -10, -75
Area 5 – Downtown Brooklyn	205	195	-10

The building height for the Manhattan Prototypical site would be taller in the With-Action condition than the No-Action condition. However, the prototypical site is surrounded by tall buildings to the north, east and west—such as 600 Third Avenue (564 feet), 622 Third Avenue (511 feet), 630 Third Avenue (258 feet), 101 Park Avenue (631 feet), 99 Park Avenue (319 feet), 325 Lexington Avenue (379 feet), 355 Lexington Avenue (285 feet), 363 Lexington Avenue (324 feet), 360 Lexington Avenue (290 feet) and 364 Lexington Avenue (321 feet). As shown in **Table 6-3**, these intervening structures would also cast shadows on the identified resources of concern.

Table 6-3 Intervening Buildings

Sunlight-sensitive Resource	Intervening Building(s)	Building Height (ft)
Park Avenue Viaduct	101 Park Avenue	631
	364 Lexington Avenue	321
Pershing Square Building	101 Park Avenue	631
	364 Lexington Avenue	321
Bowery Savings Bank Building	364 Lexington Avenue	321
Chanin Building	364 Lexington Avenue	321
Chrysler Building	363 Lexington Avenue	324
	622 Third Avenue	511
Socony-Mobil Building	363 Lexington Avenue	324
	622 Third Avenue	511
	630 Third Avenue	258
Jonathan W. Allen Stable	140 East 40th Street	124
	144 East 40th Street	76
Joseph Raphael De Lamar House	67 Park Avenue	164
Middleton S. and Emilie Neilson Burrill House	67 Park Avenue	164
	71 Park Avenue	141
	77 Park Avenue	162
Union League Club	31 East 37th Street	152
	55 Park Avenue	165
Park Avenue Median	622 Third Avenue	511

Conclusion

Five of the prototypical sites would result in an increment of 50 feet or more between the Existing and With-Action conditions—the Manhattan, Long Island City, Jamaica, Downtown Brooklyn and Brownsville sites. Therefore, a preliminary assessment (Tier 1, Tier 2 and Tier 3 assessments) was undertaken. According to the Tier 1 and 2 analyses, there are sunlight-sensitive resources located within the shadow sweep of the Manhattan, Long Island City, Jamaica and Downtown Brooklyn Prototypical Sites. As such, a Tier 3 assessment and a detailed analysis was conducted for these sites. The Tier 3 and detailed analyses indicated that, overall, the shadows generated by the prototypical sites would not have substantial effects on the sunlight-sensitive resources surrounding the sites. However, because the location and height of any future hotels developed outside M1 zones resulting from the proposed action is not known, such effects cannot be ruled out.