# Chapter 4: Shadows

## A. INTRODUCTION

According to the *City Environmental Quality Review (CEQR) Technical Manual*, a proposed action that would result in a new structure at least 50 feet in height requires a shadows assessment. If a proposed structure is adjacent to a park or other shadow-sensitive natural feature, shadows must be considered regardless of its height.

The proposed commercial retail building on the eastern part of the Brooklyn Bay Center site (the "project site") would be approximately 60 feet tall at its eastern end (63.5 feet to the top of the parapet), and approximately 53 feet tall (56.5 feet to the top of the parapet) at other portions (see Figures 1-3a and 1-3b in Chapter 1, "Project Description"). The parking garage on the western part of the site would be up to approximately 30 feet tall (33.5 feet to the top of the parapet). A ring of publicly accessible waterfront open space would be developed around the parking garage and western portions of the commercial retail building. According to CEQR methodology, since the proposed open space doesn't currently exist and wouldn't exist in the future without the proposed project, it cannot be adversely affected by the project. Since the proposed commercial retail building would reach up to approximately 63.5 feet in height, and in addition since the proposed parking garage on the western part of the site would be adjacent to Gravesend Bay, an important natural feature, an assessment of shadows is required.

As in other technical areas of a CEQR environmental assessment, the shadows analysis compares conditions with the proposed actions with conditions that would exist in the 2013 Build year in the future without the proposed project. Absent the proposed actions, it is assumed that the site would continue to be occupied by the existing bus storage facility, and the two small buildings and the at-grade bus parking lot would remain.

### PRINCIPAL CONCLUSIONS

The analysis concludes that the shadow from the proposed commercial retail building would not be long enough to reach the waters of Gravesend Bay, or any other potentially sun-sensitive resources, on any of the four analysis days. Shadows from the approximately 30-foot tall parking garage would not reach the waters of the Bay on the May 6/August 6 analysis day, but would reach the waters at the end of the June 21 analysis day, at the start of the March 21/September 21 analysis day, and in the morning on the December 21 analysis day. The very limited extent and duration of new project-generated shadows would not cause a significant adverse impact on the aquatic biota and habitats of the adjacent waters of Gravesend Bay.

## B. SCREENING ANALYSIS

An analysis was performed to determine whether the shadow cast by the proposed structures would be long enough to reach any nearby sun-sensitive resources at any time of year. According to the *CEQR Technical Manual*, sun-sensitive resources include publicly accessible

open spaces, architectural resources with sunlight-dependent features, and important natural features and scenic landscapes.

Following the guidelines of the *CEQR Technical Manual*, the analysis considered shadows on four representative days of the year: March 21 (equivalent to September 21, the equinoxes); June 21, the summer solstice; May 6 (equivalent to August 6, the midpoints between the equinoxes and summer solstice); and December 21, the winter solstice.

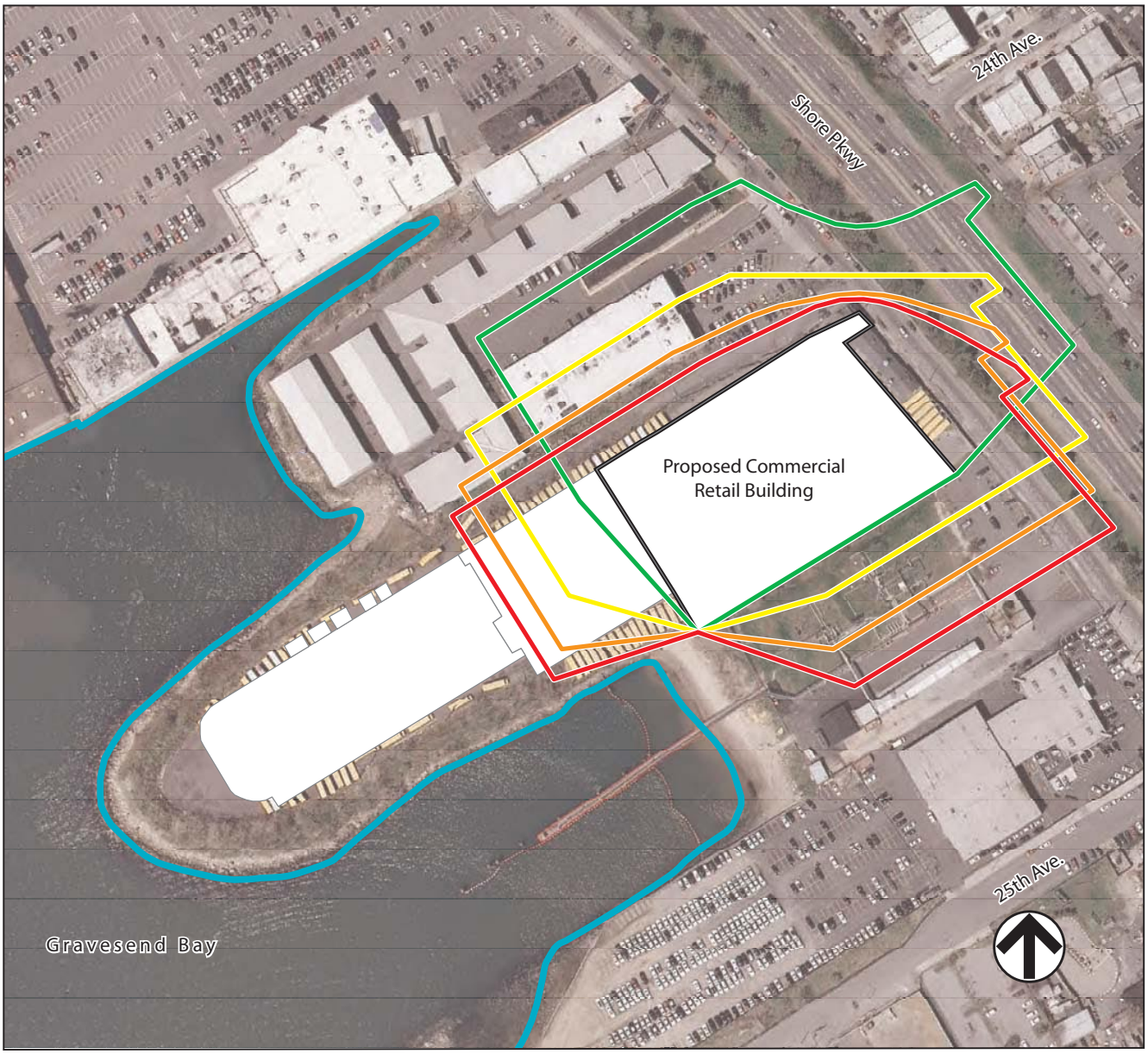
Using the heights and footprints of the proposed building and garage, and the shadow length factors and time of day for each possible shadow angle (from Table 3E-2 of the *CEQR Technical Manual*), the full extent of the area that could be reached by project shadow was calculated for each of the four analysis days and delineated on a map of the area. The screening analysis accounted for existing open spaces, water bodies, and historic resources. These features were also delineated on the map. In addition, since the project site is approximately 13 feet above the water level of the Bay, the analysis added 13 feet to the maximum shadow length where it fell onto the water.

The analysis concluded that the shadow from the proposed commercial retail building would not be long enough to reach the waters of Gravesend Bay, or any other potentially sun-sensitive resources, on any of the four analysis days (see **Figure 4-1**).

Shadows from the parking garage would not reach the waters of the Bay on the May 6/August 6 analysis day and only minimally at the end of the June 21 analysis day, for approximately an hour and 15 minutes, or 5:45 PM to 7:00 PM, southeast of the building (see **Figure 4-2**). On the March 21/September 21 analysis day, a small area of shadow from the garage would reach the water at the start of the analysis day at 8:36 AM and would last for approximately an hour, affecting a very limited area of water at the shoreline northwest of the building (see **Figure 4-2**). On December 21, incremental shadow from the proposed garage would fall on the waters northwest and north of the site for about an hour in the morning (see **Figure 4-2**). Winter shadows are longer, so a slightly larger area would be affected than in March and September, but winter shadows also move more quickly and the duration would be similar.

The very limited extent and duration of new project-generated shadows would not cause a significant adverse impact on the aquatic biota and habitats of the adjacent waters of Gravesend Bay. ✷

12.15.09




Imagery: 2004 NYC Dept. of Information Technology and Telecommunications

0 100 200 FEET
SCALE

*Footprints of proposed buildings*

*Shoreline (Source: NYC Dept. of Information Technology and Telecommunications)*

*Perimeter Showing Longest Possible Shadow from Proposed Commercial Retail Building Over Course of Day*

*December 21*

*March 21 / Sept. 21*

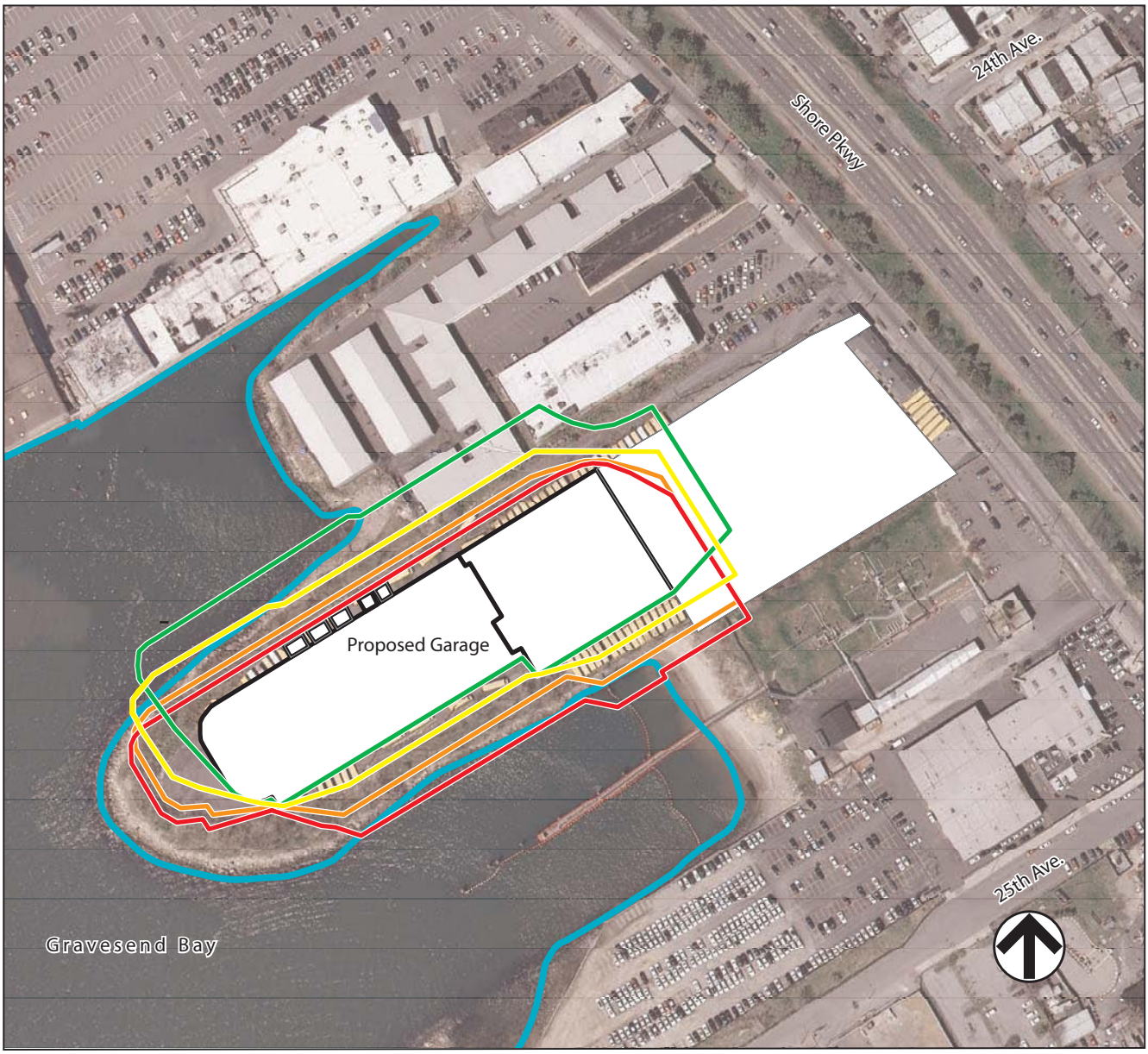
*May 6 / August 6*

*June 21*

**BROOKLYN BAY CENTER**

Daily Shadow Sweeps
**Figure 4-1**

12.15.09




Imagery: 2004 NYC Dept. of Information Technology and Telecommunications

0 100 200 FEET
SCALE

*Footprints of proposed buildings*

*Shoreline (Source: NYC Dept. of Information Technology and Telecommunications)*

*Perimeter Showing Longest Possible Shadow from Proposed Garage Over Course of Day*

*December 21*

*March 21 / Sept. 21*

*May 6 / August 6*

*June 21*

**BROOKLYN BAY CENTER**

Daily Shadow Sweeps
**Figure 4-2**