

A. INTRODUCTION

The proposed project would redevelop the James A. Farley Building and the Western Annex (collectively referred to as the Farley Complex) into a new intermodal transportation facility with private commercial development. It could also include construction of a new building using up to 1 million square feet of zoning floor area from the Farley Complex's unused development rights. As described in Chapter 1, "Project Description," Phase I of the project would involve the development of a new train station and the redevelopment of the Western Annex with commercial space. It is assumed for analysis purposes that there are two development options for Phase II of the proposed project, which would be the utilization of the unused development rights. Under Scenario 1, Phase II would be an 800-foot-tall, approximately 1-million-zoning-square-foot office overbuild constructed on the northern portion of the Western Annex. Under Scenario 2, Phase II would be an approximately up to 720-foot-tall primarily residential or mixed-use building constructed on the Development Transfer Site, which is located on the east side of Eighth Avenue between West 33rd and 34th Streets.

This chapter examines the incremental shadows from each of the two Phase II development options following the guidance of the *City Environmental Quality Review (CEQR) Technical Manual*. The only component of the Phase I development that could potentially cast shadows would be the proposed intermodal hall skylight, a primarily glass structure that would be approximately 150 to 180 feet tall. It is not expected that the transparent structure with steel framing would cast appreciable shadows. Therefore, this analysis does not consider incremental shadows from the Phase I development.

PRINCIPAL CONCLUSIONS

As presented in the shadow diagrams and the detailed discussion in this chapter, neither the shadows cast by the commercial overbuild nor the shadows cast by the Development Transfer Site building are expected to have adverse impacts on any of the open spaces or historic resources with sunlight-dependent features in the surrounding area. The largest incremental shadows cast by the Development Transfer Site building would be on the proposed intermodal hall skylight. Since the skylight would not exist without the project, the shadows on this resource are not considered an adverse impact, in accordance with CEQR methodology. The largest shadows cast by the overbuild would also fall on the proposed intermodal hall skylight. In other instances, incremental shadows from either of the Phase II development options would not meet any of the criteria that would lead to an adverse impact based on shadow coverage and duration.

B. METHODOLOGY

Following the guidelines of the *CEQR Technical Manual*, this analysis focus on uses and users of study area open spaces, landscaping and vegetation, significant natural features, and historic resources with features or details that are sunlight-dependent and make such resources

significant. Since the Farley Complex is a historic resource with sunlight-dependent features—the Eighth Avenue colonnade and steps that are also considered an open space—the analysis of potential shadow impacts considers the steps and colonnade, as well as the proposed skylights over the new intermodal hall and train concourse. The analyses are performed for four representative days of the year: March 21, which is the equivalent of September 21 (the equinoxes); May 6, the equivalent of August 6 (midpoints between the summer solstice and the equinoxes); June 21 (the summer solstice); and December 21 (the winter solstice). Since the CEQR methodology does not consider shadows and incremental increases in shadows within 1½ hours of sunrise or sunset, the analysis period on each analysis day begins 1½ hours after sunrise and ends 1½ hours before sunset.

The *CEQR Technical Manual* identifies the following situations when a proposed action may result in a significant shadow impact:

- 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.

The shadow diagrams and analysis presented in this chapter were developed using building envelope and topographical information derived from Sanborn Fire Insurance Maps and USGS data. Shadows were modeled using the solar rendering capabilities of MicroStation V8 software.

C. SCREENING

A shadow screening was performed to identify open spaces, historic resources with significant sun-sensitive features, and important natural features that could be affected by shadows from structures that would be developed as part of the Farley/Moynihan Project.

To identify resources of concern, the area in which shadows would fall is determined based on the maximum potential length of the shadows and the shadow sweeps. For example, on the December 21 analysis day a building has a maximum shadow length factor equal to 4.3 times its height at the beginning and end of the analysis period when shadows are cast to the northwest and northeast, respectively. Toward midday, as the sun rises in the sky, the shadow length factor is reduced to 2.07 times the height of the building.

The Western Annex overbuild would be approximately 800 feet tall (including mechanical space on the roof). It would have a maximum shadow length of approximately 3,440 feet at the beginning and end of the December 21 analysis period and approximately 1,656 feet at noon. The Development Transfer Site building would be approximately 720 feet tall (including mechanical space on the roof), casting a maximum shadow length of approximately 3,096 feet at the beginning and end of the December 21 analysis period, and approximately 1,490 feet at noon.

Shadow length factors for the remainder of the analysis periods are shorter than they are in December. However, the daylight hours are longer, resulting in longer analysis periods and, therefore, a larger shadow sweep. During the December analysis day, shadows are cast up to 43 degrees east and west of true north, but in June, shadows are cast up to 108 degrees east and

west. Open spaces in the southern portion of this shadow sweep in June would not be in the December shadow sweep. After the shadow sweep for each of the proposed Phase II development scenarios was determined for each analysis day, open spaces and sun-sensitive historic resources within the shadow sweeps were identified. No important natural features were identified in the area of the shadow sweeps.

The open spaces and historic resources with sunlight-dependent features that could potentially be affected by the proposed Phase II development are shown on Figure 7-1 and the results of the screening analysis are presented in Table 7-1. Some resources in the shadow sweeps would not be affected by the shadows of either potential building due to the presence of tall or relatively tall intervening buildings.

Table 7-1
Shadows Screening: Open Spaces/Historic Resources
Within Maximum Shadow Sweep Area

| Map ID | Open Spaces Within Maximum Shadow Sweep Area | Historic Resource or Open Space | Within Shadow Sweep | Fully Shaded by Intervening Buildings | Potentially Affected Resources |
|-----------------------------------------------------------------------------|----------------------------------------------|---------------------------------|---------------------|---------------------------------------|--------------------------------|
| Open Space and Sun-Sensitive Historic Resources Included in Analysis | | | | | |
| 1 | Bob's Park | Open Space | YES | YES | NO |
| 2 | 1 Penn Plaza | Open Space | YES | NO | YES |
| 3 | 2 Penn Plaza | Open Space | YES | YES | NO |
| 4 | Penn Station South Houses | Open Space | YES | YES | NO |
| 5 | Chelsea Park | Open Space | YES | YES | NO |
| 6 | Eastern Caemmerer Yards (Approved) | Open Space | YES | NO | YES |
| 7 | Train Concourse Skylight | Historic Resource | YES | NO | YES |
| 8 | Farley Building Steps | Open Space/Historic Resource | YES | NO | NO |
| 9 | Intermodal Hall Skylight | Historic Resource | YES | NO | YES |
| 10 | West Side Jewish Center | Historic Resource | YES | NO | YES |
| Note: Map reference numbers correspond to Figure 7-1. | | | | | |
| Source: AKRF, Inc., 2004 | | | | | |

D. POTENTIALLY AFFECTED RESOURCES

OPEN SPACES

As shown in Table 7-1, only two of the open spaces within the shadow sweep of the proposed project would be potentially affected by project shadows. Those spaces are described below.

ONE PENN PLAZA

Seating areas are located along West 34th Street north of the One Penn Plaza office building. Along Eighth Avenue there is a plaza with seating and planters located west of the One Penn Plaza building. The plaza located on the south side of the building contains planters that are used as a seating area.

EASTERN CAEMMERER YARD OPEN SPACE

This open space would be built by the 2015 analysis year as part of the Hudson Yards project. It would extend from West 30th to 36th Streets between Tenth and Eleventh Avenues.

HISTORIC RESOURCES

Three historic resources with sun-sensitive features could be potentially affected by project shadows. Those resources are described below.

TRAIN CONCOURSE SKYLIGHT

Under the proposed project, the existing glass skylight over the work room atrium would be either renovated or replaced with a new skylight when the space is transformed into the new station train concourse. The existing skylight is a significant sunlight-dependent feature of this historic resource, and a new skylight, as an approved alteration to a historic resource, would also be a significant sunlight-dependent feature. (Although the Farley Building steps and the Eighth Avenue colonnade are sun-sensitive features of the historic resource—and the steps function as an open space—the screening analysis determined that neither the proposed overbuild nor the Development Transfer Site building would cast incremental shadows on the steps or colonnade. Therefore, there would be no shadow effects on these features from the proposed project.)

INTERMODAL HALL SKYLIGHT

Under the proposed project, the new intermodal hall would be covered by a glass and steel skylight. As an approved alteration to a historic resource, the skylight would be a significant sunlight-dependent feature of the complex.

WEST SIDE JEWISH CENTER

Located on the north side of West 34th Street between Eighth and Ninth Avenues, this State and National Register-eligible building houses an auditorium, a synagogue, classrooms and reading rooms, and a cellar gymnasium. Stained glass is set in the arch in the front of the building—this stained glass window is a sunlight-dependent feature.

E. SHADOW EFFECTS BY SEASON

In its yearly cycle, the height of the sun in the sky and the time and directional location at which it rises and sets varies by season. In the winter, the sun travels in a low arc across the southern sky, rising late in the southeast and setting early in the southwest. Because it is so low in the sky, it casts longer shadows. In the spring and fall, the sun arcs through the sky at a somewhat higher angle, rises earlier in the east, and sets later in the west. In these seasons, shadows are of moderate length. In the summer, the sun arcs through the sky at its highest angle, rising almost directly overhead at noon. For this reason, summer shadows are shortest. However, in the summer the sun rises earliest and sets latest; it also travels farther, from the northeast to the northwest. Thus, the summer sun casts shadows in more directions than in other seasons, and its early sunrise and late sunset creates shadows earlier in the morning and later in the evening than in other seasons.

This section briefly reviews the shadows that would be cast by the two proposed Phase II development options on each analysis day.

WESTERN ANNEX OVERBUILD

The 800-foot-tall commercial overbuild would cast incremental shadows on the proposed intermodal hall skylight, the West Side Jewish Center, and the planned East Caemmerer Yards

open space. It would not cast shadows on the train concourse skylight. Shadow durations for the overbuild are presented in Table 7-2.

**Table 7-2
Phase II Overbuild: Shadow Duration Table**

| Areas | Analysis Period 7:36 AM-4:29 PM March | | Analysis Period 7:27 AM-6:18 PM May | | Analysis Period 6:57 AM-7:01 PM June | | Analysis Period 8:51 AM-2:53 PM December | |
|--------------------------|---------------------------------------------|---------|-------------------------------------------|---------|--------------------------------------------|---------|------------------------------------------------|----------|
| | Enter | Exit | Enter | Exit | Enter | Exit | Enter | Exit |
| Train Concourse Skylight | — | — | — | — | — | — | — | — |
| One Penn Plaza | — | — | — | — | 5:15 PM | 5:45 PM | — | — |
| Intermodal Hall Skylight | 2:15 PM | 4:29 PM | 2:15 PM | 5:00 PM | 2:00 PM | 4:30 PM | — | — |
| West Side Jewish Center | 1:15 PM | 2:30 PM | — | — | — | — | — | — |
| East Caemmerer Yards | 7:36 AM | 8:30 AM | — | — | — | — | 8:45 AM | 10:15 AM |

Note: September 21 is the equivalent of March 21, but one hour later. April 6 is the equivalent of May 6.

MARCH 21/SEPTEMBER 21—ANALYSIS PERIOD: 7:36 AM TO 4:29 PM EST

The Western Annex overbuild would begin to cast shadow on a section of the East Caemmerer Yards open space at the beginning of the analysis period at 7:36 AM, but the shadow would move east (see Figure 7-2) off of the open space within an hour. By 1:15 PM, and lasting just over an hour, the overbuild would cast a small shadow on the West Side Jewish Center (see Figure 7-3). From 2:15 PM until 4:29 PM (near the end of the analysis period) the shadow would fall on the northern edge of the proposed intermodal hall skylight (see Figure 7-4).

MAY 6/AUGUST 6—ANALYSIS PERIOD: 7:27 AM TO 6:18 PM DST

At 2:15 PM the overbuild would begin to cast shadow on the proposed intermodal hall skylight. The shadow would move east (see Figure 7-5) with the northern portion of the proposed skylight remaining partially in shadow until around 5:00 PM.

JUNE 21—ANALYSIS PERIOD: 6:57 AM TO 7:01 PM DST

On June 21 at 2:00 PM, the shadow of the overbuild would begin to fall on the proposed intermodal hall skylight. By 3:00 PM the northern portion of the proposed skylight would be covered by the overbuild shadow (see Figure 7-6). The incremental shadow would last until 4:30 PM. At 5:15 PM, the incremental shadow would be cast on the Eighth Avenue portion of the open space at One Penn Plaza—the duration of the increment would last half an hour.

DECEMBER 21—ANALYSIS PERIOD: 8:51 AM TO 2:53 PM EST

On December 21 the overbuild would cast incremental shadow on a small section of the East Caemmerer Yards open space north of East 35th Street starting at 8:45 AM (see Figure 7-7). By 10:15 AM, the incremental shadow would begin to leave the open space.

DEVELOPMENT TRANSFER SITE BUILDING

The approximately 720-foot tall building constructed on the Development Transfer Site (located on the east side of Eighth Avenue between West 33rd and 34th Streets) would cast incremental shadows on the train concourse skylight, the open space at One Penn Plaza, and the proposed intermodal hall skylight. Shadows durations for the Development Transfer Site building are presented in Table 7-3.

Table 7-3
Phase II Development Transfer Site Building: Shadow Duration Table

| Areas | Analysis Period 7:36 AM-4:29 PM March | | Analysis Period 7:27 AM-6:18 PM May | | Analysis Period 6:57 AM-7:01 PM June | | Analysis Period 8:51 AM-2:53 PM December | |
|--------------------------|---------------------------------------------|---------|-------------------------------------------|---------|--------------------------------------------|---------|------------------------------------------------|------|
| | Enter | Exit | Enter | Exit | Enter | Exit | Enter | Exit |
| Train Concourse Skylight | — | — | 7:27 AM | 8:30 AM | 6:57 AM | 9:00 AM | — | — |
| One Penn Plaza | 1:45 PM | 4:29 PM | 2:15 PM | 5:15 PM | 1:45 PM | 4:45 PM | — | — |
| Intermodal Hall Skylight | — | — | 7:27 AM | 8:30 AM | 6:57 AM | 9:00 AM | — | — |
| West Side Jewish Center | — | — | — | — | — | — | — | — |
| Caemmerer Yards Park | — | — | — | — | — | — | — | — |

Note: September 21 is the equivalent of March 21, but one hour later. April 6 is the equivalent of May 6.

MARCH 21/SEPTEMBER 21—ANALYSIS PERIOD: 7:36 AM TO 4:29 PM EST

The Development Transfer Site building would cast shadow on the West 34th Street plaza at One Penn Plaza from 1:45 PM until the end of the analysis period at 4:29 PM. At 3 PM the incremental shadow would cover the western end of the open space (see Figure 7-8).

MAY 6/AUGUST 6—ANALYSIS PERIOD: 7:27 AM TO 6:18 PM DST

From the beginning of the analysis period (7:27 AM) the Development Transfer Site building would cast an incremental shadow on the proposed intermodal hall skylight and the train concourse skylight (see Figure 7-9). The increment on the train concourse skylight would be small. The shadow would move north and be off of both skylights by 8:30 AM. The proposed building would begin to cast incremental shadow on the West 34th Street end of the One Penn Plaza open space by 2:15 PM. By 4:00 PM the incremental shadow would cover the western portion of the plaza. The incremental shadow would last until 5:15 PM (see Figure 7-10).

JUNE 21—ANALYSIS PERIOD: 6:57 AM TO 7:01 PM DST

On June 21 the Development Transfer Site building would cast an incremental shadow on the train concourse and intermodal hall skylights for two hours from 6:57 AM until 9 AM. At 8:00 AM the shadow would fall on the southern portion of the intermodal hall skylight (see Figure 7-11). From 1:45 PM until 4:45 PM the proposed building would cast a shadow on the West 34th Street end of the open space at One Penn Plaza. At 3:00 PM the shadow would fall on the western edge of the plaza (see Figure 7-12).

DECEMBER 21—ANALYSIS PERIOD: 8:51 AM TO 2:53 PM EST

On December 21 the proposed building would not cast incremental shadows on any of the open spaces or historic resources in the area.

F. SHADOW EFFECTS BY RESOURCE

This section considers the project’s incremental shadows throughout the year by resource, using the impact criteria established in Section C, “Methodology,” above.

EASTERN CAEMMERER YARD OPEN SPACE

On the March/September and December analysis days, the proposed overbuild would cast incremental shadows on a portion of the large open space for a short period in the morning. The duration of the March increment would be less than an hour, and the duration of the December increment would be an hour and a half. Due to the short duration and limited coverage, the shadow increment of the proposed overbuild would not have a significant adverse impact on this open space. The proposed Development Transfer Site building would not cast a shadow increment on the open space.

ONE PENN PLAZA

The proposed overbuild would cast incremental shadow on the plaza along Eighth Avenue for half an hour (5:15 to 5:45 PM) toward the end of the June analysis day. Given the time of the shadow and its short duration, the shadow increment would not be considered a significant adverse impact.

The Development Transfer Site building would replace the Eighth Avenue portion of the plaza. For three hours beginning in the early afternoon, the Development Transfer Site building would cast shadow on the plaza area along West 34th Street on the March/September, May/August, and June analysis days. However, the shadow would only cover a small portion of the western end of the open space. Project shadows would not be cast on the West 33rd Street plaza areas. The proposed building would not increase shadows in the December analysis period.

TRAIN CONCOURSE SKYLIGHT

The Development Transfer Site building would cast shadow on the train concourse skylight for one to two hours in the early morning on the May/August and June analysis days. Given the time of the shadow and its short duration, the shadow increments would not be considered a significant adverse impact.

The Phase II overbuild would not cast any shadow on the train concourse skylight.

INTERMODAL HALL SKYLIGHT

Based on its location just west of the skylight, the proposed overbuild would cast an incremental shadow on the northern portion of the intermodal hall skylight from March through September, with the increment lasting around two and a half hours each day. Conversely, the Development Transfer Site building, located to the east across Eighth Avenue, would cast incremental shadows on the southern end of the skylight from May through August for one to two hours in the early morning. Neither Phase II development option would increase the duration or coverage of shadows on the intermodal hall skylight in the December analysis period.

Farley Post Office/Moynihan Station Redevelopment Project

As an element of the intended reuse of the Farley Complex historic resource, the proposed intermodal hall skylight is considered part of the historic complex. In general, while there are some incremental shadows generated on the proposed skylight, the extent and duration of the shadows would not be considered a significant adverse impact. Moreover, as a sunlight-dependent feature being introduced as part of the proposed project, the potential shadow impact on the proposed skylight created by another element of the project is not considered a significant adverse environmental impact.

WEST SIDE JEWISH CENTER

The proposed overbuild would cast shadow on the stained glass window of the West Side Jewish Center on the March/September analysis day. The duration is short—the overbuild would cast shadow on the stained glass window from 1:15 PM to 2:30 PM. Given the short duration in the afternoon, this shadow increment is not considered a significant adverse impact. *