K. WIND

This section evaluates the effects of the Uptown Mixed Use Project on wind patterns in the Uptown District. Potential wind-related impacts that would result from implementation of the proposed Project are identified, and mitigation measures are recommended, as appropriate. This section is adapted from a Wind Impact Evaluation published on July 7, 2003.[1]

1. Setting

The following section describes the conditions that affect wind in urbanized settings, and existing wind patterns and characteristics in Oakland and the vicinity of the Project site.

a. Building Aerodynamics. Ground-level wind acceleration in urban areas is heavily influenced by building exposure, massing, and orientation. Exposure is a measure of the extent that a building extends above surrounding structures into the wind stream. A building that is surrounded by taller buildings is not likely to substantially accelerate wind speeds at ground level; however, a small building could cause acceleration if it is freestanding and exposed.

Massing, which is the physical bulk of a structure, determines how much wind is intercepted by a given structure and whether building-generated wind accelerations occur above-ground or at ground level. In general, slab-shaped buildings (i.e., buildings with long, flat fronts or sides) have the greatest potential to increase wind acceleration. Buildings with unusual shapes, rounded faces, or substantial set-backs tend to have a lesser effect on wind speed. In general, buildings with more complex massing typically have a smaller effect on ground-level wind acceleration. In addition, buildings with intricate articulation, or buildings that are surrounded by street furniture, large-scale artwork, or landscaping, can reduce overall wind speeds.

Building orientation (i.e., the direction a building faces) determines how much wind a structure intercepts. In general, a building that is oriented with its wide access against the prevailing wind direction will have a greater impact on ground-level winds than a building oriented with its long access parallel to the prevailing wind direction.

b. Wind Characteristics of the Project Site and Alameda/Oakland. The Project site contains a mixture of land uses, including surface parking, multi-story parking structures and one to three-story buildings. Taller buildings surround the Project site on the south and east; building heights to the west and north of the Project site are similar to existing building heights within the Project site.

The former Alameda Naval Air Station, which is located approximately 4 miles southwest of the Project site, provides the closest source of long-term wind data. Wind data collected over the last 23 years show that westerly winds are the most frequent and strongest winds during all seasons. Westerly winds are most common during the spring and summer months when sea breezes predominate. Southeasterly winds, which are the second most common directional winds at the Alameda Naval Air Station, are typically associated with winter storms. While southeasterly winds are not associated with the highest average wind speed, they are likely to produce the *highest* wind speed in a given year.

[1] Ballanti, Donald, 2003. *Wind Impact Evaluation for the Forest City Uptown Mixed-Use Project, Oakland*. July 7.

Calm winds occur approximately 10 percent of the time. The average annual wind speed at Alameda Naval Air Station is approximately 8.6 miles an hour; because downtown Oakland is located inland from the San Francisco Bay shoreline and is protected from Bay winds by structures, average wind speed at the Project site is less than the average wind speed at Alameda Naval Air Station.

2. Impacts and Mitigation Measures

This subsection analyzes impacts related to wind that could result from implementation of the proposed Project. The subsection begins with the criteria of significance, which establish the thresholds for determining whether an impact is significant. The latter part of this subsection presents the impacts associated with the proposed Project.

a. Criteria of Significance. CEQA does not contain specific thresholds of significance for the evaluation of wind-related impacts. In addition, neither the State nor the City of Oakland have established standards or criteria for the evaluation of wind impacts.[2] Based on pedestrian comfort considerations, implementation of the proposed Project would result in a significant wind-related impact if:

- It results in the occurrence at least one time per year of winds greater than 36 miles per hour (mph).

b. Less-than-Significant Wind Impacts. Blocks 1, 2, 4, and 6 would contain a series of five-story buildings which would be approximately 65 feet high. Buildings within these blocks would be arranged around courtyards, which are generally oriented along northwest/southeast axes. No buildings within these blocks would have continuous building faces oriented perpendicular to west and southeast winds. In addition, because buildings on these blocks would be partially sheltered by structures surrounding the Project site, they are not anticipated to generate substantial adverse wind impacts.

Block 3 would contain a 12-story building that would be approximately 156 feet high (an intermediate height in relation to the proposed five-story buildings to the south and west, and the proposed 19-story building to the north). The long axis of the Block 3 building would be aligned with Telegraph Avenue, and would not be exposed to prevailing west or southeasterly winds. Therefore, the proposed Block 3 building is not anticipated to result in significant adverse wind effects. Block 8 or Block 9 is proposed as the relocation site for the Sears Auto Center. The relocated Sears Auto Center would be a one-story building and would not result in adverse wind effects. In addition, the proposed three-story building on Block 7 is similar in height to surrounding buildings and would be immediately adjacent to a 19-story building. Therefore, the proposed Block 3 three-story building is not anticipated to significantly increase wind speeds within or in the vicinity of the Project site.

The proposed courtyards, public park, and north/south streets would be sheltered from prevailing winds by low-rise portions of the Project. Landscaping proposed for these areas would also mitigate the adverse effects of high winds.

c. Significant Wind Impacts. The following discussion describes one significant wind impact associated with the proposed Project:

[2] This criterion of significance is maintained by the City of San Francisco for significant wind impacts, and is similarly appropriate for the City of Oakland.

Impact WIND-1: Construction of 19-story buildings on Blocks 5 and 7 could result in wind speeds of over 36 mph. (S)

The 19-story building proposed for Block 5 would be oriented along a north/northwest, south/southeast alignment. Because the long face of the building would be exposed to prevailing winds, the building could substantially increase wind speeds along San Pablo Avenue and along its north and south side. Similarly, the 19-story building proposed on Block 7 would be oriented along a north/northeast, south/southwest alignment, and would intercept westerly winds. Therefore, the building could substantially increase wind speeds along its west, north, and south sides. Wind speeds could be reduced depending upon building design and associated landscaping.

Implementation of the following two-part mitigation measure would reduce the proposed Project's wind-associated impacts to a less-than-significant level.

Mitigation Measure WIND-1a: The final design of the high-rise buildings on Blocks 5 and 7 shall be in accordance with one or more of the following design guidelines. In addition, as part of the design review process for these high-rise buildings, a qualified wind consultant shall ensure the Project is designed in accordance with these guidelines:

- Align long axis of each building along a northwest-southeast alignment to reduce exposure of the wide faces of the building to westerly or southeasterly winds.
- West or southeasterly building faces shall be articulated and modulated through the use of architectural devices such as surface articulation; variation; variation of planes, wall surfaces, and heights; and the placement of setbacks and other similar features.
- Utilize properly-located landscaping that mitigates high winds. Porous materials (e.g., vegetation, hedges, screens, latticework, perforated metal), which offer superior wind shelter compared to solid surfaces, shall be used.
- Avoid narrow gaps between buildings where westerly or southeasterly winds could be accelerated; or
- Avoid breezeways or notches at the upwind corners of the building.

Mitigation Measure WIND-1b: A qualified wind consultant shall review and evaluate the final design of the high-rise buildings on Blocks 5 and 7, and shall determine whether incorporated design features would reduce wind impacts to a less-than-significant level. If the wind consultant determines that these design features would reduce wind impacts to a less-than-significant level (i.e., less than 36 mph), no further mitigation would be required. If the wind consultant determines that significant adverse wind impacts could occur, models of the proposed Blocks 5 and 7 buildings shall be subject to wind tunnel testing to determine if the buildings would result in uncomfortable or hazardous winds. The wind consultant shall work with the Project architect to develop further building design modifications that would reduce wind impacts to a less-than-significant level (i.e., standard of less than 36 mph). (LTS)