

L. SHADE/SHADOW AND LIGHT/GLARE

This section evaluates the effects of the proposed project on shade and shadow and light and glare in the project area.

1. Setting

There are 17 structures on the project site, the majority of which are one- to three-story buildings, with large building area footprints. The tallest building on the site, at seven stories in height, is the live fire training tower located on the Fire Training Center site. See Section V.A, Land Use, for a detailed description of the project site as well as Section V.L, Visual and Aesthetic Resources. Currently, buildings on the project site do not cast significant shade or shadows onto adjacent or nearby public spaces or properties.

There are a number of trees on the site; however none of these are wide or tall enough to cast significant adverse shade or shadows. There are a number of trees along the eastern project boundary, located on the banks of Los Gatos Creek. The area within the river bank is dense with trees and other vegetation and is heavily shaded.

Lighting in the project area typically comes from street lights and building security lights. The HP Pavilion is the most significant source of light in the vicinity of the site and is well lit at all times. The San Jose Diridon Station and the light rail stations in the area are also provide significant sources of light in the area.

a. Public Open Space. There are seven major open space areas within the Downtown that are particularly sensitive to shade and shadow and light and glare impacts: St. James Park, Guadalupe River Park, Plaza of Palms, Plaza de Cesar Chavez, Paseo de San Antonio, McEnery Park, and Confluence Point at the Arena Green. None of these seven major areas is near enough to the project site that shade and shadow or light and glare cast by the proposed stadium and associated structures could reach them.

Public open spaces within the project vicinity include Los Gatos Creek at the project site's eastern boundary and Diridon Station and the associated Station Green.

b. Sensitive Operations. Nearby operations that are sensitive to light and glare created within San Jose are the Norman Y. Mineta San Jose International Airport and the Lick Observatory. The airport is located approximately 1½ miles northeast of the project site. The airport operates three runways and averages 384 commercial and 156 general aviation departures and landings daily. The Lick Observatory is located at the top of Mount Hamilton in the Diablo Mountain range, approximately 20 miles east of San Jose. The Observatory is a major astronomical research and teaching institution and operates several sensitive telescopes and other instruments for projects ranging from observations of the solar system to distant galaxies.

c. Plans and Policies Framework. Plans and policies from two sources are described below.

(1) San Jose 2020 General Plan Policies. The City's General Plan includes the following policies related to shade/shadow and light glare.

Natural Resources, Natural Communities and Wildlife Habitats

- *Riparian Corridors and Upland Wetlands Policy 4:* New development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise, and toxic substances into the riparian zone.

Services and Facilities

- *Transportation Policy 38:* Development in the vicinity of airports should be regulated in accordance with Federal Aviation Administration guidelines to: avoid reflective surfaces, flashing lights and other potential hazards to air navigation.

(2) Downtown Strategy 2000. The Downtown Strategy 2000 contains the following policies regarding shade and shadow and light and glare impacts from new development:

Urban Design Concepts, Strategies, and Actions by System

- *Policy 2:* Design exterior lighting and building signage with a conscious effort to create the nighttime cityscape of the downtown, in coordination with the Lick Observatory.
- *Policy 4:* Structures should be oriented such that urban open spaces, such as Plaza de Cesar Chavez, Circle of Palms, Reparatory Plaza, and St. James Park receive adequate direct sun and filtered daylight and are protected from building glare, excessive shade, and wind.
- *Policy 5:* Exterior building materials should be chosen with consideration of their glare-causing potential not only at the street level but also from the view of other neighboring structures.

Design Guidelines

- *Building Character:* Lighting of building exteriors shall highlight facades and noteworthy features, but adjacent areas that are sensitive to nighttime lighting (e.g. the San Jose International Airport and Lick Observatory) shall be considered and respected.

2. Impacts and Mitigation Measures

Implementation of the proposed project could create shade and shadow and light and glare impacts to nearby public or private open space and major light sensitive operations in the area.

a. Shade/Shadow Impacts and Mitigation Measures. Implementation of the proposed project has the potential to create shade and shadow impacts onto nearby public or private open space between September and March.

Shade and shadow impacts occur when a structure's height or its width (or a combination of the two) reduces the access to sunlight enjoyed by another property. It should be remembered that in a built urban environment like a downtown, nearly all structures create for others and, in turn, are subject to, shade and shadows. During the summer months in San Jose when mid-day temperatures rise into the mid-90 degrees and higher levels, shading may even be desirable. In fact, the design of early buildings in San Jose provided for shade in the front of buildings during the warmest times of the year.

The City of San Jose generally identifies significant shade and shadow impacts as occurring when a building or other structure substantially reduces natural sunlight on public open spaces, measured on the spring and fall equinox, when day and night are approximately equal in length (March 21st and September 21st); the winter solstice when the sun is lowest in the sky (December 21st); and the summer solstice when the sun is at its highest point in the sky (June 21st). A series of shadow simulation studies was prepared for the proposed project.¹ Simulations assume a maximum building height for

¹ Environmental Vision, Emeryville, California, 2005.

the proposed stadium at 165 feet and a maximum height of 200 feet for the future development site located on the existing Fire Training site (although the maximum height at this location would not likely exceed the maximum proposed height of the parking garage structure, at 80 feet in height). The project boundary illustrated in the shadow simulations shows maximum building footprint boundaries with 10 foot setbacks from the street to allow for minimal sidewalk width. Simulations also assume a building footprint within no less than 120 feet from the top of the Los Gatos Creek bank.² Light standards and scoreboards were not included in the simulations as their flat/narrow design would cast minimal shadow relative to the stadium and parking garage.

Shadow pattern simulations were prepared for the proposed project on the following dates: March 21, June 21, September 21, and December 21. Shadow patterns were calculated and illustrated using software designed for this purpose for three times of day for each of the days: 9:00 a.m., 12:00 p.m. (noon), and 3:00 p.m. The resulting simulations are provided at the end of this section in Figures V.L-1 through V.L-4.

b. Light/Glare Impacts and Mitigation Measures. Implementation of the proposed project has the potential to create light and glare impacts from field and scoreboard lighting to nearby land uses during nighttime ball games and other events. The three forms of unwanted light include:

- *Spill light* – light which is emitted from the facility which falls outside its boundaries;
- *Obtrusive light* – spill light which is annoying, discomforting or distracting to nearby land uses, including airport flights; and
- *Glare* – light that is discomforting or impairs the vision of those who experience it.

Spill light can be accurately calculated and the effects of spill light can also be measured. Glare created by sports-oriented lighting systems can also be measured for one's visual impairment. However, the effects of obtrusive light are more difficult to quantify as individuals have a range of reactions to perceived effects of lighting in the environment.

Light is measured in foot candles, which indicate the amount of luminance falling onto a surface. Table V.L-1 shows typical light levels expressed in foot candles. The view of a sports lighting bank against a black sky is measured differently than against normal city lights. The further from the stadium the viewer is, and the more general city lights there are in the normal view along with the stadium lights, the less glare the viewer would experience.³

Table V.L-1: Typical Light Levels

Source of Light	Foot-Candles
Bright and sunny day	3,000
Professional baseball-field lighting	300
Office	50 to 75
Residential lighting at night	7 to 10
Main road junction street lighting	2.5 to 3
Bright moonlight	0.1

Source: San Francisco Giants Ballpark Draft EIR, 1997.

c. Criteria of Significance. Implementation of the proposed project would have a significant shade and shadow impact if it would:

² This conservatively assumes a 50 foot setback from the top of the Los Gatos Creek bank and a 70-foot right-of-way for the realignment of S. Autumn Street.

³ San Francisco, City and County of, 1997. *San Francisco Giants Ballpark at China Basin Draft Environmental Impact Report, Volume I*. March 14.

- Result in a 10 percent or greater increase in the shadow cast onto a major open space area in the Downtown San Jose area (St. James Park, Guadalupe River Park, Plaza of Palms, Plaza de Cesar Chavez, Paseo de San Antonio, McEnery Park, and Confluence Point at the Arena Green); or
- Substantially shadow other public open space (beyond the seven major open space areas) but excluding streets and sidewalks or private open space between September and March.

Implementation of the proposed project would have a significant light and glare impact if it would:

- Produce substantial light or glare such that it poses a hazard or nuisance; or
- Create a new source of substantial light or glare which would adversely affect day or night time views in the area.

d. Less-than-Significant Shade and Shadow Impacts. Implementation of the proposed project would lead to less-than-significant impacts as described below.

The maximum height of the proposed stadium would be 165 feet and the maximum height of the proposed parking structure would be 80 feet. The proposed project site is situated at the western edge of the Downtown area and is more than a ¼-mile away from the nearest major open space areas (Confluence Point at the Arena Green to the north, and McEnery Park to the east). None of the seven major areas is near enough to the project site that shade and shadow cast by the proposed stadium and associated structures could reach them. As such, the proposed project would have less-than-significant shade and shadow impacts on major open space areas.

Reach 5 of the Los Gatos Creek Trail to be located within the 50 foot setback from the Los Gatos Creek top of bank as it parallels the project site is currently in the early planning stages. This trail would be subject to afternoon shading from the proposed project; however this corridor is currently shaded by vegetation along the creek and is in a built environment where existing structures also shade the corridor.

A new public park, Cahill Park, is also located approximately 0.1 miles west of the project site at the intersection of Laurel Grove Way and West San Fernando Street. The park would not experience any increase in shading due to the proposed project.

Los Gatos Creek would be subject to shadows cast by the proposed project during the winter afternoon hours, as shown in Figures V.L-1c and V.L-4c at the end of this section. The most significant shading would occur in the afternoon hours of December 21. However, the creek corridor is already heavily shaded and increased shading of the creek would be a less-than-significant impact. The potential for late afternoon winter shade to result in adverse effects to biological resources along the creek corridor is described in Section V.F, Biological Resources.

In addition, there would be no significant impacts to any open space areas from project shadows during the noon hour throughout the year, as shown in Figures V.L-1b, 2b, 3b, and 4b.

e. Significant Shade and Shadow Impacts. Implementation of the proposed project would lead to a single significant shade and shadow impact, as described below.

The San Jose Diridon Station would be subject to shadows cast by the proposed project during the morning hours throughout most of the year (except in the summer months), as shown in Figures V.L-1a, V.L-1b, V.L-3a, V.L-3b, V.L-4a, and V.L-4b. This would result in the alteration of the character of the station's setting and the experience of pedestrians using the station, especially during the morning commute hours.

Impact SHADE-1: Throughout most of the year in the morning hours, the proposed project would increase the shade and shadow cast on the historic San Jose Diridon Station. (S)

Implementation of Mitigation Measure CULT-2a and CULT-2b would somewhat reduce this impact. However, shadows cast over the station, particularly those that would occur during winter mornings (as exemplified by the shadow simulation for December 21), would remain a significant impact. (SU)

f. Less-than-Significant Light and Glare Impacts. Implementation of the proposed project would lead to less-than-significant light and glare impacts as described below.

The baseball stadium's playing field would be illuminated with eight lighting structures, four in the outfield and four in the infield. These lighting structures would reach 235 feet above the finished grade. Two main scoreboards and several auxiliary boards would reach a maximum height of 200 feet above the finished grade.

These lighting and scoreboard structures would substantially increase light intensities in the project area during the approximately 40 nighttime baseball games per year. Additional events occurring at night throughout the year would also increase the lighting intensity in the area, although not to the extent that baseball uses would, as these events are unlikely to utilize the full capacity of the lighting and scoreboard systems. Lighting associated with baseball games could reach approximately 300 foot-candles, which is considerably higher than existing lighting produced by surrounding land uses.

Los Gatos Creek and the planned Reach 5 of the Los Gatos Creek Trail would be subject to increased lighting during nighttime events. However, as discussed in Section V.F, Biological Resources, of this EIR, increased nighttime lighting cast onto the creek would be a less-than-significant impact. The Los Gatos Creek Trail is part of an urban environment and would also be subject to other sources of light, such as street lighting. Increased lighting from the proposed stadium cast onto the trail would also be a less than significant impact.

Stadium lighting and scoreboard structures would be visible from many miles away. However, at these distances, stadium lighting would blend within the City skyline. Stadium lighting would also be visible from adjacent scenic Urban Throughways such as SR-87 and I-280. (See Section V.K.1.d.(5), Visual and Aesthetic Resources, for a detailed discussion of Urban Throughways.) These throughways are considered to be scenic primarily because they afford unique day and nighttime views of the Downtown skyline within the project vicinity. At night, the skyline is filled with light from high-rise office buildings located in the Downtown business district, which contributes to the urban character of the city. The proposed stadium, and associated lighting would enhance these urban views and would therefore have a less than significant impact on nighttime views in the area.

If the existing substation were to be relocated to the southern portion of the site, it would introduce a new source of light to the area. However, substation security lighting would be appropriately screened to minimize light and glare in the area. This would be a less than significant impact.

g. Significant Light and Glare Impacts. Implementation of the proposed project could lead to significant light and glare impacts to existing land uses and area operations which are sensitive to light as described below.

Impact SHADE-2: Obtrusive light and glare resulting from nighttime operation of the proposed stadium could present a nuisance to surrounding land uses, specifically nearby residences and the Lick Observatory. (S)

Residential areas exist east and west of the proposed stadium site. These are considered to be the most sensitive receptors for light-producing activities. Although the illumination emitted from the stadium would be seen largely at the source (resulting in a low level of spill light), the contrast between stadium lighting and ambient lighting could be considered obtrusive. Residents in the project vicinity may experience annoyance from lighting effects during nighttime games and events. This would be a localized, temporary, and intermittent effect during the approximately 40 night games per season and to a lesser extent, the approximately 15 to 20 additional events which may occur during the evening hours throughout the year.

In addition, research at the Lick Observatory is dependant upon having a clear night sky unobstructed by city lights. The City currently works with the Observatory to lessen the impacts of urban nighttime lighting, however illumination associated with the proposed stadium could significantly affect the operation of sensitive instruments at the Observatory. Implementation of the mitigation measure discussed below would reduce these impacts, but not to a less-than-significant level.

Mitigation Measure SHADE-2a: The proposed project shall incorporate lighting controls at the proposed stadium to reduce the potential nuisance associated with obtrusive light and glare resulting from nighttime stadium operation. Lighting banks shall be placed and designed to minimize obtrusive spill light and glare as much as possible (e.g. shielding at the source) and shall be directed towards the playing field and away from the sky.

Mitigation Measure SHADE-2b: After nighttime events, when nighttime stadium cleanup is necessary, the field lights shall be reduced to one-third of their standard intensity and shall remain on no more than one hour after the event to provide lighting for cleanup activities. (SU)

Impact SHADE-3: Light and glare associated with the proposed scoreboards and lighting structures and fireworks displays could interfere with the safe operation of the San Jose International Airport during nighttime events. (S)

As discussed in Section V.A, Land Use, of this EIR, a Determination of No Hazard from the FAA would be required for the proposed project prior to development approval. In addition, implementation of Mitigation Measure LU-1 requires FAA consultation (if required by FAA) for the coordination of fireworks displays. Implementation of this mitigation measure, as well as Mitigation Measures SHADE-2a and SHADE-2b, discussed above, would reduce this significant impact to a less-than-significant level. (LTS)

Figure V.L-1a: Project Shadow Pattern – March 21: 9:00 AM

8x11 B&W

Figure V.L-1b: Project Shadow Pattern – March 21: 12:00 PM

8x11 B&W

Figure V.L-1c: Project Shadow Pattern – March 21: 3:00 PM

8x11 B&W

Figure V.L-2a: Project Shadow Pattern – June 21: 9:00 AM

8x11 B&W

Figure V.L-2b: Project Shadow Pattern – June 21: 12:00 PM

8x11 B&W

Figure V.L-2c: Project Shadow Pattern – June 21: 3:00 PM

8x11 B&W

Figure V.L-3a: Project Shadow Pattern – September 21: 9:00 AM

8x11 B&W

Figure V.L-3b: Project Shadow Pattern – September 21: 12:00 PM

8x11 B&W

Figure V.L-3c: Project Shadow Pattern – September 21: 3:00 PM

8x11 B&W

Figure V.L-4a: Project Shadow Pattern – December 21: 9:00 AM

8x11 B&W

Figure V.L-4b: Project Shadow Pattern – December 21: 12:00 PM

8x11 B&W

Figure V.L-4c: Project Shadow Pattern – December 21: 3:00 PM

8x11 B&W