

IV.H Shadow

IV.H.1 Introduction

This section describes the Central SoMa Plan's potential shadow effects on publicly accessible areas, including public parks, publicly accessible private open spaces, and sidewalks. The Plan's proposed changes to height and bulk districts can be expected to result in taller, more massive buildings within portions of the Plan Area, which would cast longer shadows than the area's current predominantly low-rise and mid-rise buildings. The analysis describes the physical impacts of new shadow, qualitatively assesses the potential shadow impact on the use of affected open spaces, and also discusses *Planning Code* Section 295, which protects certain public open spaces under the jurisdiction of the Recreation and Parks Commission from shadowing by new structures greater than 40 feet tall. (The requirements of Section 295 are fully discussed in Section IV.H.3, Regulatory Framework.)

The Setting identifies the parks and open spaces in and immediately adjacent to the Plan Area; describes their particular features and the types of activities that commonly occur there; and presents an assessment of existing sunlight access and shading on these spaces, taking into account the shadows' duration, the time of day and seasons of the year that shadows presently affect local open spaces. The Impacts and Mitigation section sets forth the criteria used to evaluate the significance of impacts related to new shadow on parks and open spaces and then analyzes how altering permitted height and bulk districts in conjunction with amending the *General Plan's* height maps as part of adopting the Plan could result in a skyline taller than currently allowed, which could increase shadow impacts. This EIR analyzes the change in shadow on area parks and open spaces under Plan conditions and considers how shadows would affect the use of these spaces and whether effects may be detrimental to the uses or activities that occur there.

IV.H.2 Environmental Setting

The only park in the Plan Area under jurisdiction of the San Francisco Recreation and Parks Department is South Park. Nearby parks that could be affected include Victoria Manalo Draves Park, Gene Friend Recreation Center, and Howard-Langton Mini Park. Union Square, Boeddeker Park and Civic Center Plaza are all located well outside the Plan Area to the north or northwest and would not be affected by the Plan's proposed rezoning and are not discussed further.

Also within the Plan Area is Alice Street Community Gardens, an open space area that is not under the jurisdiction of the Recreation and Parks Department. Other publicly accessible spaces in proximity to the Plan Area include Yerba Buena Gardens, Jessie Square, Yerba Buena Lane, Mint Plaza, and a variety of smaller publicly accessible privately owned open spaces that have been developed as accessory spaces in connection with office complexes and commercial buildings in the South of Market (SoMa) area and the Financial District.

Like the SoMa neighborhood in general, the Plan Area has limited public open space. Yerba Buena Gardens, including its Children's Garden and carousel, is the area's largest open space, occupying large portions of the blocks bounded by Mission, Third, Folsom, and Fourth Streets. South Park, in the block bounded by Bryant, Second, Brannan, and Third Streets, is the only Recreation and Park Department property in the Plan Area,

although Victoria Manalo Draves Park and Gene Friend Recreation Center are about a half a block west of the Plan Area's boundary, located in the middle of the block between Columbia Square and Sherman Street. To the northwest of Victoria Manalo Draves Park at Langton and Seventh Streets, is the Howard-Langton Mini Park.

Jessie Square and Yerba Buena Lane are two connected, mostly hardscaped, plazas and linear spaces on the block bounded by Market, Third, Mission, and Fourth Streets. Alice Street Community Gardens provides, as its name implies, community garden plots on the block bounded by Folsom, Third, Harrison, and Fourth Streets. Mint Plaza, the former Jessie Street right-of-way off of Fifth Street between Market and Mission Streets (still publicly owned but privately maintained) is a pedestrian plaza in conjunction with private redevelopment of several adjacent buildings.

There are no privately owned, publicly accessible open spaces ("POPOS") located in the Plan Area. However, several POPOS are located just outside the Plan Area and may be shaded by Plan Area buildings. These POPOS were developed in conjunction with office buildings, many of which were created in accordance with Downtown Plan and *Planning Code* provisions to provide some publicly accessible space as part of private developments. The size, features, and intensity of their use vary. POPOS just outside the Plan Area include a brick plaza at 611 Folsom Street at Second Street, in front of an AT&T facility; elevated plazas at two locations in the Intercontinental Hotel at Fifth and Howard Streets; A 235 Second Street (plaza); 299 Second Street (Marriott Courtyard; two plazas); and 303 Second Street (plaza).

The 2014 update of the *General Plan* Recreation and Open Space Element (ROSE) identifies portions of the Plan Area as in need of new open space. The East SoMa Area Plan identifies Fourth Street between I-80 and Townsend Street and the area bounded by Howard, Fourth, Folsom and Fifth Streets as areas where new open spaces should be acquired and developed. The ROSE and *Better Streets Plan* envision the eventual greening of SoMa streets and alleys to extend ecological function and link neighborhoods to open space.

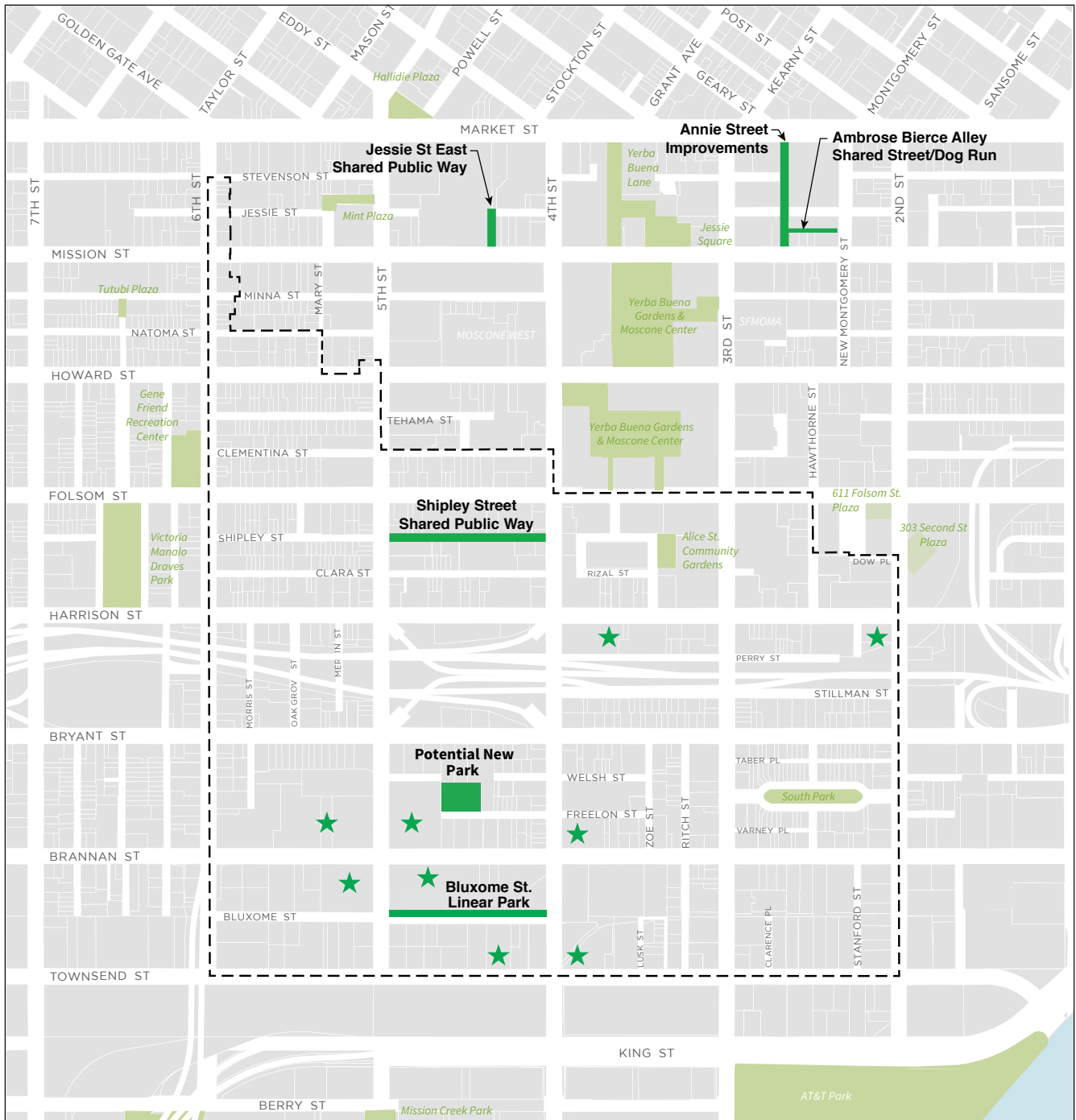
Figure IV.H-1, Open Spaces in and near Plan Area, depicts the city parks, publicly accessible open spaces, and POPOS in and near the Plan Area described above.

Existing Open Spaces In and Near the Plan Area

Recreation and Park Department Properties Subject to Planning Code Section 295

South Park

South Park is an oval-shaped park aligned east-west in the center of the block bounded by Bryant, Second, Brannan, and Third Streets. The park is ringed by a street, also called South Park, which connects to both Second and Third Streets; there is also intersection vehicular and pedestrian access to Bryant Street and Brannan Street via Jack London Alley. Originally established in the 1850s as a private amenity for San Francisco's first enclave of wealthy residents, the City acquired the 0.85-acre green space at the turn of the 20th century and converted it to a public park. The tree-lined oval includes two small children's play areas roughly in the center of the park, with swings, climbing structures, and a slide, as well as paved walking paths, benches and picnic tables at the east and west ends of the park, and grassy areas (lawns) occupying the remainder of the oval.



Existing Parks, Recreation Centers, Plazas, and Privately Owned Publicly-Accessible Open Spaces (POPOS)

Potential Parks

Central SoMa Plan Area

Potential development sites containing POPOS

SOURCE: San Francisco Planning Department

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-1
Open Spaces In and Near Plan Area

Solar Access and Shading

Prevailing building heights around South Park range from 20 feet to 40 feet, which create a varied pattern of two, three and four-story buildings that are built to their lot lines and encircle the park. Street trees along public sidewalks and vegetation within the park create a backdrop of greenery that contrasts with and provides relief to the built environment; vegetation and open space in the block's center contribute to the park's character of an outdoor room. The 40-foot height limit immediately surrounding South Park modulates building heights to avoid substantial shading of the park. Building heights on lots fronting on Bryant Street to the north and on Brannan Street to the south may be developed to a height of 45 feet. On east-west block faces, along Second and Third Streets respectively, allowable building heights are up to 65 feet.

South Park is currently in full sunshine between about 10:00 a.m. and 5:00 p.m. during most of the year. In between late fall and early winter, small amounts of shadow linger around the southern and western edges of the park throughout the day, but most of the park is in sunshine by 11:00 a.m. and remains so until about one hour before sunset.³³¹ Existing shadow is largely cast by buildings immediately surrounding the park with a small amount of new shadow between early November and mid-February cast by a newly built 65-foot-tall office building about 160 feet due south of the park at 345 Brannan Street. Observation indicates that South Park is most heavily used during the mid-day period by employees of nearby businesses who eat lunch in the park. In the afternoons and evenings, particularly on warm days, the park accommodates moderate levels of passive recreational use (reading, walking, sitting); park use is lightest during morning hours.

Victoria Manalo Draves Park

Victoria Manalo Draves Park is located in the middle third of a block bounded by Folsom and Harrison Streets to the north and south, respectively, and the smaller streets of Columbia Square and Sherman Street that form the park's east and west edges, respectively, within the block's interior. The park is located about a third of a block, or roughly 350 feet, to the west of the Plan Area within the Western SoMa Plan area. Victoria Manalo Draves is a two-acre neighborhood park featuring active amenity areas such as a baseball/softball diamond, basketball court, and children's playground, as well as more passive spaces such as a picnic area, a grassy knoll surrounded by benches, other grassy areas adjacent to the basketball court and surrounding the knoll, and a community garden. Across the street from the park to its west is the Bessie Carmichael Elementary School and Filipino Education Center. Victoria Manalo Draves Park is the only full-service park (i.e., with multiple uses such as playing fields/courts, playground, picnic and open areas, and community garden) in the SoMa neighborhood.

³³¹ The Planning Department commonly relies upon the hours governed by *Planning Code* Section 295—from one hour after sunrise to one hour before sunset—in environmental review, separate from Section 295 review, of potential shadow impacts of a project. This is because, during the first hour after sunrise and the last hour before sunset, shadows are very long due to the sun's low position near the horizon, meaning that most of the City is shaded at these times: for example, shadow from a single-story, 20-foot-tall building reaches a length of 250 feet 30 minutes after sunrise on June 21. Moreover, in the first and last hours of sunlight, these very lengthy shadows move more quickly across the ground than do shadows at other times of day. When evaluating the potential for a development to shade a particular open space during the hours subject to *Planning Code* Section 295, one may initially rule out any location that is more distant than 6.5 times the building height, which is the maximum length of any shadow during the Section 295 period, based on the lowest sun angle (at the winter solstice) at one hour after sunrise and one hour before sunset.

Solar Access and Shading

Buildings surrounding Victoria Manalo Draves Park range from one to four stories in height, or about 15 feet to 50 feet. Existing height limits surrounding the park are 45 feet along interior lots fronting Columbia Square and Sherman Streets. On the block's northern and southern frontages, height limits are 65-feet. The 65-foot height district extends across Folsom Street to the north; to the south across Harrison Street, heights are limited to 30 feet along the portion of the block traversed by the elevated I-80 freeway. South of the freeway, where currently the Hall of Justice is situated, buildings are permitted to a height of 105 feet.

Victoria Manalo Draves Park is in full sunshine during much of the day year-round. Around the winter solstice on December 21, the existing Hall of Justice shades the southern portion of the park at about 8:20 a.m., one hour after sunrise, but the park is in full sun by 9:00 a.m. Shadows advance toward the park's western edge by 1:00 p.m. and cover about half of the park by about 3:55 p.m., one hour before sunset. At the spring and fall equinoxes (around March 21 and September 21, respectively), the park is in full sun between about 9:00 a.m. and 4:00 p.m., after which shadows begin to encroach upon the park's western edge. By 6:10 p.m., one hour before sunset, shadows cover about one-third of the park. On the summer solstice (around June 21) at about 6:45 a.m., one hour after sunrise, about three-quarters of the park is covered in shade, but is in full sunshine between about 9:00 a.m. and 6:00 p.m. At about 7:35 p.m., one hour before sunset, shadows cover less than 25 percent of the park. Other than the Hall of Justice, shadow is cast on Victoria Manalo Draves Park by buildings immediately surrounding the park, including Bessie Carmichael Elementary School on Seventh Street. Observation indicates that the athletic facilities at Victoria Manalo Draves Park are fairly heavily used, particularly in the afternoons and evenings and on weekends. Midday use of the park on weekdays is quite heavy, and includes people eating lunch and relaxing on park benches. Dog walking and children using the playground are also common activities.

Gene Friend Recreation Center

Gene Friend Recreation Center is located on a 1-acre parcel at the northwest corner of Sixth and Folsom Streets, a block outside of the Central SoMa Plan Area, within the Western SoMa. The facility provides indoor and outdoor recreational areas. Indoor facilities include a gymnasium, activity room, weight room, and auditorium. Outdoor active spaces include basketball courts, a playground with sand pit, and open grass areas for passive recreation. The outdoor area is fenced and gated, and is only accessible at the times that the Center is open, currently from 9:00 a.m. to 9:00 p.m.

Solar Access and Shading

Height limits surrounding the park range from 45 feet and 65 feet to the north and west and may be permitted up to 85 feet to the east, across Sixth Street, and to the south, across Harrison Street. Surrounding buildings are typically two to four stories (about 25 feet to 50 feet) in height. Most of the use of Gene Friend Recreation Center occurs within the indoor facility, so shadow effects are not relevant there. Beginning at about 8:20 a.m. on the winter solstice, buildings south of Folsom Street shade the Center's outdoor recreation spaces until about 9:30 a.m. when most shadow recedes. Buildings to the west across Harriet Street shade the space beginning about 1:00 p.m. on the winter solstice. On late afternoon winter days, the outdoor area is fully shaded by about 3:55 p.m. On the spring and fall equinoxes, the outdoor area is partially shaded by the recreation center building in the very early morning but is in full sun by 9:00 a.m. and remains so until about 4:00 p.m., when the buildings on Harriett Street begin to shade the western edge of the outdoor area. Over the next two hours, shadows

gradually cover the space until it is fully shaded by 6:00 p.m. On the summer solstice, the outdoor recreation area is partially shaded by the recreation center building in the very early morning but is in full sun by 9:00 a.m. and remains so until about 6:00 p.m. The outdoor area is about three-fourths shaded through about 7:35 p.m. around sunset. Observation suggests that use of the outdoor area is not typically heavy, except on warm days, when people use the center for passive recreation, where they rest and relax in park-like space.

Howard-Langton Mini Park Community Garden

The Howard-Langton Mini Park Community Garden is located at Howard and Langton Streets, on a 0.22-acre (9,374-square-foot) lot on the south side of Howard Street between Seventh and Eighth Streets, about 1,200 feet west along Howard Street from the Plan Area. This park includes a community garden with benches and tables and is bordered by a slatted metal fence that limits public access to persons with plots for gardening during specified daylight hours. The park is one of about three dozen community gardens on City property, including the Alice Street Community Gardens in the Plan Area, where members grow produce and ornamental plants for personal use. The Howard-Langton Mini Park has 60 garden plots, all of which are assigned. The Park also has a substantial number of people on a waiting list for plots.

Solar Access and Shading

Prevailing buildings around the park are two to three stories (about 20 feet to 35 feet in height) and are within legislated districts that permit heights up to 55 feet.

Howard-Langton Mini Park Community Garden is partially shaded throughout the day on the winter solstice by buildings to its south and east; maximum solar access during winter occurs around 11:00 a.m., when nearly half of the park is in sun. On the spring and fall equinoxes, the park is in near full sunshine between about 12:00 noon and 2:00 p.m.; before noon, the building to the south casts partial shadow, while after 2:00 p.m., the building to the west partially shades the park. On the summer solstice, the park is fully shaded at the first Section 295 minute (about 6:45 a.m.) and shading recedes until the gardens are in near full sun from about 11:00 a.m. until almost 4:00 p.m. By the last Section 295 minute (at about 7:35 p.m. in the summertime), the gardens are nearly fully shaded.

Other Open Spaces

Alice Street Community Gardens

The Alice Street Community Gardens were developed in the 1980s as part of the Yerba Buena Center Redevelopment Project in response to input from neighborhood residents. The gardens occupy about one-third of an acre on Lapu Lapu Street, on the block bounded by Folsom, Third, Harrison, and Fourth Streets, in the north-central portion of the Plan Area. The gardens comprise raised beds that are tended by residents of mid-rise towers that make up a number of nearby senior housing developments.

Solar Access and Shading

On the winter solstice, the Alice Street Community Gardens receive substantial sunlight between about 12:00 noon and 3:00 p.m. Buildings to the south largely shade the gardens in the morning, while buildings to the west shade them later in the afternoon. On the spring and fall equinoxes, the gardens are largely in sunlight between about 1:00 p.m. and 4:00 p.m., while surrounding buildings cast at least partial shadow in

the morning and later in the afternoon. On the summer solstice, the Alice Street Community Gardens are largely in sunlight from about 10:00 a.m. to 5:30 p.m., while surrounding buildings cast partial shadow earlier and later. Unlike many community gardens, the Alice Street Community Gardens are publicly accessible.

Yerba Buena Gardens

Yerba Buena Gardens was developed in the 1990s as part of the Yerba Buena Center Redevelopment Project. It sits atop the subterranean portions of the Moscone Convention Center, occupying much of the two blocks bounded by Mission, Third, Folsom, and Fourth Streets, just north of the Plan Area. The Esplanade comprises the majority of the northern portion of these two blocks, atop Moscone Center North. The approximately 189,000-square-foot Esplanade is bordered to the north by Mission Street, to the east by the Yerba Buena Center for the Arts gallery and theater space, to the south by Howard Street and the restaurants atop the Moscone North lobby, and to the west by the Metreon, a four-story building containing entertainment/retail space, including a Target store, a movie theater, and a food court. The Esplanade includes benches, berms/terraces, the Martin Luther King, Jr., Memorial Fountain and Waterfall, pedestrian walkways, and public art. The center of the Esplanade comprises a large open grass area surrounded by smaller gardens. Also on this northern block are the East Garden, a 22,500-square-foot paved plaza on Third Street with seating areas, a sculpture, landscaped vegetation, and a water feature, and the Howard Street Plaza, an 8,200-square-foot paved plaza along Howard Street. This plaza serves as the southern entrance to the Yerba Buena Center for the Arts Novellus Theater and includes a staircase, pedestrian ramp, landscaped open space and planter boxes. A bike-sharing station and benches are located at the plaza's southeastern corner.

The southerly of the two Yerba Buena Gardens blocks contains the Children's Garden, which sits atop Moscone Center South. The irregularly shaped area is bordered to the north by Howard Street and the Moscone South lobby building; to the east by the Esplanade Building; to the south by an indoor ice rink; and to the west by the Children's Creativity Museum, the Bowling Center, the Child Development Center, and Fourth Street. The open space includes a Learning Garden, a maze, a circular lawn, a play circle with playground (open daily from 7:00 a.m. to 7:00 p.m.), a nature walk lined with plum trees, and an amphitheater. It also includes a historic carousel near the corner of Fourth and Howard Streets.

During spring, summer, and autumn months, Yerba Buena Gardens hosts musical, dance, poetry, acrobatic, and other performance events.³³²

Solar Access and Shading

Existing shadow is cast on Yerba Buena Gardens by buildings of Moscone Center North and South and by buildings surrounding the two blocks of open space, including Moscone Center West at Fourth and Howard Streets. On the northern block, the Esplanade is generally sunny during the day throughout the year, with shade present mainly in the early morning and in the late afternoon hours. The East Garden is generally partially sunny during the day throughout the year under existing conditions. Shade from surrounding buildings is present until mid-morning and returns in mid-afternoon. During the late fall and early winter months, about half of the East Garden is always shaded: there is midday sun, but the location of sunlight varies as shadows move across the plaza. The Howard Street Plaza is sunny during much of the day

³³² Yerba Buena Gardens Festival, "About" website. Available at <http://www.ybgfestival.org>, accessed June 29, 2016.

throughout the year, with shade present mainly in the early morning and in the late afternoon. Based on observation, the Esplanade does not appear to be heavily used in the mornings, but is well-used during the noon hour and afternoons, particularly on sunny days. Events are also held in the Esplanade, especially on weekends. The East Garden and Howard Street Plaza are typically lightly used; in particular, pedestrians traverse the East Garden traveling to and from the San Francisco Museum of Modern Art.

On the southern block, adjacent buildings cast shadow around the perimeter of the Children's Garden, but most of the garden is generally sunny during the day throughout the year; some shade is present in the early morning and late afternoon hours. During the late fall and early winter months under existing conditions, about half of the Children's Garden is shaded throughout the day by surrounding buildings. The Children's Garden is typically lightly used on weekdays but heavily used on weekends, when children and families congregate on the play area in the center of the open space.

Jessie Square

Jessie Square is an approximately 0.78-acre plaza that sits atop the subsurface Jessie Square Garage, on the north side of Mission Street between Third and Fourth Streets, north of the Plan Area. There is a water feature with uncovered seating areas in the plaza's center and uncovered seating with sun shades in the northeastern corner. There is also uncovered seating near the southern perimeter of the square. The square is mostly paved, with grass landscaping in the southern portion and around the water feature.

Solar Access and Shading

Because there are no buildings in Yerba Buena Gardens directly across Mission Street from Jessie Square, this open space is in full sun by about 8:00 a.m. on the winter solstice. St. Patrick's Church begins to cast shadow on Jessie Square by about 10:00 a.m., and the square is fully shaded by about 3:00 p.m. At the spring and fall equinoxes, Jessie Square is in near-complete sunlight from shortly after 10:00 a.m. to about 1:00 p.m. On the summer solstice, Jessie Square is substantially in sunlight from about 11:30 a.m. to about 2:30 p.m. Jessie Square is used primarily for passive recreation such as sitting and strolling. Observation indicates that usage of Jessie Square is typically light in the morning, mostly by pedestrians traveling to work, while during the midday period, the square is more substantially used by residents, shoppers, tourists, and workers as an outdoor lunch destination and a mid-block pedestrian crossing. Afternoon usage of the square is moderate, with a fair degree of pedestrian travel from work.

Yerba Buena Lane

Yerba Buena Lane is a one-block-long public pedestrian passage north of the Plan Area that connects Market Street to Mission Street. Yerba Buena Lane also connects to Jessie Square in front of the Contemporary Jewish Museum. Yerba Buena Lane exhibits an urban downtown character with retailers, restaurants, and a museum occupying storefronts along the passage that includes ramp, stairway and other pedestrian amenities such as formal seating areas.

Solar Access and Shading

Because of its narrow configuration and high-density urban setting, Yerba Buena Lane receives sunlight on the winter solstice only when the sun is nearly parallel to Third Street—around 9:00 a.m. On the spring and fall

equinoxes, the passage receives substantial sunlight between about 9:30 a.m. and 12:00 noon, and on the summer solstice, the open space receives substantial sunlight between about 10:30 a.m. and 1:30 p.m.

Mint Plaza

Mint Plaza is an approximately 0.4-acre paved plaza that occupies the Jessie Street right-of-way between Fifth Street and Mint Street, as well as the portion of Mint Street north of where Jessie intersects Mint, near the Plan Area. It contains restaurant spaces on the north and east, and is adjacent on the south to the Old Mint. The plaza contains tables and chairs, is planted with a row of trees, and includes a planted arbor along the northern edge. The City maintains ownership of the plaza, but the plaza is managed by a non-profit organization, Friends of Mint Plaza, which sponsors summer concerts and other events in the plaza.

Solar Access and Shading

Mint Plaza is mostly in shadow all day long on the winter solstice. However, on the spring and fall equinoxes, Mint Plaza is at least partially sunny from about 12:30 p.m. to 4:00 p.m., while on the summer solstice, Mint Plaza receives substantial sunlight between about 10:00 a.m. and 3:00 p.m. Mint Plaza is used mostly during the midday hours.

IV.H.3 Regulatory Framework

Local Regulations

Sunlight Ordinance

Section 295 of the *Planning Code*, the Sunlight Ordinance, was adopted through voter approval of Proposition K in November 1994 to protect certain public open spaces from shadowing by new structures. Section 295 effectively limits shadow on city parks, requiring that specific findings be made before buildings greater than 40 feet in height can be approved that would shade property under the jurisdiction of or designated to be acquired by the Recreation and Park Commission, during the period from one hour after sunrise to one hour before sunset. Section 295(b) states that the Planning Commission, following a public hearing, “shall disapprove” any project governed by Section 295 that would have an “adverse effect” due to shading of a park subject to this section, “unless it is determined that the impact would be insignificant.” The Planning Commission’s decision under Section 295 cannot be made “until the general manager of the Recreation and Park Department in consultation with the Recreation and Park Commission has had an opportunity to review and comment to the City Planning Commission upon the proposed project.”

In 1989, the two Commissions adopted shadow criteria for 14 downtown parks, including quantitative maximum shadow coverage (“Absolute Cumulative Limit”) for each open space and qualitative criteria for assessing new shadow.³³³ (Gene Friend Recreation Center (then known as SoMa Park), Union Square, and Boeddeker Park are the parks nearest the Plan Area for which Absolute Cumulative Limits were established.) For projects that would

³³³ The sunlight on a park is measured in terms of “square-foot-hours” of sunlight, while the shadow load is measured in terms of “shadow-foot-hours.” A square-foot-hour of sunlight is one hour of sunlight on one square foot of ground, while a shadow-foot-hour represents one hour of shade on one square foot of ground.

affect parks for which a quantitative limit was established, shadow impacts have typically been judged insignificant if the project would not exceed the Absolute Cumulative Limit. In establishing the Absolute Cumulative Limits for the 14 downtown parks, the Commissions generally relied upon the following guidelines: for smaller parks (of less than two acres) on which more than 20 percent of the potential “Prop. K” sunlight was in shadow under then-existing conditions, no additional shadow was to be allowed. (This standard was applied to nine downtown parks.) For larger parks (of two acres or more) with between 20 percent and 40 percent existing shadow, the Absolute Cumulative Limit was to set at 0.1 percent; that is, an additional 0.1 percent new shadow, measured in shadow-foot-hours, would be allowed beyond existing conditions. The increment allowed as the Absolute Cumulative Limit—0.1 percent, in the case of this subset of parks—is measured as a percentage of the theoretical annual available sunlight.³³⁴ For larger parks shadowed less than 20 percent of the time, an additional 1.0 percent new shadow was to be allowed.³³⁵ No guideline was provided for parks of less than two acres that have less than 20 percent existing shadow.³³⁶ None of the 14 parks for which an Absolute Cumulative Limit was established in 1989 are within the Plan Area.

The qualitative criteria adopted by the commissions for evaluation of a project’s shadow impact include the time of day and time of year when shadow would be cast, the size, duration, and location within the park of the new shadow, and the public good served by the building casting the shadow.

As noted, the only park subject to Section 295 within the Plan Area is South Park, although Gene Friend Recreation Center is just across Sixth Street from the Plan Area, and Victoria Manalo Draves Park is less than one-half block west of the Plan Area. Alice Street Community Gardens is within the Plan Area, but is not regulated by Section 295. Yerba Buena Gardens, which is outside of the Plan Area, is under the jurisdiction of the Office of Community Investment and Infrastructure (the Successor Agency to the San Francisco Redevelopment Agency) and is not subject to Section 295. In addition to Gene Friend Recreation Center and Victoria Manalo Draves Park, the nearest parks outside the Plan Area that are subject to Section 295 are Union Square and Boeddeker Park; however, these parks are well outside the Plan Area and would not be affected by new development built pursuant to the Plan.

Other Planning Code Regulations

Planning Code Section 147, applicable to the C-3,³³⁷ Eastern Neighborhoods Mixed Use, and SoMa Mixed Use districts,³³⁸ requires that new development and additions to existing structures where the height exceeds 50 feet must be shaped to “reduce substantial shadow impacts on public plazas and other publicly accessible

³³⁴ The theoretical annual available sunlight is the amount of sunlight, measured in square-foot-hours, which would fall on a given park during the hours covered by Section 295. It is computed by multiplying the area of the park by 3,721.4, which is the number of hours in the year subject to Section 295. Thus, this quantity is not affected by shadow cast by existing buildings, but instead represents the amount of sunlight that would be available with no buildings in place. Theoretical annual available sunlight calculations for each downtown park were used by the Planning and Recreation and Park Commissions in establishing the allowable Absolute Cumulative Limit for downtown parks in 1989.

³³⁵ The guidelines for new shadow were presented in a memorandum to the Planning and Recreation and Parks Commissions, from their staffs, dated February 3, 1989, and referred to in Joint Resolution 11595 of the two commissions, adopted February 7, 1989.

³³⁶ None of the 14 downtown parks for which Absolute Cumulative Limits were established met these criteria.

³³⁷ The only portion of the Plan Area within the C-3 use district is within the block bounded by Folsom, Third, Harrison, and Hawthorne Streets.

³³⁸ Eastern Neighborhood Mixed Use Districts include MUO, MUR, RED, SPD, SALI, WMUO, and WMUG in the Plan Area, as well as RED-MX, MUG, and UMU. South of Market Mixed Use Districts include RSD, SLI, and SSO in the Plan Area.

spaces other than those protected under Section 295, ... consistent with the dictates of good design and without unduly restricting the development potential of the site in question.” The following factors must be taken into account in determining compliance with this criterion: the amount of area shadowed, the duration of the shadow, and the importance of sunlight to the type of open space being shadowed. A determination of compliance with Section 147 is made as part of the Section 309 permit review process in the C-3 districts and as part of the Section 307 permit review process elsewhere.

IV.H.4 Impacts and Mitigation Measures

Significance Criteria

Implementation of the proposed project would have a significant shadow impact if it were to:

- Create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas.

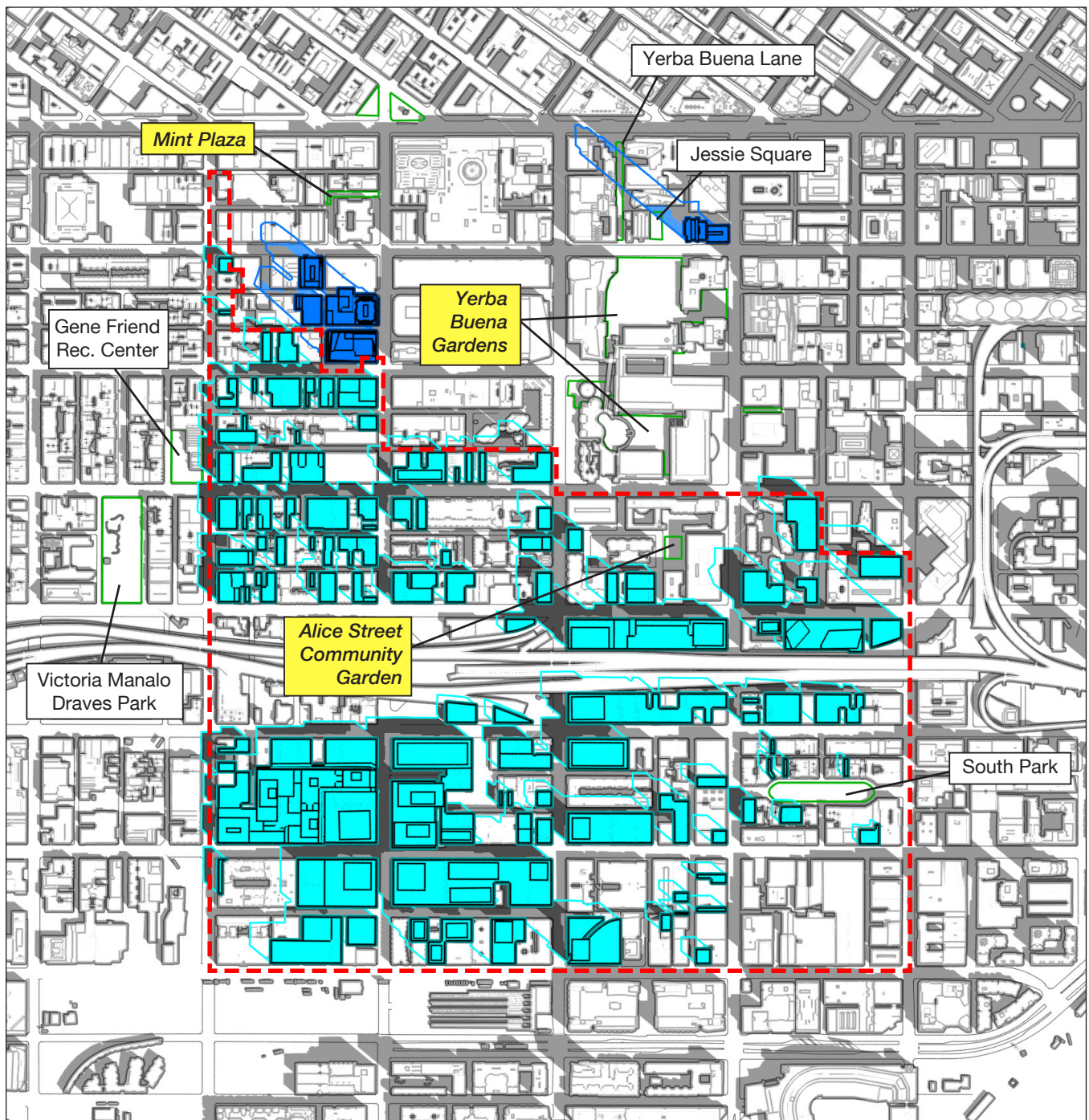
Approach to Analysis

Shadow effects of the Plan were analyzed by computer modeling of shadows that would be cast by the buildings that could be built with implementation of the Plan, as described in the discussion of Analysis Assumptions in the “Overview” section of Chapter IV, Environmental Setting, Impacts, and Mitigation Measures, p. IV-3. Shadows analyzed are based on development assumptions formulated by the Planning Department for the Plan, as described in the Overview section. The complete set of figures produced by the computer modeling is included in **Appendix E. Figure IV.H-2** through **Figure IV.H-10** are selected from the complete set and depict shadow from likely development under the Plan for representative times of day (9:00 a.m., 12:00 p.m., and 3:00 p.m.) during the four seasons: on December 20, the winter solstice, when the midday sun is at its lowest and shadows are at their longest; on June 21, the summer solstice, when the midday sun is at its highest and shadows are at their shortest; and on September 20, the fall equinox, when sun angle and shadows are midway between the solstices.³³⁹ Shadows on any other day of the year would generally be within the range of shadows presented in these figures.³⁴⁰ Shadow effects are analyzed qualitatively.³⁴¹

³³⁹ Only one set of figures is presented for the spring and fall equinoxes together because the sun’s path across the sky is generally symmetrical throughout the year and thus shadows on the two equinoxes are essentially the same. As a result, shadows from the winter solstice in December through the summer solstice in June generally mirror shadows from June through December.

³⁴⁰ Figure IV.H-2 through Figure IV.H-10 separately depict new shadows from Plan Area development and new shadows from two projects just outside the Plan Area that were approved independently of the Plan—706 Mission Street and the 5M Project. Effects of those projects are discussed in the Cumulative Impacts analysis, p. 40.

³⁴¹ This analysis does not present a quantitative analysis of potential shadow effects. Quantitative shadow analysis is typically required for analysis of individual buildings under Section 295 and/or as part of project-specific review.



--- Plan Area Boundary



OPEN SPACES

- Section 295 Park
- Other Open Space

- Potential New Buildings and their Shadows
- Potential New Buildings' Net New Shadows at Ground Level
- Existing Shadows at Ground Level

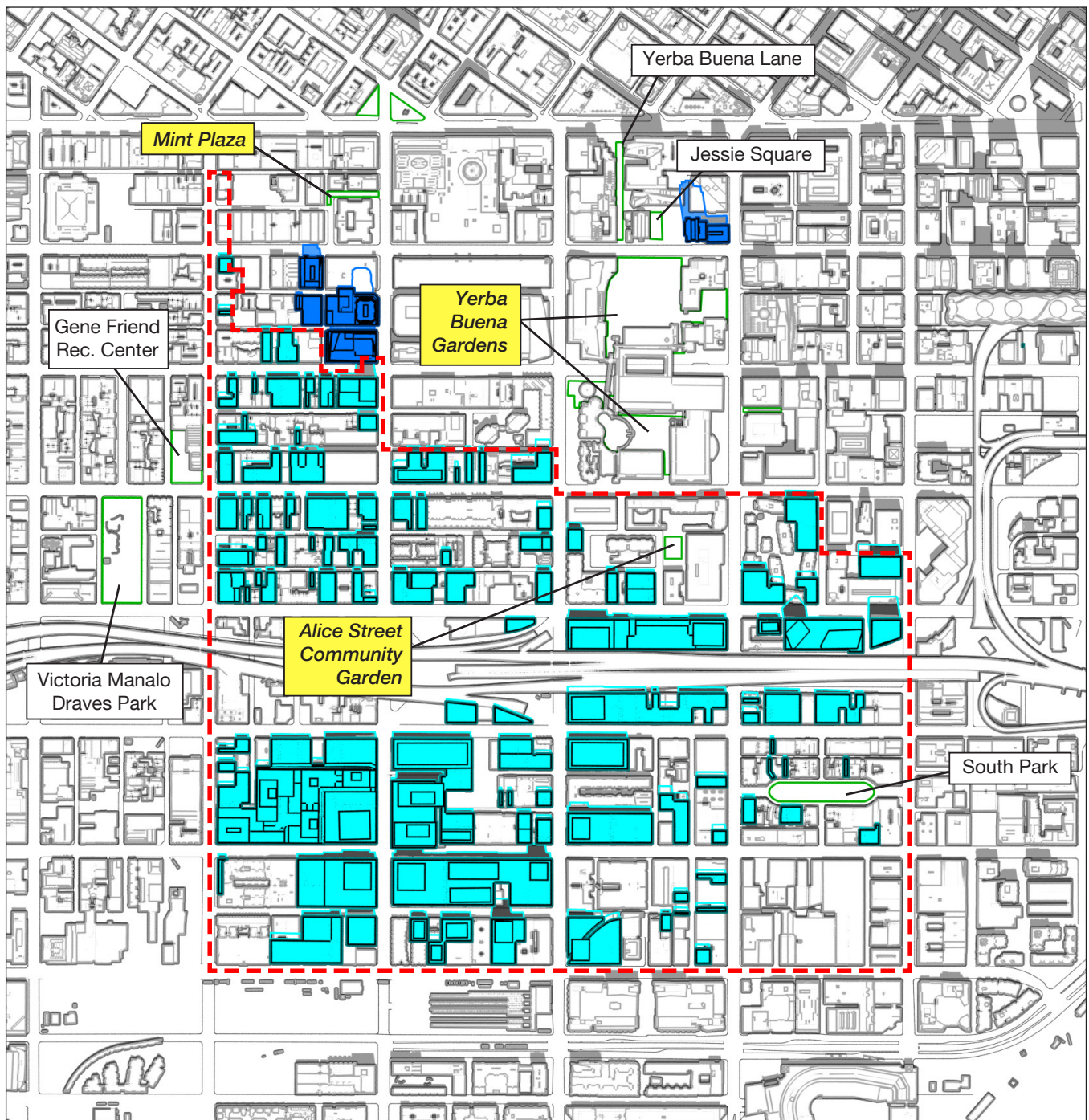
- Approved New Buildings (5M and 706 Mission) and their Shadows
- Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-2

Shadows: June 21 (Summer Solstice) 9:00 a.m.



--- Plan Area Boundary



OPEN SPACES

- Section 295 Park
- Other Open Space

- Potential New Buildings and their Shadows
- Potential New Buildings' Net New Shadows at Ground Level
- Existing Shadows at Ground Level

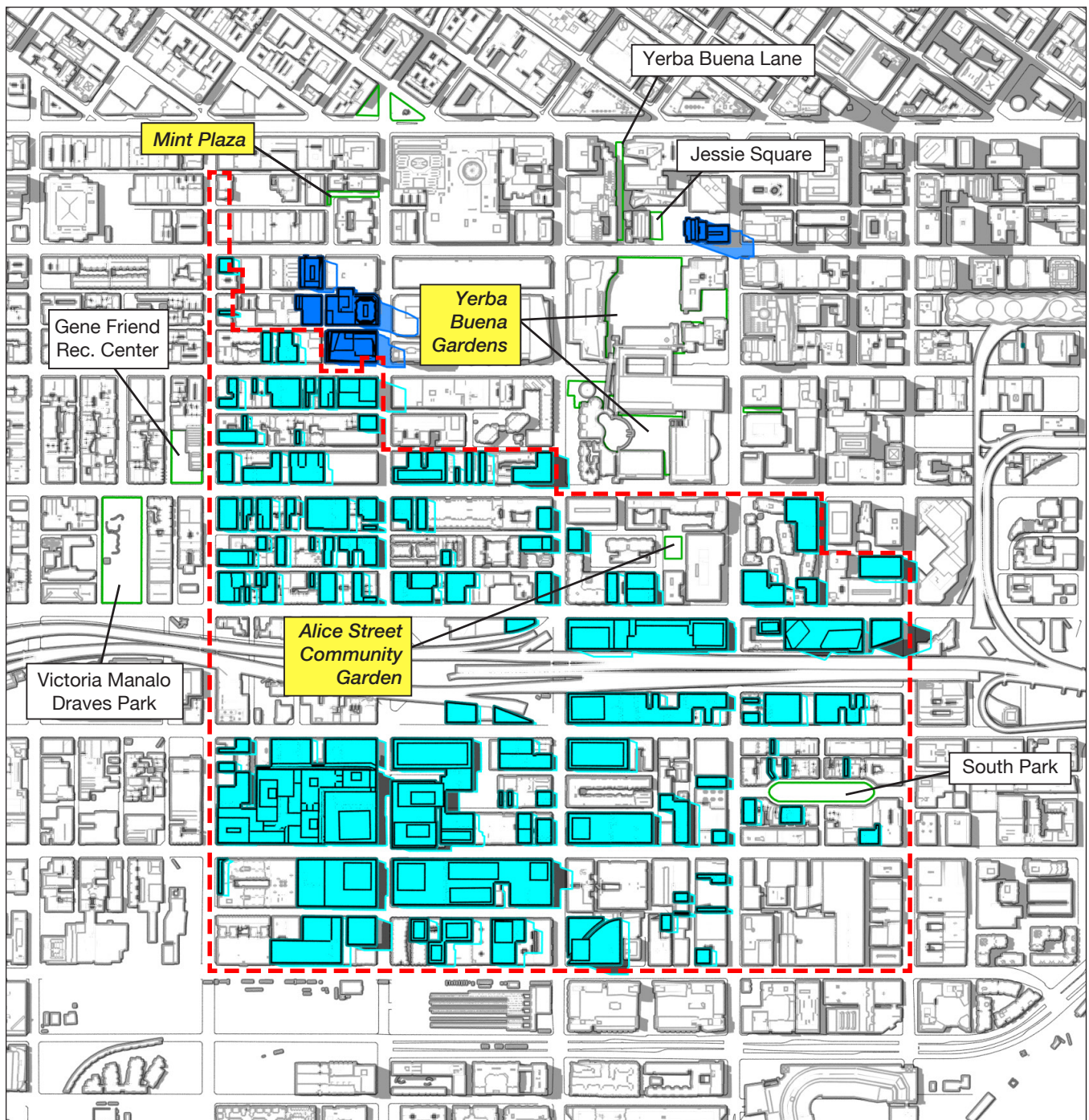
- Approved New Buildings (5M and 706 Mission) and their Shadows
- Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-3

Shadows: June 21 (Summer Solstice) 12:00 noon



--- Plan Area Boundary



NORTH

OPEN SPACES

- Section 295 Park
- Other Open Space

- Potential New Buildings and their Shadows
- Potential New Buildings' Net New Shadows at Ground Level
- Existing Shadows at Ground Level

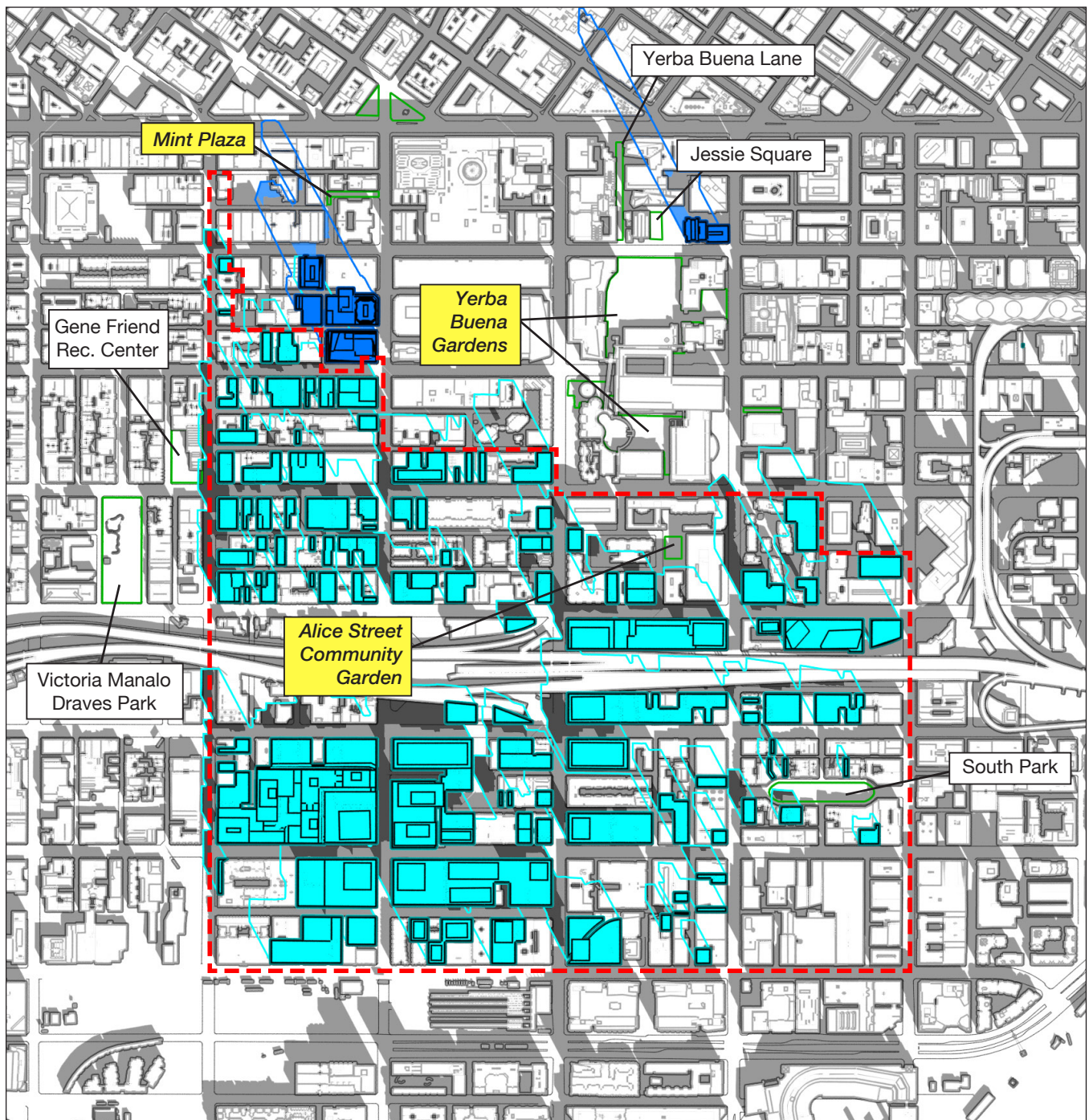
- Approved New Buildings (5M and 706 Mission) and their Shadows
- Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-4

Shadows: June 21 (Summer Solstice) 3:00 p.m.



--- Plan Area Boundary



OPEN SPACES

- Section 295 Park
- Other Open Space

- Potential New Buildings and their Shadows
- Potential New Buildings' Net New Shadows at Ground Level
- Existing Shadows at Ground Level

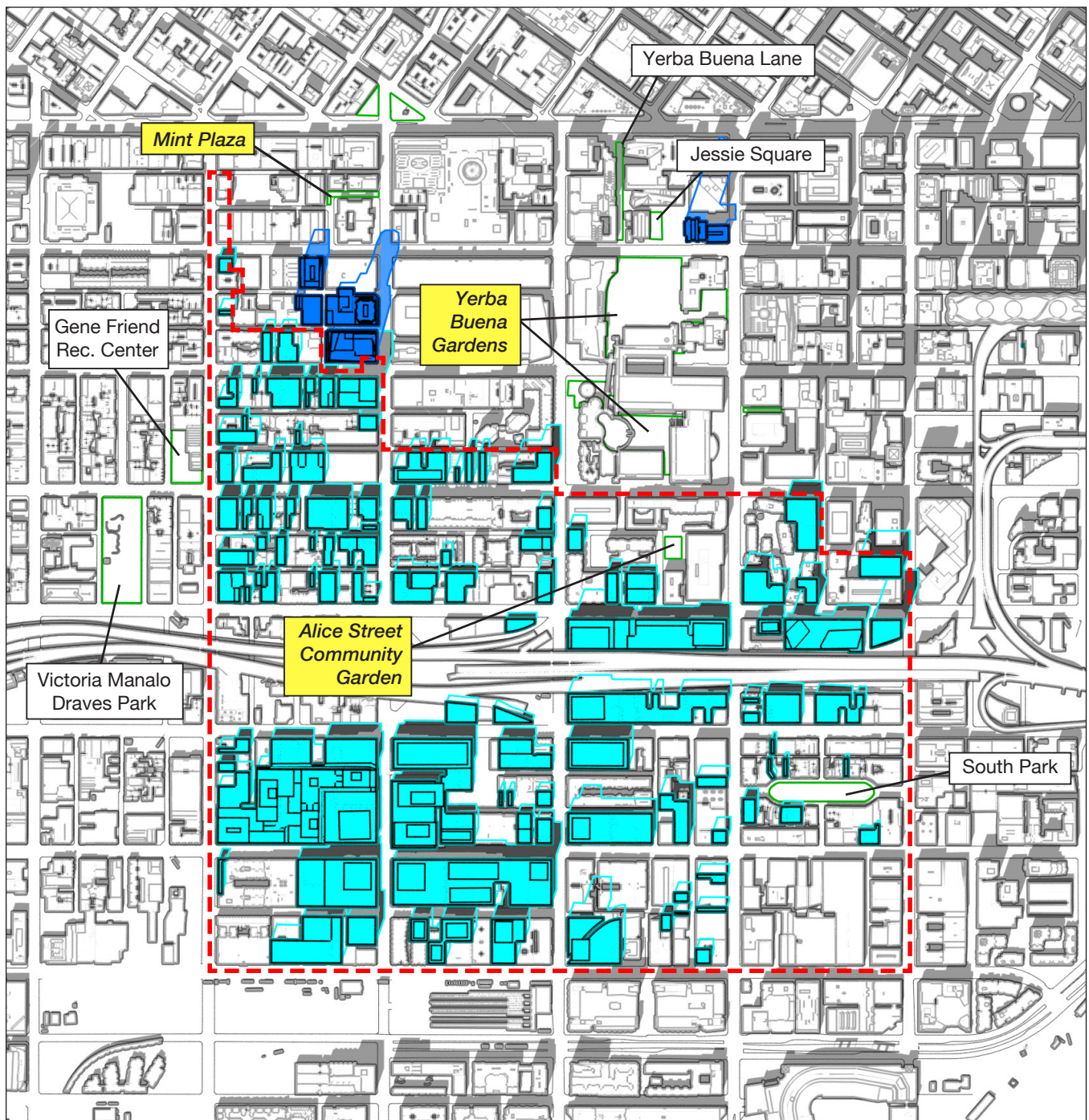
- Approved New Buildings (5M and 706 Mission) and their Shadows
- Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-5

Shadows: September 20 (Fall Equinox) 9:00 a.m.



--- Plan Area Boundary



OPEN SPACES

- Section 295 Park
- Other Open Space

- Potential New Buildings and their Shadows
- Potential New Buildings' Net New Shadows at Ground Level
- Existing Shadows at Ground Level

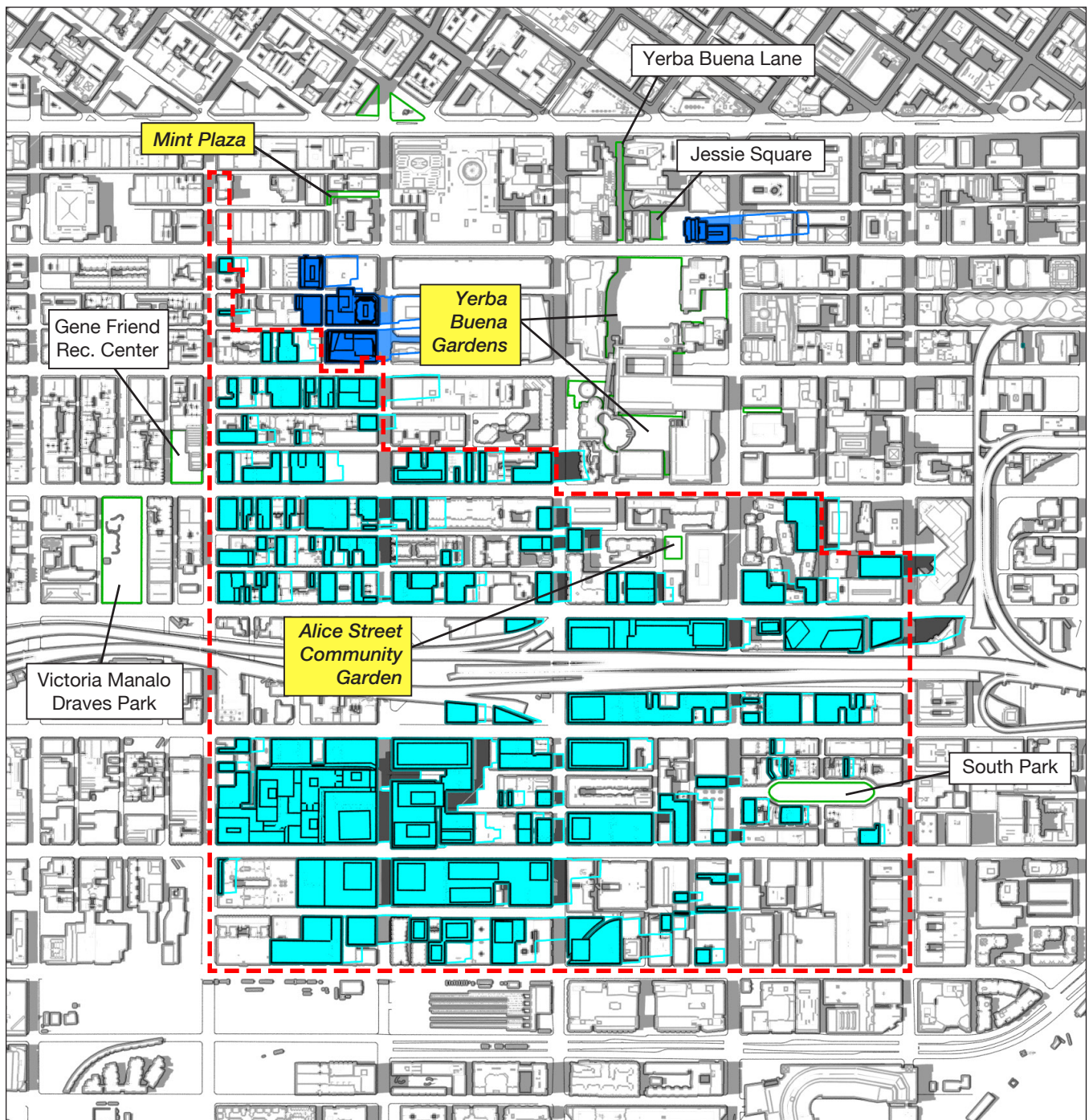
- Approved New Buildings (5M and 706 Mission) and their Shadows
- Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-6

Shadows: September 20 (Fall Equinox) 12:00 noon



--- Plan Area Boundary



NORTH

OPEN SPACES

- Section 295 Park
- Other Open Space



Potential New Buildings and their Shadows



Potential New Buildings' Net New Shadows at Ground Level



Existing Shadows at Ground Level



Approved New Buildings (5M and 706 Mission) and their Shadows



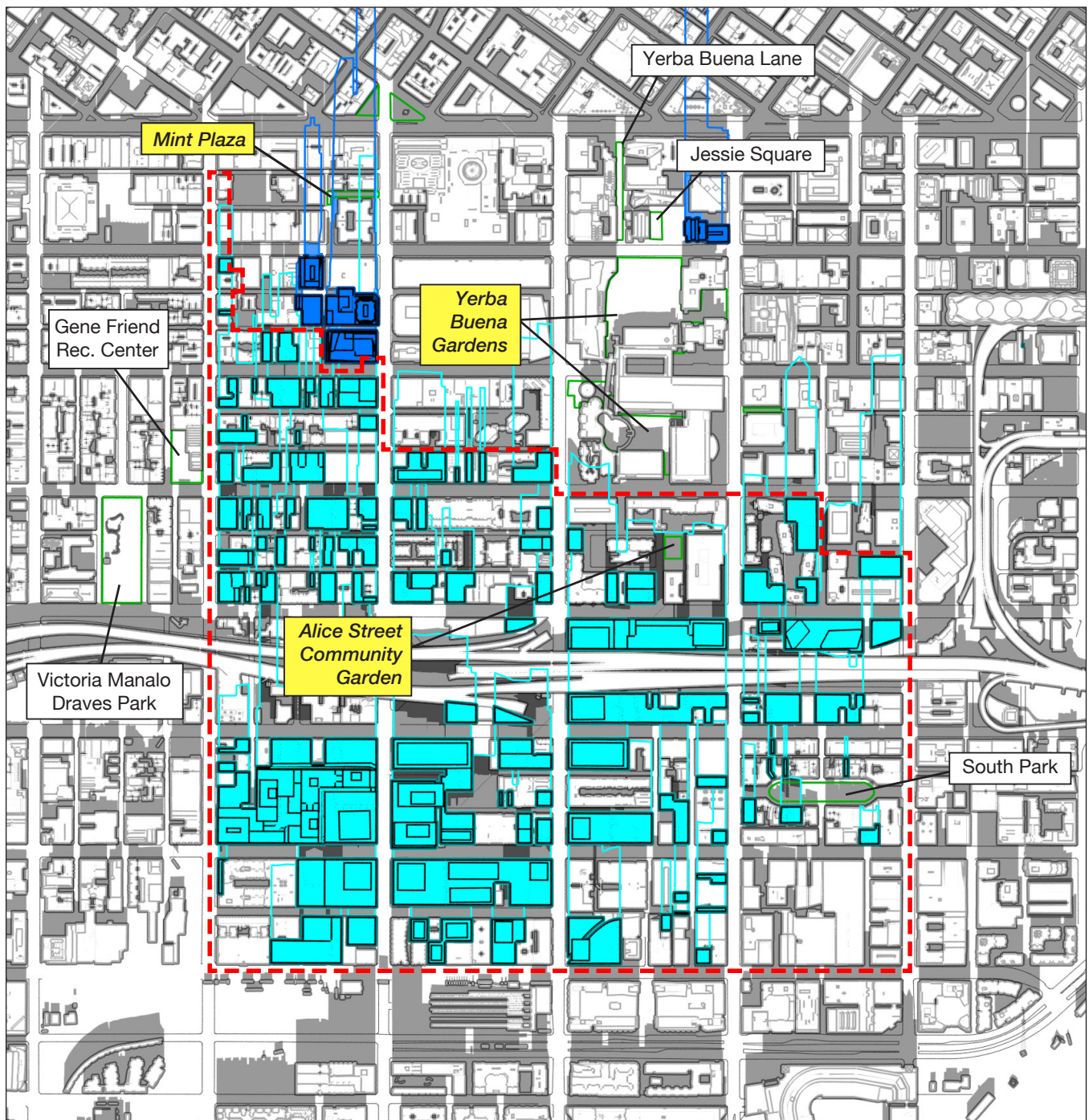
Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-7

Shadows: September 20 (Fall Equinox) 3:00 p.m.



--- Plan Area Boundary



OPEN SPACES

- Section 295 Park
- Other Open Space

- Potential New Buildings and their Shadows
- Potential New Buildings' Net New Shadows at Ground Level
- Existing Shadows at Ground Level

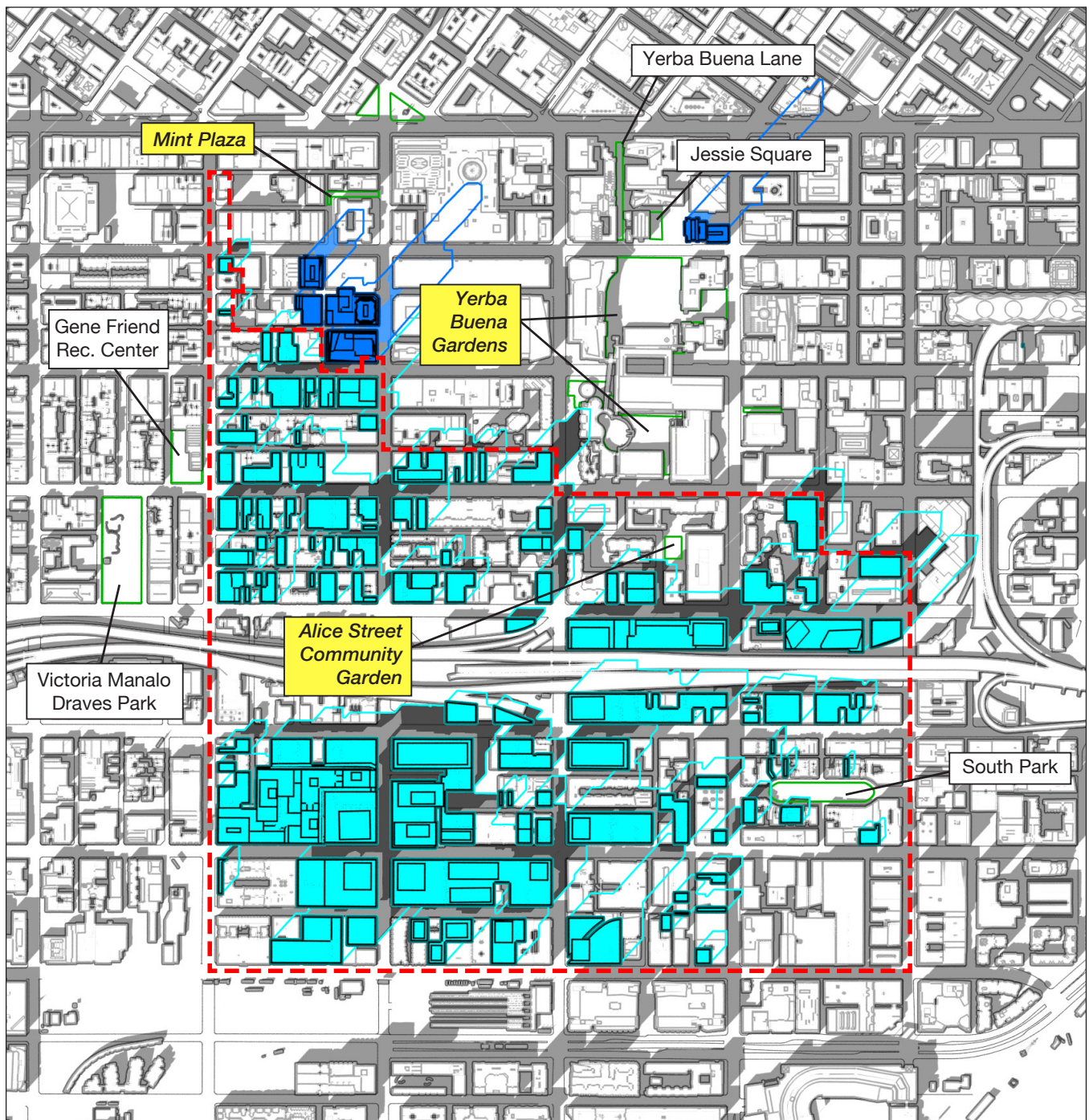
- Approved New Buildings (5M and 706 Mission) and their Shadows
- Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-8

Shadows: December 20 (Winter Solstice) 9:00 a.m.



--- Plan Area Boundary



NORTH

OPEN SPACES

- Section 295 Park
- Other Open Space

- Potential New Buildings and their Shadows
- Potential New Buildings' Net New Shadows at Ground Level
- Existing Shadows at Ground Level

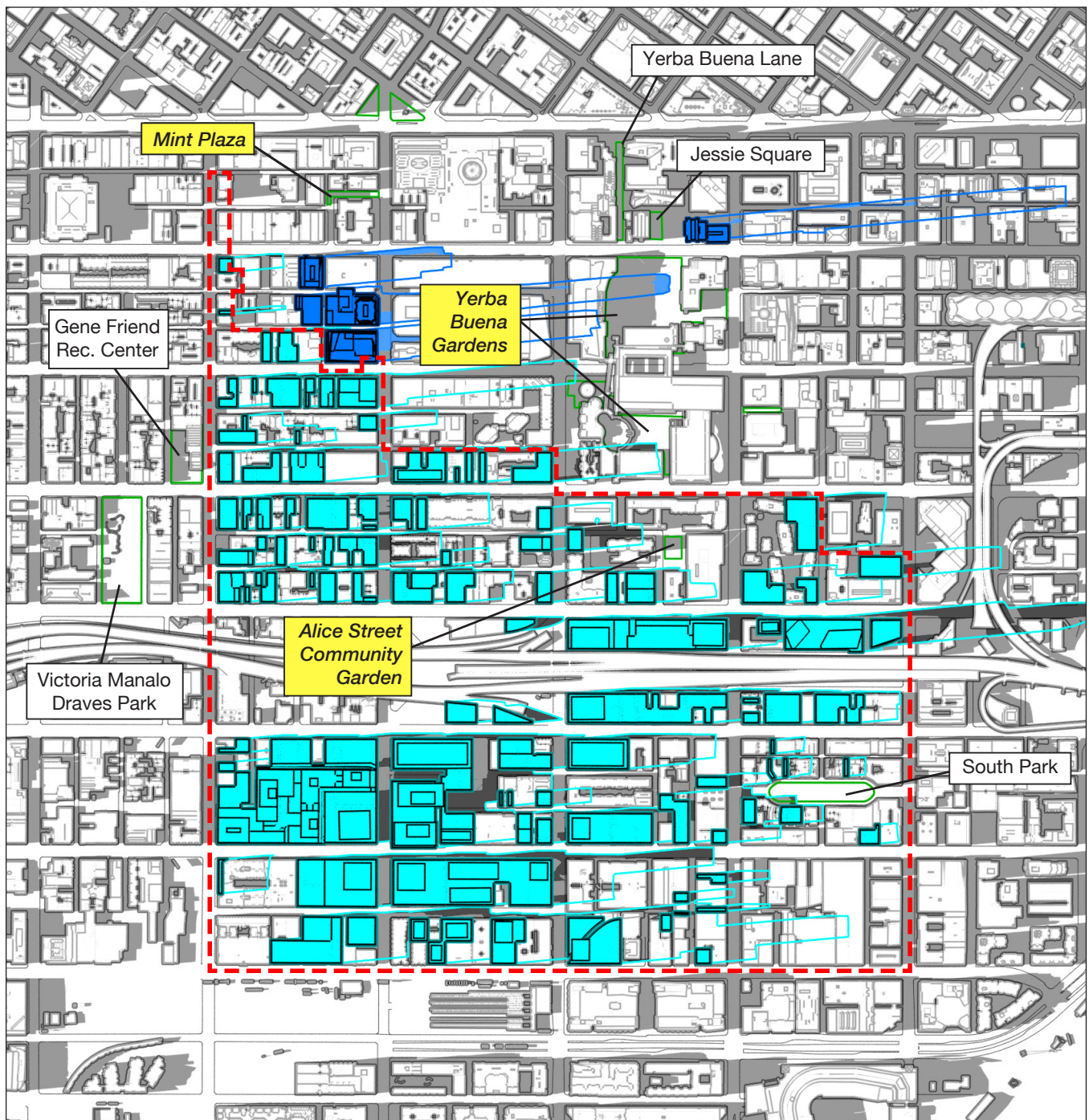
- Approved New Buildings (5M and 706 Mission) and their Shadows
- Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-9

Shadows: December 20 (Winter Solstice) 12:00 noon



--- Plan Area Boundary



NORTH

OPEN SPACES

- Section 295 Park
- Other Open Space

- Potential New Buildings and their Shadows
- Potential New Buildings' Net New Shadows at Ground Level
- Existing Shadows at Ground Level

- Approved New Buildings (5M and 706 Mission) and their Shadows
- Approved New Buildings' (5M & 706 Mission) Net New Shadows at Ground Level

SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-10

Shadows: December 20 (Winter Solstice) 3:00 p.m.

The development assumptions included simple extrusions of parcel lines up to full allowable heights under the Plan for height limits up to 85 feet. In contrast, full coverage of a parcel by a building taller than 85 feet would not be allowed under the Plan, and therefore impacts from such massing are not considered reasonably foreseeable and are not presented. Rather, for parcels with proposed allowable heights taller than 85 feet, building setbacks were built into the model along with reasonable assumptions for limited tower floor plates and tower siting on larger parcels. These assumptions are worst-case in that they do not account for the more refined building setback and bulk controls described in Goal VIII of the Plan and in Chapter II, Project Description. In addition to potential development where height limit changes are proposed under the Plan, the development assumptions upon which this analysis is based also include future development on some parcels where the height limits would not change with implementation of the Plan. Generally, these are sites where existing buildings are substantially shorter than what is allowed under existing height limits.

The massing model used as the basis of this analysis, while generally representative of a reasonably foreseeable outcome of Plan implementation, does not account for individual building designs, such as articulation in massing, parapets, or rooftop projections, as these are unknown at this time. Nor does it consider that one or more buildings may not be built even where rezoning allows for greater height than is currently allowed or where existing height limits permit taller buildings than currently exist. The analysis, therefore, provides a reasonable, conservative estimation of the magnitude of effects, at a programmatic level of analysis. Each subsequent development project that is proposed in the Plan Area—whether on a site where the height limit would be increased pursuant to the Plan or a site where existing height limits would not change—would be subject to *Planning Code* Section 295 (if greater than 40 feet tall), as well as Section 147 as applicable, and therefore project-specific shadow impacts would be analyzed at such a time as a subsequent project is being reviewed by the Planning Department. It is noted that development subsequent to Plan adoption could be proposed and undertaken on parcels not analyzed in this EIR as being the likely location of such subsequent development, and shadow effects of such projects would not have been analyzed herein. As with all subsequent projects, project-specific shadow impacts would be analyzed at such a time as an individual project is proposed.

Shadow effects of the proposed street network changes and open space improvements were evaluated in the Initial Study and determined to result in no significant effect. Accordingly, those project components are not discussed below.

Impact Evaluation

Shadow Impacts on Existing Parks and Open Spaces

Impact SH-1: Development under the Plan would not create new shadow in a manner that substantially affects existing outdoor recreation facilities or other public areas. (Less than Significant)

The discussion below analyzes impacts of the proposed Plan on four City parks (South Park, Victoria Manalo Draves Park, Gene Friend Recreation Center, and Howard-Langton Mini Park), on the Alice Street Community Gardens, which is within the Plan Area but is not subject to *Planning Code* Section 295; and on four open spaces in close proximity to the Plan Area (Yerba Buena Gardens, Yerba Buena Lane, Jessie Square, and Mint Plaza). All of these open spaces are described in the Setting. Shading of the three POPOS mentioned

in the Setting is also discussed, as well as shading of Plan Area sidewalks. Shadow impacts on potential future parks and open spaces that may be created within the Plan Area are described for informational purposes.

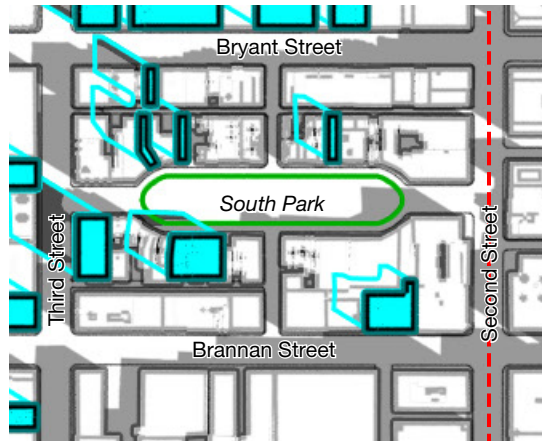
Table IV.H-1, Summary of Plan Shadow on Open Spaces, presents a summary of Plan shadow effects on the open spaces analyzed, both those that are subject to *Planning Code* Section 295 and those that are not. In the table, the time frame presented under the season header (spring/fall equinoxes and summer and winter solstices) denotes the period during which Section 295 regulates solar access. The times shown for the parks and open spaces denote when new shadow, caused by buildings that could be developed under the Plan, would occur.

TABLE IV.H-1 SUMMARY OF PLAN SHADOW ON OPEN SPACES

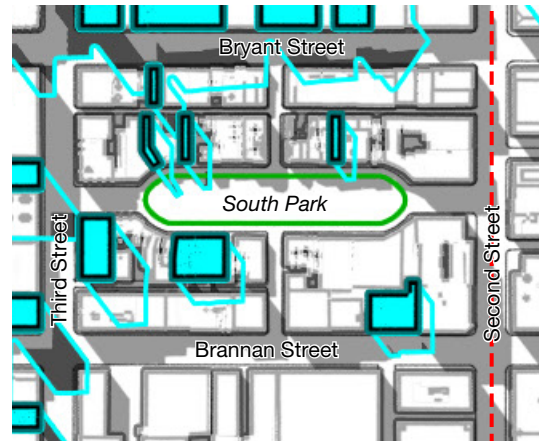
Park/Open Space	Season and Daylight Hours		
	Spring/Fall Equinoxes 7:57 a.m. – 6:09 p.m.	Summer Solstice 6:47 a.m. – 7:36 p.m.	Winter Solstice 8:20 a.m. – 3:54 p.m.
<i>Open Spaces Subject to Section 295</i>			
South Park	9:00–11:00 a.m.(minor new shadow) 6:00-6:09 p.m.(minor new shadow)	8:00 a.m. (minor new shadow) 6:00 – 7:36 p.m. (minor new shadow)	8:20 a.m.–3:54 p.m.(minor new shadow)
Victoria Manalo Draves Park	7:57–8:30 a.m. (minor new shadow)	6:47–7:00 a.m. (minor new shadow)	None
Gene Friend Recreation Center	7:57–9:00 a.m. (moderate new shadow)	6:47–9:00 a.m. (moderate new shadow)	None
Howard-Langton Mini Park	None	None	None
<i>Open Spaces Not Subject to Section 295</i>			
Alice Street Community Gardens	6:00 p.m. (minor new shadow)		11:00 a.m. (minor new shadow) 3:54 p.m. (minor new shadow)
Yerba Buena Gardens:			
Esplanade	None	None	None
East Garden	None	None	None
Howard Street Plaza	None	None	None
Children’s Garden	7:57 – 8:30 a.m. (minor new shadow)	None	11:00 a.m.(minor new shadow)
Yerba Buena Lane	None	None	None
Jessie Square	None	None	None
Mint Plaza	None	None	None

SOURCE: CADP, ESA.

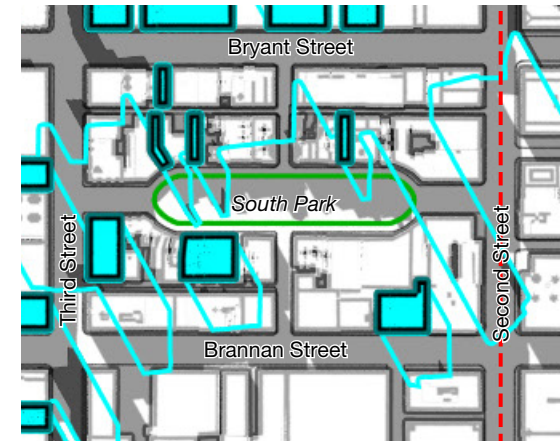
Figure IV.H-11 through **Figure IV.H-22** provide blow-ups of computer-modeled shadow on the parks and open spaces analyzed. Only the times and dates when new Plan-related shadow (i.e., shadow that would be cast by new development projects enabled by the changes to zoning and height limits proposed by the Plan) would be cast on parks and open spaces are included. The full set of model graphics is included in Appendix E.



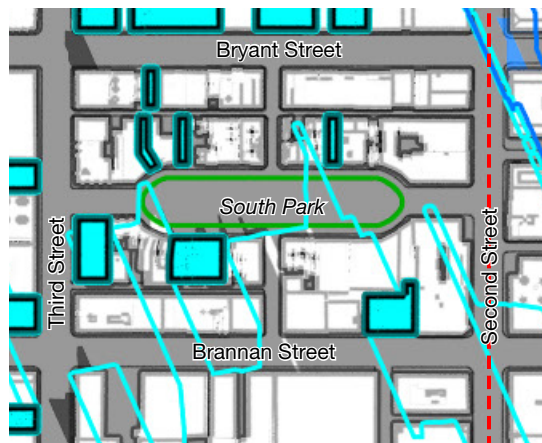
June 21, 8:00 a.m.



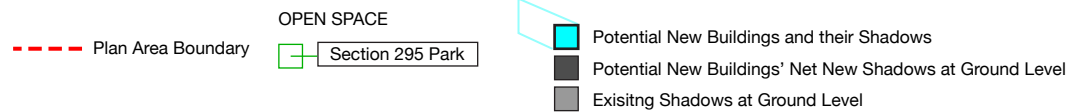
June 21, 6:00 p.m.



June 21, 7:00 p.m.



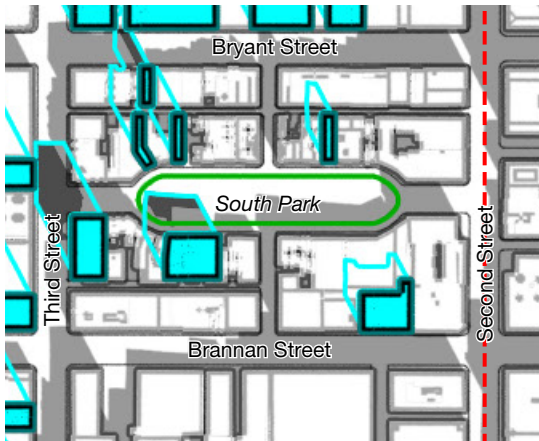
June 21, Sunset -1 hour



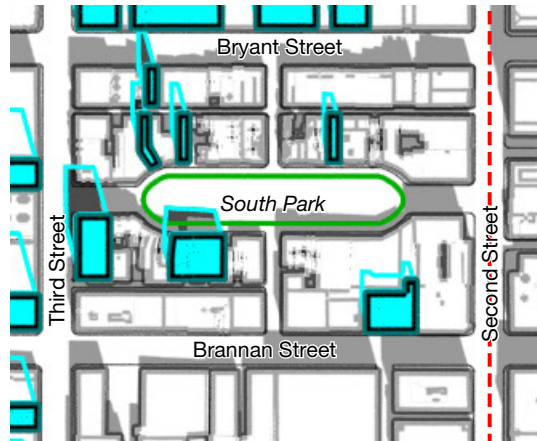
SOURCE: CADP

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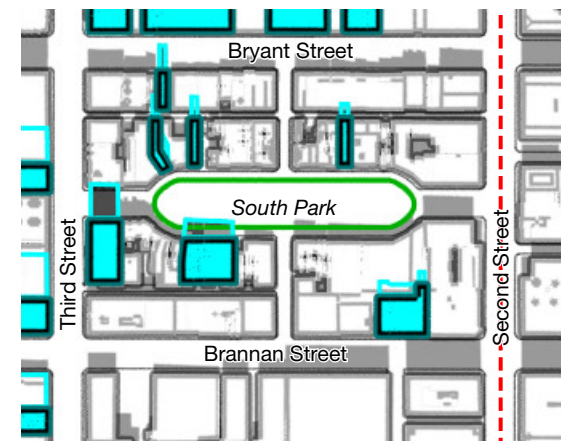
Figure IV.H-11
Shadow from Plan Area Buildings on South Park, June 21 (Summer Solstice)



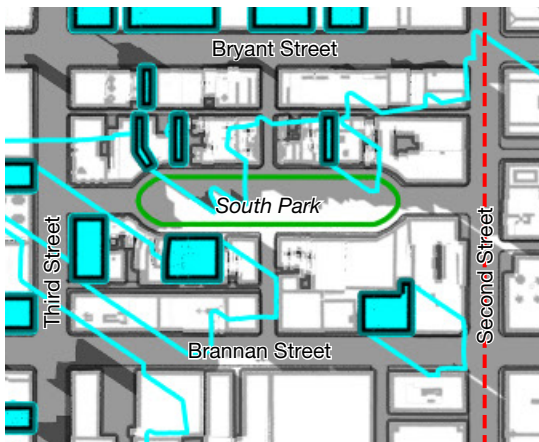
September 20, 9:00 a.m.



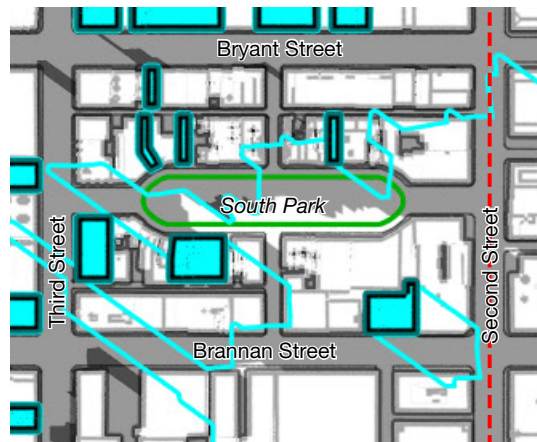
September 20, 10:00 a.m.



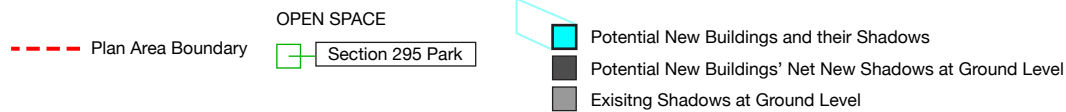
September 20, 11:00 a.m.



September 20, 6:00 p.m.



September 20, Sunset -1 hour

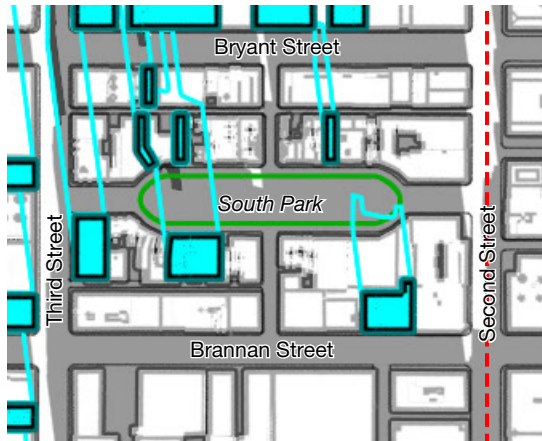


SOURCE: CADP

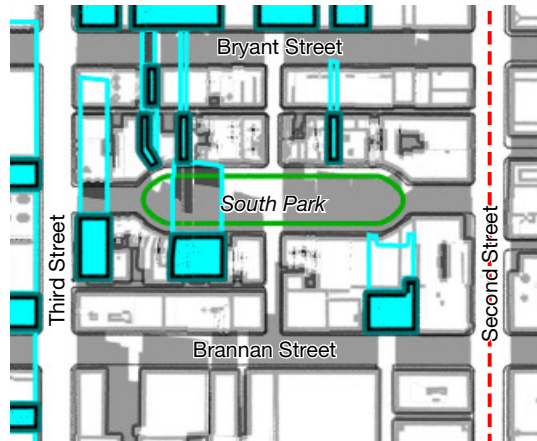
Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-12

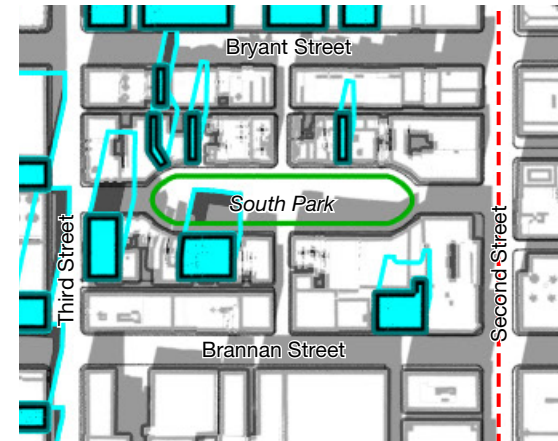
Shadow from Plan Area Buildings on South Park, September 20 (Fall Equinox)



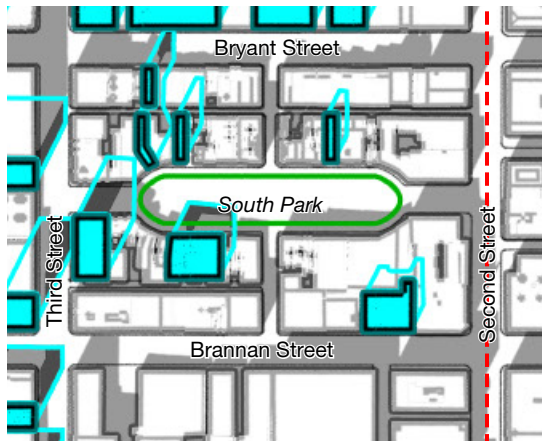
December 20, Sunrise +1 hour



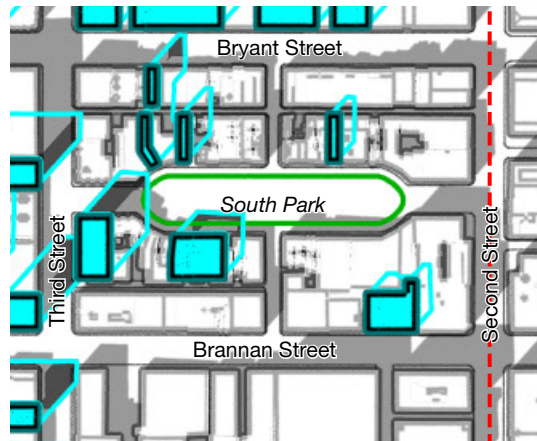
December 20, 9:00 a.m.



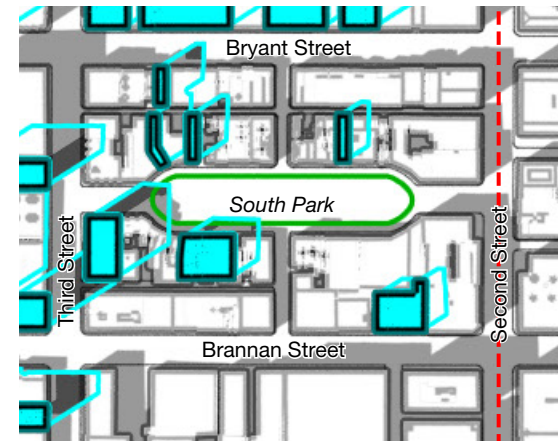
December 20, 10:00 a.m.



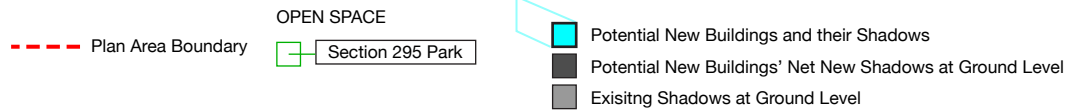
December 20, 11:00 a.m.



December 20, 12:00 noon



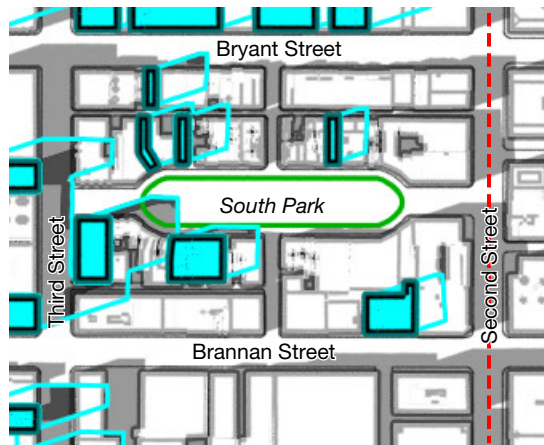
December 20, 1:00 p.m.



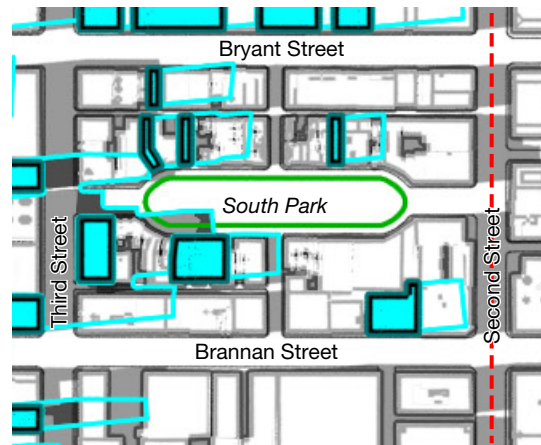
SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

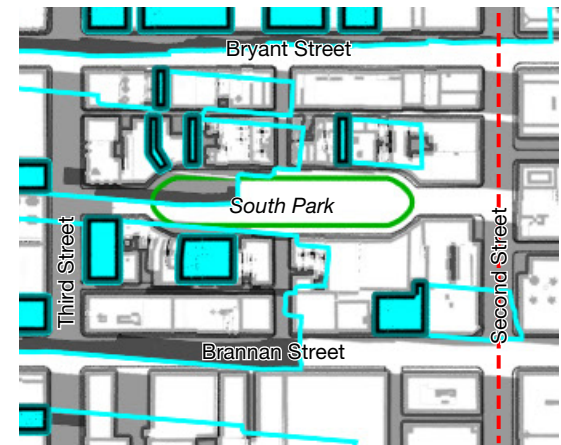
Figure IV.H-13
Shadow from Plan Area Buildings on South Park, December 20 (Winter Solstice)



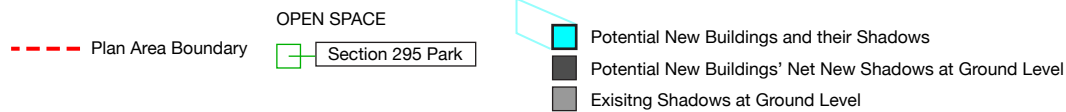
December 20, 2:00 p.m.



December 20, 3:00 p.m.



December 20, Sunset -1 hour

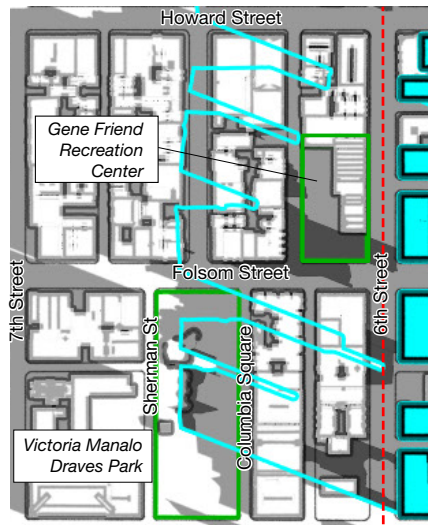


SOURCE: CADP

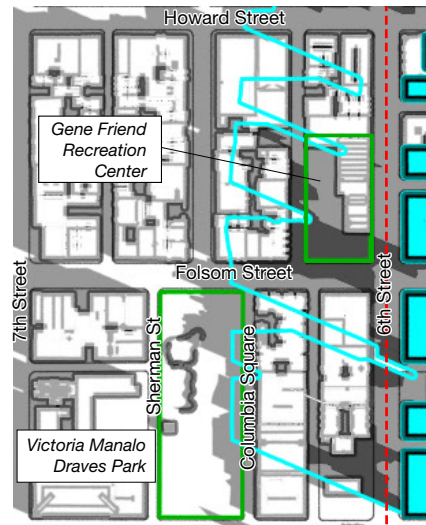
Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-14

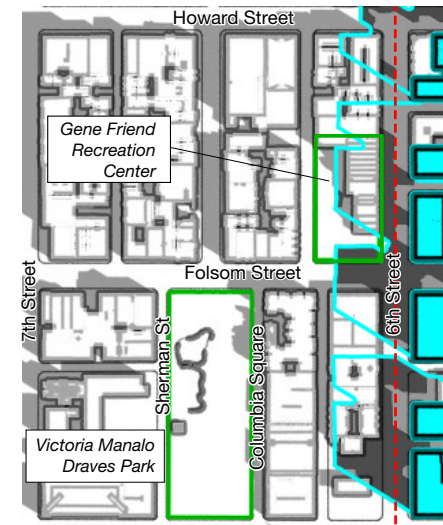
Shadow from Plan Area Buildings on South Park, December 20 (Winter Solstice) (continued)



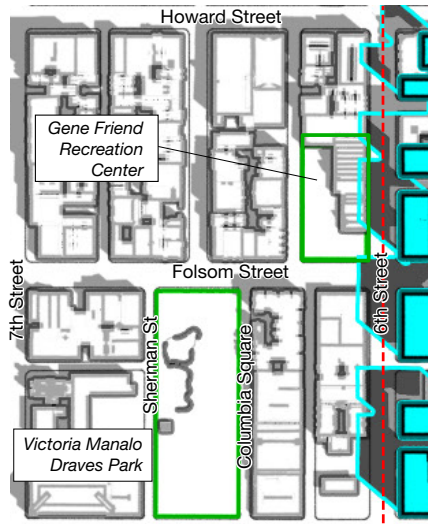
June 21, Sunrise +1 hour



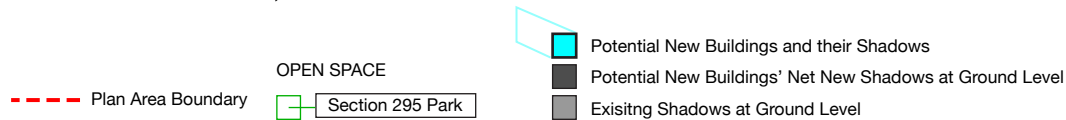
June 21, 7:00 a.m.



June 21, 8:00 a.m.



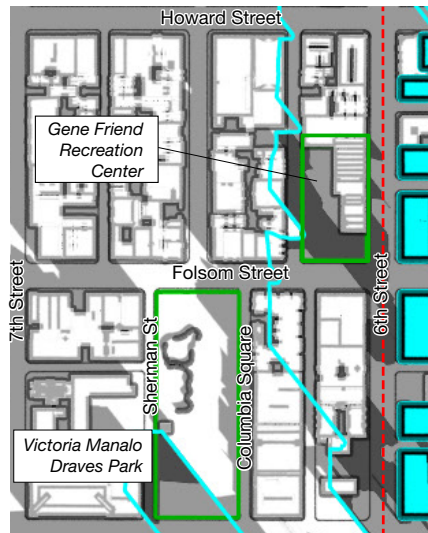
June 21, 9:00 a.m.



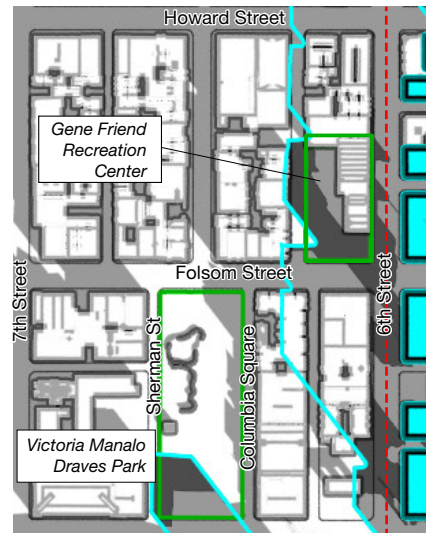
SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

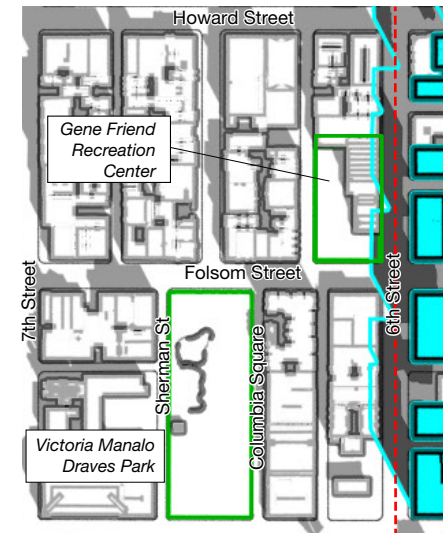
Figure IV.H-15
Shadow from Plan Area Buildings on
Victoria Manalo Draves Park and Gene Friend Recreation Center, June 21 (Summer Solstice)



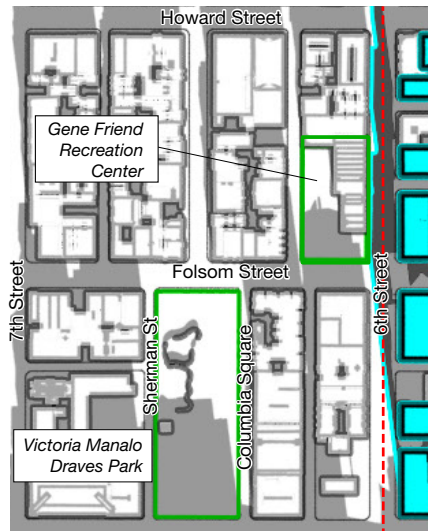
September 20, Sunrise +1 hour



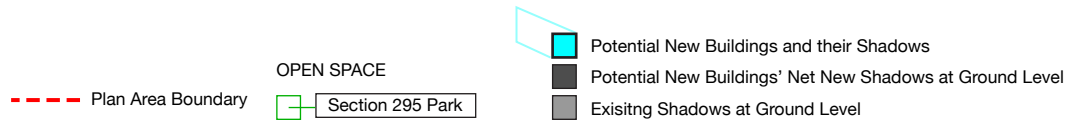
September 20, 8:00 a.m.



September 20, 9:00 a.m.



December 20, Sunrise +1 hour

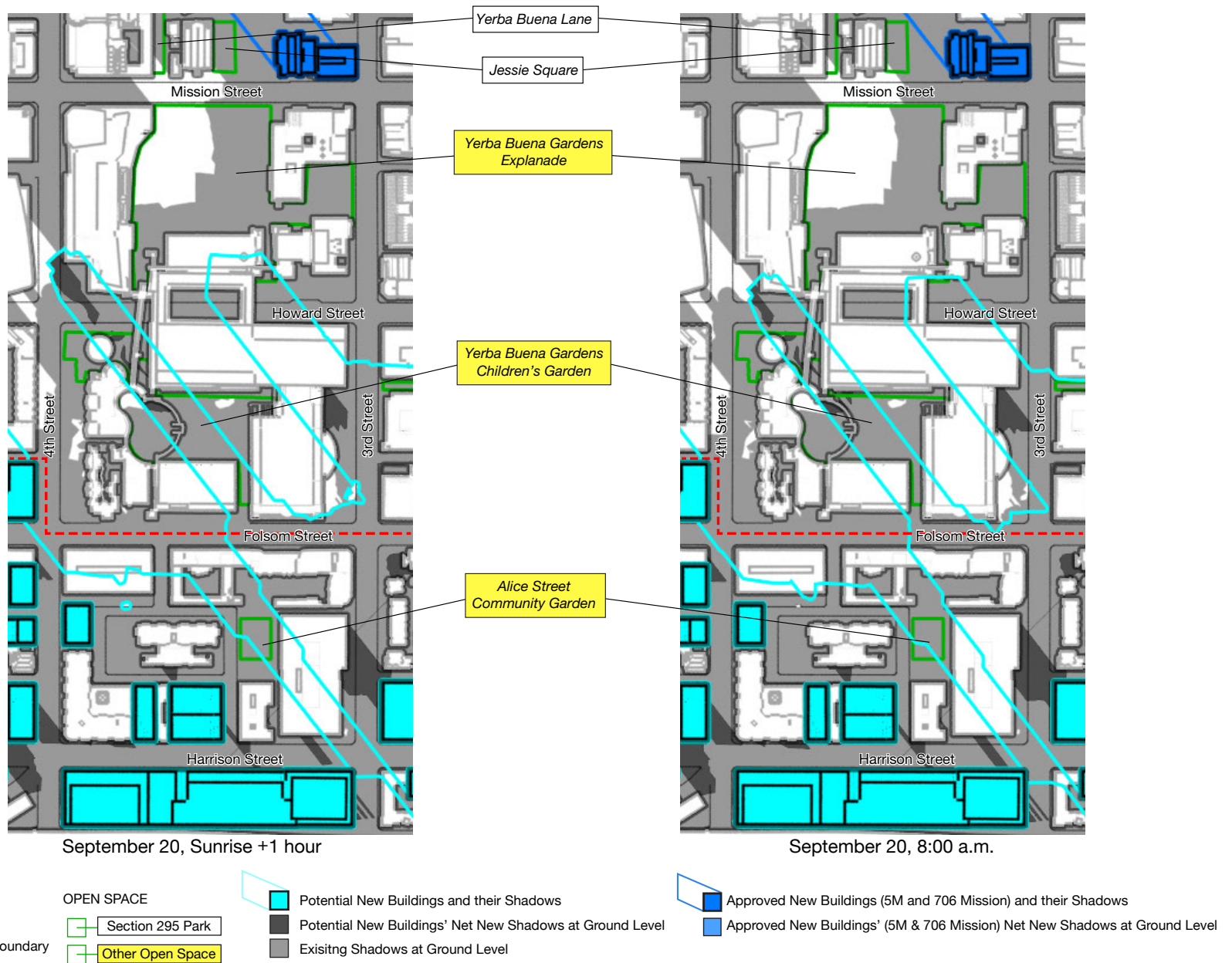


SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-16

Shadow from Plan Area Buildings on Victoria Manalo Draves Park and Gene Friend Recreation Center, September 20 (Fall Equinox) and December 20 (Winter Solstice)

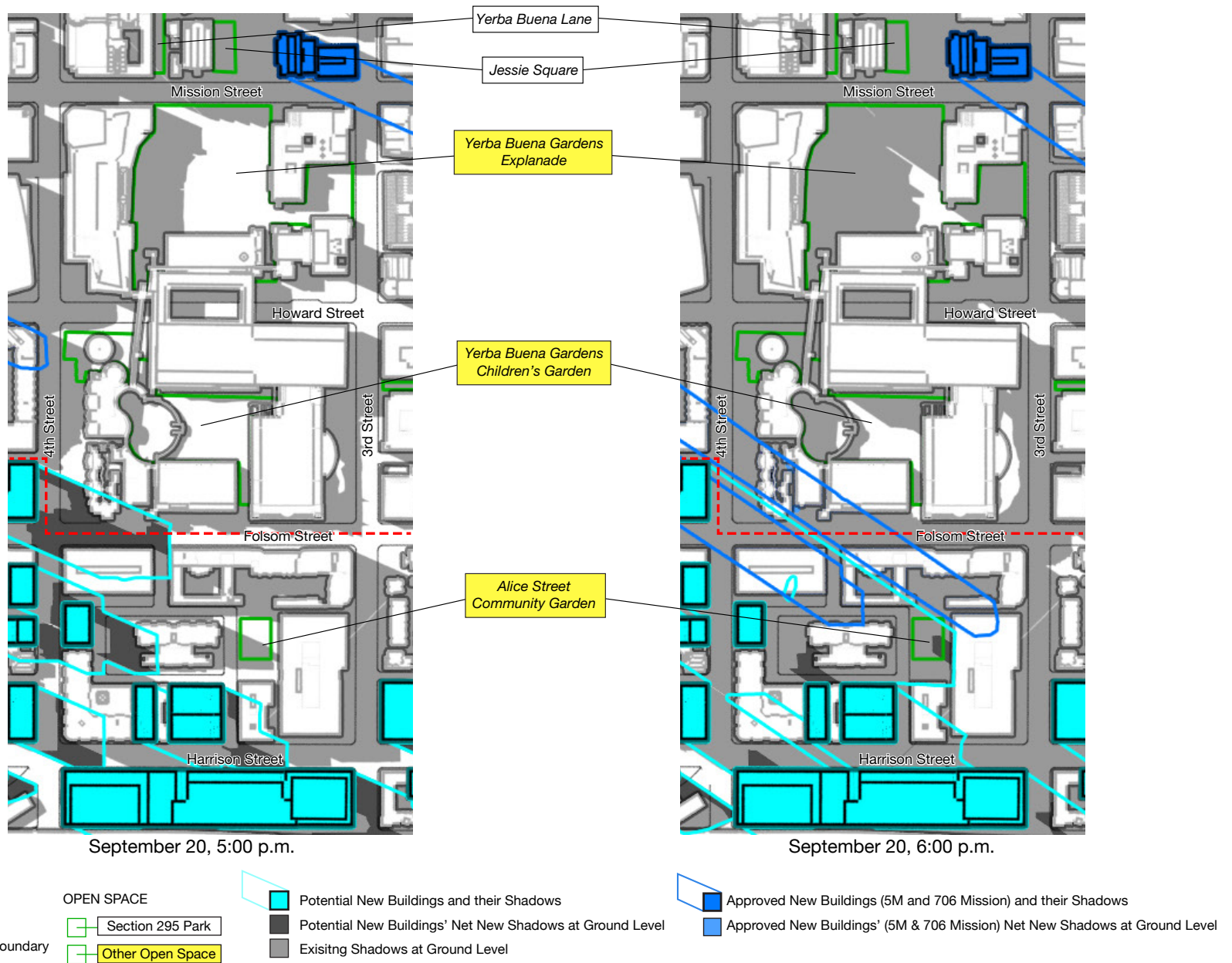


SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-17

Shadow from Plan Area Buildings on Yerba Buena Gardens, Alice Street Community Garden, Jessie Square, Yerba Buena Lane, September 20 (Fall Equinox)

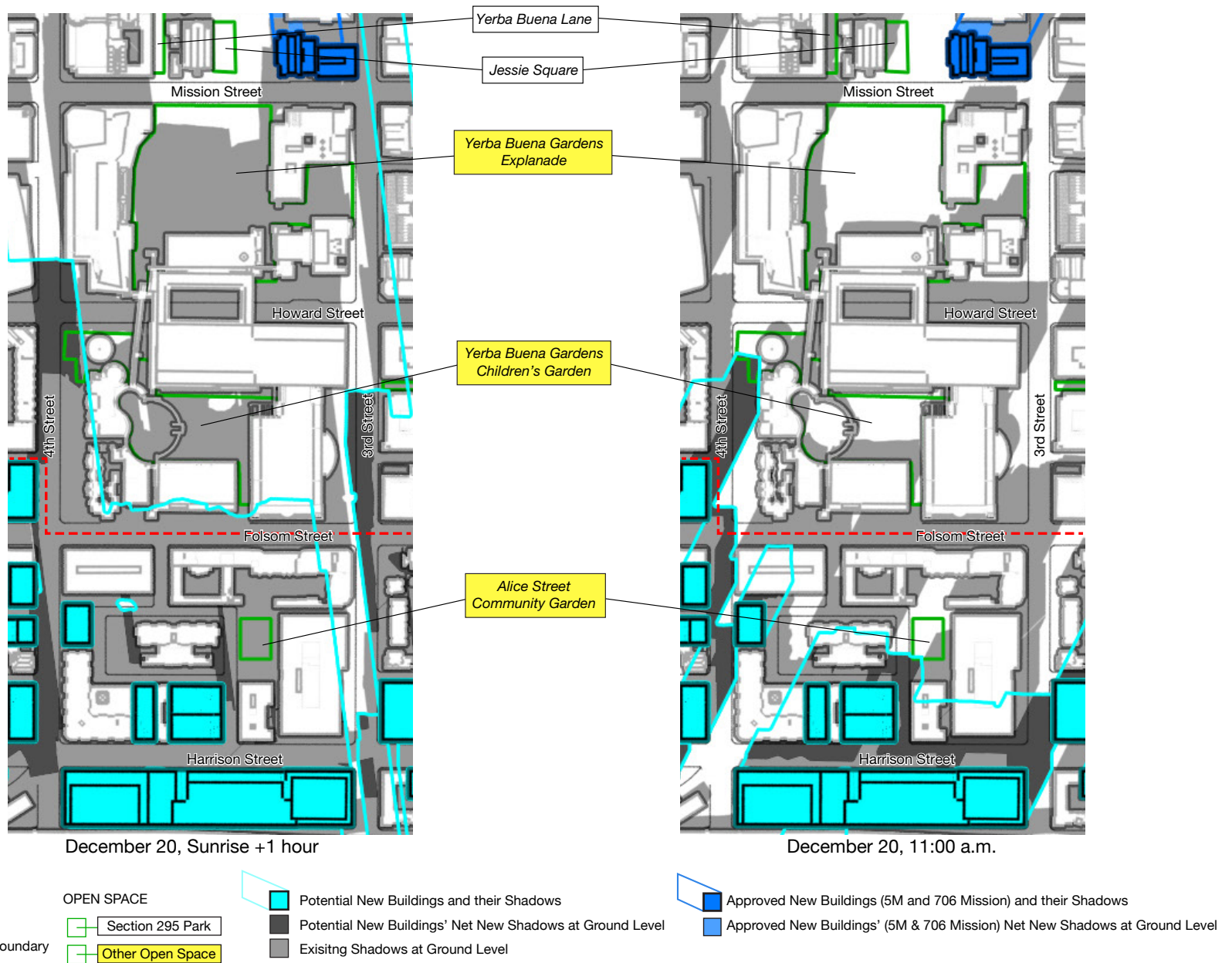


SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-18

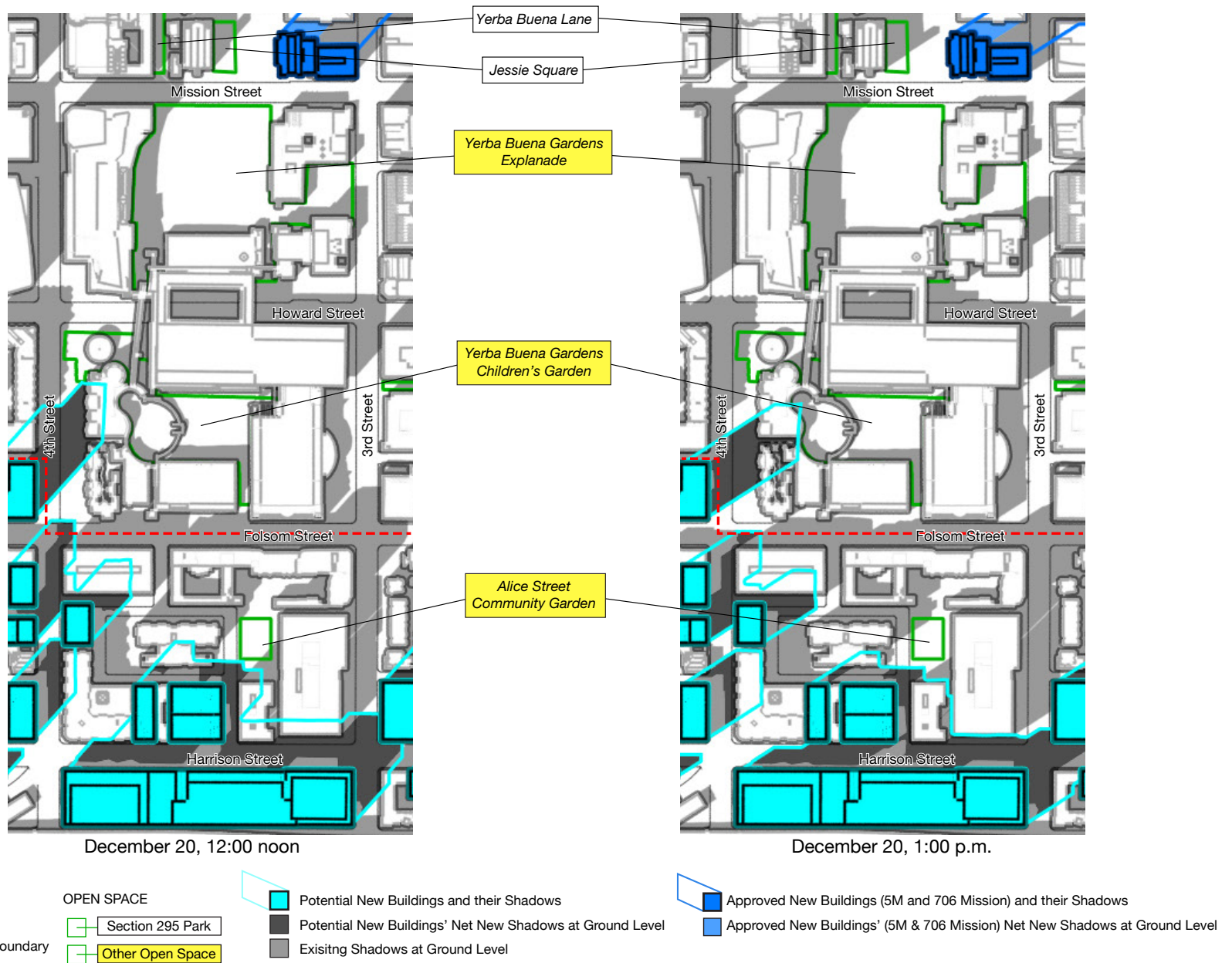
Shadow from Plan Area Buildings on Yerba Buena Gardens, Alice Street Community Garden, Jessie Square, Yerba Buena Lane, September 20 (Fall Equinox) (continued)



SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-19
Shadow from Plan Area Buildings on Yerba Buena Gardens, Alice Street Community Garden, Jessie Square, Yerba Buena Lane, December 20 (Winter Solstice)

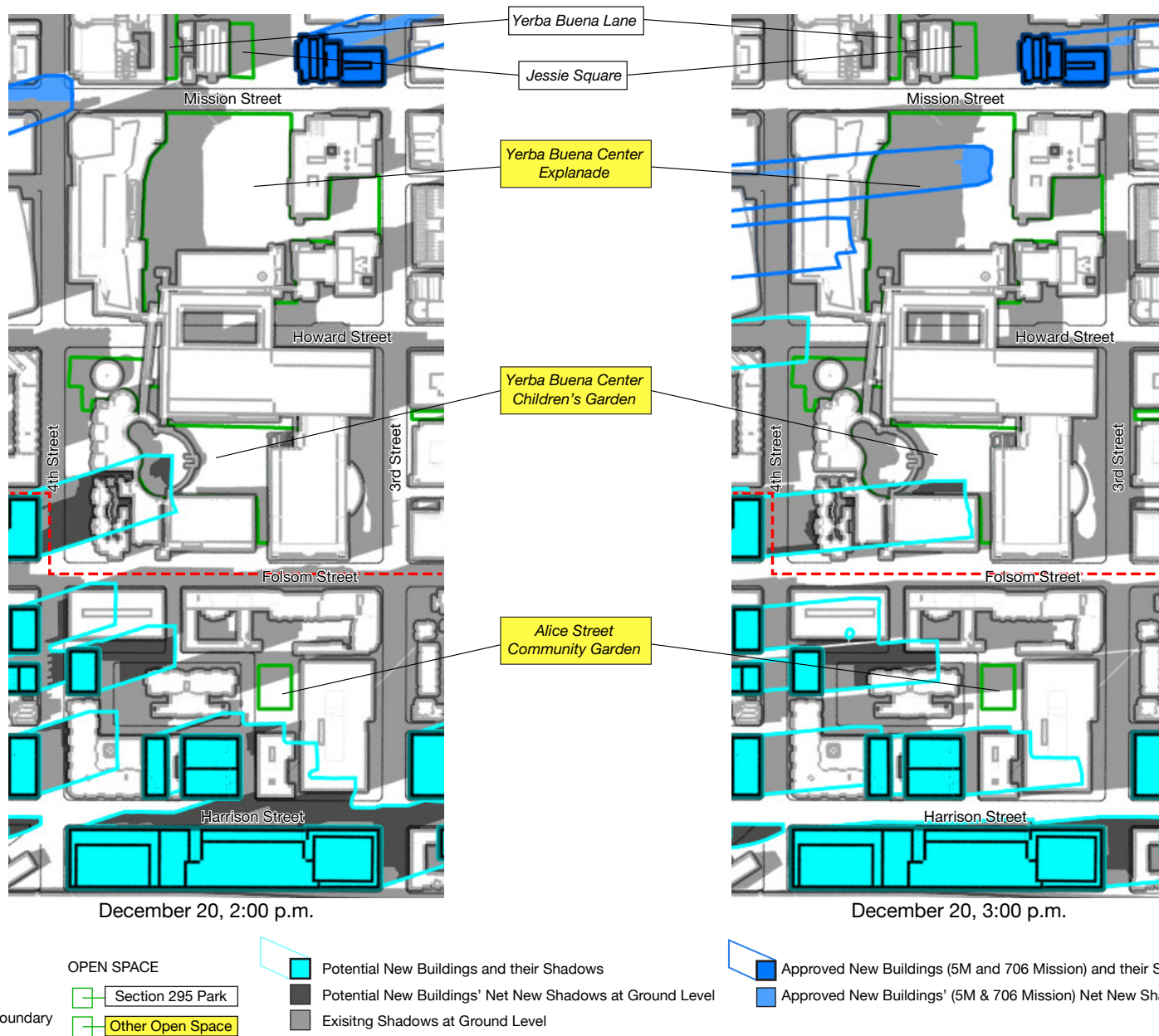


SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-20

Shadow from Plan Area Buildings on Yerba Buena Gardens, Alice Street Community Garden, Jessie Square, Yerba Buena Lane, December 20 (Winter Solstice) (continued)

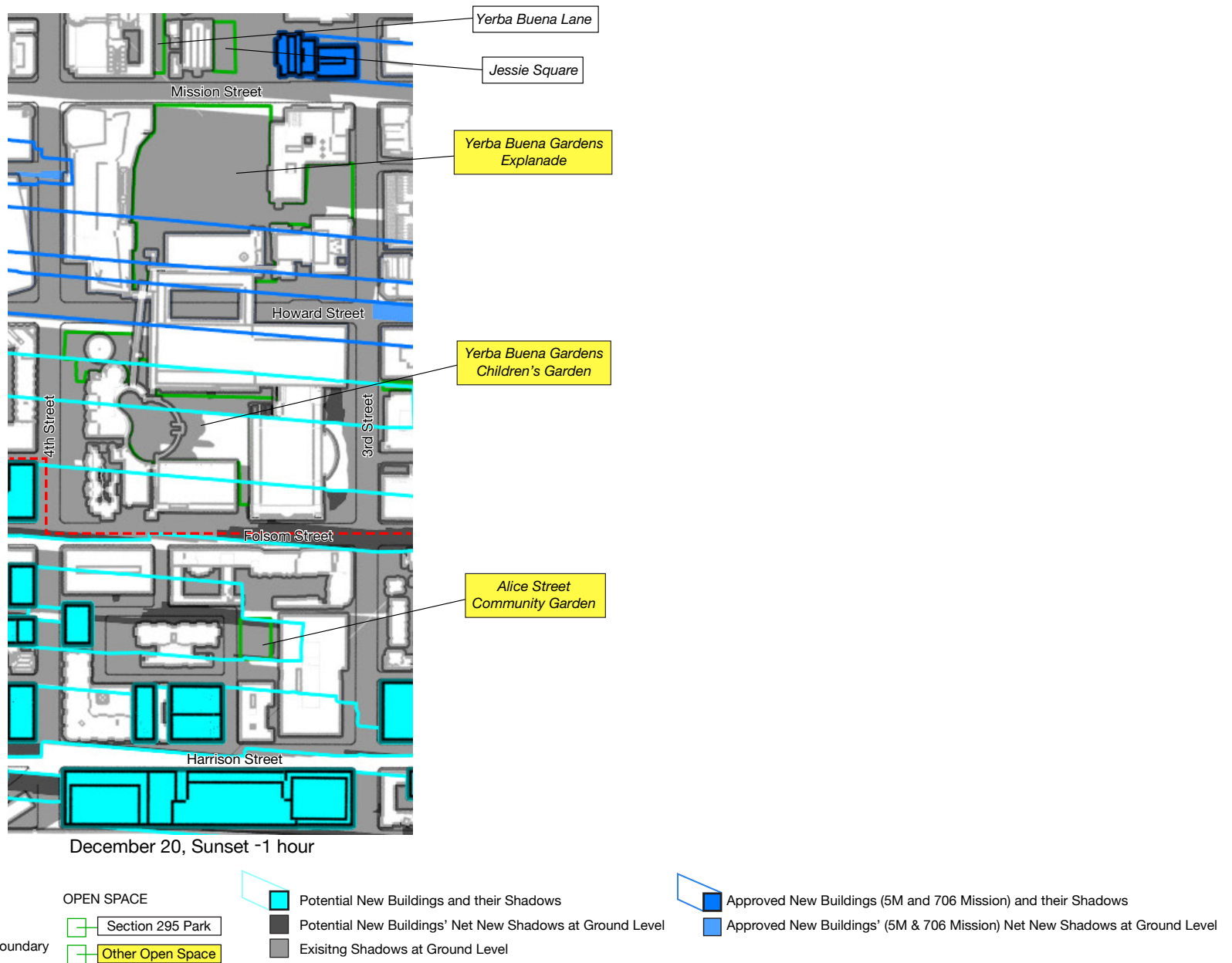


SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-21

Shadow from Plan Area Buildings on Yerba Buena Gardens, Alice Street Community Garden, Jessie Square, Yerba Buena Lane, December 20 (Winter Solstice) (continued)



SOURCE: CADP

Case No. 2011.1356E: Central SoMa Plan

Figure IV.H-22
Shadow from Plan Area Buildings on Yerba Buena Gardens, Alice Street Community Garden, Jessie Square, Yerba Buena Lane, December 20 (Winter Solstice) (continued)

Effects on Parks Subject to Section 295

South Park

New, taller buildings developed under the Plan in the vicinity of South Park could increase shadow on portions of South Park during early morning and late afternoon hours from the spring equinox to the fall equinox (March through September). On the Summer Solstice, tiny bits of new shadow could be added to shadow from existing buildings around 8:00 a.m. and in the evening starting around 6:00 p.m. These would be of extremely limited extent, as shown in Figure IV.H-11. On the equinoxes, new shadow could fall on a portion of the western end of the park beginning around 9:00 a.m., disappearing around 11:00 a.m. A very small amount of new shadow may also be added to existing shadow in the early evening on the equinoxes, starting around 6:00 p.m. (Figure IV.H-12). During the seasons of shorter day length and longer mid-day shadows, the Plan could result in an increase in shadow on South Park during most of the day. At the winter solstice, small bits of new shadow could be added to shadow from existing buildings over various parts of the park throughout the day, as shown in Figure IV.H-13 and Figure IV.H-14. All new shadow would be of very limited extent.

During the midday period of heaviest use, new shadow would be of very limited extent at the winter solstice, and would not occur from the spring equinox to the fall equinox. Because of the limited extent of potential new shadow, both in terms of area covered and length of time, and because new shadow would not affect the park during times of heaviest use, new shadow would not be expected to affect people's enjoyment of the park substantially. Because of this, and because Section 295 could function as a means to limit the height of structures that could be developed at some locations where new development could cast shadow on South Park, this impact is *less than significant* for South Park.

Victoria Manalo Draves Park

Victoria Manalo Draves Park is approximately 350 feet west, relative to the street grid, of the Plan Area. At the first Section 295 minute on the summer solstice, when shadows are at their most southerly orientation (i.e., when the sun rises at its most northerly point), a small amount of new shadow would be added to the shadow that existing buildings cast upon the central part of the park (Figure IV.H-15). This new shadow would cover a portion of the grassy knoll in the center of the park and may partially shade portions of the two children's play areas and the northern part of the baseball field. However, because shadows move quickly early in the morning, by 7:00 a.m., less than 15 minutes later, new plan-related shadow would no longer fall on the park. By 8:00 a.m., the park would be mostly in sunshine, except where an existing building shades the northeast corner of the park. Because there is limited usage of the park early in the morning, it is not anticipated that less than 15 minutes of new shadow before 7:00 a.m. on a small area of the park would adversely affect the use of this facility. Plan-related development could also cast a small amount of new shadow on Victoria Manalo Draves Park in the first few Section 295 minutes (the first minutes after one hour following sunrise, or around 8:00 a.m.) around the spring and fall equinoxes (Figure IV.H-16). This new shadow would fall upon the home plate area of the baseball field in the southwestern part of the park, but by 9:00 a.m. the entire park would be in full sun. No new Plan-related shadow would fall on the park at the winter solstice.

Section 295 could limit the height and/or bulk of any new structures at locations that would cause shadow on Victoria Manalo Draves Park, if new shadow from proposed buildings were found by the Planning Commission, on the advice of the Recreation and Park Commission, to affect the park adversely. Because

potential new shadow from Plan-related development would fall on the park for at most only a few minutes in the early morning when the Park is not heavily used, and because of Section 295 protections, the Plan would not be expected to affect use or enjoyment of Victoria Manalo Draves Park substantially, and the impact is *less than significant*.

Gene Friend Recreation Center

Gene Friend Recreation Center is located directly across Sixth Street from the Plan Area. Plan-related development could cast new shadow on the southern portion of the Center, including the open grass area and a portion of the children's play area, up to about 9:00 a.m. on the Summer Solstice and on the equinoxes (Figure IV.H-15 and Figure IV.H-16). On the winter equinox, it is possible that shadow may fall on the Sixth Street frontage of the Center in the first hour of daylight (Figure IV.H-16). Because any new shadow on the outdoor area would occur before 9:00 a.m. when the facility opens to the public, the use and enjoyment of Gene Friend Recreation Center would not likely be substantially or adversely affected by new shading that could occur with development pursuant to the Plan. Furthermore, Section 295 controls could be used to limit or modify development within the Plan Area, in order to reduce shading of the Center. Accordingly, the Plan's potential shadow impact on Gene Friend Recreation Center would be *less than significant*.

Howard-Langton Mini Park

The modeling results indicate that no new shadow from Plan-related development would fall upon the Howard-Langton Mini Park. The Plan would thus have *no impact* on the Howard-Langton Mini Park.

Effects on Open Spaces Not Subject to Section 295

Alice Street Community Gardens

No new shadow would reach the Alice Street Community Gardens at the summer solstice. As shown in Figure IV.H-18, a small amount of new shadow could also be cast on the eastern portion of the gardens late in the afternoon around the spring and fall equinoxes. As shown in Figure IV.H-19 and Figure IV.H-22, a small amount of new shadow would be cast on the gardens around the winter solstice around 11:00 a.m., and again at the end of the day. The effect would be *less than significant* because it would be limited in duration and extent and would not be expected to affect the use or enjoyment of the gardens.

Yerba Buena Gardens

Development in the Plan Area would not cast new shadow on Yerba Buena Gardens at any time during the day on the Summer Solstice. At the equinoxes, there could be a small amount of new shadow cast on a portion of the Children's Garden amphitheater as well as the landscaped area at the corner of Fourth and Howard Streets in the early morning, but this would be gone by 9:00 a.m. (Figure IV.H-17). A small amount of new shadow may also fall on the landscaped corner of Fourth and Folsom Streets around 5:00 p.m. on the equinoxes (Figure IV.H-18). At the winter solstice, small amounts of new shadow may be cast on different areas of Yerba Buena Gardens at different times of day (Figure IV.H-19 through Figure IV.H-22). New shadow may be cast along the western and eastern edges of Yerba Buena Gardens before 9:00 a.m., but these shadows would not fall on the Esplanade, Children's Garden, or East Garden. Later in the day on the winter solstice,

around 11:00 a.m., new shadow would partially cover the Creativity Carousel at the western edge of the Children's Garden. By around noon and continuing until about 3:00 p.m., this shadow would move away from the Carousel and would partially shade the landscaped area at the corner of Fourth and Folsom Streets. During the last hour or so of daylight at the winter solstice, bits of new shadow could be added to existing shadow on the margins of the southern block of Yerba Buena Gardens.

Because new shadow from Plan-related development would only affect small parts of Yerba Buena Gardens for very limited times, mostly in the early morning and evening, the Plan's impact on Yerba Buena Gardens would be *less than significant*.

Mint Plaza, Jessie Square, and Yerba Buena Lane

The computer modeling showed that no new shadow would be cast on Mint Plaza, Jessie Square, or Yerba Buena Lane by development that would be allowed under the Plan. There would therefore be *no impact* of the Plan on these open spaces.

The elevated plazas at the Intercontinental Hotel at Fifth and Howard Streets would not be substantially shaded by Plan Area development because these spaces are elevated several stories and within existing buildings, which generally makes them less sensitive to disruption, such as shading, that would affect a ground-level open space where users are more likely to feel comfortable spending a longer period of time.

Based on the foregoing, none of the above POPOS would be adversely affected by shadow under either option, and the effect would be *less than significant*.

Shadow Impacts on Sidewalks

Where the Plan would include increases to the allowable building heights and/or would create incentives for taller construction up to the proposed and existing height limits, the extent and duration of shadows cast on public sidewalks could increase if and when individual taller buildings are developed, compared to those that currently exist. The effect would likely be most noticeable south of Harrison Street, and particularly south of the I-80 freeway, where the greatest increases in height limits are proposed. The longest shadows are the fastest moving because they occur when the sun is lowest and the angle formed between the sun elevation and the ground is small; a small movement of the sun at these times results in a relatively much larger movement of distant shadow. Therefore, to the extent that the tallest buildings create more distant shadows, these are experienced for a relatively short duration. Moreover, as can be seen in Figure IV.H-2 through Figure IV.H-10, the overall increase in shading of sidewalks in the Plan Area and vicinity would not represent a substantial change, particularly during midday hours when more people are likely to be using sidewalks for leisure activities, as opposed to simply walking to and from work. Therefore, shadow impacts on sidewalks from development in the Plan Area would be *less than significant*.

Publicly Accessible Privately Owned Open Spaces (POPOS)

The 611 Folsom Street POPOS plaza is located just outside the Plan Area, at Folsom and Second Streets. A small amount of new shadow from Plan-related development could fall upon this POPOS around the winter solstice, mid-morning and again in the late afternoon. Because the 611 Folsom Street plaza includes limited amenities in the form of brick benches and five trees, is already substantially shaded, and functions to some

extent as a widened sidewalk, and because net Plan shadow would occur at very limited times of the day and year, shadow associated with Plan implementation would not be expected to substantially affect the use or enjoyment of this POPOS.

New shadow from Plan Area development could cast a small amount of new shadow on the western edge of the POPOS in front of 303 Second Street, across Second Street from the Plan Area, in the mid-afternoon on the summer solstice. On the equinoxes, new shading would begin around noon, and would continue through much of the afternoon, reaching a peak around 2:00 p.m., when about one quarter to one third of the POPOS could be shaded. On the winter solstice, new shading could increase, beginning around 10 a.m. and continuing through most of the afternoon. At its peak, new shading could cover most of the plaza, especially between about noon and 2:00 p.m. By 3:00 p.m. on the winter solstice, most of the plaza is currently shaded. The actual amount of shading would depend on the height and massing of the building projecting its shadow toward this POPOS.

This plaza is one of the most heavily used POPOS in SoMa because of its seating, landscaping, and fountain and due to the presence of restaurants in the adjacent office building that face the plaza. Use of this open space is particularly heavy at lunchtime, when the plaza would remain largely in sunshine except in late fall and early winter. Because the plaza would remain largely sunny at lunchtime except in late fall and early winter, this POPOS would be anticipated to remain heavily used.

Publicly-accessible plazas at the Courtyard by Marriott hotel at Second and Folsom Streets could receive a very small amount of new shadow around 10:00 a.m. on the winter solstice, while an outdoor plaza at 235 Second Street would not receive any additional shadow from Plan-related development. New Plan shadow would not affect the use or enjoyment of these POPOS because of the limited time that this shadow would occur.

Conclusion

Based on the foregoing analysis, development pursuant to the Plan would not create new shadow in a manner that substantially affects the use of existing outdoor recreation facilities or other public areas. Additionally, the specific massing and design of a subsequent development project would be reviewed to determine whether the project could have shadow impacts not identified at this programmatic level of analysis. Therefore, the impact would be *less than significant*.

Mitigation: None required.

Shadow on Plan-Proposed Open Spaces

As described in Chapter II, Project Description, the Plan identifies a potential new neighborhood park on the block bounded by Bryant, Fourth, Brannan, and Fifth Streets. Other proposed open space improvements under the Plan include creation of a new linear open space on a portion of the Bluxome Street right-of-way, between Fourth and Fifth Streets; conversion of several mid-block alleys into rights-of-way shared by pedestrians, bicycles, and motor vehicles, including portions of Annie Street, Jessie Street outside the Plan Area (west of Fourth Street, where Jessie meets Mission Street); and creation of one expanded and one new pedestrian plaza at either end of Annie Street, with an intersecting dog run on Ambrose Bierce (Aldrich) Alley (both outside the Plan Area). In addition, the project proposes the conversion of Lapu Lapu Street, adjacent to

the Alice Street Community Gardens, to a small park or otherwise enhancing this street as partial open space. The design and configuration of these potential new open spaces is not known, nor is any potential future programming of these spaces, and it would therefore be speculative to assess how shadow would affect these open spaces. However, potential shadow that could be cast on these open spaces is discussed below for informational purposes.³⁴²

With respect to the Plan's proposed park on the block bounded by Bryant, Fourth, Brannan, and Fifth Streets, as of March 2016, the project sponsor of the proposed mixed-use project at 598 Brannan Street has filed an application with the Planning Department to develop this area as a publicly accessible mid-block park.³⁴³ Under this proposal, the mid-block park would likely be owned by the City but maintained by the property owner; however, the park would not be under Recreation and Park Commission jurisdiction and thus not subject to Section 295.³⁴⁴ The proposed park would be connected via mid-block pedestrian passages to Bryant, Brannan, and Fifth Streets, and Welsh and Freelon Streets would provide additional pedestrian access to Fourth and Fifth Streets.

This potential new park would be partially shaded by Plan Area development throughout the year. On the summer solstice, this location would be mostly in sunlight during much of the day (between about 9:00 a.m. and 3:00 p.m.), with substantial sunlight even at 8:00 a.m. and as late at 4:00 p.m.;³⁴⁵ after that time, shadows from development at newly increased height limits would cover an increasing portion of the park until, by 6:00 p.m., when it would be nearly fully shaded. At the spring/fall equinox, there would be substantial sunlight during the midday (10:00 a.m. to 2:00 p.m.), with partial sunlight until shortly after 3:00 p.m. At 9:00 a.m., new shadow could be cast on the park, while between 3:00 p.m. and 6:00 p.m., substantial new shadow from Plan-related development could shadow the potential new park. Very early in the morning (before about 8:30 a.m.) and in the early evening (from 6:00 p.m. on), the potential park would be largely shaded by existing buildings. On the winter solstice, the park site would be at least partially shaded, mostly by development at new height limits, throughout the day, with the greatest effect of the increased height limits occurring after 10:00 a.m. Until about 9:00 a.m. and after 3:00 p.m., the potential park would be substantially shaded by existing buildings. However, even on the winter solstice, nearly half of the park would be in sunlight during the noon hour.

To the extent that any open space improvements, on this new park site or elsewhere, were to include ancillary structures, such as restrooms or play structures, that would cast shadow on open space(s), it is presumed that design of such features would ensure that shadow effects are minimal and that the ancillary features would provide an additional benefit to the open space users and would not affect use or enjoyment of the park or open space.

³⁴² It is noted that, under *California Building Industry Association v. Bay Area Air Quality Management District*, 62 Cal.4th 369, Opinion Filed December 17, 2015, effects of the environment on a project need not be analyzed under CEQA; thus, potential effects of shading by existing buildings on a proposed new open space is not an impact under CEQA.

³⁴³ Case No. 2012.0640, 598 Brannan Street; Section 295 Shadow Study Application, March 11, 2016, "Revised Project Description," undated, and plans dated September 29, 2015. Available at <http://propertymap.sfplanning.org/>, accessed July 15, 2016.

³⁴⁴ To facilitate the development of this project, an exchange of property would occur such that a portion of the development would occur on what is now SFPUC property.

³⁴⁵ Before 8:00 a.m., the park would be largely shaded by existing buildings.

New development, unless it were abutting a street or mid-block alley, would have little or no effect on linear open spaces or shared rights-of-way, because existing buildings would typically cast shadow on such streets. Bluxome Street, which, at 50 feet, is wider than most mid-block streets in the Plan Area and is lined by a number of one- and two-story buildings, would experience more new shadow from Plan Area development than would most mid-block streets where open space improvements are proposed. Other linear open spaces could be affected when shadows are at the angle in line with the park, although such instances would occur for only a few minutes at a time. These shadows would be relatively fast-moving and would cover only small areas at any given time, also use of such open spaces would not typically involve active recreation or activities that—unlike in a traditional park—would be those for which users anticipate exposure to full sunlight.

IV.H.5 Cumulative Impacts

Impact C-SH-1: Implementation of the Plan, in combination with past, present and reasonably foreseeable future projects in the vicinity, would not contribute considerably to a significant cumulative impact on shadow conditions. (Less than Significant)

Cumulative Projects Analyzed for Shadow Impacts

Of the reasonably foreseeable in the vicinity of the Plan Area, three are in close enough proximity to suggest that their shadow effects on open spaces could combine with shadow effects of Plan-related development in a cumulative manner. These projects are the Moscone Center Expansion Project, currently under construction; the 706 Mission Street project, also under construction; and the approved 5M project.

The Moscone Center Expansion project will add 300,000 gross square feet to the Moscone Center convention facility. New construction will be primarily above grade, at a height of up to 95 feet, while additional space will be created by expanding the existing below-grade exhibition halls. The Moscone Center Expansion Project will not cast new shadow on any parks subject to *Planning Code* Section 295, but will add additional shadow to Yerba Buena Gardens, including the Children’s Garden on the Moscone Center south block.

The 706 Mission Street project will develop a 47-story, 550-foot-tall tower that will accommodate the Mexican Museum and associated public uses on its first three floors and provide up to 215 dwelling units. The project will also renovate the existing Aronson Building on the northwest corner of Third and Mission Streets. The 706 Mission Street project will cast new shadow on Union Square, a Section 295 park, as well as on Jessie Square and Yerba Buena Lane. However, Plan-related development would not cast new shadow on these open spaces, and therefore there is no potential for a cumulative impact involving the 706 Mission Street project.

The approved 5M project, a 1.8-million-square-foot mixed-use development on a four-acre site at 925 Mission Street and adjacent parcels, would add new shadow to Boeddeker Park, north of Market Street, but Plan-related development would not. The 5M project will, however, cast new shadow on Yerba Buena Gardens.

Cumulative shadow impacts of the Moscone Center Expansion and the 5M project the proposed Plan are discussed below, in the order in which the open spaces were discussed for Plan-specific impacts.

Cumulative Shadow Effects on Other Open Spaces

Yerba Buena Gardens

The approved and under-construction Moscone Center Expansion project will add new shadow to various locations of Yerba Buena Gardens at different times of the day and the year. The Moscone Center expansion will add new shadow to the Esplanade primarily during the early morning hours; shadow will then decrease throughout the day until by mid- to late-afternoon. Net new shadow will be most prevalent from the first Section 295 minute until about 9:00 a.m., in the late fall and early winter months, when the shadow will fall on the central, grassy portion of the Esplanade, effectively leaving only the portion of the Esplanade adjacent to Mission Street unshaded. The Moscone Center Expansion project will also add new shadow to the East Garden (late fall and early winter, during the first Section 295 hour). The Moscone expansion will newly shade the Howard Street Plaza in the mid- to late afternoon in late spring and early summer months (cast by the Moscone North building) and to a greater extent in the morning during the rest of the year (cast by the Moscone South building). The Moscone Center Expansion project will add new shadow to the Children's Garden throughout the year and throughout the day, although to only a minimal extent until mid-afternoon hours. In late spring and early summer months, shadow will have the greatest potential effect, given that it will fall on the open space from the mid-afternoon (about 3:00 p.m.) through the last Section 295 minute; however, the majority of the garden will remain unshaded until approximately 7:00 p.m., when the play circle officially closes. The Moscone Center project will also modify some of the features in the Children's Garden, adding a tot lot, relocating and expanding the existing Learning Garden, adding an elevated social seating area, and altering certain other features.³⁴⁶ The Final EIR for the Moscone Center Expansion Project determined that shadow effects of that project would be less than significant, and the Planning Commission, in certifying the FEIR, concurred in that determination.³⁴⁷

The approved 5M Project would also cast new shadow on the Yerba Buena Center Children's Garden, although to a much lesser degree (one twenty-fifth as much net new shadow, measured in shadow-foot hours of shadow coverage annually) as would the Moscone Center Expansion project. This shadow would occur in the late afternoon around the winter solstice, and the impact was determined to be less than significant.³⁴⁸

As discussed above under Plan impacts, Plan-related development will add very little new shadow to Yerba Buena Gardens. It would add no new shadow to the Esplanade or East Garden, and would add only a small amount of new shadow, for brief periods of time, to small areas of the Children's Garden.

Together, the Moscone Center Expansion Project, the 5M Project, and potential Plan Area development would increase shadow on Yerba Buena Gardens, including the Children's Garden on top of Moscone Center South. However, Yerba Buena Gardens would continue to receive substantial sunlight, particularly during the midday hours. Given the varied uses of Yerba Buena Gardens and the relatively limited new shadow that would result from the combination of projects and Plan Area development, cumulative new shadow would not be expected to substantially affect the use and enjoyment of Yerba Buena Gardens, and the cumulative

³⁴⁶ San Francisco Planning Department, *Moscone Center Expansion Project Final EIR* (Case No. 2013.0154E), Final EIR certified August 14, 2014, pp. IV.B-14 – 19.

³⁴⁷ Planning Commission Motion No. 19219, adopted August 14, 2014.

³⁴⁸ Planning Commission Motion No. 19459, adopted September 17, 2015.

effect would be *less than significant*. Therefore, Plan shadow would not combine with cumulative development to result in significant cumulative shadow impacts on Yerba Buena Gardens.

Conclusion

Based on the above analysis of effects of the proposed Plan, the proposed Plan's contribution to cumulative shadow impacts is judged to not be considerable, and therefore the cumulative shadow impact would be *less than significant*.

Mitigation: None required.