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MEMORANDUM

February 3, 1989*

TO: The City Planning Commission
The Recreation and Parks Commission

FROM: Department of Parks and Recreation
Department of City Planning

RE: Proposition K--The Sunlight Ordinance

BACKGROUND

The Sunlight Ordinance (Section 295 of the City Planning Code) requires the Planning Commission, prior to the issuance of a permit for a project that exceeds 40 feet in height, to make a finding that any shadow on property under the jurisdiction of the Park and recreation Department cast by the project is insignificant.

The Ordinance further requires that the Planning Commission and the Parks and Recreation Commission jointly adopt the criteria to be used by the Planning Commission in the implementation of the Ordinance.

PROPOSED CRITERIA FOR DETERMINING SIGNIFICANCE

The approach recommended by staff involves two steps. The first step is to set an absolute cumulative limit for new shadow allowed in an open space. The Absolute Cumulative Limit is the additional shadow-foot-hours expressed as a percentage of the total foot-hours for each park over a period of one year. The second step is to determine individual building impacts and allocate a portion of the additional allowable shadow among specific projects within the Absolute Cumulative Limit.

Details on the methodology for measuring and modeling shadows are explained in the memorandum to the Recreation and Parks Commission and the Planning Commission on "Proposition K--The Sunlight Ordinance," dated November 1, 1987.

Absolute Limit

It is recommended that a quantitative limit be set on the amount of new shadow (summed up over a period of one year) which could be allowed in each park based on the current shadow conditions in the park and the size of the park. A large park with little shadow could be permitted a larger Absolute Cumulative Limit than a smaller park with a lot of shadow, for example.

This absolute cumulative limit could be used up by one or more new buildings, but, the final determination of how much of this limit could be used by an individual building and what form the new shadow will take should be determined on a case by case basis. However, any shadow cast beyond this limit would be considered significant and could not be allowed.

Allocation of The Absolute Cumulative Limit Among Individual Buildings

Each open space has distinctive characteristics of existing shadows and the shadow that would be created by a new building. Each potential shadow also has distinctive characteristics. Depending on the proposed new building's location the shadow could be fast or slow moving (shadows of buildings near the open space will move through the open space slower than a building farther away from the open space). The proposed new building's height and location will also determine the size and shape of potential new shadow in the park, when (e.g. time of day, time of season) and where in the park the new shadow would be cast. Since a potential shadow may have immensely varied impacts at different times of day, or different seasons, or duration of the shadow, or the size or the location of the shadow, the evaluation of impact depends on a variety of qualitative factors.

The factors to be considered in allocating additional shadow within the Absolute Cumulative Limit will vary from park to park based on the characteristics of that park and the pattern of its existing shadows.

Qualitative criteria for each park should be based on existing shadow profiles, important times of day, important seasons in the year, size and duration of new shadows and the public good served by buildings casting new shadow. These bases are explained below:

Value of the Sunlight

Time of Day (morning, mid-day, afternoon)
Based on existing shadow conditions and location of a given park, the time of day values of sunlight will have to be established. For example, afternoon and morning sun resources may be more important for preservation in neighborhood parks whereas mid-day sun may be more important in downtown parks. Additionally, some parks may have more shadow during certain times of the day when compared with other parks.

Time of Year (Spring, Summer, Fall, Winter)
In the same way that the time of day value of sunlight has to be established, sunlight value during times of year will also have to be determined.

Shadow Characteristics

Size of Shadow
Small shadows will generally be preferred to large shadows unless they last for long periods of time or fall on parts of the park where sunlight is particularly critical to users.

Duration of Shadow

Shadows lasting a short period of time will generally be preferred to shadows which last a long time unless the fleeting shadows fall during a critical time of day or season and/or are so large that they disrupt use of the park.

Location of Shadow

Efforts should be made to avoid shadows in areas of the park where existing or future use of the park is intense and where a new shadow could have detrimental effects on park vegetation.

Building Characteristics

Public Good Served By Shadow Caster

Buildings in the public interest in terms of a needed use or building design and urban form may be allocated a larger portion of the Absolute Cumulative Limit than other buildings. For example, the Civic Center Urban Design Plan calls for a building at the same height as the existing library to continue the cornice on Marshall Square thus completing the gap in the framing of Civic Center Plaza. A new library building to accommodate the growing needs of the Public Library is proposed at that space. This new building would cast new shadows in the morning hours on Civic Center Plaza. If the new building could not cast shadows, the ability to use the site for the library would be severely limited. Most of the Civic Center Plaza shadow "budget" could perhaps be allocated to be used by this library.

STAFF PROPOSAL FOR CONSIDERATION BY BOTH COMMISSIONS

The Proposition K mandate is to minimize new shadow impacts and protect the sun resource on San Francisco open spaces. On the basis of several public hearings on the subject, the objective is to construe Proposition K very strictly in terms of the additional shadow on parks. In order to accomplish this objective an Absolute Cumulative Limit is proposed for each individual park. This limit is the additional amount of shadow-foot-hours expressed as a percentage of total-foot-hours of each park as measured by the Sunlight Access Computer System (SACS) developed for the City by the University of California at Berkeley. Additionally, for each open space, criteria for the approval of new buildings have been proposed to evaluate allocations within the Absolute Cumulative Limit.

There are two major factors affecting the impact of shadow on the use of a park which are relevant to setting standards. One is the size of the park and the other is the amount of existing shadow on the park. Taking these two factors into account the staff recommends that the following standards be adopted.

In smaller parks (less than two acres) which are already shadowed 20% or more of the time during the year, it is recommended that no additional shadow

be permitted. On this basis the Absolute Cumulative Limit should be set at zero for the following parks:

Name Of Park	Absolute Cumulative Limit
Maritime Plaza	0%
Embarcadero Plaza I (north)	0%
Portsmouth Square	0%
St. Mary's Square	0%
Boeddecker Park	0%
Chinese Playground	0%
Sgt. Macaulley Park	0%
Huntington Park	0%
South of Market Park	0%

In larger parks (two acres or more) which are shadowed between 20% and 40% of the time during the year it is recommended that up to an additional 0.1% of the current shadow should be permitted if the specific shadow meets the additional qualitative criteria for the park. On this basis the Absolute Cumulative Limit for the following parks should be set at 0.1%:

Name of Park	Absolute Cumulative Limit
Embarcadero Plaza II (south)	0.1%
Union Square	0.1%

Some parks, although within this category above, have surrounding height limits that preclude the possibility of any new shadow. Therefore, the Absolute Cumulative Limit for these parks should be set at 0%. These parks are:

Name of Park	Absolute Cumulative Limit
Washington Square	0%
North Beach	0%

In larger parks which are shadowed less than 20% of the time during the year, it is recommended that additional shadow of up to 1.0% could be permitted if the specific shadow meets the additional qualitative criteria for that park. On this basis the Absolute cumulative criteria for the following park should be set at 1.0%:

Name of Park	Absolute Cumulative Limit
Civic Center Plaza	1.0%

For the three parks on which additional shadow is recommended, it is further recommended that individual project shadows within the Absolute Cumulative Limit be allocated according to the following qualitative criteria for each park.

Union Square

LOCATION: Geary, Post, Powell, Stockton
Located in the center of the City's retail district.

SIZE: 105,515 square feet
This park ranks as the third largest Downtown park.

CHARACTERISTICS: The park is surrounded by tall buildings to the east, west and the south. This relatively flat formal park is slightly elevated from the surrounding streets. Features include park furniture for sitting and lawn areas. The greatest intensity of park use occurs during mid-day hours. Users are downtown workers, shoppers, tourists. Many pedestrians use the park as a mid-block crossing. This park is the location for many civic demonstrations and cultural activities. Union Square is near the Powell Street cable car line and major hotels. A parking facility is located beneath the park.

SUN AND SHADOW CONDITIONS:

Yearly Shadow: 38.3% of the total year round sunshine is used up by existing shadows. The shadow profile for this park is generally a "U" shaped shadow distribution with significant shadows in the morning and even greater shadows in the afternoon hours. The "U" shaped distribution is increasingly flat in the Winter due to increased mid-day shadows.

Seasonal Shadow:

Summer: Least shadow impacts - greatest sun resource. Shadowed in early morning and late afternoon with relatively more shadow during the afternoon hours. Approximately 30% of the sun resource is in shadows at the time of the Summer Solstice.

Spring/Fall: Major shadow impacts during the early morning and late afternoon hours. Morning shadows increase as Fall approaches. The least shadow impacts occur between 9:30 AM and 2:30 PM. During Equinox approximately 35% of the park sun resource is in shade.

Winter: The greatest shadow impacts on Union Square occur during the Winter months. In Winter, nearly 50% of the park is in shadow for the entire day. There is very little sunlight available before 9:30 AM and after 2:30 PM during the winter. The Winter Solstice conditions are such that 60% of the park sun resource is in shadow.

ADDITIONAL SHADOW

Absolute Limit: Increase of up to 0.1% of total foot-hours for the park based on size and amount of existing shadow. A maximum of 392,663.5 new shadow foot-hours could be allowed.

Qualitative Criteria:

- Avoid additional shadows during mid-day.

Civic Center Plaza

LOCATION: Polk, Grove, Larkin, McAllister
In the Civic Center, with major government offices, library and Brook Hall surrounding the open space.

SIZE: 222,995 square feet
Civic Center Plaza is the largest downtown park.

CHARACTERISTICS: Heaviest use occurs during mid-day hours. Users are civic center workers, tourists and street people. Features include some park furniture for sitting, lawn area and fountain. This park is the location for many civic demonstrations, assemblies and cultural activities. This is a relatively flat formal park. A parking garage is located beneath the park. Adopted redesign of the park will accommodate more use by neighborhood children and day care providers.

SUN AND SHADOW CONDITIONS:

Yearly Shadow: 7.4% of the total year round sunshine is used up by existing shadows. Civic Center is one of the sunniest of the downtown parks. During most of the year the daily shadow distribution profile is that of a relatively flat "U" shape with greater shadows in the afternoon than in the morning. By Winter the "U" shape has flattened further by decreases in shadows early and late and increased shadows at mid-day.

Seasonal Shadow:

Summer: Sunny all day except in the late afternoon hours when an average of less than 40% of the park is in shade. Some shadows very early in the morning and very late in the afternoon. Almost no shadows from 9 AM to 4 PM. Approximately 5% in shadows during the Summer Solstice.

Spring/Fall: In general summer shadow conditions continue from the Spring and into the Fall. There are however less shadow impacts during the early morning hours and more shadows in the afternoon than occur during the Summer months. Approximately 5% in shadows during the Equinox.

Winter: Nearly 75% of the park remains in sun during the Winter months. In late afternoon hours there are increased shadow impacts on the open space. Approximately 10% in shadows during the Winter Solstice.

ADDITIONAL SHADOW

Absolute Limit:	Increase of up to 1.0% of total foot-hours for the park based on size of the park and the amount of existing shadow. A maximum of 8,272,486.1 new shadow foot hours could be allowed.
Qualitative Criteria:	Preserve afternoon sun, particularly on seating areas and lawn areas.

Embarcadero Center 2

LOCATION: Embarcadero, Clay & Steuart
This open space is located at the Eastern edge of the Financial District.

SIZE: 149,698 square feet
The second largest Downtown park.

CHARACTERISTICS: This park is a plaza surrounded by large office buildings with many ground floor restaurants opening on to the space. The plaza contains a large fountain, open air cafes and is predominately paved. There is a flat grass area at the South end of the plaza. The space has excellent access from Market Street and South of Market Street. During lunch hour the park is heavily used by workers from the Financial District. Tourist use of the park is also heavy due to its location at the base of Market Street, proximity to the Ferry Building, California Street cable car line and the Hyatt Regency. Noon concerts, fashion shows and performances create a great deal of day use of the park.

SUN AND SHADOW CONDITIONS:

Yearly Shadow: This open space has significant sun resources during the morning hours. Afternoon shadows are heavy. The "J" shape to the shadow profile is consistent throughout the Spring, Fall and Summer due to the morning sun and the heavy afternoon shadows. The "J" shaped shade curve disappears in the Winter. In the Winter no more than 50% of the park is in the sun after the noon hour. The shape of the curve in Winter is represented by a shaft of sun in the morning and a nearly solid block of shadow in the post morning hours. Overall, 37.6% of the annual sun resource is currently in shadow.

Seasonal Shadow:

Summer: Between 8:30 am and noon there are almost no shadows in the plaza. Before 8:30 am nearly 40% of the space is in the shade. After the mid-morning sun the shadows gradually increase until 100% of the park is in shadow at the end of the day. 30% shaded during the Summer Solstice.

Spring/Fall: For two hours in the mid-morning there is 100% sun in the park. After 11:30 am the shadows increase such that mid-afternoon shadows are greater than in Summer but never reach the 100% shadows of late afternoon Summer days. 60% shaded during the Equinox.

Winter: During the Winter there is a brief two hour period where the park is in the sun. After 10 am shadows increase rapidly and by noon in mid-December 90% of the plaza is in the shade. 80% shaded during the Winter Solstice.

ADDITIONAL SHADOW

Absolute Limit: Increase of up to 0.1% of total foot-hours for the park based on size of park and amount of existing shadows. A maximum of 557,086.1 new shadow foot-hours could be allowed.

Qualitative Criteria:

Avoid mid-day and Winter shadows.