

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT

UCSF MEDICAL CENTER AT MISSION BAY— RESIDENTIAL SOUND REDUCTION PROGRAM FOR HELICOPTER OPERATIONS State Clearinghouse Number 2008012075

University of California, San Francisco

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Note: A solid dot (●) indicates the chapter is new compared to the Draft SEIR.

CHAPTER 1

INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

This Supplemental Environmental Impact Report (“SEIR”) is an informational document prepared in accordance with the California Environmental Quality Act, Public Resources Code Sections 21000, *et seq.* (“CEQA”). It is intended to provide to decision-makers and the public supplemental environmental information concerning the University of California, San Francisco (UCSF) Medical Center at Mission Bay (“Medical Center project”), which authorized the phased development of an integrated hospitals complex to serve children, women and cancer patients at its existing 57-acre campus at Mission Bay. The initial phase Medical Center project includes a 289-bed hospital, outpatient facilities, an energy center, parking, and a helipad.

The University of California (University) is the Lead Agency and The Regents of the University of California (The Regents), or its delegated committee or administrative official, is the decision-making body for the proposed project. On September 17, 2008, The Regents certified the EIR for the UCSF Medical Center project (State Clearinghouse No. 2008012075) and approved the initial phase budget and project design.¹ In conjunction with their September 2008 approval of the Medical Center project design, The Regents approved expansion of the UCSF Mission Bay campus from 43 acres to 57 acres to include the 14.5-acre Medical Center project site. Project approval included the construction of a helipad, but approval of proposed medical helipad operations was deferred, pending the development of a Residential Sound Reduction Program (“RSRP”), as discussed below. Following completion and certification of this SEIR, the University proposes to approve helipad operations (“the project”) based upon the analyses contained in the UCSF Medical Center at Mission Bay and the SEIR and will pursue required approvals with other agencies (see Section 3.6, Required Approvals).

This SEIR has been prepared to update the helicopter noise analysis of the UCSF Medical Center at Mission Bay EIR by providing information on the RSRP. This SEIR focuses solely on the RSRP mitigation measure, as all other environmental topics and all other issues related to helicopter operations and helicopter noise were adequately analyzed in the UCSF Medical Center at Mission Bay EIR. While this document updates the UCSF Medical Center at Mission Bay EIR, that EIR remains valid and useful.

In addition, since certification of the EIR, the Federal Aviation Administration has updated its Integrated Noise Model, required for use in environmental analyses of noise from helicopter

¹ The UCSF Medical Center at Mission Bay EIR is available for viewing at UCSF Campus Planning, 3333 California Street, Suite 11, San Francisco, or online at <http://campusplanning.ucsf.edu/physical/RFEIRHospital.php>.

operations and used in the UCSF Medical Center at Mission Bay EIR. This SEIR reviews the analysis results using the updated FAA noise model and confirms that the significance of noise impacts has not changed from the prior UCSF Medical Center at Mission Bay EIR analysis.

Among the environmental topics analyzed in the UCSF Medical Center at Mission Bay EIR were helicopter noise impacts resulting from operation of the proposed medical helipad, which impacts were found to be significant. To reduce impacts of helicopter noise on nearby residents, the Draft EIR identified measures that relate to operation of the helipad that would minimize helicopter noise. In addition, the Final EIR identified a mitigation measure calling for the University to continue working with the community to develop an RSRP. These measures, which were documented collectively under Mitigation Measure MCMB.5-4, were agreed to by the University and adopted by The Regents in September 2008. This SEIR focuses on the aspect of Mitigation Measure MCMB.5-4 requiring the University to continue to work with the community to develop the RSRP and to include additional mitigation developed as part of the community process.

This document meets the criteria of CEQA Guidelines Section 15162, and more specifically Section 15163. CEQA Guidelines Section 15162, Subsequent EIRs and Negative Declarations, requires the preparation of a Subsequent EIR when, among other criteria, “New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following: . . . (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.” CEQA Guidelines Section 15163 allows the lead agency to choose to prepare a supplement to an EIR rather than a subsequent EIR if “only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation.”

The new information concerning the proposed project is the University’s further development of the RSRP mitigation measure, as required in the UCSF Medical Center at Mission Bay EIR. Only minor additions to the UCSF Medical Center at Mission Bay EIR are necessary for the EIR to adequately address the proposed revisions to the project mitigation, consisting of a description of the RSRP elements developed with the community, and an evaluation of the effectiveness of the RSRP mitigation measure in reducing the helicopter noise impacts previously identified and fully analyzed in the EIR. Because of the modest nature of this new information, a supplement to the UCSF Medical Center at Mission Bay EIR has been prepared. Pursuant to Section 15163(b), “The supplement to the EIR need contain only the information necessary to make the previous EIR adequate for the project as revised.”

1.2 ORGANIZATION OF THE DOCUMENT

This document is organized into the following chapters:

- Chapter 1, Introduction: Describes the purpose of this SEIR.
- Chapter 2, Summary: Summarizes the Residential Sound Reduction Program and supplemental environmental impact analysis.
- Chapter 3, Project Description: Provides a description of the Residential Sound Reduction Program, project objectives, project consistency with the LRDP, mitigation monitoring, and required approvals by other agencies.
- Chapter 4, Environmental Settings, Impacts and Mitigation Measures: Describes the scope of this SEIR, focusing on the topic of the Residential Sound Reduction Program mitigation measure.
- Chapter 5, CEQA Statutory Sections: Discusses various CEQA mandated considerations including unavoidable environmental impacts, cumulative impacts, and growth inducing impacts.
- Chapter 6, Alternatives: Discusses the alternatives to the project already analyzed in the UCSF Medical Center at Mission Bay EIR.
- Chapter 7, Report Preparation: Lists report authors, in this case UCSF Campus Planning staff, and other consulting staff that assisted with the preparation and review of the SEIR. Identifies persons, agencies and organizations that were consulted.

CHAPTER 2

SUMMARY

2.1 PROJECT OVERVIEW

The University proposes approval of helicopter operations associated with the UCSF Medical Center at Mission Bay project. On September 17, 2008, The Regents certified the UCSF Medical Center at Mission Bay EIR and approved the initial phase budget and project design. The University approved construction of the helipad but deferred approval of proposed medical helicopter operations, pending development of the Residential Sound Reduction Program (RSRP). The impacts associated with operation of the helipad were fully evaluated in the UCSF Medical Center at Mission Bay EIR. This supplement to the EIR, or “SEIR,” has been prepared to update the helicopter noise analysis of the UCSF Medical Center at Mission Bay EIR by providing information on the RSRP. The purpose of this SEIR is to evaluate the effectiveness of the RSRP mitigation measure in reducing the noise impacts identified in the UCSF Medical Center at Mission Bay EIR. All other environmental topics and all other issues related to helicopter operations and helicopter noise were adequately analyzed in the UCSF Medical Center at Mission Bay EIR.

In addition, this SEIR updates the helicopter noise analysis using the Integrated Noise Model developed by the Federal Aviation Administration, which has been revised since certification of the UCSF Medical Center at Mission Bay EIR.

2.1 PROJECT DESCRIPTION

The Medical Center project site is bordered by 16th Street to the north, 3rd Street to the east, and Mariposa Street to the south. In the future, a new segment of Owens Street will define the western boundary of the project site. As described in the UCSF Medical Center at Mission Bay EIR, the 14.5-acre Medical Center project site would contain a comprehensively planned, state-of-the-art medical center adjacent to the existing 43-acre UCSF Mission Bay research campus site.² The phased development would consist of an integrated complex of three hospitals to serve children, women and cancer patients. The initial phase would include a 289-bed hospital, outpatient facilities, an energy center, parking, and a helipad.

Under the existing Medical Center project approvals, the helipad would be situated on the roof of the outpatient building, at a height of approximately 140 feet above grade in order to meet FAA obstruction clearance requirements, accounting for existing and future development at Mission

² The 14.5-acre Medical Center project site was added to the 43-acre UCSF Mission Bay campus site (a total of 57 acres) in September 2008.

Bay. The helipad would serve the UCSF Children's Hospital and pregnant women in distress, and its use would be limited to incoming inter-facility (hospital-to-hospital) transports of only those patients with the most critical and life-threatening conditions. A physician would be required to approve helicopter transport based on the condition of the patient. An average of 1.4 transports per day is projected.

Approval of proposed medical helicopter operations was deferred by the University, pending the development of a Residential Sound Reduction Program (RSRP). As discussed in more detail in Section 4.1 Noise – Helicopter Operations, helicopter noise was analyzed in the UCSF Medical Center at Mission Bay EIR and noise impacts resulting from operation of the proposed medical helipad were found to be significant due to potential nighttime awakening of some residents within the single-event noise contour established as a threshold of significance. To reduce the impact of helicopter noise on nearby residents, the EIR identified a mitigation measure calling for UCSF to continue working with the community to develop an RSRP.

UCSF held two community meetings about the RSRP in November and December 2008, and had several one-on-one discussions with individual neighbors. At the community meetings, community members provided feedback on RSRP elements proposed by the University. UCSF proposed a program in which mitigation would be made available to those residential property owners within the single-event noise contour identified after commencement of helipad operations. The noise contour will be based on the 95 dB Single-Event Noise Exposure Level (SENEL) (see Section 4.1.2, Significance Criteria and Analysis Methodology). Subject to qualifications, funds will be provided to residential property owners for the purpose of implementing sound reduction measures, which could include acoustical windows, acoustical doors, weatherstripping, insulating skylights, and/or ventilation improvements as determined on a case-by-case basis, to reduce the potential impact of nighttime awakening from helicopter noise. Community members provided comments on the proposed RSRP, and UCSF agreed to revise the program. Because the RSRP would provide the qualified residential property owner with funds to implement sound reduction improvements in sleeping areas, the property owner, in return, would be required to release the University from future claims related to UCSF helicopter noise at the property. The release would be in the form of an easement.

Specific language of the proposed RSRP mitigation measure is provided in the following section and in Section 4.1, Noise – Helicopter Operations.

2.2 SUMMARY OF PROJECT IMPACTS

2.2.1 NOISE – HELICOPTER OPERATIONS

In addition to using the FAA-required Community Noise Equivalent Level metric to evaluate helicopter noise, UCSF voluntarily used the SENEL noise metric. This SEIR assesses the effectiveness of the RSRP mitigation measure to reduce or eliminate single-event helicopter noise impacts based on the significance criteria and methodology established in the UCSF Medical Center at Mission Bay EIR (pp. 4.5-9 through 4.5-17). That information is hereby incorporated by reference.

2.2.2 FAA NOISE MODEL

The FAA requires the use of the most recent version of the FAA-approved Integrated Noise Model (INM) for aircraft noise assessments. At the time the UCSF Medical Center at Mission Bay EIR was prepared, the most recent INM available was Version 7.0, which was used in the EIR analysis. Since that time, the FAA released a new version of the INM, Version 7.0a. In light of the updated noise model, the CNEL and SENEL contours for UCSF's proposed helicopter operations were modeled using INM 7.0a to compare with what was modeled in INM 7.0 and used in the UCSF Medical Center at Mission Bay EIR analysis. The updated 65 dB CNEL contour remained generally the same with the only differences being a slight bulge along the approach track from the east.

The updated 95 dB SENEL contour for each aircraft type showed a slight growth in the contours to the north and west, as well as more dramatic growth to the east. The contours south of the helipad remain generally unchanged or not perceptible.

None of the updated noise contours materially alters the UCSF Medical Center at Mission Bay EIR analysis. Although the contours grew slightly to the north and west and more dramatically to the east, these changes to the modeled noise contours are inconsequential because sensitive receptors are not affected in these areas, and with the remodeled contours show no perceptible change to the southern lobes of the noise contours where residences may be impacted by helicopter noise. As such, the conclusions of the UCSF Medical Center at Mission Bay EIR do not change. Therefore, the helicopter noise analysis and conclusions of the UCSF Medical Center at Mission Bay EIR remain valid.

2.2.3 IMPACTS AND MITIGATION MEASURES

Results of UCSF Medical Center at Mission Bay EIR Analysis

The UCSF Medical Center at Mission Bay EIR (pp. 4.5-21 through 4.5-22) found that the 65 dB CNEL noise contour is contained to the Medical Center project site itself and the UCSF Mission Bay research campus. The number of helicopter transports per day is projected at 1.4, on average. Both an average day (1.4 transports/day) and a busy day (estimated at 3 transports/day) were analyzed. Noise from helicopter operations would be compatible with land uses within the 65 dB noise contour. Noise levels with UCSF helicopter operations would increase overall noise levels in residential areas by less than 1 dB CNEL, which is less than the 1.5 dB CNEL increase that is the threshold of significance. Therefore, helicopter noise impacts using the CNEL metric were less than significant and no mitigation is required.

As discussed previously, updated noise contours were prepared for this SEIR using the most recent FAA noise model. The updated 65 dB CNEL noise contour remains generally the same, but during average day helicopter operations extends to the east across 3rd Street, and during busy day helicopter operations extends across 3rd Street and a portion of the block across 3rd Street. As no sensitive receptors would be within these new contours, noise from UCSF helicopter operations would continue to be compatible with land uses within the 65 dB noise contour.

Therefore, helicopter noise impacts using the CNEL metric would continue to be less than significant and no mitigation is required.

With regard to SENEL, the UCSF Medical Center at Mission Bay EIR (pp. 4.5-24) found that for most helicopter models projected to be used by planned UCSF air medical service providers, the 95 dB SENEL noise contour is limited to the Medical Center project site, the UCSF Mission Bay research campus, and adjacent commercial areas within Mission Bay. For one helicopter model, the 95 dB SENEL noise contour extends about one block south of the Medical Center project site, covering an area roughly between Mariposa, 18th, Illinois, and Indiana Streets. This southern lobe of the 95dB SENEL noise contour includes residential and live/work properties. With the updated SENEL noise contours, the prior description of the area affected by the 95 dB SENEL noise contour remains the same. Noise during helicopter operations has the potential to result in awakening for up to about 10% of the residents located within this 95 dB SENEL contour. For this reason, the UCSF Medical Center at Mission Bay EIR found the impact of helicopter noise using the SENEL metric to be significant, and identified the Mitigation Measure MCMB.5-4 below, which UCSF has already agreed to and which was adopted by The Regents following certification of the EIR.

UCSF proposes minor changes to Mitigation Measure MCMB.5-4 (new text in underline and deleted text in strikeout, as indicated below) that are necessary in order to make clarifications and establish consistency with new Mitigation Measure MCMB.5-4a discussed later in this chapter. CEQA Guidelines Section 15074.1 allows for substitution of mitigation measures which the lead agency determines are equivalent or more effective. In addition, CEQA allows for substitution or modification of mitigation measures so long as the new or revised mitigation measures create no new impacts. As UCSF proposes only minor changes to Mitigation Measure MCMB.5-4 that do not change the intent or effectiveness of the mitigation measures, and do not create new impacts, the proposed changes are allowed under CEQA.

(From the UCSF Medical Center at Mission Bay EIR, certified September 17, 2008)

Mitigation Measure MCMB.5-4: Prior to helicopter operations, UCSF shall implement the following:

The University shall continue to work with the community to develop a Residential Sound Reduction Program and to evaluate feasible noise mitigation measures related to UCSF helicopter operations. Once developed, this program shall undergo additional project-level environmental review prior to the start of helicopter operations at the site. Specific sound reduction measures identified in the program would be implemented after UCSF helicopter operations begin and the actual sound environment at that time is known.

The Residential Sound Reduction Program shall be implemented to the extent feasible to minimize significant disruption to receptors, and shall include the following elements:

- Limit types of landings at the site to the most critically ill patients where time is of the essence, when helicopter transport is approved by a physician
- Limit activity to incoming interfacility transfers

- Prepare a Helicopter Operations Plan that shall specify the following:
 1. All helicopter operations shall use the flight paths described in the EIR, unless safety precautions require a diversion from any of the flight paths.
 2. The primary approach and departure path is the least disruptive flight path (arrive from east and depart to east) and should be utilized as much as feasible. The alternate and secondary flight paths should be utilized only if the primary approach and departure path is not desirable due to wind conditions or safety considerations.
 3. UCSF service contracts with air medical companies shall require that all pilots be routinely trained to ensure that optimum arrival and departure flight paths procedures are followed for each helicopter type that serves UCSF. Pilots would be instructed in the use of the primary east approach and departure path.
 4. A log of UCSF helicopter activity shall be maintained which shall include a detailed record of the reason for the trip, and date and time of arrival and departure. If a diversion from prescribed flight paths occurred as discussed above, the reason for diversion shall be recorded in the log.
- Respond to noise complaints about helicopter over flight. UCSF shall investigate noise complaints and shall work to address the complaint if it is determined that the cause was from helicopter operations at UCSF. The investigation may include consultation with medical transport companies, a noise engineer, a site assessment, noise monitoring of the affected property, and other actions as may be necessary. Contact information for registering complaints shall be made publicly available. This measure shall be implemented in addition to Mitigation Measure MCMB.5-4a.
- Establish a UCSF committee, including community members ~~working group~~, that meets periodically to provide a forum for UCSF and the community to discuss helicopter noise issues and to address any outstanding UCSF helicopter noise issues or concerns.
- Include additional mitigation developed as part of the community process.

Significance after Mitigation: Significant and Unavoidable.

RSRP Mitigation Measure MCMB.5-4a

The RSRP mitigation measure, developed with neighborhood feedback resulting from the community process, would be a program in which mitigation funds would be made available to those residential property owners within the 95 dB SENEL noise contour, which was identified as the threshold of significance in the UCSF Medical Center at Mission Bay EIR. In addition, the qualifying noise contour would include all residential properties located on any block that is touched by the 95 dB SENEL noise contour, whether or not the property lies within the contour. Subject to qualifications, funds would be offered for the purpose of compensating such property owners for sound reduction measures, which could include acoustical windows, acoustical doors, weatherstripping, insulating skylights, and ventilation improvements as determined on a case-by-case basis, to reduce the potential impact of awakening from helicopter noise.

The RSRP mitigation measure, which would be implemented in conjunction with Mitigation Measure MCMB.5-4 identified in the UCSF Medical Center at Mission Bay EIR, is as follows:

Mitigation Measure MCMB.5-4a: Following helipad construction, UCSF shall implement the following program as part of the RSRP:

Start-up Period

1. During the first eight weeks of operations, UCSF will address noise complaints, if any, by revising helicopter operations where feasible. If helicopter activity does not reach the expected average of 1.4 transports per day during the start-up period, the start-up period will be extended to a maximum of 12 weeks.
2. At the end of the start-up period, UCSF will conduct a test flight and redraw the 95 dB SENEL (single-event) noise contour to reflect the noise environment that will exist at that time.

Qualifications

3. Property is located in the blocks within or touched by the redrawn 95 dB SENEL (single-event) noise contour.
4. Property is a legal residential or live/work unit, as of the date of approval of the helipad by Caltrans Aeronautics.
5. Noise level in interior sleeping area is at or greater than 80 dB SENEL with windows closed, as measured by UCSF's sound consultant. (If unit is a loft with no separate sleeping area, entire unit will be considered a sleeping area for sound mitigation funds.)

Implementation

6. UCSF sends notification about the RSRP to residential property owners in the blocks within or touched by the redrawn 95 dB SENEL noise contour, plus 2 blocks beyond the contour.

7. Property owners have 12 months after the date of notification about the RSRP to apply for the program (UCSF will send a reminder to those notified at least 3 months before the end of the application period).
8. UCSF determines if property meets qualifications.
9. UCSF will compile for property owner reference acoustical specifications identifying standard acoustical installations, such as acoustical windows and doors.
10. Qualified UCSF consultant recommends sound reduction measures in sleeping areas, which may include:
 - Standard acoustical windows;
 - Standard acoustical doors;
 - Weather stripping around doors and other openings;
 - Insulate or double pane skylights;
 - Ventilation improvements.
11. UCSF consultant estimates cost of recommended sound reduction measures in sleeping areas, which includes labor and materials costs, permit fees, and City inspections.
12. UCSF pays qualifying property owner amount of this estimate:
 - Costs will be based on “like-for-like”, that is, for replacement of existing materials similar in quality or appearance;
 - Qualifying property owners who have existing vinyl or aluminum windows can be given a choice of vinyl or aluminum and color options;
 - San Francisco Planning Code requirements within historic districts or regarding historic structures will apply. Wood windows may be required. Related costs will be included in the estimate.
13. UCSF will establish an ad hoc working group of neighbors to develop a dispute and mediation process.
14. Qualifying property owner, on her/his behalf and on behalf of tenants and future property owners, releases UCSF from future claims for UCSF helicopter noise at the property; this release shall be in the form of a permanent easement in exchange for compensation per item #12 above. The easement may be modified by written agreement executed by both parties.
15. Qualifying property owner is responsible for implementing sound reduction improvements.

Implementation of this mitigation measure in conjunction with Mitigation Measure MCMB.5-4 would in general mitigate noise impacts on sensitive receptors from helicopter operations to less than significant levels. As discussed in Section 4.1.2, Significance Criteria and Analysis Methodology, the noise analysis assumes that existing residential properties have a minimum noise reduction with windows closed of about 15 dB. In general, implementation of the sound reduction measures identified above, such as installation of the acoustical windows, acoustical

doors, weatherstripping, and insulating or double-paning skylights, is expected to achieve an exterior-to-interior noise reduction of about 20 to 25 dB, or about 5 to 10 dB more than under conditions without the sound reduction improvements. Thus, it is anticipated that helicopter noise impacts on most qualifying residential properties would be reduced to less than significant levels. However, it may not be feasible to reduce interior sleeping area SENEL levels to less than 80 dB at every residential unit. In addition, the University cannot compel property owners in the vicinity of the helipad to keep windows closed or to participate in the Residential Sound Reduction Program. Therefore, this impact would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable

2.3 SUMMARY OF ALTERNATIVES ANALYSIS

The UCSF Medical Center at Mission Bay EIR analyzed a range of reasonable helipad alternatives, including a No Helipad Alternative and Off-Site Helipad Alternatives (pp. 6-1 through 6-22). In addition, the EIR provided information concerning helipad alternatives that were considered but not included for detailed analysis in the EIR. The RSRP mitigation measure identified in this SEIR does not affect that analysis.

The UCSF Medical Center at Mission Bay EIR identified the No Helipad Alternative as the environmentally superior alternative (pp 6-19 to 6-20). The RSRP mitigation measure identified in this SEIR does not affect that analysis.

2.4 AREAS OF CONTROVERSY

The UCSF Medical Center at Mission Bay EIR identified helicopter noise and vibration effects and potential resultant impacts on health, among other topics not related to the helipad, as potentially controversial. In addition, concerns about helicopter safety were raised during that EIR process. Those topics were fully analyzed in the UCSF Medical Center at Mission Bay EIR in Sections 4.5 Noise and 4.3 Aeromedical Helicopter Flight Operations and Public Safety. This SEIR provides supplemental information with regard to the FAA Noise Model and the RSRP mitigation measure. It is anticipated that helicopter noise, vibration, and safety could continue to be an area of controversy.

CHAPTER 3

PROJECT DESCRIPTION

3.1 PROJECT OVERVIEW

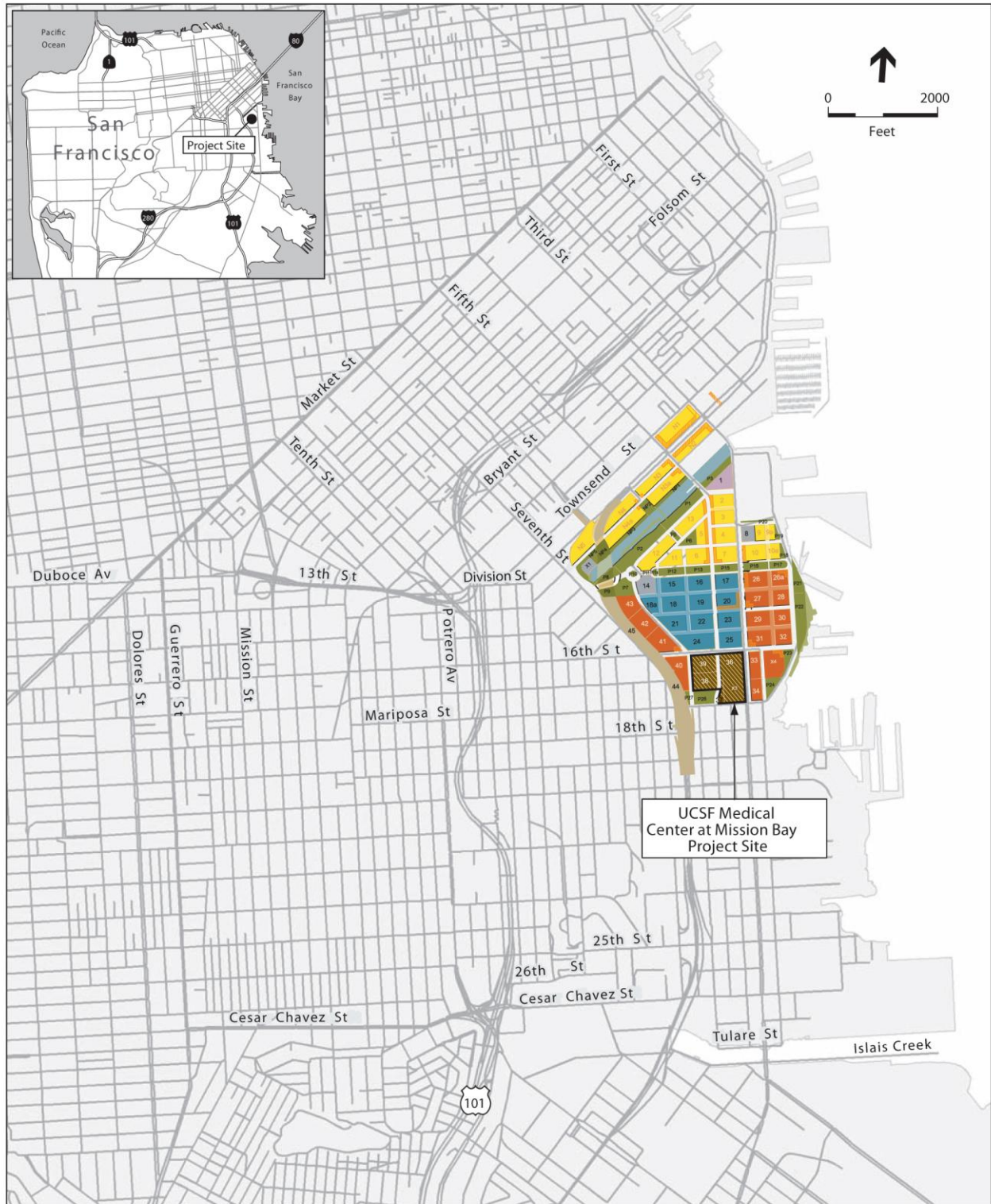
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In addition, this SEIR updates the helicopter noise analysis using the Integrated Noise Model developed by the Federal Aviation Administration, which has been revised since certification of the UCSF Medical Center at Mission Bay EIR.

3.2 PROJECT DESCRIPTION

The location of the UCSF Medical Center at Mission Bay, including the site of the helipad, is as described in the UCSF Medical Center at Mission Bay EIR. The 14.5-acre site is located in the eastern portion of the City of San Francisco, approximately one and one half miles south of downtown, and increases the UCSF Mission Bay campus from 43 acres to 57 acres (see [Figure 3-1](#)).³ The site lies within the 303-acre Mission Bay Redevelopment Plan Area, under the jurisdiction of the San Francisco Redevelopment Agency, and consists of Mission Bay South Plan Parcels 36, 37, 38, 39, and X3.

³ The 14.5-acre Medical Center project site was added to the 43-acre UCSF Mission Bay campus site (a total of 57 acres) in September 2008.



Source: Environmental Science Associates, April 2008

Figure 3-1
Project Location



Source: UCSF, April 2008

Figure 3-2
Project Site

The Medical Center project site is bordered by 16th Street to the north, 3rd Street to the east, and Mariposa Street to the south. In the future, a new segment of Owens Street will define the western boundary of the project site. As described in the UCSF Medical Center at Mission Bay EIR, the Medical Center project consists of a comprehensively planned, state-of-the art medical center. The phased development would consist of an integrated complex of three hospitals to serve children, women and cancer patients, and would include an initial phase of 289 beds, outpatient facilities, an energy center, parking, and a helipad (see [Figure 3-2](#)).

Under the existing Medical Center project approvals, the helipad would be situated on the roof of the outpatient building, at a height of approximately 140 feet above grade in order to meet FAA obstruction clearance requirements, accounting for existing and future development at Mission Bay. The helipad would serve the UCSF Children's Hospital and pregnant women under distress, and its use would be limited to incoming inter-facility (hospital-to-hospital) transports of only those patients with the most critical and life-threatening conditions. A physician would be required to approve helicopter transport based on the condition of the patient. An average of 1.4 transports per day is projected.

Approval of proposed medical helicopter operations was deferred by the University, pending the development of a Residential Sound Reduction Program (RSRP). As discussed in more detail in Section 4.1 Noise – Helicopter Operations, helicopter noise was analyzed in the UCSF Medical Center at Mission Bay EIR and noise impacts resulting from operation of the proposed medical helipad were found to be significant due to potential nighttime awakening of some residents within the single-event noise contour established as a threshold of significance. To reduce the impact of helicopter noise on nearby residents, the EIR identified a mitigation measure calling for UCSF to continue working with the community to develop an RSRP.

UCSF held two community meetings about the RSRP in November and December 2008, and had several one-on-one discussions with individual neighbors. At the community meetings, community members provided feedback on RSRP elements proposed by the University. UCSF proposed a program in which mitigation would be made available to those residential property owners within the single-event noise contour identified after commencement of helipad operations. The noise contour will be based on the 95 dB Single-Event Noise Exposure Level (SENEL) (see Section 4.1.2, Significance Criteria and Analysis Methodology). Subject to qualifications, funds will be provided to residential property owners for the purpose of implementing sound reduction measures, which could include acoustical windows, acoustical doors, weatherstripping, insulating skylights, and/or ventilation improvements as determined on a case-by-case basis, to reduce the potential impact of nighttime awakening from helicopter noise. Community members provided comments on the proposed RSRP, and UCSF agreed to revise the program. Because the RSRP would provide the qualified residential property owner with funds to implement sound reduction improvements in sleeping areas, the property owner, in return, would be required to release the University from future claims related to UCSF helicopter noise at the property. The release would be in the form of an easement.

Specific language of the proposed RSRP mitigation measure is provided in Section 4.1, Noise – Helicopter Operations.

3.3 PROJECT OBJECTIVES

3.3.1 HELIPAD OBJECTIVES IN THE UCSF MEDICAL CENTER AT MISSION BAY EIR

The Project Objectives described in the UCSF Medical Center at Mission Bay EIR remain unchanged. Project Objectives that relate to the helipad are summarized again here, with new text in italics, as follows:

- To lessen significant impacts on the surrounding community, *and to mitigate to the extent feasible helicopter noise impacts for those neighbors disproportionately affected by UCSF helicopter noise beyond a pre-determined impact level;*
- To locate the helipad so as to avoid transfers of patients from one mode of travel to another (i.e. helicopter to ambulance);
- To locate the helipad to meet the functional needs of the children's hospital and women's hospital, *in order to best serve patients to be served by helicopter transport: children and pregnant women under distress;*
- To comply with all applicable regulatory and life safety requirements for helipads and helicopter travel, including but not limited to Federal Aviation Administration (FAA) requirements for flight path obstruction clearance;
- To locate the helipad on a site where access is controlled, to ensure public safety during helicopter landings and take-offs;
- To construct a visually unobtrusive helipad, integrated into the design of the building;
- To construct a helipad in most cost-effective manner possible.

3.4 CONSISTENCY WITH THE LRDP

In September 2008, The Regents approved Long Range Development Plan (LRDP) Amendment #3 to extend the Mission Bay campus site boundaries to include the UCSF Medical Center at Mission Bay site; and to include a "clinical care" functional zone designation over the site, consistent with UCSF's space categories.

The UCSF Medical Center at Mission Bay Draft EIR evaluated the Medical Center project's consistency with the LRDP, noted the then-pending LRDP Amendment #3, and found that the Medical Center project would not conflict with the LRDP. With the approval of LRDP Amendment #3, the Medical Center project, including the currently proposed helicopter operations, would be consistent with the LRDP.

3.5 MITIGATION MONITORING

CEQA requires that when a public agency makes findings of significance based on an EIR, the public agency must adopt a reporting or monitoring program to ensure that action is completed on those mitigation measures which it has adopted, or made a condition of project approval, in order to mitigate or avoid the project's significant effects on the environment (Public Resources Code Section 21081.6). A mitigation monitoring program for the Medical Center project was adopted in September 2008 upon certification of the UCSF Medical Center at Mission Bay EIR and approval of the Medical Center project. Upon certification of this SEIR and approval of helipad operations, the revised mitigation monitoring program, updated to include mitigation measures identified in this SEIR, would be adopted.

3.6 REQUIRED APPROVALS

The University of California is the CEQA lead agency in the review of the project. The Regents of the University of California, or their delegate, will consider certification of this SEIR and approval of helipad operations.

As discussed in the UCSF Medical Center at Mission Bay EIR, the helipad approval process would include reviews and permits from the California Department of Transportation, Aeronautics Division (Caltrans), as well as a Federal Aviation Administration (FAA) Airspace Determination to ensure the helipad meets dimensional requirements and the flight paths are clear of obstructions. As part of the Caltrans approvals, the San Francisco Board of Supervisors, as the local governing body, is required to approve the helipad on the project site before Caltrans issues its permits.

CHAPTER 4

ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

4.0 SCOPE OF ANALYSES

This SEIR evaluates the effectiveness of the RSRP mitigation measure to lessen or eliminate the helicopter noise impact identified in the UCSF Medical Center at Mission Bay EIR.

The UCSF Medical Center at Mission Bay EIR analyzed at a project level all other environmental topic areas, including all other issues related to helicopter operations including noise, vibration, and safety. All other impacts related to the proposed helipad were found in that EIR to be less than significant after mitigation. With regard to helicopter safety, helicopter accidents that have occurred since certification of the UCSF Medical Center at Mission Bay EIR, none of which involved third party deaths, do not change the EIR's conclusion that helicopter safety impacts are less than significant. UCSF will keep informed of the progress of future regulatory recommendations on medical helicopter safety, such as those resulting from public hearings held by the National Transportation Safety Board (NTSB). All other environmental topics were adequately analyzed, require no further analysis, and are therefore not discussed in this SEIR.

4.1 NOISE – HELICOPTER OPERATIONS

4.1.1 SETTING

The setting information is the same as discussed in the UCSF Medical Center at Mission Bay EIR (pp. 4.5-1 through 4.5-8). That information is hereby incorporated by reference.

In brief, the existing noise environment is that of an urban mixed-use and industrial neighborhood. As stated in the UCSF Medical Center at Mission Bay EIR, “major noise sources in the Mission Bay area and vicinity include vehicles on major thoroughfares and Interstate 280 (1-280), freight and passenger trains, light rail, freight loading and unloading, and heavy equipment and machinery operation. Intrusive noises in the Mission Bay area and vicinity include train whistles, honking horns, some types of industrial process noises, hammering and banging on metal parts and surfaces, accelerating buses and trucks, and many other miscellaneous noise sources.”

The nearest residences to the project site are located south of Mariposa Street within the Dogpatch neighborhood.

Ambient sound levels measured in the surrounding neighborhoods in 2007 range from about 60 dB to 69 dB using the Community Noise Equivalent Level measurement, or CNEL, a 24-hour metric (please see Section 4.1.2 of this SEIR for noise measurement descriptors). Single-event (Single-Event Noise Exposure Level, or SENEL) noise measurements taken in 2008 at Third and Mariposa Streets ranged from 74 dB to 101 dB from a variety of noise sources that currently exist in the community such as helicopters, other aircraft, sirens, motorcycles, trucks, 3rd Street Light Rail, and construction activity.

4.1.2 SIGNIFICANCE CRITERIA AND ANALYSIS METHODOLOGY

This SEIR assesses the effectiveness of the RSRP mitigation measure to reduce or eliminate helicopter noise impacts based on the significance criteria and methodology established in the UCSF Medical Center at Mission Bay EIR (pp. 4.5-9 through 4.5-17). That information is hereby incorporated by reference.

In brief, the UCSF Medical Center at Mission Bay EIR used two noise measurement descriptors to evaluate helicopter noise impacts:

- The Community Noise Equivalent Level (CNEL) is the average A-weighted noise level during a 24-hour day. Evening (from 7:00 p.m. to 9:59 p.m.) noise events are multiplied by three, which adds 4.77 decibels to each evening event. Nighttime (between 10:00 p.m. and 6:59 a.m.) noise events are multiplied by 10, which add a 10-decibel penalty to each night event. Both penalties are intended to account for most people's increased sensitivity to noise during the evening and nighttime hours.
- The Single-Event Noise Exposure Level (SENEL) is the California descriptor for the energy-based sum of the noise experienced during a single noise event, and is typically 10 dB higher than the Lmax (maximum noise level) for aircraft noise.⁴

CNEL Significance Criteria

The FAA requires aircraft noise assessments in California to use CNEL. The impact criteria recommended by the FAA (FAA Order 1050.1E) as they apply in California to noise-sensitive receivers within CNEL contours, and the CNEL significance criteria established in the UCSF Medical Center at Mission Bay EIR, are as follows:

- A significant impact would occur if the project-related action will cause noise-sensitive areas already at or above CNEL 65 dB to experience an increase in noise of CNEL 1.5 dB or greater when compared to no project.
- If noise sensitive areas at or above CNEL 65 dB will have an increase of CNEL 1.5 dB or more, noise sensitive areas lying between CNEL 60 and 65 dB should be examined to

⁴ Outside of California, the Sound Exposure Level (SEL) is the descriptor for single-event noise. SEL is equivalent to SENEL.

identify whether increases of CNEL of 3 dB or more occur due to the proposed action. If so, noise mitigation measures should be considered.

- For air space actions affecting areas beyond the immediate vicinity of an airport, multiple airports or flight operations above 3,000 feet above ground level (AGL), populated areas should be examined for changes in CNEL greater than 5 dB.

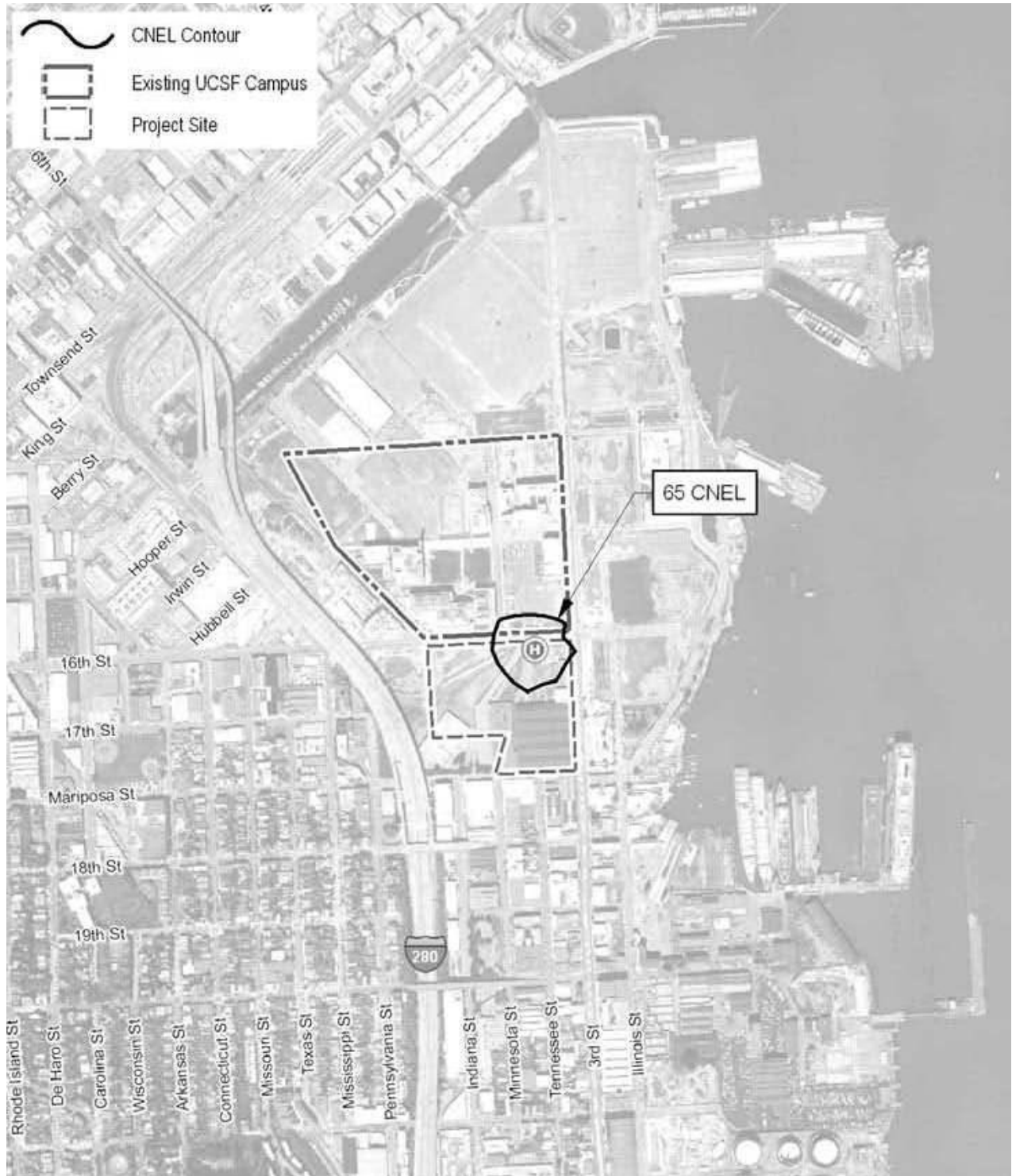
The UCSF Medical Center at Mission Bay EIR considered 65 dB CNEL noise contours for both an average day (1.4 transports/day) and a busy day (estimated at 3 transports/day) (see [Figures 4-1 and 4-2](#)).

SENEL Significance Criteria

The UCSF Medical Center at Mission Bay EIR established 95 dB SENEL as the single-event noise significance criteria.

In addition to using the FAA-required CNEL metric, UCSF voluntarily used the SENEL noise metric to evaluate helicopter noise. While there are no federal or state standards of significance for the SENEL metric, SENEL is acknowledged as a useful metric in understanding the effects of noise on the community, particularly sleep disturbance. In 1997, the Federal Interagency Committee on Aircraft Noise (FICAN) published a document summarizing the current state of knowledge concerning the effects of aviation noise on awakenings. The FICAN report summarized sleep disturbance research relative to aircraft noise, and noted in particular that research since 1992 had shown a consistent pattern, with considerably smaller percentages of the exposed population expected to be “behaviorally awakened” than had been shown in laboratory studies. In light of the new information from studies conducted since 1992, FICAN established a new dose-response curve for predicting awakening, based on aircraft noise levels experienced inside a home. To arrive at indoor sound levels, exterior sound levels are reduced by the attenuation (noise reduction) expected from residential construction, and the amount of attenuation depends on whether the residence has sound insulation and whether the windows are open or closed.

According to the FICAN report dose-response curve, an interior SENEL of about 80 dB would correspond to a maximum awakening rate of about 10% (or about 90% not awakened). At minimum, exterior noise levels are reduced by 10 to 15 dB inside residences if windows are open. Noise reduction is much greater if windows are closed – typically 15 to 20 dB for homes in the project area. Assuming an interior SENEL of about 80 dB (maximum awakening rate of 10%) and the least amount of noise reduction with windows closed, 15 dB, the corresponding exterior noise level would be 95 dB. In the absence of federal or state guidance on significance criteria using the SENEL standard, this 95 dB SENEL exterior noise level (resulting in a maximum 10% awakening rate) was determined in the UCSF Medical Center at Mission Bay EIR to be a reasonable significance standard. Therefore, the UCSF Medical Center at Mission Bay EIR established the significance criteria that, in addition to the 65 dB CNEL significance standard, noise exposures exceeding 95 dB SENEL at residential and other noise-sensitive land uses would be considered significant. The 95 dB SENEL noise contours for various helicopter



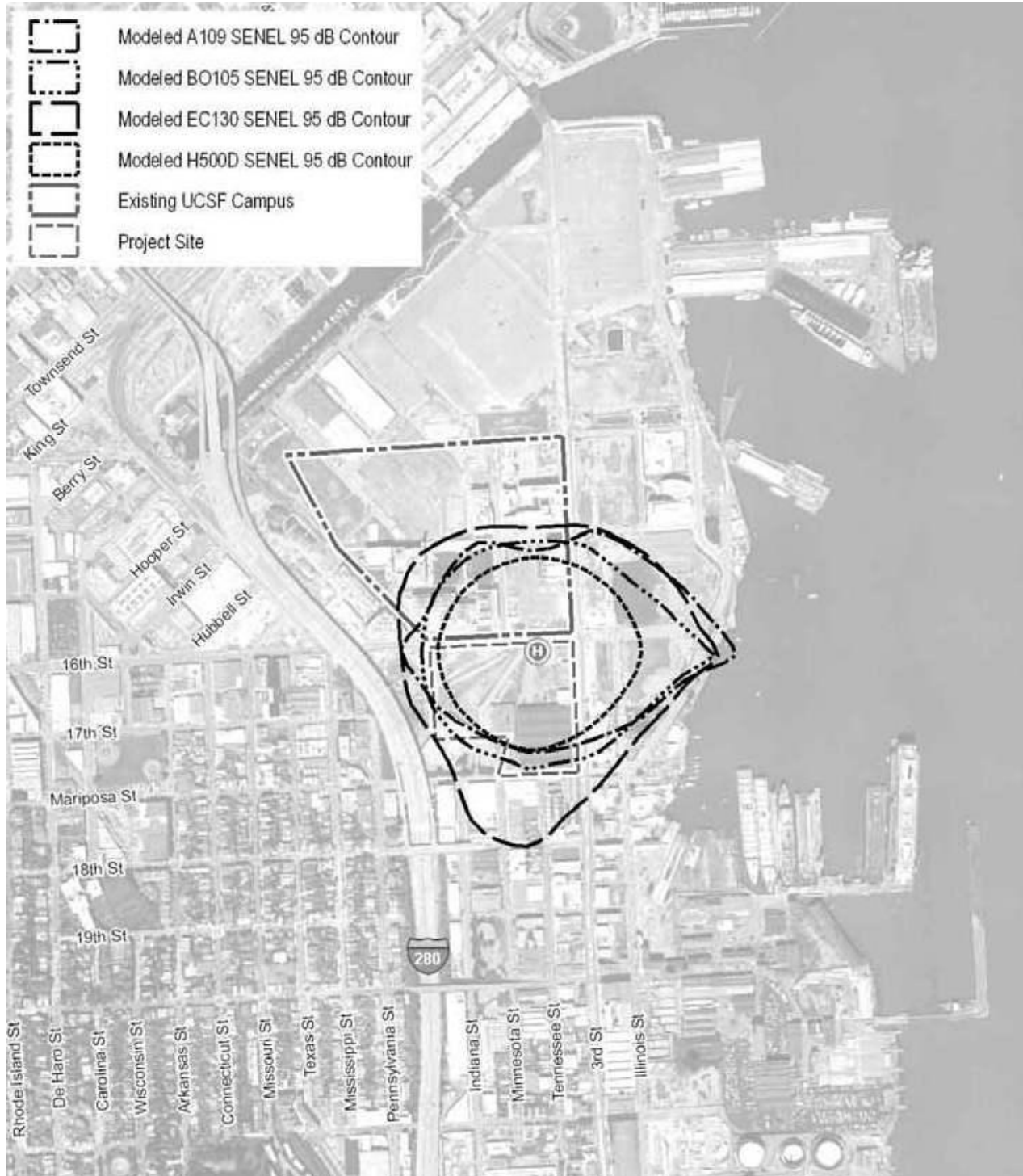
Source: Harris Miller Miller & Hanson, Inc., March 2008

Figure 4-1
CNEL 65 dB Noise Contour
Average Day Helicopter Operations



Source: Harris Miller Miller & Hanson, Inc., March 2008

Figure 4-2
CNEL 65 dB Noise Contour
Busy Day Helicopter Operations



Source: Harris Miller Miller & Hanson, Inc., March 2008

Figure 4-3
SENEL 95 dB Noise Contour

models planned for use at the site were prepared for the UCSF Medical Center at Mission Bay EIR, shown in [Figure 4-3](#).

San Francisco Noise Ordinance

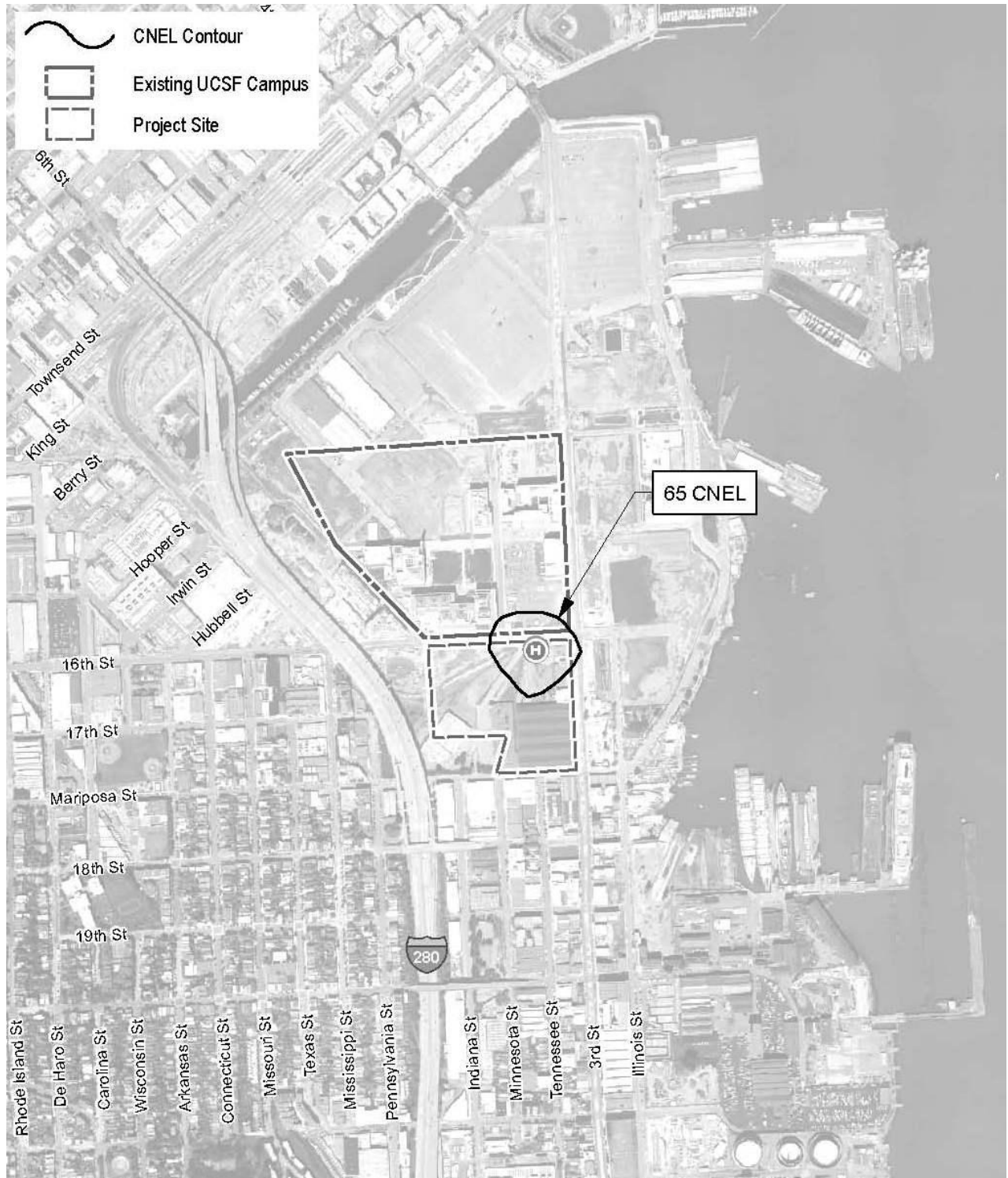
During the November and December 2008 community meetings on the RSRP, some members of the public raised the issue of the San Francisco Noise Ordinance and its applicability to helicopter noise. The San Francisco Noise Ordinance does not regulate aviation noise. It addresses specific noise sources such as waste disposal services, construction equipment and hours, machinery and places of entertainment, and also allows for exceptions to prescribed noise limits. Residential interior noise limits identified in the ordinance apply only to fixed noise sources. Because none of the noise limits applies to aircraft noise, the noise limits established in the San Francisco Noise Ordinance are not relevant to helicopter operations and therefore were not used as a standard of significance in the UCSF Medical Center at Mission Bay EIR, and are not considered in this SEIR. In addition, state law exempts emergency medical aircraft from local ordinances that restrict aircraft operational hours, aircraft type, or aircraft noise levels (California Public Utilities Code 21662.4(a)).

4.1.3 FAA NOISE MODEL

The FAA requires the use of the most recent version of the FAA-approved Integrated Noise Model (INM) for aircraft noise assessments. At the time the UCSF Medical Center at Mission Bay EIR was prepared, the most recent INM available was Version 7.0, which was used in the EIR analysis. Since that time, the FAA released a new version of the INM, Version 7.0a. In light of the updated noise model, the CNEL and SENEL contours for UCSF's proposed helicopter operations were modeled using INM 7.0a to compare with what was modeled in INM 7.0 and used in the UCSF Medical Center at Mission Bay EIR analysis. The following are the results:

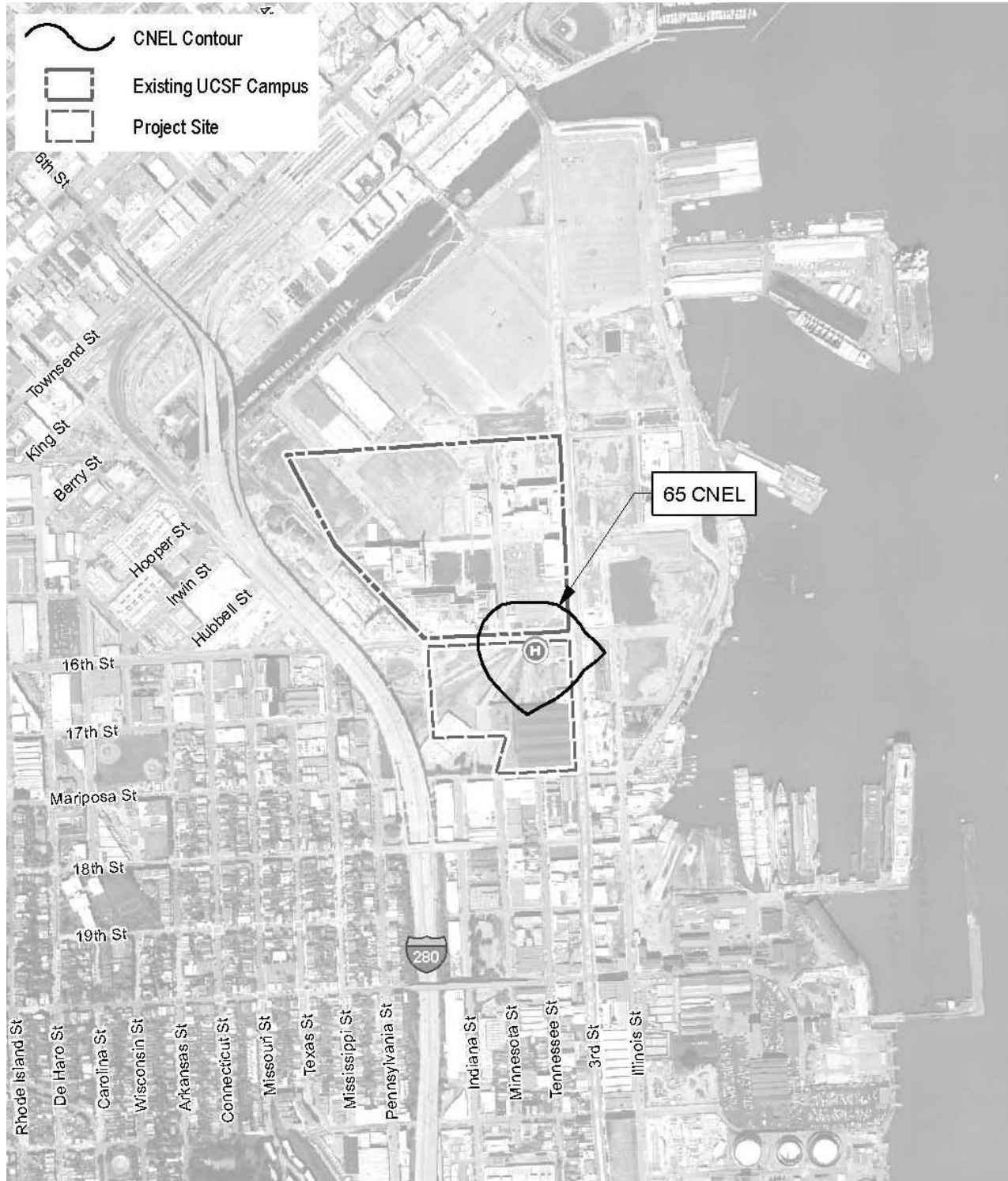
CNEL - The updated 65 dB CNEL contour remained generally the same with the only differences being a slight bulge along the approach track from the east. For the busy day this "extension" was approximately 125 feet to the east. This extends the contour across a portion of the block east of 3rd Street. The rest of the contour was unchanged or the changes were not perceptible on the base map (see [Figures 4-4 and 4-5](#)).

SENEL - The updated 95 dB SENEL contour for each aircraft type showed the same general trend as the 65 dB CNEL contour - an extension to the east along the approach course. But, for some helicopter types, the east contour edge, which previously extended to the shoreline edge, now extend into San Francisco Bay, in some cases by several hundred feet, and in one case by several hundred yards. The SENEL for the north and northwest departures also "grew" slightly to the north and for the west departures grew slightly to the west. The contours south of the helipad remained generally unchanged. This trend was for all helicopter types modeled (see [Figure 4-6](#)).



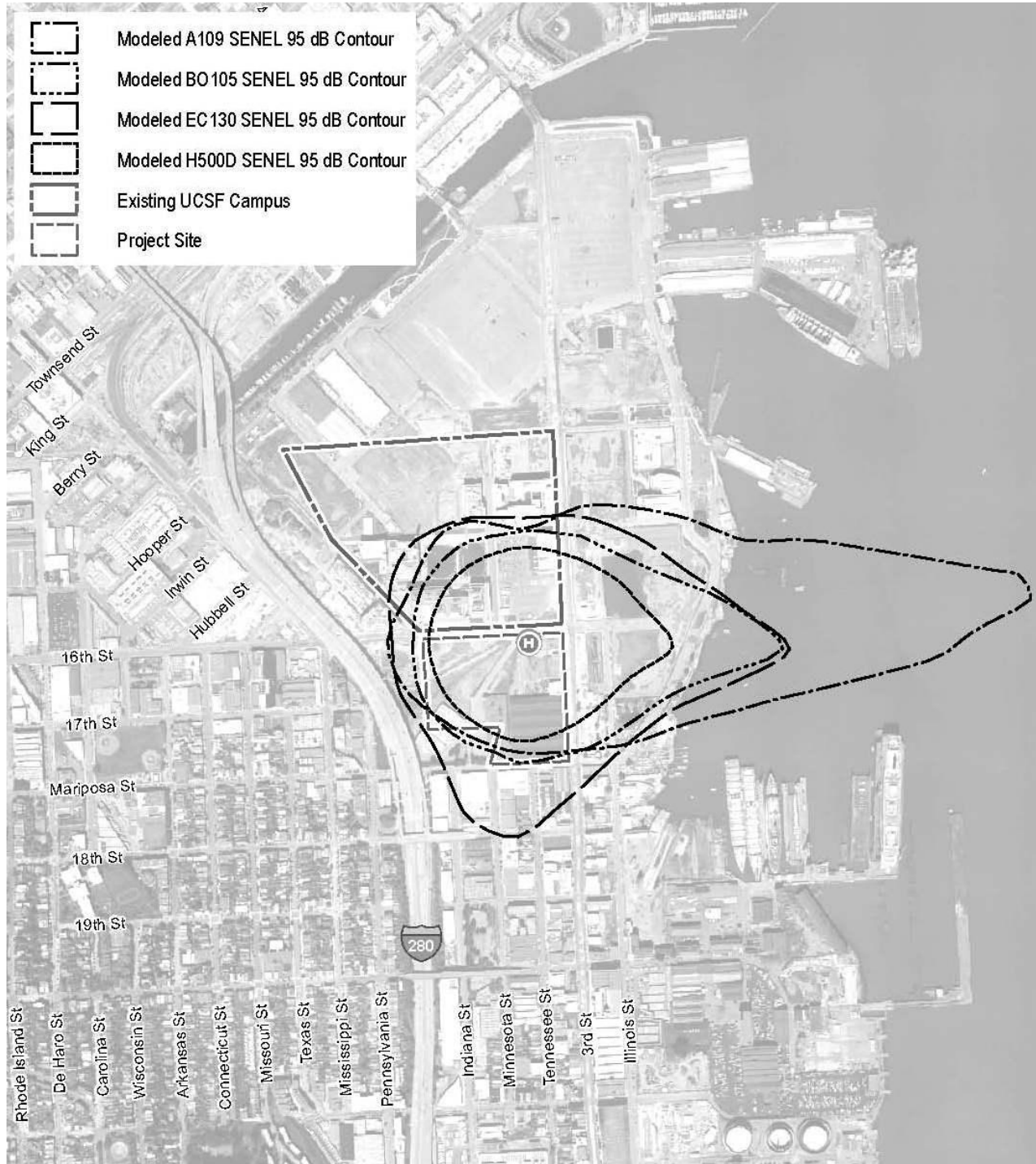
Source: Harris Miller Miller & Hanson, Inc., January 2009

Figure 4-4
Revised CNEL 65 dB Noise Contour
Average Day Helicopter Operations



Source: Harris Miller Miller & Hanson, Inc., January 2009

Figure 4-5
Revised CNEL 65 dB Noise Contour
Busy Day Helicopter Operations



Source: Harris Miller Miller & Hanson, Inc., January 2009

Figure 4-6
Revised SENEL 95 dB Noise Contour

None of the updated noise contours materially alters the UCSF Medical Center at Mission Bay EIR analysis. The contours grew slightly to the north and west and more dramatically to the east because modeled reference speeds for the approach and departure operations were adjusted. These changes to the modeled noise contours are inconsequential because sensitive receptors are not affected in these areas, and with the remodeled contours show no perceptible change to the southern lobes of the noise contours where residences may be impacted by helicopter noise. As such, the conclusions of the UCSF Medical Center at Mission Bay EIR do not change. Therefore, the helicopter noise analysis and conclusions of the UCSF Medical Center at Mission Bay EIR remain valid.

4.1.4 IMPACTS AND MITIGATION MEASURES

Results of UCSF Medical Center at Mission Bay EIR Analysis

The UCSF Medical Center at Mission Bay EIR (pp. 4.5-21 through 4.5-22) found that the 65 dB CNEL noise contour is contained to the Medical Center project site itself and the UCSF Mission Bay research campus. The number of helicopter transports per day is projected at 1.4, on average. Both an average day (1.4 transports/day) and a busy day (estimated at 3 transports/day) were analyzed (see [Figures 4-1 and 4-2](#)). Noise from helicopter operations would be compatible with land uses within the 65 dB noise contour. Noise levels with UCSF helicopter operations would increase overall noise levels in residential areas by less than 1 dB CNEL, which is less than the 1.5 dB CNEL increase that is the threshold of significance. Therefore, helicopter noise impacts using the CNEL metric were less than significant and no mitigation is required.

As discussed previously, updated noise contours were prepared for this SEIR using the most recent FAA noise model. The updated 65 dB CNEL noise contour remains generally the same, but during average day helicopter operations extends to the east across 3rd Street, and during busy day helicopter operations extends across 3rd Street and a portion of the block across 3rd Street. As no sensitive receptors would be within these new contours, noise from UCSF helicopter operations would continue to be compatible with land uses within the 65 dB noise contour. Therefore, helicopter noise impacts using the CNEL metric would continue to be less than significant and no mitigation is required.

With regard to SENEL, the UCSF Medical Center at Mission Bay EIR (p. 4.5-24) found that for most helicopter models projected to be used by planned UCSF air medical service providers, the 95 dB SENEL noise contour is limited to the Medical Center project site, the UCSF Mission Bay research campus, and adjacent commercial areas within Mission Bay. For one helicopter model, the 95 dB SENEL noise contour extends about one block south of the Medical Center project site, covering an area roughly between Mariposa, 18th, Illinois, and Indiana Streets (see [Figure 4-3](#)). This southern lobe of the 95dB SENEL noise contour includes residential and live/work properties. With the updated SENEL noise contours, the prior description of the area affected by the 95 dB SENEL noise contour remains the same. Noise during helicopter operations has the potential to result in awakening for up to 10% of the residents located within this 95 dB SENEL contour. For this reason, the UCSF Medical Center at Mission Bay EIR found the impact of helicopter noise using the SENEL metric to be significant, and identified Mitigation Measure

MCMB.5-4 below, which UCSF has already agreed to and which was adopted by The Regents following certification of the EIR.

UCSF proposes minor changes to Mitigation Measure MCMB.5-4 (new text in underline and deleted text in strikeout, as indicated below) that are necessary in order to make clarifications and establish consistency with new Mitigation Measure MCMB.5-4a discussed later in this chapter. CEQA Guidelines Section 15074.1 allows for substitution of mitigation measures which the lead agency determines are equivalent or more effective. In addition, CEQA allows for substitution or modification of mitigation measures so long as the new or revised mitigation measures create no new impacts. As UCSF proposes only minor changes to Mitigation Measure MCMB.5-4 that do not change the intent or effectiveness of the mitigation measures, and do not create new impacts, the proposed changes are allowed under CEQA.

(From the UCSF Medical Center at Mission Bay EIR, certified September 17, 2008)

Mitigation Measure MCMB.5-4: Prior to helicopter operations, UCSF shall implement the following:

The University shall continue to work with the community to develop a Residential Sound Reduction Program and to evaluate feasible noise mitigation measures related to UCSF helicopter operations. Once developed, this program shall undergo additional project-level environmental review prior to the start of helicopter operations at the site. Specific sound reduction measures identified in the program would be implemented after UCSF helicopter operations begin and the actual sound environment at that time is known.

The Residential Sound Reduction Program shall be implemented to the extent feasible to minimize significant disruption to receptors, and shall include the following elements:

- Limit types of landings at the site to the most critically ill patients where time is of the essence, when helicopter transport is approved by a physician
- Limit activity to incoming interfacility transfers
- Prepare a Helicopter Operations Plan that shall specify the following:
 1. All helicopter operations shall use the flight paths described in the EIR, unless safety precautions require a diversion from any of the flight paths.
 2. The primary approach and departure path is the least disruptive flight path (arrive from east and depart to east) and should be utilized as much as feasible. The alternate and secondary flight paths should be utilized only if the primary approach and departure path is not desirable due to wind conditions or safety considerations.
 3. UCSF service contracts with air medical companies shall require that all pilots be routinely trained to ensure that optimum arrival and departure flight paths procedures are followed for each helicopter type that serves UCSF. Pilots would be instructed in the use of the primary east approach and departure path.

4. A log of UCSF helicopter activity shall be maintained which shall include a detailed record of the reason for the trip, and date and time of arrival and departure. If a diversion from prescribed flight paths occurred as discussed above, the reason for diversion shall be recorded in the log.
- Respond to noise complaints about helicopter over flight. UCSF shall investigate noise complaints and shall work to address the complaint if it is determined that the cause was from helicopter operations at UCSF. The investigation may include consultation with medical transport companies, a noise engineer, a site assessment, noise monitoring of the affected property, and other actions as may be necessary. Contact information for registering complaints shall be made publicly available. This measure shall be implemented in addition to Mitigation Measure MCMB.5-4a.
 - Establish a UCSF committee, including community members working group, that meets periodically to provide a forum for UCSF and the community to discuss helicopter noise issues, and to address any outstanding UCSF helicopter noise issues or concerns.
 - Include additional mitigation developed as part of the community process.

Significance after Mitigation: Significant and Unavoidable.

RSRP Mitigation Measure MCMB.5-4a

As discussed in the Project Description of this SEIR, The Regents certified the EIR for the UCSF Medical Center at Mission Bay and approved the project budget and design on September 17, 2008. Approval of proposed medical helipad operations was deferred by the University, pending the development of the RSRP. UCSF then held two community meetings about the RSRP in November and December 2008, and had several one-on-one discussions with individual neighbors.

The RSRP mitigation measure, developed with neighborhood feedback resulting from the community process, would be a program in which mitigation funds would be made available to those residential property owners within the 95 dB SENEL noise contour, which was identified as the threshold of significance in the UCSF Medical Center at Mission Bay EIR. In addition, the qualifying noise contour would include all residential properties located on any block that is touched by the 95 dB SENEL noise contour, whether or not the property lies within the contour. Subject to qualifications, funds would be offered for the purpose of compensating such property owners for sound reduction measures, which could include acoustical windows, acoustical doors, weatherstripping, insulating skylights, and ventilation improvements as determined on a case-by-case basis, to reduce the potential impact of awakening from helicopter noise.

The RSRP mitigation measure, which would be implemented in conjunction with Mitigation Measure MCMB.5-4 identified in the UCSF Medical Center at Mission Bay EIR, is as follows:

Mitigation Measure MCMB.5-4a: Following helipad construction, UCSF shall implement the following program as part of the RSRP:

Start-up Period

1. During the first eight weeks of operations, UCSF will address noise complaints, if any, by revising helicopter operations where feasible. If helicopter activity does not reach the expected average of 1.4 transports per day during the start-up period, the start-up period will be extended to a maximum of 12 weeks.
2. At the end of the start-up period, UCSF will conduct a test flight and redraw the 95 dB SENEL (single-event) noise contour to reflect the noise environment that will exist at that time.

Qualifications

3. Property is located in the blocks within or touched by the redrawn 95 dB SENEL (single-event) noise contour.
4. Property is a legal residential or live/work unit, as of the date of approval of the helipad by Caltrans Aeronautics.
5. Noise level in interior sleeping area is at or greater than 80 dB SENEL with windows closed, as measured by UCSF's sound consultant. (If unit is a loft with no separate sleeping area, entire unit will be considered a sleeping area for sound mitigation funds.)

Implementation

6. UCSF sends notification about the RSRP to residential property owners in the blocks within or touched by the redrawn 95 dB SENEL noise contour, plus 2 blocks beyond the contour.
7. Property owners have 12 months after the date of notification about the RSRP to apply for the program (UCSF will send a reminder to those notified at least 3 months before the end of the application period).
8. UCSF determines if property meets qualifications.
9. UCSF will compile for property-owner reference acoustical specifications identifying standard acoustical installations, such as acoustical windows and doors.
10. Qualified UCSF consultant recommends sound reduction measures in sleeping areas, which may include:
 - Standard acoustical windows;
 - Standard acoustical doors;
 - Weather stripping around doors and other openings;
 - Insulate or double pane skylights;
 - Ventilation improvements.

11. UCSF consultant estimates cost of recommended sound reduction measures in sleeping areas, which includes labor and materials costs, permit fees, and City inspections.
12. UCSF pays qualifying property owner amount of this estimate:
 - Costs will be based on “like-for-like”, that is, for replacement of existing materials similar in quality or appearance;
 - Qualifying property owners who have existing vinyl or aluminum windows can be given a choice of vinyl or aluminum and color options;
 - San Francisco Planning Code requirements within historic districts or regarding historic structures will apply. Wood windows may be required. Related costs will be included in the estimate.
13. UCSF will establish an ad hoc community working group of neighbors to develop a dispute and mediation process.
14. Qualifying property owner, on her/his behalf and on behalf of tenants and future property owners, releases UCSF from future claims for UCSF helicopter noise at the property; this release shall be in the form of a permanent easement in exchange for compensation per item #12 above. The easement may be modified by written agreement executed by both parties.
15. Qualifying property owner is responsible for implementing sound reduction improvements.

Implementation of this mitigation measure in conjunction with Mitigation Measure MCMB.5-4 would in general mitigate noise impacts on sensitive receptors from helicopter operations to less than significant levels. As discussed in Section 4.1.2, Significance Criteria and Analysis Methodology, the noise analysis assumes that existing residential properties have a minimum noise reduction with windows closed of about 15 dB. In general, implementation of the sound reduction measures identified above, such as installation of the acoustical windows, acoustical doors, weatherstripping, and insulating or double-paning skylights, is expected to achieve an exterior-to-interior noise reduction of about 20 to 25 dB, or about 5 to 10 dB more than under conditions without the sound reduction improvements. Thus, it is anticipated that helicopter noise impacts on most qualifying residential properties would be reduced to less than significant levels. However, it may not be feasible to reduce interior sleeping area SENEL levels to less than 80 dB at every residential unit. In addition, the University cannot compel property owners in the vicinity of the helipad to keep windows closed or to participate in the Residential Sound Reduction Program. Therefore, this impact would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable

Mitigation Measure MCMB.5-4a and Potential Effects on Cultural Resources

A portion of the noise-affected area south of the Medical Center project site is located within the locally designated Dogpatch Historic District, a historical resource under CEQA. For those homes that are within the historic district and that qualify for the RSRP, UCSF would take into consideration requirements of the historic district in the selection of appropriate physical improvements, and associated estimated costs would be reflected in the payment to the property owner. Replacement of windows, doors, and any other physical alteration of homes resulting from the RSRP that are visible from the street would require that property owners apply for a Certificate of Appropriateness from the San Francisco Planning Department, with review by the Historic Preservation Commission.⁵ Because potential alterations would require regulatory agency review involving a process that ensures cultural resources are not negatively impacted, potential impacts on cultural resources that may result from property alterations pursuant to the RSRP would not be significant.

⁵ On November 4, 2008, the San Francisco electorate voted to eliminate the Landmarks Preservation Advisory Board and create a Historic Preservation Commission. While it is unclear how the review process for alterations within a historic district will change, if at all, with the new Commission, it not anticipated to change substantially.

CHAPTER 5

CEQA STATUTORY SECTIONS

5.1 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

Information regarding significant and unavoidable environmental impacts resulting from helipad operations is the same as discussed in the UCSF Medical Center at Mission Bay EIR (p. 5-1). That information is hereby incorporated by reference. The EIR found that helicopter noise impacts within the 95 dB SENEL noise contour, resulting in the potential awakening of up to 10% of residents within that noise contour, would be significant and unavoidable. As determined by this SEIR, helicopter noise impacts would continue to be significant and unavoidable, even with the identified RSRP mitigation measure.

5.2 CUMULATIVE IMPACTS

Information regarding cumulative impacts is the same as discussed in the UCSF Medical Center at Mission Bay EIR (p. 5-2), which is hereby incorporated by reference. The RSRP mitigation measure identified in this SEIR does not affect the analysis.

5.3 GROWTH-INDUCING IMPACTS

Information regarding growth-inducing impacts is the same as discussed in the UCSF Medical Center at Mission Bay EIR (pp. 5-3 to 5-4), which is hereby incorporated by reference. The RSRP mitigation measure identified in this SEIR does not affect the analysis.

5.4 EFFECTS FOUND NOT TO BE SIGNIFICANT

Information regarding effects found not to be significant is the same as discussed in the UCSF Medical Center at Mission Bay EIR (pp. 5-4 to 5-5), which is hereby incorporated by reference. The RSRP mitigation measure identified in this SEIR does not affect the analysis.

5.5 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES THAT WOULD BE CAUSED BY THE PROPOSED PROJECT

Information regarding significant irreversible environmental changes caused by the Medical Center project is the same as discussed in the UCSF Medical Center at Mission Bay EIR (pp. 5-4 to 5-5), which is hereby incorporated by reference. The RSRP mitigation measure identified in this SEIR does not affect the analysis.

CHAPTER 6

ALTERNATIVES

6.1 ALTERNATIVES TO THE PROJECT

The California Environmental Quality Act (CEQA) requires an evaluation of the comparative effects of a range of reasonable alternatives that would attain most of the basic objectives of the proposed project and avoid or substantially lessen one or more of the significant adverse effects of the proposed project, including alternatives that are more costly or could otherwise impede the attainment of the project's objectives.

The UCSF Medical Center at Mission Bay EIR analyzed a range of reasonable helipad alternatives, including a No Helipad Alternative and Off-Site Helipad Alternatives (pp. 6-1 through 6-22). In addition, the EIR provided information concerning helipad alternatives that were considered but not included for detailed analysis in the EIR. Information from the UCSF Medical Center at Mission Bay EIR concerning helipad alternatives is hereby incorporated by reference. The RSRP mitigation measure identified in this SEIR does not affect that analysis.

6.1.1 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

An EIR is required to identify the environmentally superior alternative—that is, the alternative having the fewest significant environmental impacts—from among the alternatives evaluated. The UCSF Medical Center at Mission Bay EIR identified the No Helipad Alternative as the environmentally superior alternative (pp 6-19 to 6-20). The RSRP mitigation measure identified in this SEIR does not affect that analysis.

CHAPTER 7

REPORT PREPARATION

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CHAPTER 8

COMMENTS AND RESPONSES

8.1 OVERVIEW

This chapter contains the comments received regarding the Draft Supplemental EIR prepared for the proposed project, and the responses to those comments. Comments were received during the public comment period from January 20, 2009 to March 6, 2009. In addition, a public hearing was held on the UCSF Mission Bay research campus on February 23, 2009, at which public testimony was received. Table 8-1 on the following page lists each commenter, the comment code, issue and page number of each comment verbalized at the public hearing or submitted in writing.

The comments and responses follow, in the order of commenter as shown in Table 8-1. The comments are verbatim from oral testimony at the public hearing or from letters. Excerpts of letters and e-mails or from oral testimony at the public hearing that do not address environmental issues are not included, pursuant to CEQA Guidelines Section 15088(a). Copies of the public hearing transcript and comment letters are provided at the end of this chapter.

**TABLE 8-1
COMMENTER INDEX**

Commenter	Code	Issue	Page
Public Agency Comments			
1. California Department of Transportation, Division of Aeronautics Letter dated February 25, 2009	CDOT-1	Adequacy of EIR	40
2. San Francisco International Airport E-mail dated March 6, 2009	SFO-1 SFO-2	Helicopter Noise – Significance Criteria Helicopter Noise – Project Unique	40 41
Public Hearing Comments			
3. Chris Sabre	CS-1 CS-2 CS-3 CS-4 CS-5 CS-6 CS-7 CS-8	Community Involvement Helicopter Noise – Significance Criteria Helicopter Noise – Health Effects Helicopter Noise – Methodology Helicopter Noise – Methodology Aeromedical Safety Aeromedical Safety – Flight Paths Aeromedical Safety – Operations	42 43 44 45 45 45 46 47
4. Karen Cliffe	KC-1 KC-2	Helicopter Noise – Significance Criteria Helicopter Noise – Health Effects	47 48
Written Comments			
5. Ahimsa Sumchai Letter undated, received Feb. 23, 2009	AS-1 AS-2 AS-3 AS-4 AS-5 AS-6 AS-7 AS-8 AS-9 AS-10 AS-11 AS-12 AS-13 AS-14 AS-15 AS-16 AS-17	Aeromedical Safety – Accident Frequency Alternative Helipad Sites – Pier 64 Aeromedical Safety – Operations Helicopter Noise – Aircraft Helicopter Noise – Sensitive Receptors Helicopter Noise – Sensitive Receptors Aeromedical Safety – Regulation Helicopter Noise – Arrival/Departure Time Helicopter Noise – Metric Helicopter Noise – Vibration Helicopter Noise – Significance Criteria CEQA Overriding Considerations Helicopter Noise – Significance Helicopter Noise – Arrival/Departure Time Number of Helipads Helicopter Noise – Health Effects Alternative Helipad Site – Pier 94	49 50 50 51 51 52 52 53 54 54 54 55 55 56 56 57 57
6. Richard DeWilde E-mail dated March 1, 2009	RD-1	UCSF Outreach; RSRP Mitigation	58
7. Emily Gogol E-mail dated March 5, 2009	EG-1	UCSF Outreach; RSRP Mitigation	58
8. Ryan Burns E-mail dated March 5, 2009	RB-1	UCSF Outreach; RSRP Mitigation	58

8.2 COMMENTS AND RESPONSES

1. California Department of Transportation, Division of Aeronautics

Comment CDOT-1: Adequacy of EIR

Prior to issuing a State heliport permit, the Division, as responsible agency, must be assured that the proposal is in full compliance with CEQA. The Draft Supplemental Environmental Impact (EIR) report appears to adequately address the issues of primary concern to us, heliport-related noise and safety impacts on the surrounding community.

Response

Thank you for your comments. The helipad approval process requires a Heliport Site Approval Permit from the California Department of Transportation – Division of Aeronautics. As part of the Caltrans Aeronautics review, the local governing body, the San Francisco Board of Supervisors must take action to concur with the permit issuance. Public notification about the Board of Supervisors meeting to consider the UCSF helipad project would occur in advance of the hearing.

2. San Francisco International Airport

Comment SFO-1: Helicopter Noise - Significance Criteria

San Francisco International Airport (SFO) recognizes that the 1.4 average daily helicopter operations evaluated in the SEIR is unique to the location of the proposed hospital and helipad, which is in close proximity to residences and live/work space in the Mission Bay and Dogpatch neighborhoods of San Francisco. However, utilizing the 95-SENEL noise metric is not recognized by State or Federal standards, as applied through the California State Aeronautics Act and the California Airport Land Use Planning Handbook, nor by FAA Order 1050.1E and Federal Aviation Regulations 14 CFR Part 150: Airport Noise Compatibility Planning. We write, therefore, to register SFO's objection to the 95-SENEL noise metric being recognized as a viable standard to impose on areas of aircraft operation.

Response

UCSF agrees that the 95 dB SENEL is not a threshold of significance for noise impacts resulting from aircraft operations that is recognized by State or Federal standards. As discussed in the UCSF Medical Center at Mission Bay EIR, for purposes of CEQA significance criteria, only the 65 dB CNEL threshold is recognized by State and Federal standards. Updated noise contours are presented in this SEIR. The 65 dB CNEL contour is contained on the UCSF site and to commercial areas to the east across Third Street. Therefore, CNEL noise impacts continue to be less than significant. As stated in the EIR and reiterated in the subject SEIR, there are no State or

Federal SENEL standards. UCSF voluntarily included the SENEL criteria as a standard of significance in its analysis as a useful descriptor in understanding the effects of noise on the community, particularly sleep disturbance.

Based on a Federal Interagency Committee on Aircraft Noise (FICAN) report published in 1997, which included a new dose-response curve, an interior SENEL of about 80 dB would correspond to a maximum awakening rate of about 10% (or about 90% not awakened). At minimum, exterior noise levels are reduced by 10 to 15 dB inside residences if windows are open, and by typically 15 to 20 dB if windows are closed. Assuming an interior SENEL of about 80 dB and the least amount of noise reduction with windows closed, 15 dB, the corresponding exterior noise level would be 95 dB. In the absence of Federal or State guidance on significance criteria using SENEL, this 95 dB SENEL exterior noise level (resulting in a maximum 10% awakening rate) was determined in the UCSF Medical Center at Mission Bay Final EIR to be a reasonable SENEL significance standard for purposes of the proposed project. The SENEL analysis was conservative for several other reasons: (1) noise contours for a number of other helicopter models were prepared and the noisiest helicopter model resulting in the broadest noise contour was used to determine the significance of impacts; (2) the analysis assumes existing sound insulation in homes is minimal; and (3) the analysis does not account for the proposed project buildings that may shield noise from residential buildings south of the project site. The SEIR analysis concludes that up to four blocks of residences south of the project site could be affected and could be eligible for the Residential Sound Reduction Program (RSRP). As part of the RSRP start-up period, the 95 dB noise contour will be redrawn to reflect the noise environmental that will exist at that time.

Although UCSF believes that 95 dB SENEL is an appropriate standard for the proposed medical helipad project for the reasons discussed, UCSF understands that such a standard may not be appropriate for an international airport such as SFO.

Comment SFO-2: Helicopter Noise – Project Unique

We request that the Supplemental EIR recognize that the noise characteristics of helicopter operations evaluated in Chapter 4.1 of the SEIR are unique and quite different from the noise characteristics attendant to a municipal airport, including noises related to fixed wing aircraft such as the commercial carrier operations at SFO. Those differences include the type and function of the facility, the geographical characteristics of the site, and the frequency and type of aircraft operations. With this in mind, SFO requests that the University acknowledge in the certification and findings for the Final SEIR the differences between the proposed helipad operations and operations at a commercial service airport, including the unique emergency medical function, the helipad location, and the level of helicopter operations activity that led the University to voluntarily consider the adoption of the proposed Residential Sound Reduction Program.

Response

The comment is acknowledged. UCSF recognizes that the helicopter noise characteristics of the proposed project are unique and different from those of a municipal or commercial airport, such as SFO. The proposed project is within an urban setting with nearby buildings containing institutional, industrial, commercial and residential uses. The proposed project is not in an airport setting, and would introduce helicopter operations into an area that has not previously had flight operations. An average of only 1.4 transports by helicopter per day is projected, and flight paths would not extend over residences. The 65 dB CNEL noise contour would not affect residential uses. As such, the proposed RSRP goes above and beyond noise mitigation measures that are required of airports or other helipad projects. Given the unique circumstances of the project, including the need for a medical helipad at UCSF and the concerns about helicopter noise voiced by the community, UCSF voluntarily considered the use of an SENEL standard and development of the RSRP. This information will be included in the findings for the Final SEIR.

3. Chris Sabre

Comment CS-1: Community Involvement

I see that your mitigation -- you are giving us a lot of statistics. You have mailed out this information to many, many people, although there are very few people here. The reason why there are not that many people here is because people do not think that their voice is going to be heard, and they do not think that they are going to be receiving a proper response from you. You know, it is not apathy, it is just people have given up.

Response

This comment does not address the adequacy of the SEIR. UCSF has conducted exhaustive public outreach over the years on the UCSF Medical Center at Mission Bay project and proposed helipad. UCSF has in the past held monthly community meetings regarding the UCSF Medical Center at Mission Bay, at which UCSF has demonstrated its willingness to listen and modify the project in response to community concerns. Specifically with regard to the proposed helipad, UCSF changed the site plan in response to community concerns, moving the helipad from the southern portion of the site to the now-proposed northern portion of the site, as far as possible from residential development in the Dogpatch neighborhood.

In June of 2007, UCSF invited the community to a presentation and question-and-answer session on the basics of noise metrics and analysis methods, presented by its noise consultant, so that the community would better understand forthcoming noise analysis for the UCSF Medical Center at Mission Bay. In October of 2007, UCSF conducted a helicopter test flight, planned in conjunction with interested community members, and held a community meeting shortly thereafter to discuss neighbors' firsthand experiences with the test. In March of 2008, UCSF met

with neighbors to discuss the noise analysis, which was based on the helicopter flight test and computer modeling. As part of the development of the RSRP, two community meetings were held in November and December of 2008, and UCSF revised its proposed RSRP in response to community feedback.

Public notice about the SEIR hearing included an advertisement in the San Francisco Examiner; an advertisement in the Potrero View; e-mail notification to a listserv of 450 people and organizations; direct mail postcards to the San Francisco Planning Department's community notification lists for Potrero Hill and Citywide; direct mail postcards to over 350 nearby neighbors and property owners; and posting on the UCSF Online Events calendar and on the Community and Government Relations webpage.

In addition, UCSF Community Relations has had direct one-on-one contact with many of the nearby neighbors who have the potential to be directly affected by helicopter noise, many of whom have expressed satisfaction with the community process and UCSF's response to concerns, rather than apathy. While not all neighbors are in agreement with all details of the RSRP, most that UCSF has been in contact with accept the RSRP and express a willingness to work with UCSF further on the details.

Comment CS-2: Helicopter Noise - Significance Criteria

You are talking about an indoor-outdoor ratio of noise, mitigation. Your mitigation procedures are going to put the difference between indoor and outdoor noise of a 20 dB difference, as far as I understand from glancing at your material that I just looked at just now. That would give you an outside dB of 95 dB's. Inside it would be something like 70. And if I were sleeping with a 70 dB noise coming through at night, it would be quite disruptive.

Response

As discussed in the EIR (pp. 4.5-12 to 4.5-13) and SEIR (pg. 20), and as restated in the response to Comment SFO-1 above, an interior SENEL of about 80 dB would correspond to a maximum awakening rate of about 10% of those exposed (or about 90% not awakened), according to a Federal Interagency Committee on Aircraft Noise (FICAN) report published in 1997.

Properties experiencing interior noise levels of 80 dB or greater during UCSF helicopter operations would qualify for the RSRP. In general, implementation of the sound reduction measures identified in the RSRP, such as installation of acoustical windows, acoustical doors, weatherstripping, and insulating or double-paning skylights, is expected to achieve an exterior-to-interior noise reduction of about 20 to 25 dB, or about 5 to 10 dB more than under conditions without the sound reduction improvements.

It should be noted that the neighborhood already experiences noise events in the neighborhood that are of comparable SENEL levels, such as noise from trucks, sirens, motorcycles, construction activities, and other aircraft. Table 8-2 reflects existing neighborhood noise sources compared to

predicted noise levels associated with UCSF helicopter transports. This information was shared with the community during the RSRP community process.

**TABLE 8-2
NEIGHBORHOOD NOISE SOURCES**

Noise Source	SENEL Range (dB)
Aircraft	74-85
Sirens	101
Construction	85
Non-UCSF Helicopter Flyovers	81-87
Motorcycles	88-100
Muni T Third Line	84-88
Trucks	81-99
UCSF Helicopter Transports	
Measured	67-94
Predicted	76-98

Note: Non-UCSF Helicopter Flyovers and UCSF Helicopter Transports (test flight) were measured on October 21, 2007. All other noise sources were measured on October 30, 2008.

As can be seen in the above table, the noise expected with UCSF helicopter transports (76 to 98 dB SENEL) is comparable to noise events that already occur in the neighborhood (74 to 101 dB SENEL). As UCSF recognizes it would increase the frequency of such events, it would implement the RSRP, thereby providing assistance to qualifying properties to mitigate UCSF helicopter noise to the extent feasible.

Comment CS-3: Helicopter Noise – Health Effects

The World Health Organization has said that noise levels can disturb people's sleep and change their emotional and physical well being. So what is happening is that you are putting out statistics. Statistics do not make any noise at all. Statistics are very quiet. I do not wake up at night because I hear a statistic. That is glossed over.

Response

Health effects caused by helicopter noise were fully analyzed in the UCSF Medical Center at Mission Bay EIR, and found to be less than significant (see EIR pp. 4.5-27 through 4.5-29). Therefore, the topic of health effects caused by helicopter noise did not require further analysis and is not the subject of this SEIR. As discussed in the UCSF Medical Center at Mission Bay EIR, scientific evidence is ambiguous regarding the noise environment and relationship to the origin of or contribution to any clinical non-auditory disease. Most authoritative reviews, such as

the World Health Organization Environmental Health Criteria Document on noise, agree that “research on this subject has not yielded any positive evidence, so far, that disease is caused or aggravated by noise exposure, insufficient to cause hearing impairment.” Accordingly, by using criteria that prevent noise induced hearing loss, minimize speech and sleep disruption, and minimize community reactions and annoyance, effects on health would also be avoided.

There are no conclusive studies of which the EIR authors are aware that indicate exposure to helicopter noise causes adverse effects on health. Most studies on the health impact of aviation noise focus on airports where populations are exposed to substantially greater amounts of air traffic than the 1.4 transports (average day) or 3 transports (busy day) anticipated with the project. As there is no evidence of a significant impact on human health at the proposed frequency of helicopter activity, the UCSF Medical Center at Mission Bay EIR concluded that effects of project helicopter noise on human health are less than significant.

Comment CS-4: Helicopter Noise - Methodology

You take a single noise ratio and you are averaging it over a long period of time.

Response

The UCSF Medical Center at Mission Bay EIR and the subject SEIR noise analyses included both the SENEL (single-event) and CNEL (24-hour average) noise descriptors to evaluate the impact of helicopter noise. As discussed in the UCSF Medical Center at Mission Bay EIR, there are numerous generally accepted noise descriptors, of which several rely on averaging noise over varying periods of time.

Comment CS-5: Helicopter Noise - Methodology

You are not even measuring the whole dB range that the helicopters produce. The low levels of the spectrum are not even being taken into consideration. So I will even take exception to your statistics. But in any case, you could fly out the statistics on us, but it is not going to change anything. It is still going to wake people up in the middle of the night.

Response

The UCSF Medical Center at Mission Bay EIR analyzed helicopter noise using both the A-weighted scale (frequencies that correspond to the human ear’s decreased sensitivity to low and extremely high frequencies) in terms of SENEL and CNEL, and the C-weighted scale (low-frequency noise experienced as vibration). A-weighted CNEL noise and C-weighted noise (vibration) were found to be less than significant (see EIR pp. 4.5-21 to 4.5-22 and pg. 4.5-27). A-weighted SENEL noise was found to be significant due to the potential for awakening based on the SENEL noise contour of one helicopter model, which led to the development of the RSRP mitigation measure discussed in this SEIR.

Comment CS-6: Aeromedical Safety

We still have a problem now with helicopters crashing right and left, all over the country, and the NTSB is investigating the frequency of helicopter accidents. I do not want to stop a helicopter with my house or something like that, if a helicopter crashes in this neighborhood, which is not totally unlikely.

Response

Helicopter aeromedical flight operations as it relates to public safety was fully analyzed in the UCSF Medical Center at Mission Bay EIR, and found to be less than significant (see EIR pp. 4.3-5 through 4.3-8). Therefore, the topic of aeromedical safety did not require further analysis and is not the subject of this SEIR.

As discussed in the UCSF Medical Center at Mission Bay EIR, out of 8 million medical helicopter flights in the United States from 1991 to 2007, none have caused deaths or serious injuries to third parties (i.e., persons not on the helicopter). In addition, medical helicopter accidents that have occurred since certification of the EIR, none of which involved third party deaths, do not change the EIR's conclusion that helicopter safety impacts are less than significant. Given the statistics and the fact that the helipad would be in close proximity to San Francisco Bay where no physical barriers exist to obstruct views of the approach, the likelihood of a third party death resulting from operation of the proposed helipad is extremely small. Nonetheless, UCSF will keep informed of the progress of future regulatory recommendations on medical helicopter safety, such as those resulting from public hearings held by the National Transportation Safety Board (NTSB).

Comment CS-7: Aeromedical Safety – Flight Paths

You have an intersection between and you are proposing helicopters to be taking off and landing at San Francisco General. You are having these helicopters taking off and landing here. Your flight pattern intersects, and one of the scenarios for your flight pattern intersects at Potrero and 16th Street with the flight path of the helicopters taking off at San Francisco General Hospital.

Response

Helicopter aeromedical flight safety was fully analyzed in the UCSF Medical Center at Mission Bay EIR (see EIR pp. 4.3-7 to 4.3-8). As described in that EIR, the analysis considered the effects related to the proposed operations at San Francisco General Hospital (SFGH) as well as at the proposed project site. One of the secondary flight routes studied by SFGH would cross the intersection of Potrero Avenue and 16th Street which is about 4,000 feet to the north of the proposed SFGH helipad. UCSF's secondary flight route would extend along 16th Street for 4,000 feet west to approximately Kansas Street, east of Highway 101. The two routes would be separated by four blocks (over 1,000 feet) and would not intersect. The EIR concluded that the combined effects would be less than significant.

Comment CS-8: Aeromedical Safety - Operations

I had an official comment when I spoke with one person here, and they said -- an official comment was, "Well, don't you think the helicopters are going to watch out where they're going?" And I would say that, as far as I know, and as far as the reports are from the NTSB, the Transportation Safety Board, you are not getting a full disclosure about how the helicopters are dispatched and guided. There is no night vision. The night vision is inadequate on helicopters and we have a hill here. Now, all of these maybe do not speak to the sound aspect, I guess this is what we are talking about is the sound, but there are a lot of other factors here involved. And a helicopter crash would make a lot of noise -- a lot of dB's when a helicopter crashes.

Response

The UCSF Medical Center at Mission Bay EIR fully analyzed helicopter safety in Section 4.3 of the EIR (pp. 4.3-1 through 4.3-8 and in Responses to Comments (pp. 8-10 through 8-25). UCSF will continue to monitor NTSB hearings and encourage air medical companies that it contracts with to consider implementing any resulting regulatory recommendations on helicopter safety.

4. Karen Cliffe

Comment KC-1: Helicopter Noise - Significance Criteria

I understand that the criteria to be eligible for the Noise Reduction Program is that you live within the 95 decibel contour that you are showing there on the map, and that the sound level in your bedroom be 80 decibels, and that the proposed mitigations through soundproofing reduce the exterior to interior noise level 20-25 decibels. That is what your document says, so that, at the most, it would bring the sound level in one's bedroom down to 70 decibels. And I know that you have a study that says that this sound level only wakes up 10 percent of the population, but this is an issue that I think really does not portray the actual experience. A vacuum cleaner is rated at 70 decibels. Rush hour traffic in some of these documents is rated as 70 decibels. If you had either of those noise events in your bedroom, more than 10 percent of the population would awaken, so the mitigation that you are offering is really, really not adequate. I think that is my primary concern.

Response

Please see Response to Comment CS-2 on page 43. As discussed in the EIR and SEIR, an interior SENEL of about 80 dB would correspond to a maximum awakening rate of about 10% of those exposed (or about 90% not awakened), according to a Federal Interagency Committee on Aircraft Noise (FICAN) report published in 1997.

Properties experiencing interior noise levels of 80 dB or greater during UCSF helicopter operations would qualify for the RSRP. In general, implementation of the sound reduction measures identified in the RSRP, such as installation of acoustical windows, acoustical doors, weatherstripping, and insulating or double-paning skylights, is expected to achieve an exterior-to-interior noise reduction of about 20 to 25 dB, or about 5 to 10 dB more than under conditions without the sound reduction improvements.

The commenter's example of a vacuum cleaner or rush hour traffic generating 70 decibels of noise is not an appropriate example to compare to helicopter noise. First, the 70 decibel level does not reflect the SENEL, but rather is another type of descriptor such as Lmax (the instantaneous maximum noise level) or Leq (the equivalent sound level, or average noise exposure level over a specified period of time). In contrast, the SENEL is the total noise exposure for the duration of a single noise event. Typically the SENEL is about 7-12 dB higher than the Lmax for a given event. Thus, a noise level of 80 dB SENEL is about 68-73 Lmax. However, there are other important differences in how the noise is generated and perceived. Using the vacuum cleaner example, a vacuum cleaner generating 70 dB Lmax would do so at a constant rate, and would include a startling effect due to the sudden change from a quiet ambient setting to the operation of the vacuum cleaner at its highest noise level. A helicopter landing, on the other hand, would involve a slow introduction of noise as the helicopter arrives from a distance, with noise increasing to its highest point at its closest distance to the noise receptor. The highest noise level would occur for a brief period of time until the landing is completed. For these reasons, it is anticipated that noise from a helicopter landing would not be as disruptive as noise from a vacuum cleaner.

However, rather than compare helicopters to appliances or SENEL to Lmax, the more appropriate comparison to the 95 dB exterior SENEL (or 80 dB interior SENEL) is another noise event using the SENEL descriptor. As shown in Table 8-2 Neighborhood Noise Sources (see Response to Comment CS-2 on page 43), the noise expected with UCSF helicopter transports (76 to 98 dB SENEL) is comparable to noise events that already occur in the neighborhood (74 to 101 dB SENEL). These other noise events that already occur in the neighborhood include noise from trucks, sirens, motorcycles, construction activities, and other aircraft.

Comment KC-2: Helicopter Noise – Health Effects

There has been some recent research in this past few years, and I do not have the articles with me, but I have not seen them cited in your documents, that were research projects taken in residential areas near airports. And the findings showed that even those people who were not actually woken by airport and aircraft noise had a significant rise in blood pressure, even as a result of the noise, even if they were not woken. And the rise in blood pressure was considered to be significant in terms of adverse effects on health. People really do not want to address the fact that these noise levels are harmful to residents and people exposed to this kind of event.

Response

Please see Response to Comment CS-3 on page 44.

5. Ahimsa Sumchai

Comment AS-1: Aeromedical Safety – Accident Frequency

The major conclusion of my comments is in reprimand of the UCSF Mission Bay Hospital Planners for their gross underestimation of the public safety issues of the potential siting of a rooftop helipad. The Cumulative Impacts statement on page 4.3-7 states, "Based on data available since 1991, the roughly 100 million helicopter flights in the United States have generated seven fatal collisions involving two helicopters."

In fact, the average number of EMS helicopter crashes climbed to more than 15 per year since 2000 as the U.S. fleet of emergency medical helicopters climbed to over 800 aircraft in 2008 carrying up to 400,000 patients a year. In July of 2008 a fiery collision killed six people aboard two medical helicopters that were arriving with patients at Flagstaff Medical Center in Arizona. Up to 33% of EMS helicopter crashes occur during arrivals.

Response

Helicopter aeromedical flight operations as it relates to public safety was fully analyzed in the UCSF Medical Center at Mission Bay EIR, and found to be less than significant. Therefore, the topic of aeromedical safety did not require further analysis and is not the subject of this SEIR.

The commenter quotes and challenges a statement from the already certified UCSF Medical Center at Mission Bay EIR in regard to helicopter collisions. The referenced statistic "100 million helicopter flights in the United States have generated seven fatal collisions involving two helicopters" are, as stated, in reference to the colliding of two helicopters into one another, and not in reference to EMS helicopter crashes in general. Elsewhere within the same section of the UCSF Medical Center at Mission Bay EIR on pages 4.3-6 and 4.3-7, statistics about EMS helicopter accidents and fatalities are discussed. The UCSF Medical Center at Mission Bay EIR

acknowledges the recent increased incidence of EMS helicopter accidents. However, the potential for third party deaths still remains extremely rare. Therefore, the UCSF Medical Center at Mission Bay EIR conclusion remains valid that helicopter safety impacts are less than significant.

Comment AS-2: Alternative Helipad Site – Pier 64

The siting of a ground based helipad at Pier 64 offers the safest, most efficient and environmentally sound alternative. The UCSF Medical Center at Mission Bay EIR identified the No Helipad Alternative as the environmentally superior alternative.

Response

Alternative helipad sites were analyzed in the UCSF Medical Center at Mission Bay EIR. Therefore, the topic of alternative helipad sites did not require further analysis in this SEIR.

The EIR authors continue to believe that a No Helipad Alternative is the superior alternative from an environmental standpoint, as discussed in the UCSF Medical Center at Mission Bay EIR (see EIR pg. 6-10). Under this alternative, helicopter noise and air emissions from helicopters would be eliminated in the project vicinity. The commenter offers no explanation for why she believes a helipad at Pier 64 (no longer extant at the foot of 16th Street) would be the most environmentally sound alternative, compared to the No Helipad Alternative.

In addition, it is debatable whether Pier 64 would be the safest alternative as the commenter contends, as a helipad at the former site of Pier 64 would involve a ground-level helipad, requiring the helicopter to be brought closer to the ground at the Bay's edge where various obstructions may be present at the time of landing, such as boats or other large waterborne objects.

Finally, a helipad at the former site of Pier 64 would not be the most efficient, due to the need to transfer the patient from the helicopter to a ground ambulance in order to reach the hospital. As stated in the UCSF Medical Center at Mission Bay EIR, this adds additional risk to the patient due to extra maneuvering of the patient and transfer of intensive care equipment from the helicopter to the ground ambulance.

Comment AS-3: Aeromedical Safety - Operations

The recommendation that UCSF implement an Air controller system using GPS and radar for EMS helicopter operations should be adopted as a public safety mitigation measure.

Response

The UCSF Medical Center at Mission Bay EIR fully analyzed helicopter aeromedical flight operations as it relates to public safety and concluded that impacts would be less than significant because the risk of third party death or injury is extremely rare. The topic of air controller

systems was also discussed in the UCSF Medical Center at Mission Bay EIR. As stated in that EIR, UCSF has no authority or capability to establish and operate such an air controller system. However, UCSF will establish a system to ensure that there will be adequate communications between the arriving and departing helicopters and the UCSF Medical Center. Communication among pilots in the vicinity would be accomplished by radio and visual flight rules. This would include other Emergency Medical Services (EMS) flights related to San Francisco General, as well as other aircraft in the eastern quadrant of the city. As stated previously, UCSF will continue to monitor NTSB hearings and encourage air medical companies that it contracts with to consider implementing any resulting regulatory recommendations on helicopter safety.

Comment AS-4: Helicopter Noise - Aircraft

Additionally, I am submitting in public comment the findings of a research investigation authored by Eric E. Sabelman, Director of the Rehabilitation, Research and Development Center of the Palo Alto Veterans Administration and myself submitted to John Zuk, Ph.D, Director of the Rotary Wing and Powered Lift Division of the Nasa-Ames Research Center titled Advanced Aeromedical Transport: Synergistic Design For Optimum Medical & Aeronautical Performance. The study proposed the aeromedical adaptation of an advanced generation rotorcraft - the experimental XV-15 civil tiltrotor aircraft.

A medical helipad or vertiport expected to be operational by 2014 must consider the siting of next generation rotorcraft like the civil tiltrotor. The U.S military deployed tiltrotor aircraft to Iraq in 2007. These aircraft incorporate the technological thrusts of rotorcraft development including the use of advanced composite materials, the development of cockpit designs with simplified controls and advanced blade tip geometry and higher power margins to reduce noise footprints of future rotorcraft.

Response

Thank you for your comment. UCSF has no plans to purchase its own helicopters, rather it will contract with an air medical service company or companies. As such, UCSF will have no control over specifications of particular aircraft. However, UCSF will encourage air medical services companies that it contracts with to use the quietest aircraft feasible.

Comment AS-5: Helicopter Noise – Sensitive Receptors

A major inadequacy of the Mission Bay Helicopter Operations SEIR is its failure to identify the UCSF Mission Bay Medical Center and its proposed hospital complex as noise sensitive receptors as defined by the California Environmental Quality Act.

Response

UCSF takes seriously the well-being of patients under its care. The issue of exposure of hospital patients to excessive noise was discussed in the UCSF Long Range Development (LRDP) Amendment #2 – Hospital Replacement EIR (certified by The Regents on March 17, 2005), and therefore was not discussed further in the UCSF Medical Center at Mission Bay EIR or the subject SEIR. As stated in the UCSF LRDP Amendment #2 EIR, the new hospital design and construction would incorporate noise insulation and meet modern standards to limit noise exposure to hospital occupants. Therefore, the impact of ambient noise levels upon these sensitive receptors would not be significant (see LRDP Amendment #2 EIR pg. 4.8-26). Likewise, single-event noise exposure would be minimized and would not be significant.

Comment AS-6: Helicopter Noise – Sensitive Receptors

Additionally, the loudest helicopter noise levels expected at the closest sensitive receptor - the future child care center on the hospital property are 80 to 94 dB! The most significant adverse effects of aviation noise on children and their learning is demonstrated in 20 studies which found that reading was impaired in children subjected to aircraft noise. Another dozen studies support a reduced task persistence in settings of uncontrollable noise and still others document delayed language acquisition, interference with speech perception and deficits in short and long term memory in noisy environments. The U.S. Environmental Protection Agency finds speech interference at sound levels exceeding 65 dB.

Response

A child care center is not planned on the hospital property, but a possible site for a potential future child care center has been identified on Block 23 of the UCSF Mission Bay research campus, a block to the north of the proposed helipad. The federal and state thresholds of significance for determining impacts on noise sensitive land uses is 65 dB CNEL. Block 23 is well outside of the 65 dB CNEL noise contour. Therefore, a potential child care center on Block 23 would be exposed to less than 65 dB CNEL.

As discussed previously, the noise expected with UCSF helicopter transports (76 to 98 dB SENEL) is comparable to noise events that already occur in the neighborhood (74 to 101 dB SENEL), including noise from trucks, sirens, motorcycles, construction activities, and other aircraft. UCSF helicopter transports would be infrequent contributors to this noise environment, about an average of 1.4 transports per day.

Comment AS-7: Aeromedical Safety - Regulation

Of note, the San Francisco Noise Ordinance does not regulate aviation noise. Additionally, state law exempts emergency aircraft from local ordinances that restrict aircraft operational hours, aircraft type, or aircraft noise levels. (California Public Utilities Code 21662.4(a)). The lack of state and regulation has been identified as a key factor in the spiraling incidence of aeromedical

helicopter crashes. While Caltran's Division of Aeronautics issues permits for all helipads in the State of California, and Board of Supervisors approval of a medical helipad operating within county confines must be obtained, there are no State or Federal regulations that set aeromedical transport standards for helipad operations and no criteria exist for determining the impact of conducting aeromedical transports for a hospital project outside of helipad dimensional requirements allowing for room to maneuver gurneys around a helicopter and obstruction clearance requirements. Two Congressional bills were introduced in 2008 -HR 3939 and S 1300 Section 508- to stem the surge of aeromedical helicopter crashes. Both urge the FAA to enforce more stringent flight safety regulations.

Response

Helicopter aeromedical flight operations as it relates to public safety were fully analyzed in the UCSF Medical Center at Mission Bay EIR. The EIR concluded that impacts would be less than significant because the risk of third party death or injury is extremely rare. Please see Response to Comment AS-3 on page 50. Again, UCSF will continue to monitor NTSB hearings and encourage air medical companies that it contracts with to consider implementing any resulting regulatory recommendations on helicopter safety.

Comment AS-8: Helicopter Noise – Arrival/Departure Time

In the State of California the FAA has approved the use of the Community Noise Equivalent Level or CNEL. The CNEL is a more restrictive noise standard. FAA Order 1050.1E requires that aircraft noise assessments use CNEL. The Integrated Noise Model or INM determines CNEL at gridpoints. The INM computes the time or duration for the helicopter arrival or departure operation based on the airspeeds and altitudes of the profiles. The CNEL model used by the Mission Bay Helicopter Operations SEIR for RSRP is based on an aircraft arrival time of 4.4 minutes and a departure time of 3.5 minutes. In fact, helicopter arrivals are delayed in the foggy, windy inclement weather that prevails in the San Francisco Bay Area. The proposed Mission Bay Helipad mandates arrivals and departures from an eastward direction over the Bay. The mean vector for wind direction at Mission Bay is west to east, thus, aircraft arrive in the direction of headwinds.

Response

The UCSF Medical Center at Mission Bay EIR and the subject SEIR noise analyses included the use of the required CNEL (24-hour average) noise metric to evaluate helicopter noise. In addition, UCSF voluntarily used the SENEL (single-event) noise metric, which, in UCSF's view is a more stringent metric because it casts a larger noise contour and thus has the greater potential to require mitigation.

With regard to landing time, that issue was raised and addressed in the UCSF Medical Center at Mission Bay EIR (see Response to Comment RH et al-2.11 on page 8-39 of the EIR). Proposed helipad operations would be similar to other Bay Area hospital helipads, which have landing

times of 2-3 minutes and never exceeding 5 minutes at the Bay Area medical centers contacted. In inclement weather under poor visibility or high wind conditions, helicopter operations would not occur.

Comment AS-9: Helicopter Noise - Metric

There is increasing use of single event noise metrics to supplement cumulative exposure metrics in response to community concerns that often arise in response to specific loud aircraft operations like news or aeromedical helicopters. SNEL metrics are used to help determine the effects of the noise. For example, both speech and sleep disturbance from noise are more easily understood in terms of single event noise metrics. The SNEL is the total noise energy at each grid point produced by each operation modeled.

Response

Thank you for your comment. UCSF has voluntarily included SENEL in the EIR and SEIR analysis for the reasons cited.

Comment AS-10: Helicopter Noise - Vibration

Helicopters produce low frequency noise and vibration in the range of 10-80 Hz. According to a TNO study, helicopter operations produce vibrations of buildings and rattling of windows, ceiling tiles and objects in buildings. Fourier transform analysis of a typical four blade rotor identifies considerable energy under 100 Hz of helicopter noise. The main rotor of a commercial helicopter rotates at 120 to 400 rpm producing a sound frequency up to 6.7 Hz. Helicopters produce more noise and vibration upon arrival. The most sensitive components of conventional neighborhood structures are windows, followed by doors and floors. Residential wood frame construction sound energy sensitivity falls below 30 Hz.

Response

The UCSF Medical Center at Mission Bay EIR included an analysis of vibration impacts that could be caused by low-frequency noise from proposed helicopter operations (see EIR pg. 4.5-27). That analysis indicates that in nearby properties, vibration of windows may occur, but that windows of nearby newer residential and commercial properties built to Title 24 standards would be much less susceptible to such vibration than the windows of older buildings. Any vibration effects from helicopter operations would be airborne-generated, and therefore are expected to be confined to windows first, and then walls, and associated with objects rattling. Ground-borne vibrations, which have the potential to be transmitted through building structures and floors, would not occur with proposed helicopter operations.

Comment AS-11: Helicopter Noise - Significance Criteria

The human ear has been found to be relatively insensitive to lower frequencies. People find low frequency noise to be less annoying than mid to high frequency noise.

In response to questions submitted to the UCSF Medical Center EIR, the University concedes a 1.5 decibel increase in CNEL would impact speech, sleep and community reaction. The FAA CNEL standard of significance is defined as a project related action causing a 1.5 dB increase in noise at or above 65 db.

Response

The commenter is correct that the significance standards identified in the EIR include a 1.5 dB CNEL increase in noise-sensitive areas already at or above 65 dB CNEL. The proposed project would not exceed this standard (see EIR pp. 4.5-21 through 4.5-22).

Comment AS-12: CEQA Overriding Considerations

The California Environmental Quality Act (CEQA) mandates that significant unmitigated impacts to the environment, human health and safety include a statement of overriding considerations. The Planners must include a statement documenting the irrefutable benefits of helicopter transport for pediatric patients and the reduced risks associated with scheduled interfacility transports of patients stabilized in a primary care setting.

Response

Thank you for your comment. The University is aware of the need to include a statement of overriding considerations that meets the requirements of CEQA Guidelines Section 15093 in its CEQA findings.

Comment AS-13: Helicopter Noise - Significance

The planners must make clear to the community and residential property owners -most notably those in the Dogpatch Historic District- accepting mitigation funds that despite noise mitigation measures, the SEIR concludes that helicopter noise impacts within the 95 dB SENEL noise contour, resulting in the potential awakening of up to 10% of residents within that contour, will be significant and unavoidable. As determined by the SEIR, helicopter noise impacts will continue to be significant and unavoidable, even with the identified RSRP mitigation measures.

Response

This comment does not address the adequacy of the subject SEIR. Nonetheless, in response, the EIR and SEIR, which are publicly available documents, will be referenced in future written exchanges with affected residential property owners regarding the RSRP. The SEIR's conclusion that helicopter noise impacts resulting from proposed UCSF helicopter operations would be significant and unavoidable is conservative because only one of the helicopter models analyzed in the EIR and SEIR resulted in a 95 dB SENEL noise contour that could affect residential properties. In addition, the analysis assumes existing homes have minimal exterior-to-interior noise attenuation of 15 dB.

As discussed in the SEIR (SEIR pg. 32), implementation of the RSRP mitigation measure in conjunction with Mitigation Measure MCMB.5-4 would in general mitigate noise impacts on sensitive receptors from helicopter operations to less than significant levels. However, it may not be feasible to reduce interior sleeping area SENEL levels to less than 80 dB at every residential unit. In addition, the University cannot compel property owners in the vicinity of the helipad to keep windows closed or to participate in the Residential Sound Reduction Program. Therefore, the SEIR concludes that helicopter noise impacts would remain significant and unavoidable.

Comment AS-14: Helicopter Noise – Arrival/Departure Time

Mission Bay Helicopter operations projects 1.5 to 2 flight arrivals a day. An increase in duration of arrival time will increase the CNEL. The 4.4 minute arrival time used by the Mission Bay EIR was projected based on studies performed at UCLA Medical Center. Investigations have determined that flight arrival can be delayed up to 15 minutes in inclement weather. Given the fog and wind factors at the proposed Mission Bay helipad site the CNEL will be increased. Note that the wind vector is west to east therefore flights arriving and departing in an easterly direction will face opposing winds.

Response

Flight arrival times projected in the UCSF Medical Center at Mission Bay EIR were computed by the FAA's Integrated Noise Model (INM), based on the airspeeds and altitudes of the arrival profile. The arrival times were not based on studies performed at UCLA Medical Center, as the commenter claims. Additionally, the claim that flight arrival may take up to 15 minutes in inclement weather is not true and has been refuted in responses to comments on the UCSF Medical Center at Mission Bay EIR (see Response to Comment RH et al-2.11 on page 8-39, and Response to Comment TM-16 on page 8-80). Proposed helipad operations would be similar to other Bay Area hospital helipads, which have landing times of 2-3 minutes and never exceeding 5 minutes at the Bay Area medical centers contacted. In inclement weather under poor visibility or high wind conditions, helicopter operations would not occur (see Response to Comment AS -8 in this document on page 53).

Comment AS-15: Number of Helipads

Helipad planners should include a "nesting" pad for disabled aircraft or for use in the setting of two simultaneous arrivals.

Response

This comment does not address the adequacy of the subject SEIR. While the University appreciates the suggestion of a second helipad, the University does not foresee that another helipad would be necessary. As discussed in the UCSF Medical Center at Mission Bay EIR, Response to Comment RH et al-2.11 on page 8-39, helicopter transports to the UCSF Medical

Center at Mission Bay would only consist of inter-facility transfers and the use of UCSF's helipad will be coordinated to avoid multiple use of the helipad.

Comment AS-16: Helicopter Noise – Health Effects

Numerous studies document evidence that chronic exposure to industrial and environmental noise can lead to increased incidences of cardiovascular diseases and hypertension. The physiological effects of sound include impacts on blood flow, heart rate, startle response, respiration, pupillary dilatation and galvanic skin response.

A critical review of 43 studies on the negative effects of noise on cardiovascular health found a statistically significant increase in blood pressure in studies for occupational noise exposure. Van Brederode found a relationship between military aircraft noise and hypertension in 1988. In a four year study published by the European Health Journal in 2008, a research team led by Lars Jarup, an Environmental Health Researcher at the University of Glasgow found that people living for at least five years near an airport or under a flight path have a greater risk of developing high blood pressure than those who live in quieter areas. High blood pressure can lead to stroke, heart attack, heart and kidney failure. The study concludes that living near airports with exposure to nighttime noise is a major risk factor. The study of nearly 5,000 people found an increase in nighttime aircraft noise of 10 decibels increased the risk of high blood pressure by 14 percent in both men and women. These findings are highly significant in southeastern San Francisco where the highest levels of hospitalization for chronic cardiopulmonary diseases has been documented by the Department of Public Health.

Response

Please see Response to Comment CS-3 on page 44.

Comment AS-17: Alternative Helipad Site – Pier 94

The proposal to site a ground level helipad at Pier 94 should be abandoned given the historic community opposition to the use of this site. In 1999 the Police Department leased contaminated property adjacent to Building 606 on Parcel E of the Hunters Point Shipyard for a helicopter program...the most toxic shipyard parcel. The use of the site was subject to conditions designed to protect the public from underlying soil contamination stirred up by the downwash from the main rotors. The police helicopter program closed after a fatal crash that killed two officers.

In September 2002, commercial medical helicopters under contract with the Department of Public Health began making approximately 5 landings per week at the shipyard heliport. Due to community complaints and documented violations of environmental restrictions on use of the helipad, the authorization was revoked by the San Francisco Redevelopment Agency in December 2002.

Response

UCSF does not propose to site a helipad at Pier 94 or Hunters Point Shipyard.

6. Richard DeWilde

Comment RD-1: UCSF Outreach; RSRP Mitigation

I attended the meetings regarding the proposed helipad for the new UCSF Mission Bay hospital. I live on the corner of 18th and Tennessee, one block from the hospital site and probably two blocks from the proposed helipad site on the hospital.

I found UCSF's efforts in response to neighbor concerns to be more than fair and more than generous. Given the responses, as provided by UCSF, of other hospitals with helipads, UCSF's efforts stand out. UCSF has modified the time lines, the sound reduction measures, the SENEL contoured area, and even added measures such as ventilation improvements, all to the benefit of the nearby residents.

While I live in a neighborhood inundated by the sound of buses, Harleys, trucks, light-rail, construction, and helicopters/planes for PacBell Park events, I do understand the need to mitigate noise. However, if I am going to hear a helicopter, I would prefer it have more important business than circling a baseball game with advertising.

I have discussed the helipad with my housemates and neighbors (including a person who operates a recording studio), and no one has concerns about the noise level of a helicopter used twice a day for medical reasons.

Response

Thank you for your comments.

7. Emily Gogol

Comment EG-1: UCSF Outreach; RSRP Mitigation

I am a homeowner at 2030 3rd St, and have attended numerous meetings concerning the new UCSF hospital. I am excited about their plans for the helipad. UCSF has done an amazing job educating my neighborhood about many issues, such as how the helipad will affect the noise levels in the surrounding areas. I live in the sound contour area closest to the hospital, so I am concerned about the noise I may experience. UCSF did a fantastic job explaining the different ways sound levels are calculated, and what they mean in terms I could understand. In addition,

they were very responsive (and always polite!) to the questions and suggestions of neighbors, even when some neighbors were rude. UCSF went above and beyond what I think is necessary in their outreach efforts. However, I think UCSF went too far with their financial commitment to improve homes that qualify under the sound reduction program. It is not UCSF's responsibility, and from some of the neighbor's comments at recent meetings, I think many are trying to get their drafty homes upgraded.

Overall, UCSF has done a great job educating my neighborhood and involving us in the helipad design process.

Response

Thank you for your comments.

8. Ryan Burns

Comment RB-1: UCSF Outreach; RSRP Mitigation

I live at 2030 3rd St, which is within the 95dB SENEL noise contour of the future helipad. As a home owner that is directly affected by the Residential Sound Reduction Program, I'd like to thank you. Not only does this program demonstrate UCSF's commitment to the neighborhood, but it goes above and beyond what any other institution in similar positions has done. This program is an exceptional gift to both those directly affected and to the neighborhood in general.

UCSF's continual efforts to involve the community in their planning are admirable. I have attended several of the community meetings regarding the hospital, helipad, and other projects in the neighborhood. In each of these meetings, UCSF representatives have been incredibly generous, polite, informative, and overall exceptionally accommodating. Lastly, although I cannot officially represent my neighbors, those I've spoken with are all in favor of UCSF and its hospital plans. I'd like to urge those at UCSF to regard any lack of response or involvement from my fellow neighbors as a sign of approval of UCSF's plans and actions. Ultimately, it's not UCSF that owes the neighborhood, It's the neighborhood that will owe UCSF for its amazing improvements to the area.

Response

Thank you for your comments.

8.3 ORIGINAL COMMENT LETTERS and PUBLIC HEARING TRANSCRIPT

The responses to comments included in this chapter were excerpted from full-length e-mails and letters submitted by interested parties, as well as the transcript of the public hearing held February 23, 2009. This correspondence is included in its entirety on the pages following. The comments are indexed to Table 8-1 and responses included in Section 8.2 of this Chapter.

DEPARTMENT OF TRANSPORTATION

DIVISION OF AERONAUTICS – M.S.#40

1120 N STREET

P. O. BOX 942873

SACRAMENTO, CA 94273-0001

PHONE (916) 654-4959

FAX (916) 653-9531

TTY 711

*Flex your power!
Be energy efficient!*

February 25, 2009

Ms. Michelle Schaefer
University of California, San Francisco
3333 California Street, Suite 11
San Francisco, CA 94143-0286

**RECEIVED
UCSF****MAR - 5 2009****CAMPUS PLANNING
OFFICE**

Dear Ms. Schaefer:

Draft Supplemental Environmental Impact Report for the University of California, San Francisco Medical Center at Mission Bay-Residential Sound Reduction Program for Helicopter Operations; SCH# 2008012075

The California Department of Transportation (Caltrans), Division of Aeronautics (Division), reviewed the above-referenced document with respect to airport-related noise, safety, and regional land use planning issues pursuant to the California Environmental Quality Act (CEQA). The Division has technical expertise in the areas of airport operational safety and airport land use compatibility. We are a funding agency for airport projects. We also have permit authority for public-use and special-use airports and heliports.

The proposal is for a residential sound reduction program for the proposed heliport at the University of California, San Francisco Medical Center at Mission Bay.

The Division is aware of the proposed heliport, which will require the issuance of a State heliport permit by the Division. The applicant should be advised to contact the Division's Aviation Safety Officer for San Francisco County, Don Haug, at (916) 654-5174, for assistance with the State permit requirements. Information regarding the State heliport permit process is also available on-line at <http://www.dot.ca.gov/hq/planning/aeronaut/heliportpermit.html>.

CDOT-1

Prior to issuing a State heliport permit, the Division, as responsible agency, must be assured that the proposal is in full compliance with CEQA. The Draft Supplemental Environmental Impact (EIR) report appears to adequately address the issues of primary concern to us, heliport-related noise and safety impacts on the surrounding community. Please provide us with copies of the Final EIR and the Notice of Determination when available.

The FAA will require the filing of a Notice of Landing Area Proposal (Form 7480-1). A copy of the form is available on the FAA website at <http://forms.faa.gov/forms/faa7480-1.pdf>.

These comments reflect the areas of concern to the Division of Aeronautics with respect to airport-related noise, safety, and regional land use planning issues. We advise you to contact our District 4 office concerning surface transportation issues.

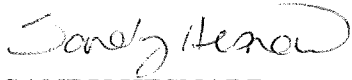
Ms. Michelle Schaefer

February 25, 2009

Page 2

Thank you for the opportunity to review and comment on this proposal. If you have any questions, please call me at (916) 654-5314.

Sincerely,

A handwritten signature in cursive script, reading "Sandy Hesnard".

SANDY HESNARD

Aviation Environmental Specialist

c: State Clearinghouse

From: Nixon Lam [mailto:Nixon.Lam@flysfso.com]

Sent: Friday, March 06, 2009 4:14 PM

To: Campus Planning - EIR

Cc: John L Martin; Jackson Wong; Danielle Rinsler; Bill Wycko; Michael McCarron; Bert Ganoung

Subject: Comments on the DSEIR for UCSF Med Center - Residential Sound Reduction Program for Helicopter Operations

March 6, 2009

VIA E-Mail - eir@planning.ucsf.edu

Michelle Schaefer

Environmental Coordinator

UCSF Campus Planning

3333 California Street, Suite 11

San Francisco, CA 94123

Subject: *Comments on the Draft Supplemental EIR for the UCSF Medical Center at Mission Bay
– Residential Sound Reduction Program for Helicopter Operations*

Dear Ms. Schaefer:

SFO-1 Thank you for the opportunity to provide comments on the Draft Supplemental EIR for the UCSF Medical Center Residential Reduction Program for Helicopter Operations. San Francisco International Airport (SFO) recognizes that the 1.4 average daily helicopter operations evaluated in the SEIR is unique to the location of the proposed hospital and helipad, which is in close proximity to residences and live/work space in the Mission Bay and Dogpatch neighborhoods of San Francisco. However, utilizing the 95-SENEL noise metric is not recognized by State or Federal standards, as applied through the California State Aeronautics Act and the California Airport Land Use Planning Handbook, nor by FAA Order 1050.1E and Federal Aviation Regulations 14 CFR Part 150: *Airport Noise Compatibility Planning*. We write, therefore, to register SFO's objection to the 95-SENEL noise metric being recognized as a viable standard to impose on areas of aircraft operation.

SFO-2 We request that the Supplemental EIR recognize that the noise characteristics of helicopter operations evaluated in Chapter 4.1 of the SEIR are unique and quite different from the noise characteristics attendant to a municipal airport, including noises related to fixed wing aircraft such as the commercial carrier operations at SFO. Those differences include the type and function of the facility, the geographical characteristics of the site, and the frequency and type of aircraft operations. With this in mind, SFO requests that the University acknowledge in the certification and findings for the Final SEIR the differences between the proposed helipad operations and operations at a commercial service airport, including the unique emergency medical function, the helipad location, and the level of helicopter operations activity that led the University to voluntarily consider the adoption of the proposed Residential Sound Reduction Program.

Should you have any questions regarding these comments on the SEIR, please do not hesitate to call me at (650) 821-5347 or nixon.lam@flysfso.com. Thank you.

Sincerely,

Nixon Lam
Manager of Environmental Affairs
Planning & Environmental Affairs
San Francisco International Airport
650.821-5347
650.821-5383 Fax

cc: John L. Martin, Airport Director
Jackson Wong, Airport COO
Danielle Rinsler, Airport Planning Director
Bill Wycko, San Francisco Environmental Review Officer
Michael McCarran, Community Affairs
Bert Ganoung, Noise Abatement Manager

UCSF Medical Center at Mission Bay
Residential Sound Reduction Program
For Helicopter Operations

DRAFT Supplemental EIR

Monday, February 23, 2009, 7:30 P.M.

UCSF Medical Center at Mission Bay
600 16th Street
Genentech Hall
San Francisco, CA

1 Ms. Yamauchi - I think we will get started. Good
2 evening. My name is Lori Yamauchi. I am the Assistant Vice
3 Chancellor for Campus Planning at the University of
4 California San Francisco, or U.C.S.F. I will be the Hearing
5 Officer for tonight's public hearing conducted by U.C.S.F.
6 on the Draft Supplemental Environmental Impact Report for
7 the U.C.S.F. Medical Center at Mission Bay Residential Sound
8 *Reduction Program for Helicopter Operations, or Draft SEIR.*

9 The primary purpose of this hearing is to receive
10 public testimony and evidence regarding the adequacy of the
11 Environmental Review for the proposed project. This is not
12 a hearing on the proposed project itself. We held two
13 community meetings in November and December of 2008
14 regarding the Residential Sound Reduction Program. Nor is
15 this a hearing on the U.C.S.F. Medical Center at Mission Bay
16 Project, for which numerous community meetings were held
17 over the past several years. The first phase of the
18 hospital project was approved at the September 2008 Regents
19 Meeting. If you are already on our mailing list or signed
20 in at the front, you will be notified of future community
21 meetings related to this project.

22 Tonight's hearing is being conducted pursuant to
23 the University of California's procedures for implementation
24 of the California Environmental Quality Act, or CEQA.
25 Public Notice regarding this hearing and the availability of

1 the Draft SEIR included an advertisement in the San
2 Francisco Examiner, an ad in the Potrero View, email
3 notification to a list serve of 450 people and
4 organizations, direct mail postcards to the San Francisco
5 Department of City Planning's Potrero Hill and Citywide
6 Community Notification Lists, direct mail postcards to over
7 350 nearby neighbors and property owners, and posting on the
8 U.C.S.F. online Events Calendar, and on the Community and
9 Governmental Relations Web Page.

10 This hearing will be transcribed by a reporter. A
11 complete transcript of this proceeding, as well as all
12 written comments received during the SEIR public review
13 period, will be included in and responded to in the Final
14 SEIR. All comments will be presented to the Regents of the
15 University of California, or its delegated committee or
16 administrative official, for review before considering the
17 certification of the Final SEIR.

18 If you do not wish to speak tonight, you may
19 submit written comments which are given equal weight with
20 oral remarks. Written comment sheets are available on the
21 table in the back if you would like to use them. You may
22 also supplement any oral testimony given tonight with
23 additional written material. All written comments must be
24 received by the close of the public review period on Friday,
25 March 6, 2009, at 5:00 p.m. in order to be considered as

1 part of the record. Correspondence should be sent to
2 Michelle Schaefer, Campus Planning, 3333 California Street,
3 Suite 11, San Francisco, California 94143-0286, or by email
4 to EIR@Planning.UCSF.edu.

5 Regarding the hearing tonight, if you would like
6 to speak and have not already signed up, please fill out a
7 speaker's card now, and return it to the staff. In order to
8 assure that everyone has an opportunity to be heard, each
9 speaker will be given five minutes. We will call out to
10 each speaker when one minute of permitted time remains, and
11 when 30 seconds remains. When the five minutes have
12 elapsed, we will call time to notify you. After everyone
13 who has signed up this evening has had an opportunity to
14 speak, anyone who feels he or she did not complete their
15 initial comments may return and speak a second time.
16 Speakers will be called by number in the order that the
17 cards are received. If you turned in a speaker card, you
18 should have been given a number indicating where you fall in
19 the order of speakers this evening. In order for your
20 testimony to be accurately recorded, and so that we may
21 respond accurately in the Final SEIR, please come forward
22 when called by number, and use the microphones at the front.
23 As you begin your remarks, please spell your name for the
24 Reporter and indicate the name of any organization you
25 represent.

1 Because the purpose of this hearing is to receive
2 testimony and evidence for the Regents to consider, UCSF
3 staff will not attempt to respond to the testimony this
4 evening or engage in a dialogue with the public; however, I
5 will be happy to answer any procedural questions about the
6 hearing. Are there any questions that have not been
7 addressed by my comments? May I please have speaker 1?

8 Mr. Sabre - I am speaking kind of extemporaneously
9 here --

10 Ms. Yamauchi - If you could just state your name
11 and spell it.

12 Mr. Sabre - My name is Christopher Sabre, C-h-r-i-
13 s-t-o-p-h-e-r, S-a-b-r-e.

14 Ms. Yamauchi - Thank you.

15 Mr. Sabre - I see that your mitigation -- first of
16 all, you are giving us a lot of statistics in the -- you
17 have mailed out this information to many many people,
18 although there are very few people here. The reason why
19 there are not that many people here is because people do not
20 think that their voice is going to be heard, and they do not
21 think that they are going to be receiving a proper response
22 from you. You know, it is not apathy, it is just people
23 have given up. But you are talking about an indoor-outdoor
24 ratio of noise, mitigation -- you want to put -- your
25 mitigation procedures are going to put the difference

CS-1

CS-2

1 between indoor and outdoor noise of a 20 db difference, as
2 far as I understand from glancing at your material that I
3 just looked at just now. So that would give you an outside
4 db of 95 db's, inside it would be something like 70. And if
5 I were sleeping with a 70 db noise coming through at night,
6 it would be quite disruptive. The World Health Organization
7 has said that, you know, noise levels can disturb people's
8 sleep and change their emotional and physical well being.
9 So what is happening is, you know, is that you are putting
10 out statistics; we see statistics. Statistics do not make
11 any noise at all. Statistics are very quiet, you know, and
12 they can -- you know, I do not wake up at night because I
13 hear a statistic, and they gloss over. You are taking
14 averages, you take a single noise ratio and you are
15 averaging it over a long period of time. You are not even
16 measuring the whole db range that the helicopters produce.
17 So you are taking the low levels of the spectrum and they
18 are not even being taken into consideration. So I will even
19 take exception to your statistics. But in any case, you
20 could fly out the statistics on us, but it does not -- it is
21 not going to change anything, it is still going to wake
22 people up in the middle of the night. We still have a
23 problem now with helicopters crashing right and left, you
24 know, all over the country, and the NTSB is investigating
25 the frequency of helicopter accidents. And, you know, I do

CS-6
cont'd

1 not want to stop a helicopter with my house or something
2 like that, you know, if a helicopter crashes in this
3 neighborhood, which is not totally unlikely. You have an
4 intersection between and you are proposing helicopters to be
5 taking off and landing at San Francisco General. You are
6 having these helicopters taking off and landing here. Your
7 flight pattern, flight path intersects, and one of the
8 scenarios for your flight pattern intersects at Potrero and
9 16th Street with the flight path of the helicopters taking
10 off at San Francisco General Hospital. I had an official
11 comment when I spoke with one person here, and they said --
12 an official comment was, "Well, don't you think the
13 helicopters are going to watch out where they're going?"
14 And I would say that, as far as I know, and as far as the
15 reports are from the NTSB, the Transportation Safety Board,
16 you are not getting a full disclosure about how the
17 helicopters are dispatched and guided. There is no night
18 vision. The night vision is inadequate on helicopters and
19 we have a hill here. Now, all of these maybe do not speak
20 to the sound aspect, I guess this is what we are talking
21 about is the sound, but there are a lot of other factors
22 here involved. And a helicopter crash would make a lot of
23 noise -- a lot of db's when a helicopter crashes. Thanks.

CS-8

24 Ms. Yamauchi - May I have speaker number two?

1 Ms. Cliffe - My name is Karen Cliffe, K-a-r-e-n,
2 C-l-i-f-f-e. There are a couple of comments I would like to
3 make. I understand that the criteria to be eligible for the
4 Noise Reduction Program is that you live within the 95
5 decibel contour that you are showing there on the map, and
6 that the sound level in your bedroom be 80 decibels, and
7 that the proposed mitigations through soundproofing reduce
8 the exterior to interior noise level 20-25 decibels. That
KC-1 9 is what your document says, so that, at the most, it would
10 bring the sound level in one's bedroom down to 70 decibels.
11 And I know that you have a study that says that this sound
12 level only wakes 10 percent of the population, but this is
13 an issue that I think is really -- it really does not
14 portray the actual experience. A vacuum cleaner is rated at
15 70 decibels. Rush hour traffic in some of these documents
16 is rated as 70 decibels. If you had either of those noise
17 events in your bedroom, more than 10 percent of the
18 population would waken, so you are really not -- so the
19 mitigation that you are offering is really really not
20 adequate. I think that is my primary concern. Oh,
21 actually, there is one other point and that is that there
KC-2 22 has been some recent research in this past few years, and I
23 do not have the articles with me, but I have not seen them
24 cited in your documents, that were research projects taken
25 in residential areas near airports. And the findings showed

KC-2
cont'd

1 that even those people who were not actually woken by
2 airport and aircraft noise had a significant rise in blood
3 pressure, even as a result of the noise, even if they were
4 not awoken. And the rise in blood pressure was considered
5 to be significant in terms of adverse effects on health.
6 People really do not want to address the fact that these
7 noise levels are harmful to residents and people exposed to
8 this kind of event. Thank you.

9 Ms. Yamauchi - May I have speaker number 3, if
10 there is a speaker number 3? Do either previous speaker
11 number 1 or number 2 wish to speak again, because there does
12 not seem to be any other speakers? If not, I will close
13 the hearing. Thank you very much.

14 (Adjourned at 7:55 P.M.)

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**PUBLIC COMMENT
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT
UCSF MEDICAL CENTER AT MISSION BAY
RESIDENTIAL SOUND REDUCTION PROGRAM FOR HELICOPTER OPERATIONS
PUBLIC HEARING DATE: FEBRUARY 23, 2009**

**SUBMITTED BY:
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SUBMITTED TO NASA-AMES RESEARCH CENTER ROTORY WING AND POWERED LIFT
DIVISION**

In addition to the following public comments submitted in specific response to findings of the DRAFT SEIR for UCSF Medical Center at Mission Bay RSRP for Helicopter operations and the Environmental Impact Report findings for UCSF Medical Center at Mission Bay certified by the Regents of the University of California on September 17, 2008, I have submitted to the Environmental Coordinator my curriculum vitae, research and annotated bibliography and a 23 year on-going review of literature and research titled Rotorcraft Aeromedical Transport that was the focus of a two year postdoctoral clinical and research fellowship at Stanford University Hospital beginning in 1986.

AS-1

The major conclusion of my comments is in reprimand of the UCSF Mission Bay Hospital Planners for their gross underestimation of the public safety issues of the potential siting of a rooftop helipad. The Cumulative Impacts statement on page 4.3-7 states, "Based on data available since 1991, the roughly 100 million helicopter flights in the United States have generated seven fatal collisions involving two helicopters."

AS-2

In fact, the average number of EMS helicopter crashes climbed to more than 15 per year since 2000 as the U.S. fleet of emergency medical helicopters climbed to over 800 aircraft in 2008 carrying up to 400,000 patients a year. In July of 2008 a fiery collision killed six people aboard two medical helicopters that were arriving with patients at Flagstaff Medical Center in Arizona. Up to 33% of EMS helicopter crashes occur during arrivals. The siting of a ground based helipad at Pier 64 offers the safest, most efficient and environmentally sound alternative. The UCSF Medical Center at Mission Bay EIR identified the No Helipad Alternative as the environmentally superior alternative. The recommendation that UCSF implement an Air controller system using GPS and radar for EMS helicopter operations should be adopted as a public safety mitigation measure.

AS-3

AS-4

Additionally, I am submitting in public comment the findings of a research investigation authored by Eric E. Sabelman, Director of the Rehabilitation, Research and Development Center of the Palo Alto Veterans Administration and myself submitted to John Zuk, Ph.D, Director of the Rotary Wing and Powered Lift Division of the Nasa-Ames Research Center titled Advanced Aeromedical Transport: Synergistic Design For Optimum Medical &

Aeronautical Performance. The study proposed the aeromedical adaptation of an advanced generation rotorcraft - the experimental XV-15 civil tiltrotor aircraft.

AS-4

cont'd

A medical helipad or vertiport expected to be operational by 2014 must consider the siting of next generation rotorcraft like the civil tiltrotor. The U.S military deployed tiltrotor aircraft to Iraq in 2007. These aircraft incorporate the technological thrusts of rotorcraft development including the use of advanced composite materials, the development of cockpit designs with simplified controls and advanced blade tip geometry and higher power margins to reduce noise footprints of future rotorcraft.

Annoyance is recognized as the most common adverse community reaction to aircraft noise. According to the Helicopter Noise Analysis - UCSF Mission Bay HMMH Report March 2008, the FAA requires the use of the noise metric for aircraft noise assessment. The DNL or Day-Night Average Sound Level is the most widely accepted metric. DNL measures the accumulation of noise produced by each and every aircraft operation at any point on the ground within the facility environs during a 24 hour period. The DNL metric adds a 10 decibel penalty to noise that occurs during the nighttime hours of 10pm to 7am to account for people's greater sensitivity to nighttime noise. A major inadequacy of the Mission Bay Helicopter Operations SEIR is it's failure to identify the UCSF Mission Bay Medical Center and its proposed hospital complex as noise sensitive receptors as defined by the California Environmental Quality Act.

AS-5

Additionally, the loudest helicopter noise levels expected at the closest sensitive receptor - the future child care center on the hospital property are 80 to 94 dB ! The most significant adverse effects of aviation noise on children and their learning is demonstrated in 20 studies which found that reading was impaired in children subjected to aircraft noise. Another dozen studies support a reduced task persistence in settings of uncontrollable noise and still others document delayed language acquisition, interference with speech perception and deficits in short and long term memory in noisy environments. The U.S. Environmental Protection Agency finds speech interference at sound levels exceeding 65 dB.

AS-6

Of note, the San Francisco Noise Ordinance does not regulate aviation noise. Additionally, state law exempts emergency aircraft from local ordinances that restrict aircraft operational hours, aircraft type, or aircraft noise levels. (California Public Utilities Code 21662.4(a)). The lack of state and regulation has been identified as a key factor in the spiraling incidence of aeromedical helicopter crashes. While Caltrans's Division of Aeronautics issues permits for all helipads in the State of California, and Board of Supervisors approval of a medical helipad operating within county confines must be obtained, there are no State or Federal regulations that set aeromedical transport standards for helipad operations and no criteria exist for determining the impact of conducting aeromedical transports for a hospital project outside of helipad dimensional requirements allowing for room to maneuver gurneys around a helicopter and obstruction clearance requirements. Two Congressional bills were introduced in 2008 -HR 3939 and S 1300 Section 508- to stem the surge of aeromedical helicopter crashes. Both urge the FAA to enforce more stringent flight safety regulations

AS-7

In the State of California the FAA has approved the use of the Community Noise Equivalent Level or CNEL. The CNEL is a more restrictive noise standard. FAA Order 1050.1E requires that aircraft noise assessments use CNEL. The Integrated Noise Model or INM determines CNEL at gridpoints. The INM computes the time or duration for the helicopter arrival or departure operation based on the airspeeds and altitudes of the

AS-8

AS-8
Cont'd

profiles. The CNEL model used by the Mission Bay Helicopter Operations SEIR for RSRP is based on an aircraft arrival time of 4.4 minutes and a departure time of 3.5 minutes. In fact, helicopter arrivals are delayed in the foggy, windy inclement weather that prevails in the San Francisco Bay Area. The proposed Mission Bay Helipad mandates arrivals and departures from an eastward direction over the Bay. The mean vector for wind direction at Mission Bay is west to east, thus, aircraft arrive in the direction of headwinds.

AS-9

There is increasing use of single event noise metrics to supplement cumulative exposure metrics in response to community concerns that often arise in response to specific loud aircraft operations like news or aeromedical helicopters. SNEL metrics are used to help determine the effects of the noise. For example, both speech and sleep disturbance from noise are more easily understood in terms of single event noise metrics. The SNEL is the total noise energy at each grid point produced by each operation modeled.

AS-10

Helicopters produce low frequency noise and vibration in the range of 10-80 Hz . According to a TNO study, helicopter operations produce vibrations of buildings and rattling of windows, ceiling tiles and objects in buildings. Fourier transform analysis of a typical four blade rotor identifies considerable energy under 100 Hz of helicopter noise. The main rotor of a commercial helicopter rotates at 120 to 400 rpm producing a sound frequency up to 6.7 Hz. Helicopters produce more noise and vibration upon arrival. The most sensitive components of conventional neighborhood structures are windows, followed by doors and floors. Residential wood frame construction sound energy sensitivity falls below 30 Hz.

AS-11

The human ear has been found to be relatively insensitive to lower frequencies. People find low frequency noise to be less annoying than mid to high frequency noise. In response to questions submitted to the UCSF Medical Center EIR, the University concedes a 1.5 decibel increase in CNEL would impact speech, sleep and community reaction. The FAA CNEL standard of significance is defined as a project related action causing a 1.5 dB increase in noise at or above 65 db.

In 1997 the Federal Interagency Committee on Aircraft Noise published a document summarizing the current state of knowledge concerning the effects of aviation noise on awakening. According to FICAN report dose response curves, an interior SENEL of about 80 dB can be expected to awaken about 10% of people. The UCSF Medical Center at Mission Bay EIR determined a 95 dB SENEL exterior noise level to be a significant standard for residential and other noise sensitive land uses including the hospital and medical center. The SEIR finds the 95 dB SENEL contour to be significant and unmitigated despite identified mitigation measures included in the SEIR.

AS-12

The California Environmental Quality Act (CEQA) mandates that significant unmitigated impacts to the environment, human health and safety include a statement of overriding considerations. The Planners must include a statement documenting the irrefutable benefits of helicopter transport for pediatric patients and the reduced risks associated with scheduled interfacility transports of patients stabilized in a primary care setting.

AS-13

The planners must make clear to the community and residential property owners -most notably those in the Dogpatch Historic District- accepting mitigation funds that despite noise mitigation measures, the SEIR concludes that helicopter noise impacts within the 95

AS-13
cont'd

dB SENEL noise contour, resulting in the potential awakening of up to 10% of residents within that contour, will be significant and unavoidable. As determined by the SEIR, helicopter noise impacts will continue to be significant and unavoidable, even with the identified RSRP mitigation measures.

AS-14

Mission Bay Helicopter operations projects 1.5 to 2 flight arrivals a day. An increase in duration of arrival time will increase the CNEL. The 4.4 minute arrival time used by the Mission Bay EIR was projected based on studies performed at UCLA Medical Center. Investigations have determined that flight arrival can be delayed up to 15 minutes in inclement weather. Given the fog and wind factors at the proposed Mission Bay helipad site the CNEL will be increased. Note that the wind vector is west to east therefore flights arriving and departing in an easterly direction will face opposing winds. Helipad planners should include a "nesting" pad for disabled aircraft or for use in the setting of two simultaneous arrivals.

AS-15

The 106th Congress mandated a study to investigate the effects of non-military helicopter noise on individuals in densely populated areas within the continental U.S. and to develop recommendations for the reductions of the effects of aircraft noise. Advanced by New York Congresswoman Carolyn B. Maloney, the 2004 report on the effects of helicopter noise on individuals in densely populated areas found that significant advances have been made in reducing the noise levels of commercial aircraft but that the technological advancement for quieter helicopters has been slow in coming. The balancing costs to implement noise improvement with costs to users presents a challenge. The FAA report to Congress in 2004 reviewed the effects of helicopter noise characteristics and vibration on human beings.

Helicopters, or rotary wing aircraft, can be piston or turbine powered. The main rotor provides the thrusting power for lift and forward thrust while the tail rotor provides directional stability. Noise characteristics are multidirectional and generated in both the horizontal and vertical planes.

The main rotor produces a low frequency tone most audible to the human ear. A separate sound called blade slap is responsible for the "whop-whop-whop" heard by observers. The tail rotor operates at high speeds and is often the dominant noise source upon aircraft approach. Aircraft designed with no tail rotors (NOTARs) are significantly quieter and potentially safer for aeromedical transport given the risk of rotor injury to flight crew approaching the rear of the aircraft during a "hot load".

The 2003 Needs & Feasibility Report of the San Francisco General Hospital Medical Helipad Project identified noise and safety to be the overriding concerns of hospital neighbors attending the community outreach meetings for the project. In April of 2005 the Board of Supervisors City Operations Committee conducted a hearing after receiving hundreds of phone calls, emails and letters complaining about news helicopters hovering over a sink hold on Highway 101 at 5:30 am in proximity of San Francisco General Hospital. Neighbors complained that windows shook so loudly they terrified children and animals and that the noise went on for over an hour.

AS-16

Numerous studies document evidence that chronic exposure to industrial and environmental noise can lead to increased incidences of cardiovascular diseases and hypertension. The physiological effects of sound include impacts on blood flow, heart rate, startle response, respiration, pupillary dilatation and galvanic skin response.

AS-16
cont'd

A critical review of 43 studies on the negative effects of noise on cardiovascular health found a statistically significant increase in blood pressure in studies for occupational noise exposure. Van Brederode found a relationship between military aircraft noise and hypertension in 1988. In a four year study published by the European Health Journal in 2008, a research team led by Lars Jarup, an Environmental Health Researcher at the University of Glasgow found that people living for at least five years near an airport or under a flight path have a greater risk of developing high blood pressure than those who live in quieter areas. High blood pressure can lead to stroke, heart attack, heart and kidney failure. The study concludes that living near airports with exposure to nighttime noise is a major risk factor. The study of nearly 5,000 people found an increase in nighttime aircraft noise of 10 decibels increased the risk of high blood pressure by 14 percent in both men and women. These findings are highly significant in southeastern San Francisco where the highest levels of hospitalization for chronic cardiopulmonary diseases has been documented by the Department of Public Health.

AS-17

The proposal to site a ground level helipad at Pier 94 should be abandoned given the historic community opposition to the use of this site. In 1999 the Police Department leased contaminated property adjacent to Building 606 on Parcel E of the Hunters Point Shipyard for a helicopter program...the most toxic shipyard parcel. The use of the site was subject to conditions designed to protect the public from underlying soil contamination stirred up by the downwash from the main rotors. The police helicopter program closed after a fatal crash that killed two officers.

In September 2002, commercial medical helicopters under contract with the Department of Public Health began making approximately 5 landings per week at the shipyard heliport. Due to community complaints and documented violations of environmental restrictions on use of the helipad, the authorization was revoked by the San Francisco Redevelopment Agency in December 2002.

ROTORCRAFT AEROMEDICAL TRANSPORT
Risk Benefit Analysis, Safety, Noise and Human Factors Considerations
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Submitted to the City and County of San Francisco Disaster Council October 18, 2006 and January
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Submitted to the UCSF Medical Center at Mission Bay Residential Sound Reduction Program
January 20, 2009 (EIR@planning.ucsf.edu)

On a 15th Century parchment manuscript titled Codex Atlanticus, Leonardo DaVinci first conceptualized an aircraft lifted and sustained in the air by rotating blades turning on vertical axes. DaVinci modeled the aerodynamics of the rotary wing in 1483 by experimenting with large rulers... "whirling most rapidly through the air so that you will find your arm borne in the same direction along the same axis as the plane of the ruler."

From the Greek word helix or spiral and the Latin word pteron or wing, the achievement of rotary wing powered flight emerged 500 years later. The first helicopters were built in northern France in 1907. The first emergency flight of a US helicopter took place on January 3, 1944 when blood plasma was rushed by a Coast Guard R-4 to a badly burned crew aboard a US Navy ship near New York harbor.

In 1956 Bell Helicopter Textron won the contract to build a prototype helicopter for the U.S. Army. The Bell UH-1 Iroquois or Huey aircraft remains the most popular aircraft in the Western hemisphere and the prototype air ambulance. A battlefield helicopter used for riverine patrol during the Vietnam war, the Huey gained iconic stature in its application to the humanitarian mission of air evacuation of the war wounded and disaster response.

The Huey accommodates a pilot, six stretchers and an attendant. Its maximum take off weight is 9,500 pounds. The colossal threshing power of its 48 foot main rotor generates a maximum cruising speed of 127 mph.

The properties of vertical lift and hover and the ability to land on lawns, streets, parking lots, hospital rooftops...or not to land at all! To hover while hoisting an injured disaster victim upward using a cable and basket, make helicopters adaptable to the mission of land and sea search and rescue and hospital based aeromedical transport.

Conventional rotorcraft cannot fly safely in dense fog, at low altitudes, over varying or unfamiliar terrain, in icing conditions, in high winds or severe turbulence. With few exceptions, there may not be direct access for helicopters in residential or high rise areas that do not have provisions for helicopter landing.

Where civil helicopters differ from army and navy aircraft is that, in general, they have to make a profit for their operators carrying people and cargo. Helicopters are less efficient than airplanes. They need more power to carry a given payload. They burn more fuel and fly more slowly. Early helicopters were inefficient and uneconomic because they carried fewer passengers.

The Aeromedical Mission

According to the Association of Air Medical Services, an industry group in Washington, D.C., the U.S. fleet of emergency medical helicopters has climbed from roughly 400 in 2002 to more than 800 in 2008. These helicopters carry up to 400,000 patients a year.

According to USA Today research the average number of aeromedical helicopter crashes climbed even faster, from about five per year during the early and mid 1990's, to more than 15 per year since 2000 - a 200% increase.

Transportation of critically ill and severely injured patients by air is becoming an increasingly common practice due to factors such as prolonged ground transit times, improvements in survival of the severely traumatized when given prompt treatment and a trend towards concentration of expert medical and surgical specialties in tertiary care centers.

In the state of California an aging population combined with the negative impact of rural emergency room closures and hospital consolidation drives the need for rapid interfacility transport of the acutely ill or injured patient.

Hospital based aeromedical transport programs were born out of the Korean and Vietnam war experience. In the 1960's emergency physicians and trauma surgeons began organizing regionalized trauma care systems in the United States patterned after military field (MASH) units that incorporated the lifesaving benefits of airlifting the wounded to well equipped and expertly staffed surgical hospitals.

The first U.S. hospital based aeromedical transport program began in Denver, Colorado in 1972. The number of programs tripled from 1981-1986. Over 200 aeromedical transport programs now operate within the United States. In Germany and Switzerland, aeromedical transport offers expanded search and rescue capabilities and air ambulances and flight crews operate in the first responder capacity.

Aeromedical missions can be classified as primary or secondary responses. In a primary response the mission involves transport from the scene of an accident or injury.

The "scene call" is one of rapid response with a goal of takeoff within 6 minutes and minimum flight time. Scene calls constitute from 30 to 60% of air ambulance missions from program to program.

A secondary response is activated following a request from an institution that does not offer tertiary care services. Secondary response missions have inherently longer response times. A long distance response may be 150 to 500 miles. Interfacility transports involve the transfer of patients from emergency room to emergency room or from emergency room to burn units, critical care units, operating rooms, neonatal intensive care units or organ donors.

Controversy exists over the need for up to 50% of aeromedical transports. A 1996 investigation published in the prestigious Journal of Trauma evaluated the inappropriate use of helicopter transport in an urban area finding that 45% of patients were admitted to non-ICU areas of the receiving hospitals. A 1997 J Trauma investigation comparing 1350 patients transported by helicopter with 17,000 transported by ambulance found an increased survival in the helicopter group with higher ISS trauma scores. A 2002 J Trauma study of the utility of helicopter transport in an urban system found helicopters were used excessively for patients who weren't severely injured and often didn't get patients to the hospital more quickly than ground ambulances. In that study 33% of patients were discharged home from the emergency department, 9% underwent emergency surgery for fractures and only 2% needed life saving surgery.

An extensive review of literature found aeromedical transport offered its greatest life saving benefits to patients with major trauma and severe injury scores, especially pediatric patients. Trauma patients transported by helicopter received more advanced life support intervention and benefited, in general, from faster transport times.

A 1996 investigation published in the Journal of Pediatric Surgery found a better survival among severely injured air transported children. A 2004 J Trauma review of 1200 traumatized children found improved survival and shorter ICU stays for children with major trauma transferred by air ambulance after hospital stabilization. This benefit is believed to stem from pediatric airway management.

This author (Sumchai, Eliastam, Sternbach) published a 1988 J Trauma case report of the youngest child in the medical literature with a traumatic cervical spine fracture. Stanford Life Flight was activated for an interfacility transport of an unrestrained 2 month old thrown backwards in a motorvehicle collision sustaining a fracture dislocation of the cervical spine. The infant was treated in the regional spinal care unit at the Santa Clara Valley Medical Center in a custom fitted spinal immobilization jacket.

The Needs and Feasibility Report of the San Francisco Department of Public Health Medical Helipad Project concludes that "This primary benefit would be realized in small annual numbers, with the transport of critically injured infants, toddlers, and young children from SFGH to a

Pediatric Trauma Center. There is an overall trend toward better outcomes for children treated at Pediatric Trauma Centers compared with those treated at Adult Trauma Centers."

Other tertiary care benefits of air medical transport have been seen in patients with spinal cord injuries, severe burns, limb amputations, strokes, myocardial infarctions, high risk obstetrics and neonates.

Ethical debate rages over the profit motive fueling inappropriate utilization of air ambulances by hospital and non-hospital based programs who receive on average \$7,500 per flight from third party payers including Medicare.

In 2008 the U.S. EMS helicopter fleet is estimated to include 800 aircraft. Aeromedical helicopters are typically adapted from commercial airframes. Most are modified from general purpose aircraft. There are exceptions. The Stanford Life Flight MBB BK117 aeromedical helicopter is a European aircraft specifically designed and developed for the air ambulance mission with features customized to optimize the medical response including back loading clam shell doors and a tail boom and rear rotor height that reduces the risk of injury to personnel approaching from the rear of the aircraft during a "hot load"- when the rotors of the helicopter remain in motion to facilitate a rapid takeoff.

Due to the restricted size of the medical compartment, noise, vibration and lighting, a limited amount of intervention can be performed on the patient while in transit. The average passenger compartment of a medical helicopter is approximately 4 to 5 feet wide, five feet high and 5 to 7 feet in length. The size restrictions of the medical compartment mandate either rapid delivery to a specialty care center or maximum patient stabilization prior to transport.

Flight crews consist of a pilot and medical attendants with varying skills and qualifications including paramedics, flight nurses, flight physicians and specialized transport teams for neonatal transports, high risk obstetrics and organ harvesting.

Surge in Air Ambulance Crashes

The safety of aeromedical transport has become the subject of increasing scrutiny and concern. A series of accidents in the 1980's led the National Transportation Safety Board to study air ambulances. It found that most accidents were preventable, and recommended tighter standards, better training and improved government oversight. The number of accidents dropped and remained low until the mid-1990's.

Since the year 2000 the number of air ambulances has climbed 50% from 500 to 800 according to the USA Today data base of 275 helicopter accidents since 1978. The average number of crashes climbed even faster, from about five per year during the early and mid 1990's to more than 15 per year since 2000 - a 200% increase. The newspaper's analysis found 82% of fatal crashes were caused by human error - almost all by pilots.

From 2000 to 2005, 60 people died in 84 crashes- more than double the number of crashes during the previous five years. According to the USA Today July 18, 2005 cover story Surge in Crashes Scars Air Ambulance Industry, "Since 2000, more than 10% of the U.S. air ambulance helicopter fleet has crashed. If commercial airlines lost the same proportion of large passenger jets as air ambulance companies lost helicopters, 90 airliners would crash each year."

Proponents of aeromedical transport argue that the greatest number of occupational fatalities in emergency medical services are transport related whether by helicopter or ground ambulance. A 2002 six year analysis published in Annals of Emergency Medicine found that of 114 EMS worker deaths, 75% were transport related...67 occurred during ground transport and 19 or 22% during air ambulance transport.

In 2008 a fiery collision killed six people aboard two medical helicopters arriving with patients at Flagstaff Medical Center in Arizona. It was the ninth accident of the year involving aeromedical helicopters bringing the death toll to 16. According to the National Transportation Safety Board there were 13 accidents and 10 deaths involving air ambulances in 2006. There were 14 accidents and 24 deaths in 2007. From the period October 2007 through October 2008, nine crashes killed 35 people.

According to the Congressional Research Service from 2002 to 2005, 1 of every 50 aeromedical helicopters in the U.S. fleet was involved in a crash. According to NTSB data the accident rate for aeromedical helicopters rose from 3.52 accidents per 100,000 flight hours between 1992 and 2001 to

4.56 accidents per 100,000 flight hours between 1997 and 2001. In all, a total of 110 patients and medical professionals have been killed in 120 aeromedical helicopter crashes since the year 2000.

In January of 2006 the five member NTSB urged the Federal Aviation Administration to take steps to improve the safety of medical helicopters. The NTSB has no power to force the FAA to adopt its recommendations but voted unanimously in October of 2008 to elevate the recommendations to its annual list of top safety priorities:

- Require aeromedical helicopter operators to install Terrain Awareness Systems to warn pilots when helicopters are in danger of crashing into the ground, mountains or buildings.
- Require aeromedical flights carrying only medical personnel to follow the more stringent safety rules applied to flights carrying patients and donor organs. Of 55 EMS helicopter crashes from 2002 to 2005, 10 involved medical personnel only.
- Require a formal flight risk evaluation before takeoff. Fifteen of the 55 crashes could have been prevented.
- Require aeromedical flights to use formalized dispatch procedures that include up to date weather information and assistance in flight risk-assessment decisions.

In 2000 the air ambulance trade industry called on the FAA to push for the type of training used by airlines to minimize mistakes. Called "Crew Resource Management", the training encourages pilots to listen to crewmember concerns and monitor themselves for fatigue and tension.

The National Transportation Safety Board and its investigators express concern about the adequacy of FAA oversight of air ambulance companies. Government inspections of air ambulance operations, a process critical to holding companies accountable for safety, have been called "haphazard and inadequate."

In 2005 the number of employees the FAA classifies as inspectors fell from 3,600 to 3,400 and its budget cut by \$25 million by the Bush Administration. As a result, the air ambulance industry is accepting a higher accident ratio than other areas of the aviation industry.

An FAA task force called for several interventions to improve air ambulance safety. They include mandatory pilot training for handling poor visibility, tightening air ambulance regulations to make them more consistent with those for small airlines and adopting stricter guidelines for flying in bad weather conditions. Air ambulances programs that fly using instrument flight regulations (IFR) are inherently safer than aircraft depending solely upon pilots using visual flight rules (VFR).

Advanced instruments and avionics in the next generation of rotorcraft will improve pilot performance by reducing the high level of concentration needed to fly contemporary helicopters and by providing electromechanical control assist, navigational aids and reduced cockpit noise and vibration.

The inauguration of U.S. President Barack Obama offers hope of economic stimulus for the aviation industry where up to \$5 billion is expected to be allocated for upgrades in aviation infrastructure.

Health Effects of Noise Exposure

For over two decades community acceptance has been the overriding consideration in efforts to site a medical helipad in San Francisco. San Francisco neighborhoods have historically considered heliports to be an undesirable land use, primarily because of concerns about noise and safety.

In 1999 the Police Department leased the contaminated property adjacent to Building 606 at the Hunters Point Shipyard for their new helicopter program subject to conditions designed to protect the public from underlying soil contamination on property designated a Federal Superfund Site.

The Environmental Protection Agency was concerned that contaminated soil would be stirred up by the downwash from the main rotors. The EPA established a minimum size for a paved helicopter pad and required that landings be made at the helipad center, based on the 36 foot length of the police department's helicopter rotor. EMS helicopter rotor diameters range from 36 to 48 feet.

The police helicopter program was closed down in 2000 after a fatal accident that killed two officers.

In September 2002, commercial medical helicopters under contract with the San Francisco Department of Public Health began making approximately 5 landings per week at the unused police heliport at the Hunters Point Shipyard. Helicopters landing at the shipyard transported patients to specialized emergency services available at Davies Medical Center for the reattachment of severed limbs or to UCSF Medical Center for high risk obstetrics, transplants and cardiac bypass surgery.

The shipyard heliport became an alternative to the Seton Hospital helipad in Daly City. The transport time from both helipads to San Francisco receiving hospitals was approximately 15 minutes or more.

Due to community complaints in December 2002 and documented violations of the environmental restrictions on the helipad the use of the shipyard heliport for aeromedical transports was revoked.

In April of 2005 the Board of Supervisors City Operations committee conducted a hearing after receiving hundreds of phone calls, emails and letters complaining about news helicopters hovering over a sinkhole on Highway 101 at 5:30 am in proximity to San Francisco General Hospital. Neighbors complained that windows shook so loudly they terrified children and animals and that the noise went on for more than an hour.

An organized neighborhood opposition group - Stop The Helipad- held meetings in anticipation of the October 2006 projected release of the Environmental Review for the San Francisco General Hospital Medical Helipad Project. The organization also opposes the planned medical helipad at the new UCSF Mission Bay hospital.

The Needs & Feasibility Report of the SFGH Medical Helipad Project identified noise and safety as being the overriding concern of hospital neighbors attending the community outreach meetings for the project.

Charles M. Salter Associates, a San Francisco acoustical engineering firm, conducted preliminary noise analyses as part of the study. Helicopter noise contours developed by Salter indicate that under a worst-case scenario of two daytime and one nighttime flights to and from the hospital, the criterion noise level of 65 dB DNL (day-night noise level) used by the FAA and CalTrans, would be confined almost entirely to the hospital campus.

The University of California at San Francisco has proposed the construction of a Women's and Children's Hospital at the Mission Bay Campus with a state of the art rooftop helipad offering a more safe arrival and departure flight path along the eastern coastline of San Francisco bay. As one of the clearest benefits in helicopter transport has been seen in the transport of severely injured children to pediatric trauma centers, this project offers the greatest utility for siting of both a hospital based helipad and potentially a state of the art aeromedical transport program.

The UCSF Mission Bay helipad is slated for completion in 2014. An environmental impact report scheduled for completion in March 2008 was delayed in order to conduct additional noise studies.

A helicopter flight test was conducted on October 21, 2007 to allow residents to experience noise levels associated with the aircraft. Noise experts hired by the medical center put the expected sound level at about 80 decibels. Noise experts described this as "similar to the noise created by a garbage disposal from about 3 feet away."

On September 17, 2008, The Regents certified the EIR for the UCSF Medical Center project. Project approval included the construction of a helipad, but approval of proposed medical helipad operations was deferred pending the development of a Residential Sound Reduction Program.

On January 20, 2009 a Draft Supplemental Environmental Impact Report was published which identified that helicopter noise impacts within the 95 dB SENEL (Single Event Noise Exposure Level) noise contour would be significant and unavoidable. Resulting in the awakening of up to 10% of residents within that contour even with the identified RSRP mitigation measures.

The UCSF Medical Center at Mission Bay Residential Sound Reduction Program for Helicopter Operations scheduled a public meeting on February 23, 2009 to solicit public comments on the adequacy and accuracy of information presented in the Draft Supplemental Environmental Impact Report focusing on the RSRP mitigation measures.

In a four year study published in the European Health Journal, a research team led by environmental health researcher Lars Jarup at the University of Glasgow found that people living for at least five years near an airport or under a flight path have a greater risk of developing high blood pressure than those who live in quieter areas. High blood pressure can lead to stroke, heart attack, heart failure and kidney failure.

Jarup concluded that living near airports where there is chronic exposure to nighttime aircraft noise is a major health risk. The study of nearly 5,000 people found that an increase in nighttime aircraft noise of 10 decibels increased the risk of high blood pressure by 14 percent in both men and women. The researchers remotely measured the blood pressure of 140 volunteers every 15 minutes while they slept in their homes near London's Heathrow airport.

Using digital recorders to determine what noises had the biggest impact on blood pressure ranging from snoring, to road traffic and aircraft takeoffs and landings, they determined the decibel level of the sound - not it's origin had the most significant impact.

The 65 to 95 decibel sound levels generated by up to three aeromedical helicopter arrivals and departures a day at the proposed San Francisco General Hospital and UCSF Mission Bay Hospital helipads will exceed the noise levels found by Jarup to cause chronic hypertension in residents living under the flight path of arriving and departing aircraft.

As a full time flight physician for Stanford Life Flight for two years from 1986 through 1988, I can personally attest to the sleep and emotional disturbance generated by having flight crew sleep quarters immediately adjacent to a medical helipad at a level 1 Trauma center.

Transport of the Spine Injured Patient

From 1975 to 1984, acutely injured spinal cord patients within 150 miles of the Regional Spinal Cord Injury Unit at the Santa Clara Valley Medical Center were evacuated by M.A.S.T., (Military Assistance to Safety and Traffic) of the Department of the Army 237th Medical Detachment stationed at Fort Ord, California.

In May 1984, Stanford Life Flight came into being providing helicopter service throughout the catchment area for the spinal unit. The superb service offered helicopter activation on a five minute call basis with its main response being trauma scene calls and interfacility transports.

From March of 1986 to March of 1988 I served as a Postdoctoral fellow in the Department of Surgery and full time Flight Physician with the Stanford Life Flight helicopter conducting research on the transport of spine injured patients with Principal Investigator Eric Sabelman, head of the Rehabilitation, Research and Development Center of the Palo Alto Veterans Administration.

I participated in 300 transports during a two year fellowship, served as a "junior" attending physician in the emergency department at Stanford University Hospital and as teaching faculty with the Stanford Life Support Training Center. In March of 1988 I became a Research Associate to Dr. Sabelman at the Palo Alto Veteran's Administration RR&D furthering our investigations into cervical spine trauma and the biomechanical analysis of falls in the elderly.

Interfacility transport introduces significant risks of exacerbation of injury to the patient with spinal injury. Several methods have been developed to minimize this risk. Although tape, sandbags and backboard is seen as an effective means of immobilization in the prehospital setting, once identified, cervical spine injury is best approached with a technique that ensures both rigid immobilization and quantifiable traction. Traction maintains the cervical spine in a neutral axis to overcome the "telescoping" effect that spasm of cervical muscles has on unstable spine elements and the damaged cord. It also prevents attendants from inadvertent manipulation beyond the neutral range.

Early studies, including the experience of the Flying Squads and Paraplegic unit of Dublin, Ireland demonstrated a reduction in induced injury attributed to better management during transport. In 1978 Connolly and Mains of the National Aeronautics and Space Administration evaluated the performance of standard cervical traction devices used in transport. The application of traction during ambulance or helicopter transport had been traditionally undertaken by one of two methods. The first employed tongs as skull calipers with traction generated by a cable. The second method utilized a "bungee cord" - a cord with one or more knots - as the source of traction and a small in-line spring scale to indicate the amount of force applied.

The results of the NASA investigation determined hanging weights to be detrimental in the high vibration environment of the ambulance or helicopter. The weights were found to swing constantly during transport with variation of applied traction over a range of 15 pounds. With severe road conditions the applied force nearly doubled. The recommendation of the NASA engineers was to promote the development of a constant force spring assembly to minimize the variation in traction forces generated during air or ground ambulance transport.

Testing at the Santa Clara Valley Medical Center yielded three prototypes of a constant force backboard traction system. The third became the method of choice for the interfacility transport of adult patients with acute cervical spine injury. The device allowed adjustable traction to be applied via Gardner Wells tongs. The series of all acute, cervical spine injured adults transported by the

aeromedical service to the regional spinal service was reviewed. In three years 59 patients were transported with cervical spine injury using the backboard traction device. In no case was there documented deterioration in neurological function.

The San Francisco Medical Helipad Project

The San Francisco Health Commission approved the City and County of San Francisco Trauma Care System Plan in August of 2001 and requested that SFGH conduct a needs assessment and feasibility analysis for a medical helipad at the San Francisco General Hospital. The Trauma Care System Plan revealed vulnerabilities in San Francisco's ability to prevent death and disability from injury. The trauma system vulnerabilities -geographic isolation, traffic congestion and population density- are especially aggravated by the lack of air medical access to San Francisco's only Trauma center. This can be particularly problematic when injuries are sustained by children requiring specialized care and transfer to Oakland's Children's Pediatric Trauma Center.

In September 2002, the San Francisco Health Commission approved an agreement with the San Francisco architectural firm of Gerson & Overstreet to provide analytical, planning and architectural services for the San Francisco General Air Medical Access Needs and Feasibility Study. On March 4, 2003 the Air Access Needs and Feasibility Study was presented to the Health Commission. The study concluded SFGH should pursue the prospect of siting a medical helipad at its main hospital campus.

The study cited a decline in annual admissions volumes at SFGH and the concern that Title XXII (California Code of Regulations, Chapter 7 Trauma Care Systems) requires that a level 1 Trauma Center meet a minimum annual patient admission volume as necessary to maintain a high level of trauma care skill and expertise for members of the trauma team.

Additionally, the primary benefits of a medical helipad are summarized as mitigation of trauma system vulnerabilities particularly in the care of injured children in a city of significant urban density and traffic congestion surrounded on three sides by water with only one trauma center and lacking a pediatric trauma center. This benefit was seen to be most important in the setting of a natural disaster, multi-casualty incident or facility problem at SFGH including an earthquake structural collapse, power or massive equipment failure.

Secondary benefits include financial and patient volume support for the Trauma Center generated by increasing numbers of tertiary referrals and the positive impact on medical staff retention and recruitment.

The financial incentives invite controversy and ethical debate. A 2002 study in The Journal of Trauma found that helicopters were used "excessively" for patients who weren't severely injured and often didn't get the patients to the hospital any faster than ground ambulances. One explanation for the overuse was profit.

According to Bryan Bledsoe, M.D. an emergency physician and University of Nevada researcher of medical helicopter accidents, only a small subset of patients benefit from aeromedical transport including those who need a cardiac stent or balloon within a 90 minute window. Bledsoe said 2 out of 3 patients transported by EMS helicopter generally have minor injuries and 1 in 4 is sent home without being admitted to the hospital.

The authors of the Executive Summary of the San Francisco General Hospital Medical Center Air Medical Access Needs and Feasibility Study deserve reprimand for efforts to minimize helicopter safety issues. Their summary states, "The study found that air medical helicopter operations are not inherently unsafe, but accidents can and do happen. Secondly, should an accident occur, the greatest danger would be to the aircrew members. There is little evidence to support any danger to surrounding neighborhoods, even though some of these neighborhoods would be subject to helicopter overflight."

The reality is that since the year 2000, 110 people have died in 120 air ambulance crashes and the dead include an 11 day old infant and her mother, a 63 year old business executive with chest pain, and a 70 year old doctor with heart problems all occurred during aeromedical transport to tertiary care medical centers.

From 2002 to 2005, 1 in about 50 medical helicopters in the U.S fleet was involved in a crash. This is a far deadlier rate than the U.S. airline industry which went nearly five years without a commercial jetliner crash earlier this decade.

More significantly, the study fails to acknowledge the consequences of a crash near a San Francisco urban neighborhood. The San Francisco Police Department helipad program at the Hunters Point Shipyard was shut down in 2000 after a fatal crash in which two officers were killed.

A third concern voiced by neighbors was the potential effects of helicopter operations at the hospital on residential property values.

Two additional options have been utilized for emergency landing zones for air ambulances seeking access to San Francisco hospitals. A temporary landing zone or "helispot" was used in the 1980's by Stanford LifeFlight on Pier 29. Air ambulances currently use San Francisco airport which adds thirty minutes to the ground transit time because the helicopters must join a queue that approaches the airport from the south, even though most flights approach from the north.

In May of 2006 a 19 member Civil Grand Jury released the report Realities of Emergency and Disaster Medical Preparedness in San Francisco. The report found that a principle vulnerability of medical emergency preparedness is the lack of air medical access to the city's 9 functioning hospitals. Additionally it identified that, "a major unknown facing San Francisco will be the physical integrity of its hospitals after a major earthquake. For this reason San Francisco has been actively involved in a regional planning process with Marin County and San Mateo County and with a ten county plan formulated under the latest DHS grant application."

Controversies in Prehospital Care and Aeromedical Transport

On October 19, 2004 the Scientific Assembly of the American College of Emergency Physician's convened in San Francisco's Moscone Convention Center. Marc Eckstein, M.D, FACEP Associate Professor of Emergency Medicine, University of Southern California and Medical Director of the Los Angeles Fire Department presented an update titled Controversies in Prehospital Care: Aeromedical Transport.

Eckstein reviewed the literature on the utility, safety and cost of aeromedical transport and discussed the risk benefit considerations of hospital based air ambulance programs. His primary focus was on safety concerns and the inherent risks in helicopter transport. He analyzed the impact of the down wash of rotors on ground personnel, weather and urban obstacles and cited a study appearing in Annals of Emergency Medicine 40:2002 Occupational Fatalities in EMS which documents that in a 6 year analysis of 114 fatalities 75% were transport related and 22% involved air ambulances.

The driving question of Eckstein's review was "Is the emergency aeromedical transport of patients justified?" He suggests that no good controlled studies have been undertaken and that comparing different flight programs is like comparing "apples and oranges" because staffing differences in flight crews (medics, RNs, MDs) introduces variations in scope of practice and capabilities.

Eckstein concludes that aeromedical transport finds its greatest utility where patients cannot be accessed via ground transport but that, in general, helicopters are overused in urban settings. An investigation examining the utility of helicopter transport of trauma patients in an urban system- J Trauma 53:2002- looked at a 10 retrospective review of air ambulance patients finding 33% were discharged home from the emergency room and only 2% needed life saving surgery.

Yet another study analyzed the impact of discontinuing a hospital based air ambulance program on trauma patient outcomes in Galveston, Texas. A 12% decline in trauma admissions and a 17% decline in admissions of severely injured patients was seen with no difference in mortality including hypotensive patients. The study also revealed the total transport time for patients brought by helicopter was significantly longer than for patients brought by ground.

A statewide 7 year study in North Carolina found that patients transported by air ambulance had a lower trauma score and a higher injury severity score. An increased survival was seen in patients with a TS of 5-12 and ISS of 21 to 30. The majority of patients transported by air ambulance had a low ISS that did not justify helicopter transfer.

A 4 year trauma registry from Boston, MA examined 17,000 blunt trauma patients transported by air with 23,000 transported by ground and found a 24% reduction in mortality in patients transported by air by multivariate analysis. Helicopters were staffed with medics and either RNs or MDs.

A study in *Military Medicine* 164:1999, however, examined aeromedical transport of trauma patients looking at 700 patients transported by ground and 100 transported by helicopter finding no difference in mortality when controlled for injury severity score.

The Air Ambulance of the Future

"The time is ripe for beginning a new effort to design and ultimately build an advanced aeromedical transport (AAT) aircraft using current technology for materials, propulsion and flight instrumentation. This effort cannot be solely the province of the traditional aircraft designer, however; the needs and new capabilities of the medical community are the driving factors underlying this proposal. Until now there has been no aircraft of domestic manufacture designed specifically to meet the requirements of patient transport." *Advanced Aeromedical Transport: Synergistic Design for Optimum Medical & Aeronautical Performance* Eric E. Sabelman and Ahimsa P. Sumchai

The Executive Summary of the Emergency Medical Service Rotorcraft Technology Workshop (Washington, D.C. Oct. 14-14, 1981) concludes that key technological needs for the EMS helicopter of the future are:

- Ride quality of a fixed wing aircraft ie: reduced internal and external noise and vibration
- No tail rotor optimizing safety to crew and ground personnel during "hot loading"
- Small rotor diameter - minimizing rotor downwash
- Improved visibility from cockpit optimizing safety in landing and departure
- Crashworthy vehicle
- IFR capability optimizing safety during flights in inclement weather
- More affordable
- High reliability
- Fuel efficient
- Specialized cabins for advanced medical, diagnostic and communications equipment

In the Spring of 1987 Eric Sabelman, Ph.D my principle investigator in a series of research projects published in peer review journals on cervical spine stabilization during helicopter transport arranged a meeting with John Zuk, Ph.D. head of the Rotary Wing and Powered Lift Division of the NASA - Ames Research Center in Mountain View to discuss NASA's cooperation with our investigations.

Dr. Zuk accompanied Dr. Sabelman and I on a tour of the hanger at the Mountain View facility introducing us to "the air ambulance of the future" -the experimental XV-15 Civil Tiltrotor research aircraft, a helicopter airplane hybrid.

Bell Helicopter, a Textron Company, is a \$1.6 billion, leading producer of commercial and military helicopters and the pioneer of the revolutionary tiltrotor aircraft. The rotors of the tiltrotor aircraft are called nacelles. With its nacelles in the vertical position, the tiltrotor takes off, lands and hovers like a traditional helicopter. When the nacelles are tilted forward to the horizontal position, the aircraft flies with the speed and range of a turboprop fixed-wing airplane.

Working with human factors engineers from the Stanford Center for Design Research, Dr. Sabelman and I submitted a project proposal to NASA-Ames outlining a methodology to prepare computer and physical simulations demonstrating the capabilities of candidate vehicles for the synergistic engineering design and medical transport needs of an advanced air ambulance.

"A civil aeromedical transport using the technology proven by the XV-15 Tiltrotor research aircraft would have several intrinsic advantages over helicopters presently employed in this service. These advantages originate in the combination of vertical flight with the characteristics of fixed wing aircraft during forward flight. A medically configured tiltrotor design could incorporate all user tasks including first response capabilities. The design effort will concentrate on adaptation of the fuselage, including internal dimensions, crew placement, ingress and egress for both patient and crew and location of medically significant facilities. The XV-15 appears to be sized to have the minimum lift capacity and the maximum rotor area or landing footprint desirable for foreseeable aeromedical missions."

Our proposal was greeted with much enthusiasm but was ultimately deemed "ahead of its time". Tiltrotor technology was in need of the national development of a civil aviation infrastructure.

Additionally, while the XV-15 had been successfully flight tested, a larger tiltrotor model, the military V22 Osprey and the conceptual 8-10 passenger civil CTR-800 failed flight testing and for nearly 20 years was put on the "back burner" of civilian aviation technology research and development.

On July 22, 2005 at Fort Worth, Texas, the Bell/Agusta 609 tiltrotor streaked over the skies of Central Texas with its outboard nacelles rotating forward to full airplane mode for the first time. When making its first transition to airplane mode the BA609 flew at 219 mph. The BA609 is a six to nine passenger aircraft with market applications for corporate business and government customers for a variety of roles including search and rescue.

On June 14, 2006 two MV-22 Ospreys, the military's first fully operational tiltrotor aircraft, arrived at Miramar Marine Corps Air Station in San Diego to run practice exercises such as aerial refueling.

Bell/Agusta Programs Director Jack Gallagher is quoted as saying, "This is truly a momentous point in aviation history because we have finally achieved the full range of flight on the world's first civil tiltrotor. This changes everything in vertical lift and general aviation.

From: Richard DeWilde [mailto:rdewilde@sbcglobal.net]
Sent: Sunday, March 01, 2009 12:28 PM
To: Campus Planning - EIR
Subject: UCSF Mission Bay Helipad

Dear UCSF:

I attended the meetings regarding the proposed helipad for the new UCSF Mission Bay hospital. I live on the corner of 18th and Tennessee, one block from the hospital site and probably two blocks from the proposed helipad site on the hospital.

I found UCSF's efforts in response to neighbor concerns to be more than fair and more than generous. Given the responses, as provided by UCSF, of other hospitals with helipads, UCSF's efforts stand out. UCSF has modified the time lines, the sound reduction measures, the SENEL contoured area, and even added measures such as ventilation improvements, all to the benefit of the nearby residents.

While I live in a neighborhood inundated by the sound of buses, Harleys, trucks, light-rail, construction, and helicopters/planes for PacBell Park events, I do understand the need to mitigate noise. However, if I am going to hear a helicopter, I would prefer it have more important business than circling a baseball game with advertising.

I have discussed the helipad with my housemates and neighbors (including a person who operates a recording studio), and no one has concerns about the noise level of a helicopter used twice a day for medical reasons.

Thank you for your consideration,

Richard DeWilde
704 18th Street
San Francisco, CA
C 415-595-7789
H 415-626-4645

RD-1

-----Original Message-----

From: Gogol, Emily

Sent: Thursday, March 05, 2009 7:49 PM

To: Campus Planning - EIR

Subject: EIR comments

To whom it concerns,

EG-1 I am a homeowner at 2030 3rd St, and have attended numerous meetings concerning the new UCSF hospital. I am excited about their plans for the helipad. UCSF has done an amazing job educating my neighborhood about many issues, such as how the helipad will affect the noise levels in the surrounding areas. I live in the sound contour area closest to the hospital, so I am concerned about the noise I may experience. UCSF did a fantastic job explaining the different ways sound levels are calculated, and what they mean in terms I could understand. In addition, they were very responsive (and always polite!) to the questions and suggestions of neighbors, even when some neighbors were rude. UCSF went above and beyond what I think is necessary in their outreach efforts. However, I think UCSF went too far with their financial commitment to improve homes that qualify under the sound reduction program. It is not UCSF's responsibility, and from some of the neighbor's comments at recent meetings, I think many are trying to get their drafty homes upgraded.

Overall, UCSF has done a great job educating my neighborhood and involving us in the helipad design process.

Sincerely,

Emily Gogol

-----Original Message-----

From: Ryan Burns [mailto:rburns@stic.net]

Sent: Thursday, March 05, 2009 8:48 PM

To: Campus Planning - EIR

Subject: Residential Sound Reduction Program comments

Dear UCSF,

I live at 2030 3rd St, which is within the 95dB SENEL noise contour of the future helipad. As a home owner that is directly effected by the Residential Sound Reduction Program, I'd like to thank you. Not only does this program demonstrate UCSF's commitment to the neighborhood, but it goes above and beyond what any other institution in similar positions has done. This program is an exceptional gift to both those directly effected and to the neighborhood in general. UCSF's continual efforts to involve the community in their planning are admirable. I have attended several of the community meetings regarding the hospital, helipad, and other projects in the neighborhood. In each of these meetings, UCSF representatives have been incredibly generous, polite, informative, and overall exceptionally accommodating. Lastly, although I cannot officially represent my neighbors, those I've spoken with are all in favor of UCSF and its hospital plans. I'd like to urge those at UCSF to regard any lack of response or involvement from my fellow neighbors as a sign of approval of UCSF's plans and actions. Ultimately, its not UCSF that owes the neighborhood, its the neighborhood that will owe UCSF for its amazing improvements to the area.

Sincerely,
Ryan Burns

RB-1

CHAPTER 9

MITIGATION MONITORING and REPORTING PROGRAM

9.1 OVERVIEW

As a result of the analysis presented in this SEIR, a project-specific mitigation measure is identified under Noise to address impacts resulting from helicopter operations. The Monitor referenced in this Mitigation Monitoring and Reporting Program is the Senior Vice Chancellor, University Advancement and Planning, at UCSF.

In addition, for the convenience of the decision makers and individuals responsible for implementing all mitigation measures that apply to the proposed project, the previously adopted UCSF Medical Center at Mission Bay EIR mitigation measures relevant to the proposed project are reprinted here.

MITIGATION MONITORING AND REPORTING PROGRAM

UCSF MEDICAL CENTER AT MISSION BAY EIR

Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
MITIGATION MEASURES NEWLY IDENTIFIED IN THE SUPPLEMENTAL EIR FOR THE UCSF MEDICAL CENTER AT MISSION BAY – RESIDENTIAL SOUND REDUCTION PROGRAM FOR HELICOPTER OPERATIONS				
4.1 NOISE – HELICOPTER OPERATIONS				
<p><i>MCMB.5-4:</i> Operation of the helicopter landing site (“helipad”) proposed as part of the project would lead to increased noise levels at nearby sensitive receptors. Operations at any time of day could cause speech interference. Nighttime helicopter operations could cause increased awakening of residents in the immediate vicinity of the helipad at the site.</p>	<p>Mitigation Measure MCMB.5-4a: Following helipad construction, UCSF shall implement the following program as part of the RSRP:</p> <p>Start-up Period</p> <ol style="list-style-type: none"> During the first eight weeks of operations, UCSF will address noise complaints, if any, by revising helicopter operations where feasible. If helicopter activity does not reach the expected average of 1.4 transports per day during the start-up period, the start-up period will be extended to a maximum of 12 weeks. At the end of the start-up period, UCSF will conduct a test flight and redraw the 95 dB SENEL (single-event) noise contour to reflect the noise environment that will exist at that time. <p>Qualifications</p> <ol style="list-style-type: none"> Property is located in the blocks within or touched by the redrawn 95 dB SENEL (single-event) noise contour. Property is a legal residential or live/work unit, as of the date of approval of the helipad by Caltrans Aeronautics. Noise level in interior sleeping area is at or greater than 80 dB SENEL with windows closed, as measured by 	Implement Residential Sound Reduction Program according to procedures identified in the mitigation measure.	UCSF Medical Center Transport Coordinator in conjunction with Community Relation and Campus Planning	Responsible units will provide written verification in report form to Monitor during Start-up Period and at completion of Implementation phase. Documentation should include the new 95 dB SENEL noise contour, measured interior noise levels at qualifying properties, addresses of properties that participated in the RSRP, cost estimates, amount paid to qualifying property owners, and copy of easement recordation.

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
UCSF MEDICAL CENTER AT MISSION BAY EIR

Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	UCSF's sound consultant. (If unit is a loft with no separate sleeping area, entire unit will be considered a sleeping area for sound mitigation funds.)			
	Implementation			
	6. UCSF sends notification about the RSRP to residential property owners in the blocks within or touched by the redrawn 95 dB SENEL noise contour, plus 2 blocks beyond the contour.			
	7. Property owners have 12 months after the date of notification about the RSRP to apply for the program (UCSF will send a reminder to those notified at least 3 months before the end of the application period).			
	8. UCSF determines if property meets qualifications.			
	9. UCSF will compile for property owner reference acoustical specifications identifying standard acoustical installations, such as acoustical windows and doors.			
	10. Qualified UCSF consultant recommends sound reduction measures in sleeping areas, which may include: <ul style="list-style-type: none"> • Standard acoustical windows; • Standard acoustical doors; • Weather stripping around doors and other openings; • Insulate or double pane skylights; • Ventilation improvements. 			
	11. UCSF consultant estimates cost of recommended sound reduction			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
UCSF MEDICAL CENTER AT MISSION BAY EIR

Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	measures in sleeping areas, which includes labor and materials costs, permit fees, and City inspections.			
	12. UCSF pays qualifying property owner amount of this estimate:			
	<ul style="list-style-type: none"> Costs will be based on “like-for-like”, that is, for replacement of existing materials similar in quality or appearance; Qualifying property owners who have existing vinyl or aluminum windows can be given a choice of vinyl or aluminum and color options; San Francisco Planning Code requirements within historic districts or regarding historic structures will apply. Wood windows may be required. Related costs will be included in the estimate. 			
	13. UCSF will establish an ad hoc working group of neighbors to develop a dispute and mediation process.			
	14. Qualifying property owner, on her/his behalf and on behalf of tenants and future property owners, releases UCSF from future claims for UCSF helicopter noise at the property; this release shall be in the form of a permanent easement in exchange for compensation per item #12 above. The easement may be modified by written agreement executed by both parties.			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

UCSF MEDICAL CENTER AT MISSION BAY EIR

Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	15. Qualifying property owner is responsible for implementing sound reduction improvements.			

MITIGATION MEASURES IDENTIFIED IN THE UCSF MEDICAL CENTER AT MISSION BAY EIR

4.1 AESTHETICS, VISUAL QUALITY, WIND AND LIGHT AND GLARE

<p><i>MCMB.1-5:</i> Operation of the Medical Center at Mission Bay project would include a helicopter landing site (“helipad”), which would introduce lighting that would be noticeable after dark.</p>	<p>[Note: This mitigation will be triggered if the helicopter operations are approved.]</p> <p>UCSF shall develop a helipad design plan to minimize light and glare, including:</p> <ul style="list-style-type: none"> •Lighting: <ul style="list-style-type: none"> –Perimeter Lights: Perimeter lights shall be flush mounted along the edge of the landing pad and shall have green lenses. A minimum of eight lights shall be spaced evenly around a square pad, or around the perimeter of a circular pad. Care shall be exercised in the design to ensure that perimeter lights do not impede movement of gurneys to and from the access ramp. The lighting layout shall be planned so that lights are to the sides of, rather than at the entrance to, the ramp. –Windcone: A windcone (windsock) shall be installed and lighted for nighttime operations. The windcone can also be located atop an elevator penthouse. Lighted windcones are normally equipped with four 150-watt flood lights mounted at the ends of crossbars, and are usually equipped with red obstruction lights at the top of their masts. The floods shine down on the orange 	<p>Issue instructions to the architect and helipad consultant to incorporate the mitigation as design criteria.</p> <p>Working with the project manager, require architects and design professionals to document how siting and design measures are addressed and incorporated. Review design plans for the proposed helipad to ensure that such features have been incorporated in the design to address the impacts.</p>	<p>UCSF Campus Planning, Medical Center Design and Construction Team</p>	<p>Provide written verification in report form to Monitor during design phase regarding helipad design plan and compliance with this mitigation measure. After construction, the Project Manager shall provide written verification to the Monitor that lights/equipment were installed according to the design.</p>
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MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
UCSF MEDICAL CENTER AT MISSION BAY EIR

Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	<p>cone so that it remains illuminated in all quadrants. The downward-directed lights do not normally cause glare to nearby land uses. As an alternate, an internally lighted windcone shall be used. This system employs two floodlights inside the windcone that rotate with it rather than the four external lights.</p> <p>•Lighting Activation:</p> <p>Activation of perimeter lights would occur only when a helicopter is on approach. Two remote activations are feasible:</p> <p>–Manually switched from inside the hospital: This would minimize energy usage and lamp replacement costs but would require that staff be available to activate lighting when an aircraft is inbound.</p> <p>–Pilot-controlled lighting: This system requires a radio receiver/lighting controller at the hospital. Pilots would tune the helicopter’s communications radio to the receiver’s frequency and key the microphone to activate the lighting. This would allow the pilot to activate the lighting when inbound, eliminating reliance on hospital staff. The weatherproof receiver/controller enclosure has a short whip antenna and can be located outside of the hospital in a secure location.</p> <p>Lighting deactivation can be set to a timer so that perimeter lighting would not remain on for a significant period following departure of the helicopter.</p>			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

UCSF MEDICAL CENTER AT MISSION BAY EIR

Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
4.2 AIR QUALITY				
<i>MCMB.2-1</i> : Demolition and construction activities associated with the Medical Center at Mission Bay project would generate fugitive dust and criteria pollutant emissions that could adversely affect local air quality.	<p>To further mitigate less-than-significant project-level impacts, additional measures related to the 2007 CARB off-road diesel rule on equipment exhaust emissions from construction equipment shall be required in UCSF construction contracts to comply with the following measures:</p> <ul style="list-style-type: none"> Prohibit the use of conventional cutback asphalt for paving to restrict the maximum VOC content of asphalt emulsion. Diesel portable generators less than 50 horsepower shall not be allowed at the construction site, except for those used by welders. All diesel-fueled engines used for on- and offsite construction activities shall be fueled only with ultralow sulfur diesel, which contains no more than 15 ppm sulfur. All construction diesel engines used for on- and offsite activities that have a rating of 100 hp or more shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, section 2423(b)(1) unless it is certified by the construction contractor that such engine is not available for a particular item of equipment. In the event a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine shall be a Tier 1 engine. In the event a Tier 1 or Tier 2 engine is not available for any offroad engine larger than 100 hp, that engine shall be 	Issue instructions in each bid package of each construction project for contractors to incorporate the mitigation. The successful contractor will prepare a construction air pollution control strategy to report on the implementation of the mitigation measure.	Project Manager, Medical Center Design and Construction Team, or Capital Programs Facilities Management, as appropriate.	Provide written verification in report form to the Monitor within 10 working days of each contract bid on each phase to certify that selected bid includes provision for construction air pollution control. Provide a report on construction air pollution control strategies and report to Monitor upon request; but no less than quarterly after beginning each construction phase.

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	<p>equipped with a CARB Level 3-verified diesel emission control device (e.g., catalyzed diesel particulate filter), unless the engine manufacturer or the construction contractor certifies that the use of such devices is not practical for specific engine types. In the event that a CARB Level 3 verified diesel emission control device is not practical for the specific engine type, then the engine shall be equipped with a CARB Level 1- or 2-verified control device (e.g., diesel oxidation catalyst), unless the engine manufacturer or the construction contractor certifies that such devices are not available for the engine in question. For purposes of this condition, the use of such devices is “not practical” if, among other reasons:</p> <ol style="list-style-type: none"> 1. The construction equipment is intended to be onsite for ten (10) days or less. 2. The use of the diesel emission control device is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or reduced power output due to an excessive increase in backpressure. 3. The diesel emission control device is causing or is reasonably expected to cause significant engine damage. <p>In the event that the use of a diesel emission control device is to be terminated, the construction contractor</p>			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	<p>shall be required to inform the UCSF project manager within 10 days prior to such termination.</p> <ul style="list-style-type: none"> • Construction equipment shall be properly tuned and maintained in accordance with manufacturers' specifications. • Best management construction practices shall be used to avoid (or limit) unnecessary emissions (e.g., trucks and vehicles in loading and unloading queues would turn their engines off when not in use, and to the extent practical, all diesel heavy construction equipment shall not remain running at idle for more than five minutes) • Use alternative fueled equipment when feasible (such as ULSD, CNG, biodiesel, water emulsion fuel, and electric). The construction contracts shall require each contractor and subcontractor to consider this measure and adopt it for their work unless they can demonstrate to UCSF the inapplicability or infeasibility of the measure to their specific work, or can provide mitigation measures with equivalent or better effectiveness. This information shall be reported as part of the Mitigation Monitoring Reporting and Compliance Program. • Use on-site power when feasible to reduce reliance on portable generators. The construction contracts shall require each contractor and subcontractor to consider this measure and adopt it for their work unless they can demonstrate to UCSF the 			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	inapplicability or infeasibility of the measure to their specific work, or can provide mitigation measures with equivalent or better effectiveness. This information shall be reported as part of the Mitigation Monitoring Reporting and Compliance Program.			
<i>MCMB.2-3b</i> : Operation of the Medical Center facilities in the Future Phase would generate vehicular, stationary source, and helicopter-related criteria pollutant emissions that would contribute to regional air pollution.	<p>[Note: Regarding helicopter emissions, impacts would not occur until helicopter operations are approved.]</p> <p>UCSF would implement previously adopted measures and new measures identified in this EIR. In addition, prior to approval of the Future Phase project, UCSF would conduct additional CEQA review and would consider any new recommendations and methodologies for mitigating criteria pollutants available at the time of Future Phase project approvals.</p>	<p>Implement previously adopted measures, consisting of extending existing UCSF Transportation Demand Management programs to the project site to promote shuttle services, ride-sharing and bicycle programs to reduce the number of trips at the project site.</p> <p>Conduct additional CEQA review for Future Phase development and consider any new recommendations and methodologies for mitigating criteria pollutants available at the time of the Future Phase project approvals.</p>	<p>UCSF Campus Planning, Parking and Transportation Services</p> <p>UCSF Campus Planning</p>	<p>Prepare memo to Monitor within 30 days of the start of project operations confirming that Transportation Demand Management programs have been extended to the project site.</p> <p>Prepare memo to Monitor within 10 days of preparation of Project Planning Guide (PPG) for Future Phase development that additional CEQA review for Future Phase development will be prepared and will consider any new recommendations and methodologies for mitigating criteria pollutants available at that time.</p>
4.5 NOISE				
<i>MCMB.5-1</i> : Demolition and construction activities associated with the proposed project would elevate noise levels in and around the project site, and particularly at nearby sensitive receptors.	<p>UCSF shall require construction contractors to minimize unavoidable construction noise impacts by use of proper equipment and work scheduling:</p> <ul style="list-style-type: none"> Limit construction hours to the following schedule. [Monday through Friday, 7 a.m. to 5 p.m. for “Not Noisy” work; and Monday through Friday 8 a.m. to 5 p.m. for Noisy work] Approve extended hours [Monday through Friday, 5 p.m. to 8 p.m.; Saturday 7 a.m. to 8 p.m.; and Sunday 8 a.m. to 4:30 p.m.] only with advanced notice from the UCSF project manager. Prohibit high impact 	<p>Issue instructions in each bid package of each construction project for contractors to incorporate the mitigation. The successful contractor will prepare a construction noise impact abatement plan to report on the implementation of the mitigation measure.</p>	<p>Project Manager, Medical Center Design and Construction Team, or Capital Programs Facilities Management, as appropriate</p>	<p>Provide written verification in report form to the Monitor within 10 working days of each contract bid on each phase to certify that selected bid includes provisions for construction noise abatement (including limitations on construction hours). Provide a report on construction noise abatement to Monitor upon request; but no less than quarterly after beginning each construction activity.</p>

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

UCSF MEDICAL CENTER AT MISSION BAY EIR

Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	noise on Saturdays and Sundays.			
	<ul style="list-style-type: none"> Designate a UCSF Community Contact to receive and resolve construction complaints. 	Designate a UCSF Community Contact to receive and resolve construction noise complaints.	UCSF Community Relations	Provide written verification to the Monitor within 10 working days of the first contract bid identifying the UCSF Community Contact and contact information.
<p><i>MCMB.5-4:</i> Operation of the helicopter landing site (“helipad”) proposed as part of the project would lead to increased noise levels at nearby sensitive receptors. Operations at any time of day could cause speech interference. Nighttime helicopter operations could cause increased awakening of residents in the immediate vicinity of the helipad at the site.</p>	<p>[Note: Mitigation Measures MCMB.5-4 and MCMB.5-4a will be triggered if the helicopter operations are approved.]</p> <p>Mitigation Measure MCMB.5-4: The University shall continue to work with the community to develop a residential sound reduction program and to evaluate feasible noise mitigation measures related to UCSF helicopter operations. Once developed, this program shall undergo additional project-level environmental review prior to the start of helicopter operations at the site. Specific sound reduction measures identified in the program would be implemented after UCSF helicopter operations begin and the actual sound environment at that time is known. The residential sound reduction program shall be implemented to the extent feasible to minimize significant disruption to receptors, and shall include the following elements:</p> <ul style="list-style-type: none"> Limit types of landings at the site to the most critically ill patients when time is of the essence, when helicopter transport is approved by a physician. Limit activity to incoming interfacility transfers. Prepare a Helicopter Operations Plan that shall specify the following: <ol style="list-style-type: none"> All helicopter operations shall use the flight paths described in the 	<p>Develop a residential sound reduction program as described in this mitigation measure. Conduct additional project-level environmental review, if required.</p> <p>Issue instructions to UCSF Medical Center transport coordinator and transport team regarding limits on types of landings and limits to interfacility transfers only.</p> <p>Prepare a Helicopter Operations Plan that at a minimum includes the elements described in this mitigation measure. Issue Helicopter Operations Plan to all air medical service companies that may</p>	<p>UCSF Medical Center, Campus Planning and Community and Governmental Relations</p> <p>UCSF Medical Center</p> <p>UCSF Medical Center in consultation with Campus Planning and Community Relations</p>	<p>Provide report to Monitor describing the residential sound reduction program.</p> <p>Provide copy of instructions to Monitor prior to start of helicopter operations. Confirm to Monitor in writing that instructions were sent to UCSF Medical Center transport coordinator, transport team, and any other relevant staff.</p> <p>Provide copy of Helicopter Operations Plan to Monitor prior to start of helicopter operations. Confirm in writing that Helicopter Operations Plan was sent to relevant air medical service companies.</p>

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
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	<p>EIR, unless safety precautions require a diversion from any of the flight paths.</p> <p>2. The primary approach and departure path is the least disruptive flight path (arrive from east and depart to east) and should be utilized as much as feasible. The alternate and secondary flight paths should be utilized only if the primary approach and departure path is not desirable due to safety considerations.</p> <p>3. UCSF service contracts with air medical companies shall require that all pilots be routinely trained to ensure that optimum arrival and departure flight procedures are followed for each helicopter type that serves UCSF. Pilots would be instructed in the use of the primary east approach and departure path.</p> <p>4. A log of helicopter activity shall be maintained which shall include a detailed record of the reason for the trip, and date and time of arrival and departure. If a diversion from prescribed flight paths occurred as discussed above, the reason for diversion shall be recorded in the log.</p> <p>• Respond to noise complaints about helicopter overflight. UCSF shall investigate noise complaints and shall work to address the complaint if it is determined that the cause was from helicopter operations at UCSF. The investigation may include consultation with a noise engineer, a site assessment, noise monitoring of the</p>	<p>land at the proposed UCSF helipad.</p> <p>Assign UCSF personnel to respond to and investigate noise complaints about helicopter overflight. Make UCSF contact information for registering complaints publicly available.</p>	<p>UCSF Medical Center in consultation with Campus Planning and Community Relations</p>	<p>Provide report to Monitor on helicopter noise complaints, investigative actions, and resolution. Provide report to Monitor upon request; but no less than quarterly beginning within 3 months after the start of helipad operations.</p>

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	<p>affected property, and other actions as may be necessary. Contact information for registering complaints will be made publicly available.</p> <ul style="list-style-type: none"> Establish a UCSF community working group that meets periodically to provide a forum for UCSF and the community to discuss helicopter noise issues. 	<p>Establish UCSF community working group that meets periodically to provide a forum for UCSF and the community to discuss helicopter noise issues.</p>	<p>Community Relations in consultation with UCSF Medical Center.</p>	<p>Provide report to Monitor prior to the start of helipad operations identifying community working group members and anticipated meeting frequency.</p>
	<ul style="list-style-type: none"> Include additional mitigation developed as part of the community process. 	<p>Implementation to be determined.</p>	<p>To be determined</p>	<p>Provide report to Monitor confirming implementation of additional mitigation measures.</p>
	<p>Mitigation Measure MCMB.5-4a: Following helipad construction, UCSF shall implement the following program as part of the RSRP:</p> <p>Start-up Period</p> <p>16. During the first eight weeks of operations, UCSF will address noise complaints, if any, by revising helicopter operations where feasible. If helicopter activity does not reach the expected average of 1.4 transports per day during the start-up period, the start-up period will be extended to a maximum of 12 weeks.</p> <p>17. At the end of the start-up period, UCSF will conduct a test flight and redraw the 95 dB SENEL (single-event) noise contour to reflect the noise environment that will exist at that time.</p> <p>Qualifications</p> <p>18. Property is located in the blocks within or touched by the redrawn 95</p>	<p>Implement Residential Sound Reduction Program according to procedures identified in the mitigation measure.</p>	<p>UCSF Medical Center Transport Coordinator in conjunction with Community Relation and Campus Planning</p>	<p>Responsible units will provide written verification in report form to Monitor during Start-up Period and at completion of Implementation phase. Documentation should include the new 95 dB SENEL noise contour, measured interior noise levels at qualifying properties, addresses of properties that participated in the RSRP, cost estimates, amount paid to qualifying property owners, and copy of easement recordation.</p>

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	dB SENEL (single-event) noise contour.			
	19. Property is a legal residential or live/work unit, as of the date of approval of the helipad by Caltrans Aeronautics.			
	20. Noise level in interior sleeping area is at or greater than 80 dB SENEL with windows closed, as measured by UCSF's sound consultant. (If unit is a loft with no separate sleeping area, entire unit will be considered a sleeping area for sound mitigation funds.)			
	Implementation			
	21. UCSF sends notification about the RSRP to residential property owners in the blocks within or touched by the redrawn 95 dB SENEL noise contour, plus 2 blocks beyond the contour.			
	22. Property owners have 12 months after the date of notification about the RSRP to apply for the program (UCSF will send a reminder to those notified at least 3 months before the end of the application period).			
	23. UCSF determines if property meets qualifications.			
	24. UCSF will compile for property owner reference acoustical specifications identifying standard acoustical installations, such as acoustical windows and doors.			
	25. Qualified UCSF consultant recommends sound reduction measures in sleeping areas, which			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	<p>may include:</p> <ul style="list-style-type: none"> • Standard acoustical windows; • Standard acoustical doors; • Weather stripping around doors and other openings; • Insulate or double pane skylights; • Ventilation improvements. <p>26. UCSF consultant estimates cost of recommended sound reduction measures in sleeping areas, which includes labor and materials costs, permit fees, and City inspections.</p> <p>27. UCSF pays qualifying property owner amount of this estimate:</p> <ul style="list-style-type: none"> • Costs will be based on “like-for-like”, that is, for replacement of existing materials similar in quality or appearance; • Qualifying property owners who have existing vinyl or aluminum windows can be given a choice of vinyl or aluminum and color options; • San Francisco Planning Code requirements within historic districts or regarding historic structures will apply. Wood windows may be required. Related costs will be included in the estimate. <p>28. UCSF will establish an ad hoc working group of neighbors to develop a dispute and mediation process.</p> <p>29. Qualifying property owner, on her/his behalf and on behalf of tenants and future property</p>			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	<p>owners, releases UCSF from future claims for UCSF helicopter noise at the property; this release shall be in the form of a permanent easement in exchange for compensation per item #12 above. The easement may be modified by written agreement executed by both parties.</p> <p>30. Qualifying property owner is responsible for implementing sound reduction improvements.</p>			

4.6 TRANSPORTATION AND TRAFFIC

MCMB.6-3: Operation of the Medical Center at Mission Bay project would increase traffic at intersections on the adjacent roadway network in the Future Phase.

Regarding Owens Street at the Center Garage Access, UCSF would conduct project-level CEQA review at the time the Future Phase development is considered for approval. In addition, UCSF would coordinate with the City of San Francisco in the periodic update of the Mission Bay traffic triggers survey and would monitor on-site parking access and circulation in order to determine the need for LOS improvements on Owens Street between 16th and Mariposa Streets. UCSF would coordinate with the Municipal Transportation Agency (which includes the Department of Parking and Traffic) and the Planning Department to confirm the feasibility and effectiveness of mitigation measures resulting from future analysis or consider equivalent recommendations made by these agencies, and UCSF will pay its fair share of the cost of implementing the selected mitigation.

Conduct project-level CEQA review for Future Phase development. Coordinate with the City of San Francisco in the periodic update of the Mission Bay traffic triggers survey. Monitor on-site parking access and circulation in order to determine the need for LOS improvements on Owens Street between 16th and Mariposa Streets. Coordinate with the Municipal Transportation Agency (including the Department of Parking and Traffic) and the Planning Department to confirm the feasibility and effectiveness of mitigation measures resulting from future analysis or consider equivalent recommendations made by these agencies. Pay for fair share of the cost of implementing selected mitigation.

UCSF Campus Planning

Prepare memo to Monitor within 10 days of preparation of Project Planning Guide (PPG) for Future Phase development that project-level CEQA review for Future Phase development will be prepared. Following project-level CEQA review for Future Phase development, prepare additional memo to Monitor describing status of LOS improvements on Owens Street between 16th and Mariposa, coordination efforts with the City to confirm the feasibility and effectiveness of mitigation measures, and status of fair share payments for cost of implementing selected mitigation.

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
MITIGATION MEASURES CARRIED FORWARD FROM THE UCSF LRDP AMENDMENT #2 – HOSPITAL REPLACEMENT EIR				
4.1. AESTHETICS				
4.1-1: New hospital development at any of the sites could increase light and glare which could affect nighttime views at the selected site and in its vicinity.	<p>Minimize light and glare from new hospital development through the orientation of buildings, use of landscaping materials, and choice of primary facade materials. Design standards and guidelines to minimize light and glare would be adopted for the new hospital development, including:</p> <p>Reflective metal walls and mirrored glass walls shall not be used as primary building materials for facades.</p> <p>Installation of illuminated building signage shall strive to be consistent with City Planning Code sign requirements and/or Mission Bay design guidelines.</p> <p>Exterior light fixtures shall be configured to emphasize close spacing and lower intensity light. Light fixtures shall use luminaries that direct the cone of light downward. (Modified from LRDP FEIR Mitigation Measure 12LI-3 for the LRDP and Future Phases)</p>	<p>Issue instruction in each bid package of each architectural services contract for architects and design professionals to incorporate the mitigation as design criteria.</p> <p>Working with the project and construction managers, require architects and design professionals to document how siting and design measures are addressed and incorporated. Review design plans for each new proposed structure to ensure that such features have been incorporated in the design to address light/glare impacts.</p>	Medical Center Design and Construction Team, Project Manager.	Provide written verification in report form to Monitor within 10 working days of each contract bid on each phase. Report will certify that selected bids utilize design elements which maximize compliance with design criteria.
4.1-2: Construction of a new hospital could result in flood lighting at any of the sites during nighttime construction activities.	<p>UCSF would require a condition in construction contracts that flood or area lighting for construction activities be placed and directed so as to avoid potential disturbances to adjacent residences or other uses. (Modified from LRDP Mitigation Measure 12L1-4 for the LRDP and Future Phases)</p>	<p>Issue instructions in each bid package of each architectural services contract for architects and design professionals to incorporate the mitigation as design criteria.</p> <p>Working with the project and construction managers, require contractors to document how siting and construction lighting measures are incorporated. Review construction documentation to ensure that mitigation is included to address lighting effects.</p>	Medical Center Design and Construction Team, Project Manager.	Provide written verification in report form to Monitor within 10 working days of each contract bid on each phase. Report will certify that selected bids utilize design elements which maximize compliance with design criteria.

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
4.1-4: Construction and operation of a hospital at the Mission Bay South site could substantially degrade the visual quality of the Mission Bay campus site or its surroundings.	Extend to the CMPDG to the Mission Bay South site or develop Mission Bay South site land use designations and design guidelines that apply 1996 LRDP goals and objectives for visual quality, protection of view corridors, creation of open space, and compatibility with the surrounding area. Implementation of this measure would avoid a substantial degradation of the visual quality due to the Mission Bay South site development. (Identified by this EIR for the LRDP and Future Phases)	Prior to or as part of project-specific planning and design, develop design guidelines for the Mission Bay South site and adjacent blocks, as applicable.	UCSF Campus Planning and Medical Center Design and Construction Team	Issue new design guidelines with specific prescriptions for the Mission Bay South site and incorporate the site as appropriate into the revised CMPDG.
4.1-6: Operation of a hospital at Mission Bay North or South could include a helicopter landing site (“helipad”), which would introduce lighting that would be noticeable after dark.	<p>[Note: This mitigation will be triggered if the helicopter operations are approved.]</p> <p>UCSF shall develop a helipad design plan to minimize light and glare, including:</p> <p>Lamp wattage shall be minimized to the extent allowed by Federal Aviation Administration requirements.</p> <p>Lighting shall be activated remotely as needed by an approaching helicopter pilot or by staff meeting an incoming flight to the extent allowed by Federal Aviation Administration requirements.</p> <p>[Superceded by Mitigation Measure MCMB.1-5]</p> <p>Project-specific environmental review shall be conducted on potential light and glare impacts when more specific hospital designs for either the North or South sites are available. (Identified by this EIR for the LRDP and Future Phases)[Implemented]</p>	<p>Issue instructions in each bid package of each architectural services contract for architects and design professionals to incorporate the mitigation as design criteria.</p> <p>Working with the project and construction managers, require architects and design professionals to document how siting and design measures are addressed and incorporated. Review design plans for each new proposed structure to ensure that such features have been incorporated in the design to address the impacts.</p>	UCSF Campus Planning, Medical Center Design and Construction Team.	Provide written verification in report form to Monitor within 10 working days of each contract bid on each phase. Report will certify that selected bids utilize design elements which maximize compliance with design criteria.

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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4.2 AIR QUALITY				
4.2-1: Construction and operation of replacement hospital facilities would generate vehicular, stationary source, and helicopter-related emissions (depending on scenario) that would contribute to regional air pollution.	<p>[Note: Regarding helicopter emissions, impacts would not occur until helicopter operations are approved.]</p> <p>UCSF shall continue its existing Transportation Demand Management programs to promote shuttle services, ride-sharing, and bicycle programs to reduce the number of trips at its campus sites. These transit options divert trips from single occupancy vehicles and would thus reduce impacts of vehicular trips generated by the project. (Modified from LRDP FEIR Mitigation Measures 12D4-2 for the LRDP and Future Phase)</p>	Extend UCSF shuttle service to the project site; work to promote other TDM programs at the project site, such as pre-tax transit passes and ride-sharing; consider in parking plans allocations for vanpool, motorcycle, and bicycle parking.	UCSF Parking & Transportation Services in conjunction with UCSF Medical Center and Campus Planning	Provide written verification to Monitor regarding TDM programs considered and implemented.
4.2-2: Demolition and construction activities associated with the hospital construction would generate fugitive dust and criteria pollutant emissions that could adversely affect local air quality.	During construction, UCSF shall require the construction contractor to implement the appropriate level of BAAQMD's dust control procedures for all construction sites. UCSF shall include this requirement in all construction contracts. This mitigates this impact to less than significant. (Modified from LRDP FEIR Mitigation Measure 12D1-1 for the LRDP and Future Phase)	Issue instructions in each bid package of each construction project for contractors to incorporate the mitigation. The successful contractor will prepare a construction air pollution control strategy to report on the implementation of the mitigation measure.	Project Manager, Medical Center Design and Construction Team.	Provide written verification in report form to the Monitor within 10 working days of each contract bid on each phase to certify that selected bid includes provisions for construction air pollution control. Provide a report on construction air pollution control strategies and report to Monitor upon request; but no less than quarterly after beginning each construction activity.
4.2-5: Vehicular traffic generated by construction and operation of a 400-bed or 650-bed hospital and associated facilities, in conjunction with traffic generated from concurrent LRDP projects at each campus site, plus non-UCSF projects, would result in criteria pollutant emissions that would have a significant cumulative impact on the ambient air quality.	Implement Mitigation Measure 4.2-1.			
4.3 CULTURAL RESOURCES				
4.3-1: Building construction,	If the discovery includes human remains,	Issue instructions in each bid package of	UCSF Capital Projects	Provide written verification in report form

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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including excavation and grading associated with the proposed project, could cause substantial adverse changes to archaeological resources at the project sites.	<p>CEQA Guidelines 15064.5 (e)(1) shall be followed:</p> <p>In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:</p> <p>(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:</p> <p>(A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and</p> <p>(B) If the coroner determines the remains to be Native American: (1) The coroner shall contact the Native American Heritage Commission within 24 hours. (2) The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. (3) The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or</p> <p>(2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to</p>	each construction project for contractors to incorporate the mitigation. The successful contractor will demonstrate knowledge of procedures and requirements when cultural resources are discovered during construction activities.	Facilities Management Project Manager.	to the Monitor within 10 working days of each contract bid on each phase to certify that selected bid includes provisions for mitigation if cultural resources are discovered during construction activities. Provide construction status report to Monitor upon request.

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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	<p>further subsurface disturbance.</p> <p>(A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.</p> <p>(B) The descendant identified fails to make a recommendation; or</p> <p>(C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner. (Identified by this EIR for the LRDP and Future Phase)</p>			

4.4 GEOLOGY AND SOILS

<p>4.4-4: In the event of a major earthquake in the region, seismic ground shaking could expose people and property to liquefaction and earthquake-induced settlement at Mission Bay.</p>	<p>A site-specific, design-level geotechnical investigation shall be completed based on the proposed project design and shall provide engineering recommendations for mitigation of liquefiable soils, in accordance with the California Geological Survey's Geology Guidelines for Evaluating and Mitigating Seismic Hazards (CGS Special Publication 117, 1997). These geotechnical recommendations shall be incorporated into the final design of the project. (Identified by this EIR for the LRDP Phase)</p>	<p>The successful architectural design team will prepare a geotechnical survey and incorporate the results of the investigation into the project design to address impacts.</p>	<p>UCSF Campus Planning, and Medical Center Design and Construction Team.</p>	<p>Provide Medical Center Design and Construction Team final geotechnical investigation that reports feasible measures and incorporates them into project design.</p>
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MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
4.5 HAZARDS AND HAZARDOUS MATERIALS				
4.5-4: Operation of the new hospital facilities would generate hazardous waste that could place an additional load on hazardous waste management facilities.	<p>UCSF shall implement hazardous waste handling, minimization, and disposal procedures at any chosen site for hospital replacement consistent with safety requirements and applicable laws and regulations.</p> <p>UCSF shall extend its existing hazardous waste minimization plan to include any chosen site for hospital replacement.</p> <p>UCSF shall implement the operational controls required to comply with laws and regulations, including, but not limited to, monthly safety and compliance audits and training of staff at any chosen site for hospital replacement. This would 1) allow efficient processing of wastes for shipment to treatment facilities or disposal, reducing the time that hazardous wastes are at a chosen hospital replacement site, and 2) ensure that safety controls such as OSHA training, correct practices and safety equipment are in place.</p> <p>UCSF shall implement procedures to minimize increases in the long-lived radioactive waste generation. According to the California Department of Health Services Radiologic Health Branch, California, radiologic licenses should:</p> <ol style="list-style-type: none"> 1) minimize the amount of low-level radioactive waste in possession and avoid accumulating waste that cannot be disposed promptly; 2) segregate for disposing radioactive wastes that are not subject to Southwestern Low-Level Radioactive Waste Disposal 	<p>At the new hospital facilities, UCSF will extend its program for hazardous waste handling, minimization and disposal, including implementation of all the measures identified in the mitigation measure. In addition, in conjunction with bi-annual inspections of UCSF by the City and County of San Francisco Department of Public Health, and the Department of Health Services, Radiologic Health Branch, initiate a review by the Chemical Safety Officer and the Radiation Safety Officer (in consultation with the Chemical Safety Committee and the Radiation Safety Committee as required) of existing source reduction and management plans for additional measures that are feasible to implement at UCSF to minimize hazardous waste and dry long-lived radioactive waste.</p>	<p>Environmental Health & Safety, Chemical Safety Officer and Radiation Safety Officer.</p>	<p>Notify Monitor when hazardous waste handling, minimization and disposal measures are extended to the new hospital facilities. In addition, provide hazardous chemical waste and radioactive waste source reduction and management review to Monitor every other year as part of the bi-annual Business Plan inspection and RHB inspection. Report feasible measures to be implemented and timetable for such additional measures.</p>

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	<p>Compact regulations;</p> <p>3) segregate waste that can be disposed of or reduced in volume by approved treatment methods;</p> <p>4) segregate short-lived radioactive waste for decay;</p> <p>5) consider recycling radioactive materials;</p> <p>6) consider extended on-site storage of any remaining low-level radioactive waste; and</p> <p>7) consider non-radioactive substitutes. (Modified Measure from LRDP FEIR Mitigation Measure 12F1-3)</p>			
4.5-6: Soil and groundwater contamination at the Mission Bay North and South sites could expose construction workers, the public, and the environment to hazards associated with soil and groundwater contamination.	UCSF shall develop a RMP for Parcel X-3 if it is acquired or extend the 1999 RMP to Parcel X-3, if feasible.	The UCSF Office of Environmental Health & Safety will coordinate with the current land owner to prepare or contract for preparation of a complete site assessment and implementation of the identified mitigation measures. Alternatively, UCSF could conduct the assessment and remediation itself in accordance with federal and state requirements.	Environmental Health & Safety, Asbestos / Hazardous Materials Removal Officer	Provide copies of the assessment and remediation plans to Monitor for each project and phase. Provide evidence from the Regulatory Agency of satisfactory completion of remediation.
4.6 HYDROLOGY AND WATER QUALITY				
4.6-3: Construction of new hospital buildings at the Mission Bay North or South sites by the LRDP Phase or Future Phases could result in hydrology and water quality impacts at Mission Bay.	<p>UCSF shall adopt Mitigation Measures K.2, K.3 and K.4 of the Mission Bay Subsequent EIR as follows:</p> <p>K.2 Participate in the City's existing Water Pollution Prevention Program. Facilitate implementation of the City's Water Pollution Prevention Program by providing and installing wastewater sampling ports in any building anticipated to have a potentially significant discharge of pollutants to the sanitary sewer, as determined by the</p>	Issue instructions in each bid package of each construction project for contractor to incorporate the mitigation measures.	Medical Center Design and Construction Team	Provide written verification in report form to the Monitor within 10 working days of each contract bid on each phase to certify that selected bid includes provisions for mitigation measures. Provide construction status report to Monitor upon request.

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	<p>Water Pollution Prevention Program of the San Francisco Public Utilities Commission's Bureau of Environmental Regulation and Management, and in locations as determined by the Water Pollution Prevention Program.</p> <p>This mitigation measure could be implemented by including the Water Pollution Prevention Program in the review process, as each individual construction is proposed. The Water Pollution Prevention Program would review each project, determine if one or more sampling ports should be installed in a particular building, and specify the location of the sampling port(s).</p> <p>K.3 Design and construct sewer improvements such that potential flows to the City's combined sewer system from the project do not contribute to an increase in the annual overflow volume as projected by the Bayside Planning Model by providing increased storage in oversized pipes, centralized storage facilities, smaller dispersed storage facilities, or detention basins, or through other means to reduce or delay stormwater discharges to the City system.</p> <p>K.4 Implement alternative technologies or use other means to reduce settleable solids and floatable materials in stormwater discharges to China Basin Channel to levels equivalent to, or better than, City-treated combined sewer overflows. Such alternatives technologies could include one or more of the following: biofilter system, vortex sediment system, catch basin filters, and/or additional source control measures to remove particulates from</p>			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	streets and parking lots. (Identified by this EIR for the LRDP and Future Phase)			
4.8 NOISE				
4.8-1: The proposed Hospital Replacement Program would result in noise associated with demolition and construction activities.	<p>Mitigation Measure 4.8-1: UCSF shall require construction contractors to minimize unavoidable construction noise impacts by use of proper equipment and work scheduling:</p> <p>Limit construction hours to between 7:00 a.m. and 8:00 p.m. on weekdays and 9:00 a.m. to 5:00 p.m. on weekends. Approve extended hours only with advanced notice from UCSF project manager. Prohibit high impact noise on Sundays. [Superceded by Mitigation Measure MCMB.5-1]</p> <p>Require use of construction equipment with noise reduction devices (i.e., mufflers in good working order).</p> <p>Erect temporary noise walls to protect adjacent noise-sensitive areas. Use of impact tools would be minimized to the extent feasible.</p> <p>Implement “quiet” pile-driving technology (such as pre-drilling of piles, and/or the use of more than one pile driver to shorten the total pile-driving duration), where feasible, in consideration of geotechnical and structural requirements and conditions.</p> <p>Locate stationary noise sources away from residential or other sensitive-receptor areas, and require use of acoustic shielding with such equipment when feasible and appropriate.</p> <p>(Modified measure from LRDP FEIR</p>	Issue instructions in each bid package of each construction project for contractors to incorporate the mitigation. The successful contractor will prepare a construction noise impact abatement plan to report on the implementation of the mitigation measure.	Capital Projects Facilities Management or Medical Center Design and Construction Team, as appropriate	Provide written verification in report form to the Monitor within 10 working days of each contract bid on each phase to certify that selected bid includes provisions for construction noise abatement. Provide a report on noise abatement to Monitor upon request; but no less than quarterly after beginning each construction activity.

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	Mitigation Measure 12E1-1)			
4.8-2: Operational activities and mechanical equipment would increase noise levels at sensitive receptors.	UCSF shall incorporate standard industrial noise control measures for stationary equipment at any site chosen for hospital replacement. UCSF shall also adopt noise performance standards to ensure that operational noise from UCSF sources would not exceed noise guidelines set forth in local General Plans or ordinances for adjacent areas based on use standards. If ambient noise levels in areas adjacent to the site(s) proposed for hospital replacement already exceed local noise standards, UCSF shall not increase average daily noise levels (Ldn) from operational noise sources by 3 or more dBA at the property line. UCSF shall use standard design features including installation of relatively quiet models, orientation or shielding to protect sensitive uses, and installation within enclosures when necessary to reduce noise. (Modified measure from LRDP FEIR Mitigation Measure 12E1-2)	All contractors and design professionals responsible for selecting mechanical equipment will be required to perform noise calculations based on mechanical equipment specifications of the vendor or measure equipment noise levels at the nearest property line to ensure the selected equipment meets the criteria. If the projected equipment noise levels exceed Noise Ordinance specifications, the contractor or design professional will be required to implement additional measures, to ensure that the standards are met, and re-monitor.	Medical Center Design and Construction Team, Project Manager.	Provide written verification to the Monitor of the inclusion of the performance standards and conduct final monitoring as required.
4.8-6: Operation of a hospital at Mission Bay North or South could include a helicopter landing site (“helipad”) that would lead to increased noise levels at nearby sensitive receptors. Nighttime helicopter operations could cause increased awakening of residents in the immediate vicinity of the helipad at the North or South site.	[Note: This mitigation will be triggered if the helicopter operations are approved.] For the North site, none feasible. For the South site, nighttime departures shall be required to use the east or northeast flight path, as feasible. (Identified by this EIR for the LRDP and Future Phases) [Superceded by Mitigation Measure MCMB.5-4]	Include measures in helicopter service vendor contract.	Medical Center Administration Director, Medical Center Facilities	Provide written verification to the Monitor of the inclusion of the performance standards and conduct final monitoring as required.
4.8-7: Site-specific construction and demolition activities at each campus site would have a local, significant cumulative impact on the local noise environment.	Implement Mitigation Measure 4.8-1.			

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)

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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
4.11 TRANSPORTATION				
<p><i>4.11-1:</i> Building construction, including demolition, excavation, and grading associated with the proposed LRDP Amendment could cause substantial adverse impacts to traffic flow, circulation and access as well as to transit, pedestrian, and parking conditions.</p>	<p>Mitigation 4.11-1: To assure that construction and/or demolition activities minimize parking demand and circulation obstruction, UCSF shall require construction and/or demolition contractors to develop and implement construction traffic and parking management plans during demolition and/or construction activities at all campus sites. The plans would be expected to include measures such as the following:</p> <p>Develop a traffic management plan in consultation with the San Francisco DPT and Muni to minimize disruption due to lane closures. The plan should be consistent with the Regulations for Working in San Francisco Streets and Chapter 6 of the California Supplement to the Manual of Uniform Traffic Control Devices.</p> <p>Prepare an offsite parking plan for construction employees and subcontractor employees. An alternative plan would provide shuttle service to/from designated remote parking lots and/or public transportation transfer nodes. This plan would be incorporated into the construction contract between UCSF and the contractor.</p> <p>Schedule heavy-truck deliveries with the construction project manager at least one day in advance.</p> <p>Whenever possible, make deliveries using trucks of 40 feet maximum bumper-to-bumper length.</p> <p>Whenever possible schedule heavy</p>	<p>Issue instructions in each bid package of each construction project for contractors to incorporate the mitigation. Require the successful contractor to prepare a construction traffic and circulation plan for each new proposed construction project to report on the implementation of the mitigation measure.</p>	<p>Medical Center Design and Construction Team, Capital Projects Facilities Management, as appropriate.</p>	<p>Provide written verification in report form to the Monitor within 10 working days of each contract bid on each phase to certify that selected bid includes provisions for a construction traffic and circulation plan. Provide a construction traffic and circulation plan implementation report to Monitor upon request; but no less than quarterly after beginning each construction activity.</p>

MITIGATION MONITORING AND REPORTING PROGRAM (Continued)
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Impact	Mitigation Measure	Implementation	Responsible Unit	Report Mechanism
	trucks deliveries to arrive at off-peak hours, outside of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. Note any deliveries that cannot comply with the above requirements for heavy trucks on the schedule, and notify the UCSF construction project manager at least 48 hours in advance. The contractor may provide flagmen to direct traffic in those cases. (Identified by this EIR for the LRDP and Future Phases)			
4.11-2: Operation of a hospital at the Mission Bay North or South sites would increase traffic at intersections on the adjacent roadway network.	See below.			
4.11-2a: Operation of a hospital at the Mission Bay South site would increase average delay per vehicle during the p.m. peak hour at the intersection of 16th Street / Owens Street.	UCSF shall coordinate with the City of San Francisco to provide the following lane configuration for the southbound approach on Owens Street at the intersection of 16th Street / Owens Street: one southbound shared through-left-turn lane, one southbound through-lane, and one southbound exclusive right-turn lane. (Identified by this EIR for Future Phases)	Work with appropriate City Departments on lane configuration at this intersection to achieve acceptable level of service.	Vice Chancellor - University Advancement & Planning, Campus Planning, Government Relations.	Report coordination efforts to Monitor and provide documentation confirming lane configuration has been approved by City and implemented.
4.11-2b: Operation of a hospital at the Mission Bay South site would increase average delay per vehicle during the p.m. peak hour at the intersection of Mariposa Street / 3rd Street.	UCSF shall coordinate with the City and County of San Francisco to provide an additional southbound exclusive right-turn lane of a minimum 50-foot length on 3rd Street at the intersection of Mariposa Street / 3rd Street. (Identified by this EIR for Future Phase)	Work with appropriate City Departments to get Board of Supervisor approval for the dedication of land that would be required for the lane.	Vice Chancellor - University Advancement & Planning, Campus Planning, Government Relations.	Report coordination efforts to Monitor. If UCSF cannot dedicate to City, this measure would remain a significant unavoidable impact.