Proposed Residential Sound Reduction Program for the UCSF Medical Center at Mission Bay Helipad

December 11, 2008
Agenda

1. Welcome and Introductions
2. Agenda Overview
3. Proposed Residential Sound Reduction Program
   a. Project Overview: UCSF Medical Center at Mission Bay
   b. Program Elements *(revised since last meeting)*
   c. Response to Questions/Comments
4. Community Feedback
5. Summary and Next Steps
Project Site

Existing UCSF Campus

Hospital Site
Helipad Information

Facts:
• Helipad is for transport of high-risk newborns, critically ill kids, pregnant mothers
• Not a trauma center
• Estimated transports: 1.4 per day

Siting:
• Located helipad at northern-most Medical Center building to maximize distance from residences
• Developed flight paths that are over San Francisco Bay to extent possible
• Designated flight paths away from residences
• Placed elevator shaft to the south of the landing pad to deflect sound away from the Dogpatch neighborhood
Helicopter Flight Paths
Helicopter Test Flight
Noise Measurement Basics

Community Noise Equivalent Level, CNEL
• Describes noise exposure over 24-hour period
• CNEL includes the number of noise events by time of day

Single-Event Noise Exposure Level, SENEL
• Describes noise exposure of complete single event
• SENEL includes the noise level and the duration of single noise events
Noise Measurement Basics

SENEL – Measured near UCSF Hospital Site

<table>
<thead>
<tr>
<th>Neighborhood Noise Sources</th>
<th>Lmax Range</th>
<th>SENEL Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft</td>
<td>60-78</td>
<td>74-85</td>
</tr>
<tr>
<td>Sirens</td>
<td>98</td>
<td>101</td>
</tr>
<tr>
<td>Construction</td>
<td>59-80</td>
<td>85</td>
</tr>
<tr>
<td>Non-UCSF Helicopter Flyovers</td>
<td>61-80</td>
<td>81-87</td>
</tr>
<tr>
<td>Motorcycles</td>
<td>84-96</td>
<td>88-100</td>
</tr>
<tr>
<td>Muni T</td>
<td>58-72</td>
<td>84-88</td>
</tr>
<tr>
<td>Trucks</td>
<td>64-84</td>
<td>81-99</td>
</tr>
<tr>
<td>UCSF Helicopter Transports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measured</td>
<td>56-83</td>
<td>67-94</td>
</tr>
<tr>
<td>Predicted</td>
<td>64-82</td>
<td>76-98</td>
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</table>
Noise Analysis

- Most airports and hospitals surveyed use CNEL or 24-hour metric as the basis of impact

- UCSF Medical Center at Mission Bay EIR analyzed helicopter noise using both CNEL (24-hour average) and SENEL (single-event) metrics

- Consistent with federal and state standards, EIR significance threshold using CNEL is 65 dB

- UCSF analysis goes above and beyond standards and requirements to address potential noise effects by including SENEL metric as well as CNEL

- Based on research from Federal Interagency Committee on Aircraft Noise (FICAN), EIR significance threshold using SENEL is 95 dB exterior noise (corresponding to 80 dB interior noise)
Noise Analysis

EIR Findings using CNEL (24-hour average)

- 65 dB CNEL contour from the expected UCSF helicopter operations will be contained entirely on the UCSF hospital site and research campus
- EIR found noise impacts using CNEL to be less than significant and would not require sound mitigation

EIR Findings using SENEL (Single-event)

- 95 dB noise contour is expected to be contained largely to the UCSF campus or commercial areas
- *Exception:* For one helicopter model—the EC-130—residences are within the impact area one block to the south of the hospital site
- EIR found noise impacts using SENEL to be significant due to the potential noise impact of this one helicopter model
Noise Analysis
Noise Analysis

Mitigation Measures UCSF has agreed to:

- Limit landings to critically ill patients where time is of the essence
- Helicopter transport must be approved by physician
- Limit activity to incoming inter-facility transfers
- Prepare Helicopter Operations Plan:
  - Use flight paths described in EIR, unless diversion necessary for safety
  - Use primary approach/departure path as much as feasible
  - Use alternate and secondary flight paths only if necessary for safety
  - UCSF service contracts with air medical companies to require pilots be routinely trained about flight paths
  - Maintain log of helicopter activity
Noise Analysis

Mitigation Measures UCSF has agreed to (cont’d):

- Respond to and investigate noise complaints
- Establish community working group for UCSF helicopter operations
- Include additional mitigation developed as part of the community process
# Top-Ranked Children’s & Women’s Hospitals in Urban Areas

<table>
<thead>
<tr>
<th></th>
<th>Hospital</th>
<th>City</th>
<th>Noise Metric</th>
<th>Transports/Day</th>
<th>Limits on Hours</th>
<th>Sound Insulation Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Johns Hopkins Hospital</td>
<td>Baltimore</td>
<td>No study</td>
<td>3</td>
<td>No</td>
<td>No</td>
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<tr>
<td>2.</td>
<td>Stanford Hospital</td>
<td>Palo Alto</td>
<td>No study</td>
<td>2</td>
<td>No</td>
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<tr>
<td>3.</td>
<td>UCLA Medical Center</td>
<td>Los Angeles</td>
<td>CNEL</td>
<td>0.8</td>
<td>No</td>
<td>No</td>
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<tr>
<td>4.</td>
<td>Children’s Memorial Hospital</td>
<td>Chicago</td>
<td>SEL</td>
<td>0.2</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>5.</td>
<td>Brigham &amp; Women’s Hospital (helipad for Boston Children’s Hosp.)</td>
<td>Boston</td>
<td>No study</td>
<td>1.6</td>
<td>No</td>
<td>No</td>
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<tr>
<td>6.</td>
<td>Children’s Hospital</td>
<td>Philadelphia</td>
<td>No study</td>
<td>1</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>7.</td>
<td>Methodist Hospital (helipad for Texas Children’s Hosp.)</td>
<td>Houston</td>
<td>No study</td>
<td>Information not available</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>8.</td>
<td>Children’s Medical Center</td>
<td>Dallas</td>
<td>No study</td>
<td>Information not available</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
## Other Northern California Hospitals

<table>
<thead>
<tr>
<th>Hospital</th>
<th>City</th>
<th>Noise Metric</th>
<th>Transports/Day</th>
<th>Limits on Hours</th>
<th>Sound Insulation Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Santa Rosa Memorial</td>
<td>Santa Rosa</td>
<td>No study</td>
<td>2</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2. Children’s Hospital</td>
<td>Oakland</td>
<td>No study</td>
<td>Information not available</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3. John Muir Medical Center</td>
<td>Concord</td>
<td>CNEL</td>
<td>0.5</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>4. UC Davis Medical Center</td>
<td>Sacramento</td>
<td>CNEL</td>
<td>2</td>
<td>No</td>
<td>Nominal payment</td>
</tr>
<tr>
<td>5. Sutter Hospital</td>
<td>Sacramento</td>
<td>SEL</td>
<td>Information not available</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6. Kaiser Permanente Medical Center</td>
<td>Santa Clara</td>
<td>SEL</td>
<td>0.04</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>7. Santa Clara Valley Medical Center</td>
<td>San Jose</td>
<td>No study</td>
<td>0.8</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Benchmarks

• Airports use CNEL (24-hour average) metric to determine noise impact

• Most hospitals surveyed have not studied noise impacts

• Of peer hospitals and Northern California hospitals surveyed, only UC Davis Medical Center offered nominal compensation for sound insulation
UCSF Residential Sound Reduction Program Proposal

—Goal—

• To reduce noise level from UCSF helicopters in interior sleeping areas of qualifying properties
UCSF Residential Sound Reduction Program Proposal (Revised)

—Qualifications—

• Property is located in the blocks within or touched by the 95 dB SENEL (single-event) contour zone at the time helicopter operations commence.
  – Map shows the 95 dB SENEL contour for loudest helicopter analyzed in EIR
  – [Zone includes all blocks touched by 95 dB noise contour]
  – Before helicopter operations start, UCSF will conduct a test flight and redraw the contour

• Property is a legal residential or live/work unit

• Noise level in interior sleeping area at or greater than 80 dB SENEL with windows closed
  - If unit is a loft with no separate sleeping area, entire unit will be considered for sound mitigation
UCSF Residential Sound Reduction Program Proposal (Revised)

—Start-Up Period—

• During first six weeks of operations, UCSF will address noise complaints, if any, by revising helicopter operations where feasible
  – Confirm proper flight paths being used
  – Consider altering flight paths
  – Work with flight companies to reduce use of louder helicopters

• UCSF sends notification about RSRP to residential property owners in contour zone
UCSF Residential Sound Reduction Program Proposal (Revised)

—Implementation—

• Property owners have 12 months after start-up period to apply
  - UCSF will send a reminder 3 months before the end of the application period

• UCSF determines if property meets agreed-upon qualifications
UCSF Residential Sound Reduction Program Proposal (Revised)

—Implementation —

• UCSF will have prepared an acoustical specification book

• Qualified UCSF consultant recommends sound reduction measures [, and prepares cost estimate for these items, including materials, labor, permits and inspections] – moved to next section

• Measures may include:
  – standard acoustical windows
  – standard acoustical doors
  – weather stripping around doors and other openings
  – insulate or double pane skylights
  – ventilation improvements
UCSF Residential Sound Reduction Program Proposal (Revised)

—Implementation—

- UCSF consultant will estimate cost of sound insulation measures
- UCSF pays property owner the amount of estimate
• Estimate includes permit fees, labor and material costs and City inspections

• Costs will be based on “like-for-like” for design purposes

• Homeowners who have existing vinyl or aluminum windows can be given a choice of vinyl or aluminum and color options

• San Francisco Planning Code regarding historic district or historic structures will apply. Wood windows may be required. Related costs will be included in the estimate.
UCSF Residential Sound Reduction Program Proposal (Revised)

—Implementation—

• UCSF will establish a community working group to develop a dispute and mediation process

• Property owner is responsible to implement sound reduction improvements
UCSF Residential Sound Reduction Program Proposal (Revised)

—Agreement —

• UCSF provides property owner with funds based on the cost estimate

• Property owner releases UCSF from future claims for UCSF helicopter noise at the property

• Release shall be in the form of an easement
UCSF Residential Sound Reduction Program Proposal

Summary

• EIR noise analysis includes assumptions that favor the community:
  - Voluntary use of SENEL (single-event) noise metric in addition to FAA-required CNEL (24-hour) noise metric
  - Noisiest helicopter model was used to determine contour for RSRP
  - Assumes existing sound insulation in homes is minimal

• UCSF’s proposed RSRP goes above and beyond other hospitals surveyed

• UCSF amended the program in response to community feedback

• UCSF is making a sincere effort to be a good neighbor and reduce noise on impacted properties in a meaningful way
Responses to Comments/Questions
Responses to Comments/Questions
SF Noise Ordinance

- Does not apply to aircraft of any kind
- Addresses specific noise sources: waste disposal, construction, machinery, entertainment
- *Allows for exceptions to noise limits*
- Noise limits on properties do not apply to helicopters; if they did, UCSF helicopters would minimally exceed them briefly (seconds)
- Residential interior noise limits apply to *fixed* noise sources
Responses to Comments/Questions
The RSRP’s noise contour

Why 95 dB SENEL contour?

• There is no industry standard for SENEL, since CNEL is the standard

• FICAN (Federal Interagency Committee on Aviation Noise) study:

  80 dB interior noise level = 90% not awakened
+ 15 dB conservative estimate of a home’s sound reduction

  95 dB SENEL contour
Responses to Comments/Questions
The RSRP’s noise contour

Why not broaden the contour to include more properties?

- The 95 dB SENEL contour (80 dB interior) is much more generous than the 65 dB CNEL metric that some surveyed hospitals use (others did not study noise at all)
Responses to Comments/Questions
The RSRP’s noise contour

More details on the FICAN* study?

- 90% not awakened corresponds to about 80 dB SENEL
- 95% to about 65 dB SENEL
- 99% to about 45 dB SENEL

* Federal Interagency Committee on Aviation Noise
Responses to Comments/Questions

The RSRP’s noise contour

What if a property is outside the 95 dB contour but has interior noise level greater than 80?

• Very unlikely, but this would be evaluated on a case-by-case basis

In the winter there would be more impact because it takes longer to land.

• According to EMS pilots, it does not take longer to land during the winter.
Responses to Comments/Questions

The RSRP’s noise contour

Contour is based on your primary flight path; need to adjust contour for other paths.

• 95 dB SENEL contours represent arrival from east and use of any departure paths.

• Arrival dominates shape of contour due to “blade-slap” effect and shallower descent angle than ascent angle on departure.

• Various modeled departure paths had no effect (size or shape) on the SENEL contours of 95dB+.

• Planned elevator tower prevents south flight path.
Responses to Comments/Questions

Air traffic in the area

*How is air traffic safety ensured?*

- UCSF will establish a system to ensure adequate communications between the arriving and departing helicopters and the UCSF Medical Center.

- All pilots in the vicinity follow standard procedure by radio and visual flight rules.
Responses to Comments/Questions

Air traffic in the area

Info on other helicopters currently in the area?

SFO Aircraft Noise and Operations Monitoring System data from a Thursday in October 2007 showed for aircraft at or below 2,500 feet in the vicinity:

- 38 daytime
- 2 evening
- 4 nighttime
- 44 total flights
Responses to Comments/Questions

Hospital interior noise standard

SF General interior standard is 45 dB. What is the interior noise standard for the UCSF hospital? You should plan for same level in your neighbors’ homes.

- SFGH and UCSF are being built to industry standards for hospitals (with or without helipads)
- 45 dB “Ldn” (day-night equivalent level)--similar to CNEL (24-hour averaging) but without penalty for evening
- SENEL metric is not used for interior noise standard
- We expect no residences to have interior exposure greater than 45 dB Ldn (see 65 dB CNEL contour) due to UCSF helipad operations
Responses to Comments/Questions

Existing noise environment

_Demonstrate in this room at your next meeting what 95 SENEL sounds like._

- Audio speaker here would not reflect real experience. This is why neighbors requested test flight. A truck passing by your home would be similar.

_How many above 95dB SENEL noise events are there in a typical day at a given location in the area?_

- On October 30, 2008 there were 12 noise events above 95dB SENEL recorded during a 5-hour daytime period at Third and Mariposa.
Responses to Comments/Questions
Existing noise environment

How does terrain influence noise?

• Terrain can influence noise and is reflected in the computer modeling which produces the noise contour.

At what distance from the measuring device were the SENEL events in the SENEL noise event chart?

• Ranges on chart reflect different distances of noise-measuring device from the noise source--vary from 20 feet to 75 feet.
Responses to Comments/Questions

Existing noise environment

CNEL: Consider the night time average (10pm-7am) versus the average for a whole day. Ambient noise is lower at night.

• CNEL already considers evening and night by weighting them more heavily (see graphic).
Responses to Comments/Questions
Program elements*

Size of acoustic windows—are they very small?

• They are thicker and need sturdy frames; glass may be a few inches smaller (maximum 1 inch per side).

Why not include business/commercial properties?

• This is a residential program which is based on awakenings impact. Commercial properties do not have residents.

* In addition to those discussed under revised program
Responses to Comments/Questions
Other potential impacts

How will UCSF address other non-noise impacts such as diesel fumes?

• UCSF will work to address all complaints related to the helipad—not just noise.
Responses to Comments/Questions

Other hospitals

On your list of other hospitals, how many of these were new hospitals?

Of the hospitals with helipads in our survey, the following are new facilities:

- Johns Hopkins – under construction
- UCLA Medical Center – just opened
- Children’s Memorial Hospital, Chicago – under construction
- John Muir Medical Center, Concord – proposed new hospital
- Kaiser Santa Clara – proposed new hospital
Community Feedback
Next Steps
Next Steps

- Prepare Supplemental Environmental Impact Report for RSRP

- **San Francisco Board of Supervisors** must approve helipad before the California Department of Transportation (Caltrans) Aeronautics Division will consider UCSF’s application to construct and operate the helipad

- UCSF is also required to obtain an **FAA Airspace Determination**, to ensure the proposed flight paths are clear of obstructions and meet dimensional requirements, prior to requesting approval by Caltrans