Noise Analysis Report

Associated with the Reid-Hillview Airport Master Plan Environmental Impact Report

HMMH Report No. 304650.000
October 2011

Prepared for:

County of Santa Clara
Planning Division
70 W. Hedding Street
San Jose, CA 95110

Prepared by:

Eugene Reindel
Robert Behr
Michael Hamilton

HARRIS MILLER MILLER & HANSON INC.

Harris Miller Miller & Hanson Inc.
8880 Cal Center Drive, Suite 430
Sacramento, CA 95826
T 916.368.0707
F 916.368.1201

This page intentionally left blank

Executive Summary

The purpose of this study was to determine the forecast aircraft noise environment around Reid-Hillview Airport (RHV) for the Existing conditions (Year 2011) and for Year 2022 under No-Project and Project alternative scenarios and to conduct a screening-level analysis of potential traffic noise impacts due to non-aviation related commercial development.

The Existing conditions analysis includes the current physical layout of the airport with the aircraft operations based on the latest 12 months of FAA traffic counts. The No-Project alternative includes the existing physical layout of the airport with the aircraft operations forecast for 2022. The Project alternative involves an extension of both runways slightly to the north, the addition of a taxiway to the west of Runway 13R/31L, and a higher ratio of single-engine propeller aircraft pattern operations on Runway 13R/31L with the aircraft operations forecast for 2022.

The Existing aircraft operations (109,757) were derived from the FAA Air Traffic Control Tower counts, collated with the aircraft fleet mix previously used for the RHV Part 150 Update in 2002, and confirmed by the County. The forecast aircraft operations (245,988 aircraft operations) were derived from the RHV Master Plan for 2022 and the aircraft fleet mix mirrored what was reported in the RHV Part 150 Update in 2002. Changes to airfield layout were derived from the latest Airport Layout Plan and confirmed with the airport staff. The Federal Aviation Administration's Integrated Noise Model (INM) Version 7.0b was used to model the noise exposure for the three scenarios.

The modeling results showed the Existing contours on the order of 3-4 dB less than the forecast contours due to the fewer total aircraft operations. The No-Project and Project contours were very similar to each other and to the existing (2002) and forecast (2007) Noise Exposure Maps developed for the 2002 RHV Part 150 update. Table ES-1 shows the estimated number of housing units and population (based on Census 2010) within the RHV aircraft operations noise exposure level contours for the three different modeled scenarios.

Table ES-1 Estimated Residential Population within the Existing, No-Project. and Project Alternative CNEL Contours

Source: Census 2010, County of Santa Clara, HMMH

Noise Level CNEL Interval	2011 Existing Conditions		2022 No-Project Alternative		2022 Project Alternative	
	Estimated Population	Estimated Dwelling Units	Estimated Population	Estimated Dwelling Units	Estimated Population	Estimated Dwelling Units
60-65	1,198	258	4,344	877	4,351	881
65-70	80	20	418	96	450	101
70-75	0	0	42	11	43	11
75+	0	0	0	0	0	0
Total	1,278	278	4,804	976	4,844	993

Other than residential areas, for the No-Project and Project alternatives there are two schools located within the 60-65 dB CNEL contour intervals. The noise modeling showed that the changes to the noise exposure at these two schools for the No-Project and Project alternatives in year 2022 were approximately 0.1 dB. The modeling analysis of other non-residential noise sensitive sites (schools and places of worship) located near or under the flight paths or local patterns also indicated less than 1 dB increases or decreases to the noise exposure level for the forecast alternatives in year 2022.

Based on Federal and state regulations, all residential land use is compatible with cumulative noise exposure of aircraft noise less than 65 dB CNEL, which is based on percent of the population highly annoyed. Per federal standards, a significant noise impact, as defined in FAA Order 1050.1E, "would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe." For California, the FAA allows CNEL to replace the Day-Night Average Sound Level (DNL) in the regulations and orders.

The final results of the aircraft noise modeling analysis indicates that there is a 3-4 dB increase in noise exposure for the No-Project and Project alternatives compared to the Existing conditions based primarily on the increase in aircraft operations. The difference in noise exposure for the Project alternative compared to the No-Project alternative is less than a 1-dB increase.

The traffic impact study was conducted according to Federal Highway Administration (FHWA)[1] and California Department of Transportation (Caltrans)[2] standards. The project does not meet the definition of either a Type I or Type II project under FHWA regulations; therefore a traffic noise analysis is required only under the provisions of the California Environmental Quality Act (CEQA). Because the project is not expected to increase traffic noise levels during the worst traffic noise hour, no adverse environmental effects are expected to be caused by traffic noise under CEQA, and consideration of traffic noise mitigation is not warranted.

[1] Title 23, Part 772, Code of Federal Regulations, Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010.
[2] California Department of Transportation, Division of Environmental Analysis, *Traffic Noise Analysis Protocol For New Highway Construction, Reconstruction, and Retrofit Barrier Projects*, May 2011.

Contents

Figures

Tables

1 Introduction

A Master Plan update for Reid-Hillview Airport (RHV) was completed in July 2006 and updated in June 2007[3]. As part of the recommendations based on the approximate 20-year forecast (Year 2022), various projects were proposed that may affect the overall noise exposure of the local community due to aircraft operations and surface traffic. The projects include:

- Proposed new taxiway to the west of Runway 13R/31L
- Small changes to the runway alignment
- Non-aviation commercial development on two parcels totaling 11 acres

The following sub-sections provide background information on the Airport to include its location and physical operating inventory. Appendix A provides background on the noise terminology used throughout this report.

1.1 Airport Location and Surroundings

RHV is a two parallel runway airport located approximately four miles east of downtown San Jose (Figure 1). It serves as a general aviation reliever airport for San Jose International Airport. It is adjacent to parks and residential areas to its west, north, and east and primarily commercial property to the south. The airport has two parallel runways in a general northwest-southeast orientation.

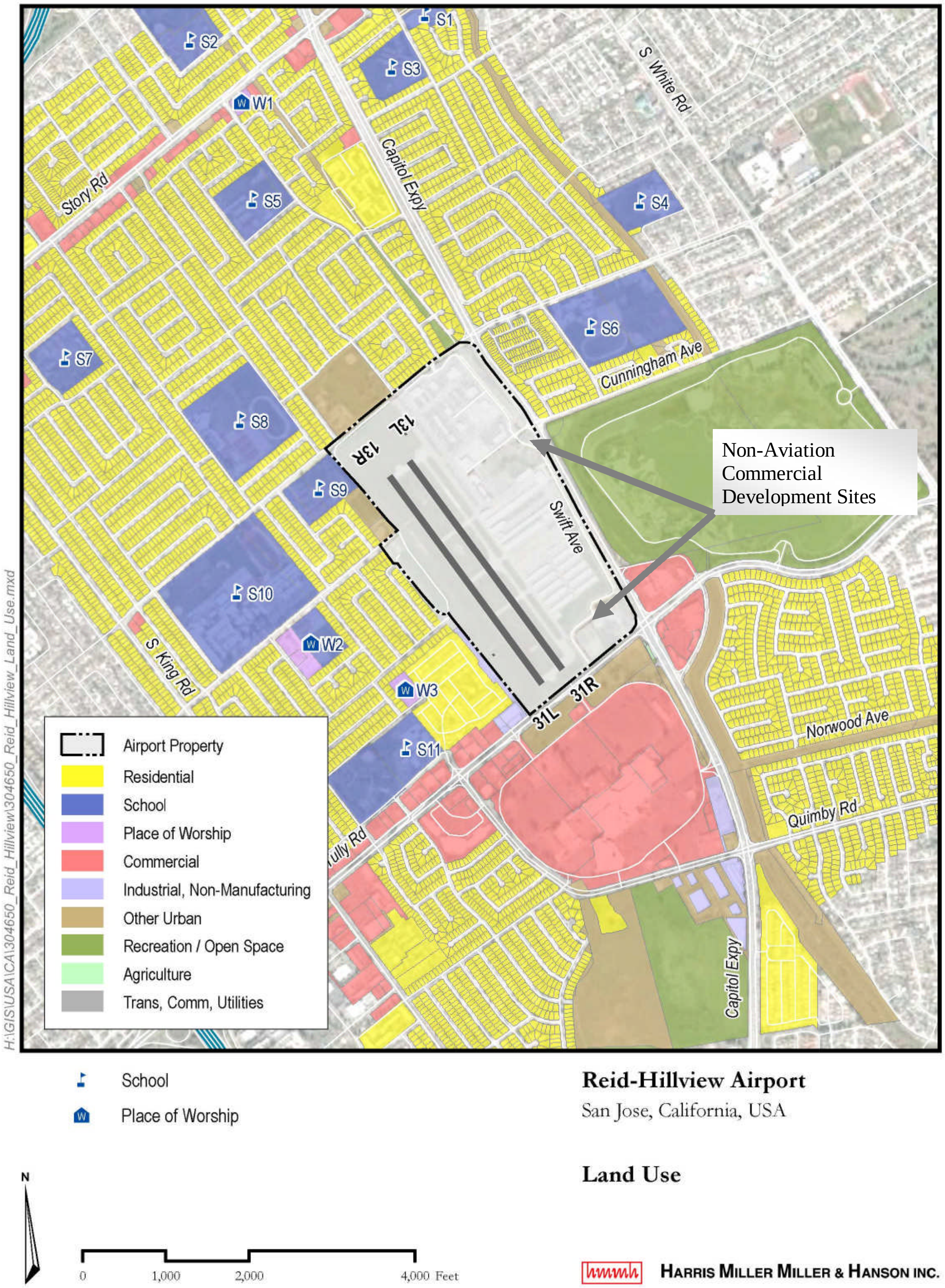
In its current configuration the Runway Safety Area (RSA) to the south does not quite meet the FAA standards (120 feet wide and 240 feet beyond the runway end). Thus, part of the Master Plan projects include increasing the length of the runways to the north and shifting the landing thresholds for all runways the same distance to meet the RSA requirements. This change to the RHV runways will be evaluated in this study.

All taxiways are on the east side of the runway complex, which requires aircraft on runway 13R/31L that have landed and are taxiing back for another takeoff to cross runway 13L/31R at the end of the runway or at the various exit taxiways along the runways. A west taxiway is another element of the Master Plan to accommodate the aircraft landing and taxiing back for another takeoff. The additional taxiway will also be analyzed in the overall noise exposure review.

The airport is accessed via surface traffic on Cunningham Avenue. The proposed non-aviation commercial development as described in the Hexagon Report[4] includes two areas as shown in Figure 1: one is located at the corner of Capitol Expressway and Tully Road and the other is between Swift Avenue and Capitol Expressway adjacent to Cunningham Avenue. There may also be plans to develop light rail services in the area. The traffic analysis that is included here used the data in the Hexagon report and, as such, is a more conservative review of the traffic impact than what may actually transpire in the future.

[3] "Reid-Hillview Airport Master Plan", prepared by Mead & Hunt, July 2006 updated June 2007
[4] Hexagon Transportation Consultants, Inc., *Reid Hillview Airport Master Plan Draft Transportation Impact Analysis*, Prepared for: Santa Clara County, April 15, 2011.

Figure 1 Land Use Surrounding Reid-Hillview Airport
Source: County of Santa Clara, HMMH



1.2 Aircraft Types and Operations at the Airport

Aircraft generally using RHV consist of single-engine propeller aircraft like the Cessna 172, twin engine propeller aircraft like the Beech Baron 55, and twin-engine turboprop aircraft like the King Air. In addition there is some helicopter activity consisting of helicopter types similar to the Bell Ranger and the smaller Boeing MD500 Defender. This analysis will use the same mix of aircraft types used for the 2002 Part 150 update[5] and the 2006/7 Master Plan. The existing aircraft operations are based on FAA air traffic reports (109,757). The forecast annual operations are based on the Master Plan forecast for year 2022 (245,988 annual operations) derived from a recommended aircraft basing capacity of 750 aircraft averaging approximately 328 operations annually.

[5] "Reid-Hillview Airport FAR Part 150 Noise Exposure Map – 2002" prepared by Harris Miller Miller & Hanson Inc., July 2002.

This page intentionally left blank

2 Existing Conditions (2011) and Forecast (2022) Alternatives

This study determined the noise environment due to aircraft operations at RHV for three different scenarios:

- Existing Conditions (2011)
- No-Project Alternative (2022)
- Project Alternative (2022)

Harris Miller Miller & Hanson Inc. (HMMH) used the Federal Aviation Administration's (FAA) Integrated Noise Model (INM), version 7.0b to determine the noise environment for each scenario. Helicopter pads and operation profiles were updated from the Part 150 update for use in this newer version of the INM.

2.1 Existing Conditions

The Existing conditions scenario for Year 2011 required determining the aircraft operations levels for a 12-month period using the Federal Aviation Administration's (FAA) air traffic counts. The airport layout, runway use and flight tracks were assumed to be the same as developed for the Part 150 update study.

2.2 No-Project Alternative

The No-Project alternative evaluated the aircraft noise exposure based on no changes to the runway or taxiway environment with the year 2022 forecast level of aircraft operations. Runway use and flight tracks are the same as developed for the Part 150 update study.

2.3 Project Alternative

According to the 2006/7 Master Plan, the Project alternative evaluated the aircraft noise exposure based on small changes to the runways' lengths and displaced thresholds, construction of a west taxiway (Taxiway W), a shift in local flight operations for the single-engine propeller aircraft (Cessna 172 [CNA172] and General Aviation Single-Engine Fixed-Pitch propeller [GASEPF]) to 60% on the west runway, and formalization of the helicopter hover/landing sites. The operations of the other aircraft types will remain unchanged from the No-Project alternative. The new west taxiway is expected to be used by 80% of the CNA172 and GASEPF local flight operations on the west runway and 10% of the turboprop and twin-engine propeller aircraft on the west runway. These percentages were based on RHV ATCT estimates (See Appendix D). Except for the local operations noted above, runway use and flight tracks will be the same as used in the No-Project alternative.

2.3.1 Runway environment changes

According to the 2006/7 Master Plan, the north runway ends will be shifted to allow the landing thresholds on Runways 31L/R to be shifted the same amount thereby expanding the RSA to meet FAA requirements. Runway 13L runway end and its displaced threshold will be shifted 93 feet to the north. The landing threshold for Runway 31R will like-wise be shifted 93 feet to the north resulting in a total displaced threshold of 493 feet. Runway 13R runway end and its displaced threshold will be shifted 79 feet to the north. The landing threshold for Runway 31L will like-wise be shifted 79 feet to the north resulting in a total displaced threshold of 478 feet. The displaced thresholds for Runways 13L/R will shift the same distance as the runway ends thereby remaining the same as prior to the shift of the runway end. The distance displaced is the same, but the threshold point is shifted to the north as well. The Master Plan Airport Layout Plan (ALP) shows these adjustments (Appendix E).

2.3.2 Construction of Taxiway W

Taxiway W will be constructed 150 feet (runway centerline to taxiway centerline) west of and parallel to Runway 13R/31L. Taxiway W will have a width of 35 feet with run-up aprons at either end. It will be connected to the runways by five taxiways (Taxiways A, B, C, D, and E) that currently exist to connect the runways to the east taxiways, Taxiways Y and Z (See Figure 2 or ALP Appendix E). Aircraft in the local pattern will land, exit one of the taxiways, and taxi back to the end of the runway for another takeoff on the same runway. The use of the taxiways will be based on input received from the RHV ATCT (Appendix D) and shown in Table 1.

Table 1 Anticipated Use of Exit Taxiways to the West Taxiway for Local Flight Operations
Source: RHV ATCT

Taxiway	Percentage of Flights Landing on Runway 31L	Percentage of Flights Landing on Runway 13R
A	0%	20%
B	10%	20%
C	20%	50%
D	50%	10%
E	20%	0%
Total	100%	100%

3 Aircraft Noise Modeling Inputs

Version 7.0b of the FAA INM is the latest version to be released by the FAA and will be used to model the three scenarios. The previous Part 150 study update and Airport Master Plan used an earlier version (Version 6.0b). Version 7.0b has been enhanced with updated aircraft types, including better helicopter profile and procedure data, and lateral attenuation computational algorithms. Therefore, there may be some differences between the previously developed noise exposure contours and the resulting noise exposure contours from this modeling effort due to the model updates in the interim.

The inputs to the INM include the following:

- Airport configuration (runways, taxiways)
- Number and mix of aircraft operations
- Day-evening-night split of operations (by aircraft)
- Aircraft noise and performance characteristics
- Runway utilization rates
- Flight track descriptions and utilization
- Meteorological data
- Terrain data

The development of the west taxiway and modeling the expected taxiway operations are also included in the modeled noise contours for the Project alternative scenario.

3.1 Airport Physical Layout

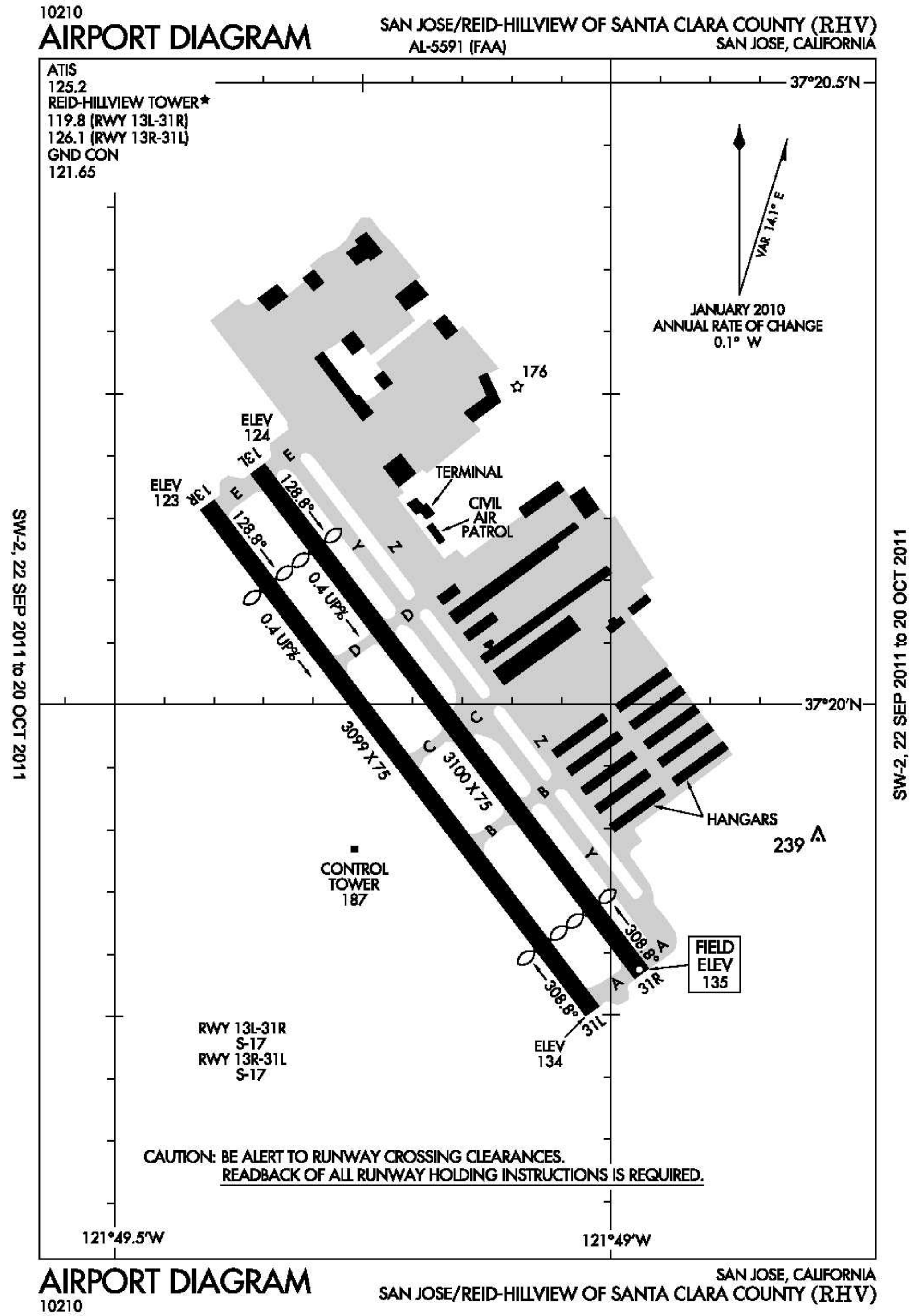
The INM includes an internal database that contains the airport layout, including runway locations, orientation, start-of-takeoff roll points, runway end elevations, landing thresholds, approach angles, etc. HMMH verified and corrected, when necessary, the information in the INM database using the existing RHV Airport Layout Plan (ALP) in Appendix E. The existing airport layout will be the same for the Existing conditions and No-Project alternative scenarios.

3.1.1 Existing conditions and No-Project alternative

The existing airport diagram is shown in Figure 2. Runway 13L/31R is currently 3,101 feet long and 75 feet wide. Runway 13R/31L is currently 3,099 feet long and 75 feet wide. The ends of both runways have displaced landing thresholds to increase the height of landing aircraft over the park and residential area to the north and the airport perimeter fence and Tully Road to the south. These displaced landing thresholds from the respective runway ends are:

- Runway 13L – 491 feet
- Runway 13R – 490 feet
- Runway 31L – 399 feet
- Runway 31R – 400 feet

Figure 2 Reid-Hillview Airport Existing Airport Diagram
Source: FAA SW-2 22 Sep 2011 to 20 Oct 2011



3.1.2 Project alternative

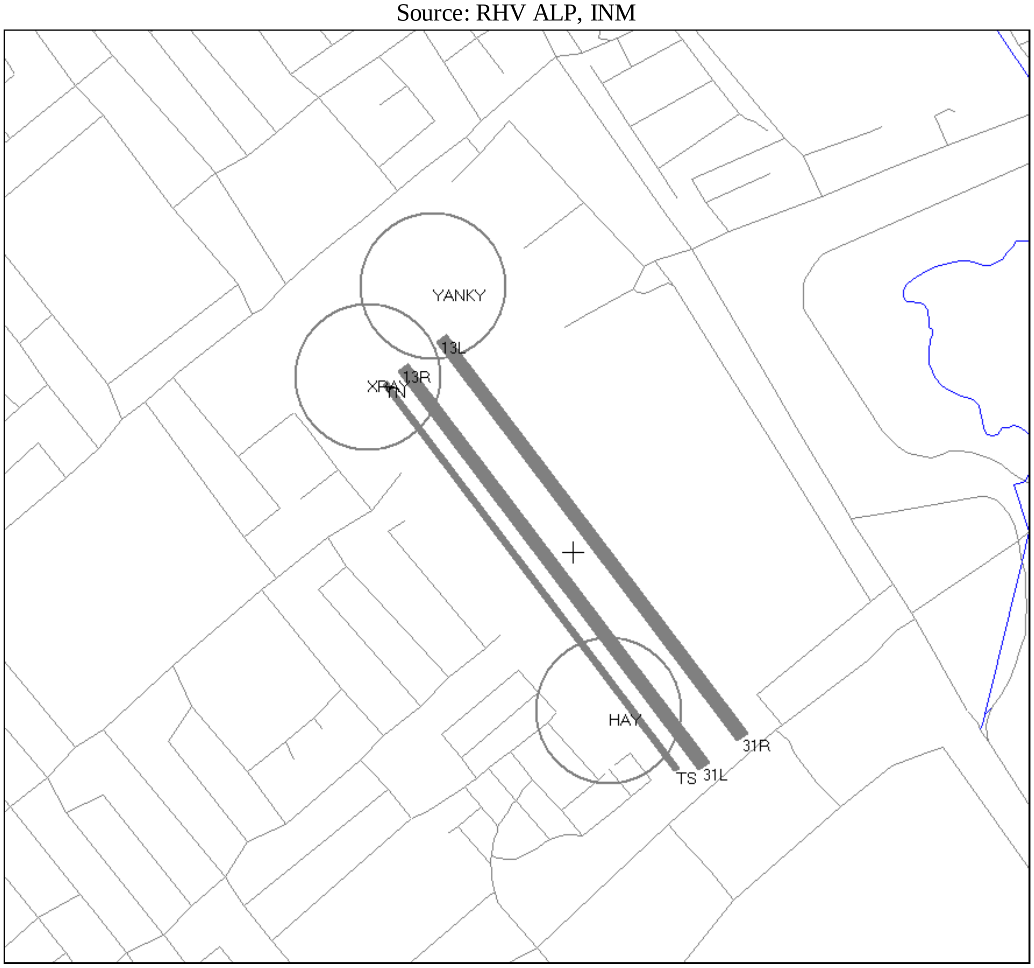
The airport physical layout for the Master Plan Project alternative involves extending both runways to the northwest (93 feet for Runway 13L/31R and 79 feet for Runway 13R/31L) along with displacing the approach landing thresholds the same distances. The southeastern ends of the runways will remain fixed but the approach landing thresholds will be displaced an additional 79 feet for Runway 31L and 93 feet for Runway 31R. The resulting displaced landing thresholds from the respective runway ends will be:

- Runway 13L – 491 feet
- Runway 13R – 490 feet
- Runway 31L – 478 feet
- Runway 31R – 493 feet

A new west taxiway, Taxiway W, will be constructed parallel to the runways. This new 35-foot wide taxiway will run the length of runways with the centerline of the taxiway located 150 feet west of the centerline of runway 13R/31L. The taxiway will connect to the existing taxiways A-E that allow entry to and exit from the parallel runways. Figure 3 shows a depiction of the position of the new taxiway, runways and helicopter hover/landing sites (circles).

Figure 3 Reid-Hillview Airport Project Alternative Depiction

Source: RHV ALP, INM



3.2 Aircraft Operations

The aircraft operations for the Existing conditions were developed for input into the INM using the most current FAA data on RHV traffic counts. The two forecast alternatives used the aircraft operations forecast for Year 2022 developed for the Airport Master Plan.

3.2.1 Existing conditions (2011)

Twelve months of FAA data (May 2010 – April 2011) for aircraft operations at RHV were collected from the FAA website[6]. These data consist of the aircraft operations by aircraft category and operation type as reported by the RHV Air Traffic Control Tower (ATCT). The FAA Terminal Area Forecast (TAF)[7] was also reviewed for consistency for the years 2010 and 2011. The operations are listed as either itinerant or local. Itinerant operations are operations performed by an aircraft, under Instrument Flight Rules (IFR), Special Visual Flight Rules (SVFR), or Visual Flight Rules (VFR), that lands at an airport, arriving from outside the airport area, or departs an airport and leaves the airport area. Local operations are those operations performed by aircraft that remain in the local traffic pattern, execute simulated instrument approaches or low passes at the airport, and the operations to or from the airport and a designated practice area within a 20‒mile radius of the tower. The FAA data include a few Air Carrier aircraft as itinerant operations (228). It was assumed that these operations should have been categorized as “overflights” and thus were removed from the total operations to be modeled.

Since the RHV ATCT is only operational from 7:00 am through 10:00 pm daily, the nighttime operations are not included in the air traffic counts. From the Part 150 study and Master Plan forecast, nighttime operations make up 1% or less of the total operations. Therefore, the total aircraft operations based on the FAA data adjusted for the aforementioned overflights (109,757) were distributed using the same percentage breakdown for day, evening, and night as the Part 150 update and Master Plan studies. Appendix B shows the air traffic activity system data for the 12- month period and Appendix C shows the operations distributed among the various aircraft types and operations. The INM uses the average annual day operations which are derived by dividing the annual operations by 365 days in a normal year. Thus, the annual average day aircraft operations for the Existing conditions are approximately 301.

3.2.2 Forecast alternatives (2022)

The Master Plan considered three alternatives to develop this forecast taking into consideration the three County airports – Palo Alto, Reid-Hillview, and South County:

1. Develop each airport based on its own demand
2. Designate South County Airport to accommodate all of the forecasted growth in demand
3. Develop policies that combines elements of Alternatives 1 and 2 above

The County Board of Supervisors adopted the third alternative for determining the forecast of operations at the three airports. Therefore, a forecast basing capacity at Reid-Hillview Airport was determined to be 750 aircraft. The annual operations per based aircraft were assumed to decrease slightly from the Year 2002 rate of 342 to approximately 328 for the forecast Year 2022. This results in a forecast of 245,988 total annual operations for year 2022.

Appendix C lists the breakout by aircraft type that was used in the Part 150 study and Master Plan and used for this noise analysis. The INM uses the average annual day operations which are derived by

[6] http://aspm.faa.gov/opsnet/sys/Tower.asp
[7] http://aspm.faa.gov/main/taf.asp

dividing the annual operations by 365 days in a normal year. Thus, the annual average day aircraft operations for the two forecast scenarios are approximately 674.

3.3 Aircraft Noise and Performance Characteristics

Specific noise and performance data must be entered into the INM for each aircraft type operating at the airport. Noise data is included in the form of sound exposure level (SEL – see Appendix A) at a range of distances (from 200 feet to 25,000 feet) from a particular aircraft with engines at a specific thrust level. Performance data includes thrust, speed and altitude profiles for takeoff and landing operations. The INM database contains standard noise and performance data for over 100 different fixed-wing aircraft types and over 20 different helicopter types. The program automatically accesses the applicable noise and performance data for departure, approach, and circuit or pattern operations by those aircraft. Different specific profiles and procedures were developed for modeling the taxi operations by the affected fixed-wing aircraft and the hover operations by the helicopters.

The modeling of helicopters for this study was refined when compared to the Part 150 study due to the improved capabilities of the current version of the INM. The Part 150 study treated helicopters like fixed-wing aircraft with flight track and profile construction. INM 7.0b provided more "helicopter like" profiles with steeper rates of descent and ascent and hovering during final stages of landing or lift-off combined with specific helipads for a better representation of the helicopter operations.

3.4 Runway Utilization

Runway utilization is generally determined by prevailing wind conditions or, if the airport is part of a larger region of airports, by the system of aircraft flow patterns for all airports. The primary direction of flow at Reid-Hillview is to the north as documented in the Part 150 update study.

Tables C-3 and C-4 in Appendix C list the runway and helipad utilization for both fixed-and rotary-wing aircraft, respectively, for the Existing and No-Project and Project alternative scenarios. The runway use shown in Table C-3 for the Existing conditions and No-Project alternative is similar to the runway utilization from the Part 150 study update, except that all nighttime operations are confined to Runway 13L/31R or the easterly runway. For the Project alternative shown in Table C-4 the same general runway use exists except that Runway 13R/31L becomes the primary runway for local patterns for the single-engine piston propeller aircraft (Cessna 172 [CNA172] and general substitution aircraft representing a multitude of similar single-engine propeller aircraft [GASEPF]). These aircraft identified in the Table as "Fixed-Wing B" aircraft are assumed to fly 60% of their local patterns to Runway 13R/31L in the Project alternative versus 37.5% in the No-Project alternative. The other aircraft identified as "Fixed-Wing A" aircraft are assumed to maintain Runway 13L/31R as the primary runway for local patterns (62.5%). It was also assumed for the west taxiway that the "Fixed-Wing B" aircraft would use it for 80% of its local operations and "Fixed-Wing A" aircraft would only use it for 10% of its local operations on Runway 13R/31L.

The helipad use for the helicopter operations mirrored what was presented in the Part 150 update.

3.5 Flight Track Utilization and Geometry

The flight track design and utilization was the same as presented in the Part 150 update and the Airport Master Plan. Tables C-5 and C-6 in Appendix C list the various brief flight track descriptions and their use by operation and fixed-wing or helicopter aircraft type. The Existing conditions and No-Project and Project alternatives used the same general flight tracks and usage from the data used for the Part 150 update. Flight track depictions can be found in the Part 150 update.

3.6 Meteorological Conditions

The INM has several settings that affect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include average annual temperature (degrees Fahrenheit), barometric sea-level pressure (inches of mercury), relative humidity (percent) at the airport, and average headwind speed (knots), This analysis used the same inputs used in the Part 150 update (Temperature 58.5º F, barometric pressure 29.92 in. mercury, average headwind 8 knots), except it also included the relative humidity value of 70 percent which allowed for the calculation of noise levels based on atmospheric absorption.

3.7 Terrain

Terrain data describe the elevation of the ground surrounding the airport and on airport property. The INM uses terrain data to adjust the ground level under the flight paths and thereby determine the vertical distance between the aircraft and a "receiver" on the ground. This distance affects the noise propagation assumptions about how the noise propagates over the ground. The terrain data were obtained from the Unites States Geological Survey (USGS).[8]

[8] Data downloaded from http://gisdata.usgs.gov/website/seamless/viewer.htm on 03/17/2011 in 1/3 arc-second resolution Gridfloat format. Gridfloat is a data format of the National Elevation Dataset (NED).

4 Aircraft Noise Modeling Results

CNEL is the fundamental noise metric for determining land use compatibility and for identifying any impacts associated with changes to operations, airport configuration, etc. With the modeling inputs discussed above, the INM Version 7.0b modeled CNEL contours (60-75 dB) for the Existing Conditions (2011) and the No-Project and Project alternatives for the forecast year 2022. The 60 -75 dB CNEL contours in 5-dB increments for these three scenarios are displayed in Figures 4 through 6.

4.1 Comparison of Existing Conditions and No-Project and Project Alternative Contours

A comparison of the Existing conditions and No-Project alternative is shown in Figure 7. The airport configuration, aircraft types, and flight tracks are the same; however, the modeled aircraft operations increase more than twofold for the forecast No-Project alternative compared to the 2011 Existing conditions. This increase in aircraft operations is the primary factor in the modeled noise exposure for the No-Project alternative being 3-4 dB higher than modeled for the Existing conditions.

A comparison of the Existing conditions and Project alternative is shown in Figure 8. The results are similar to the 3-4 dB increase shown for the No-Project alternative, again primarily due to the increase in aircraft operations. The slight changes in the runway configuration do not have any significant additional effect.

Finally, Figure 9 compares the No-Project and Project alternatives. The aircraft operations for both of these alternatives were identical. The only differences, as previously discussed, were slight changes for the Project alternative to the north ends of the runways and displaced landing thresholds, development of a west taxiway, and changes in runway use for local operations. With these changes, the comparison shows little to no change to the noise exposure.

4.2 Estimated Population and Dwelling Units within the Existing, No-Project, and Project CNEL Contour Areas

The estimated residential population and housing counts for the existing conditions and the two forecast alternative scenarios were calculated using the Census 2010 data. Using the smallest enumeration unit, Census block data and Geographic Information Systems (GIS) tools, the contours were intersected with the Census block data for each CNEL noise contour interval (60-65, 65-70, 70-75, >75). The resultant wholly or partially encompassed Census blocks were then used to determine the total population and total housing units within the contour intervals as presented in Table 2. While the No-Project and Project alternatives are somewhat similar, the affected dwelling units and population for the Existing conditions are significantly less due to the fewer aircraft operations.

Table 2 Estimated Residential Population for the Existing, No-Project, and Project Alternative CNEL Contours

Source: Census 2010, HMMH

Noise Level CNEL Interval	2011 Existing Conditions		2022 No-Project Alternative		2022 Project Alternative	
	Estimated Population	Estimated Dwelling Units	Estimated Population	Estimated Dwelling Units	Estimated Population	Estimated Dwelling Units
60-65	1,198	258	4,344	877	4,351	881
65-70	80	20	418	96	450	101
70-75	0	0	42	11	43	11
75+	0	0	0	0	0	0
Total	1,278	278	4,804	976	4,844	993

Figure 4 Reid-Hillview Airport Noise Exposure Contours – Existing Conditions
Source: County of Santa Clara, HMMH

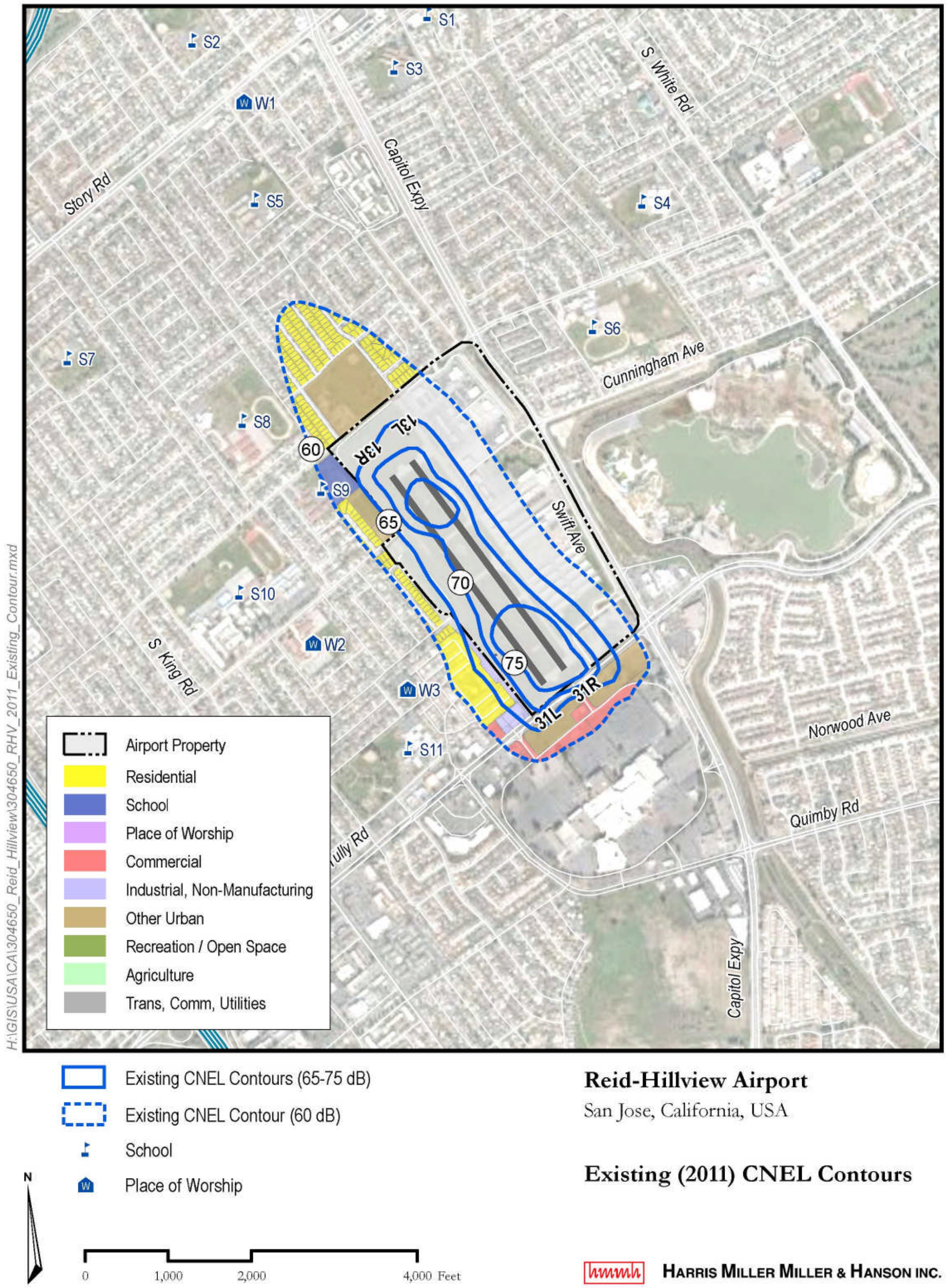


Figure 5 Reid-Hillview Airport Noise Exposure Contours – Forecast 2022 No-Project Alternative
Source: County of Santa Clara, HMMH

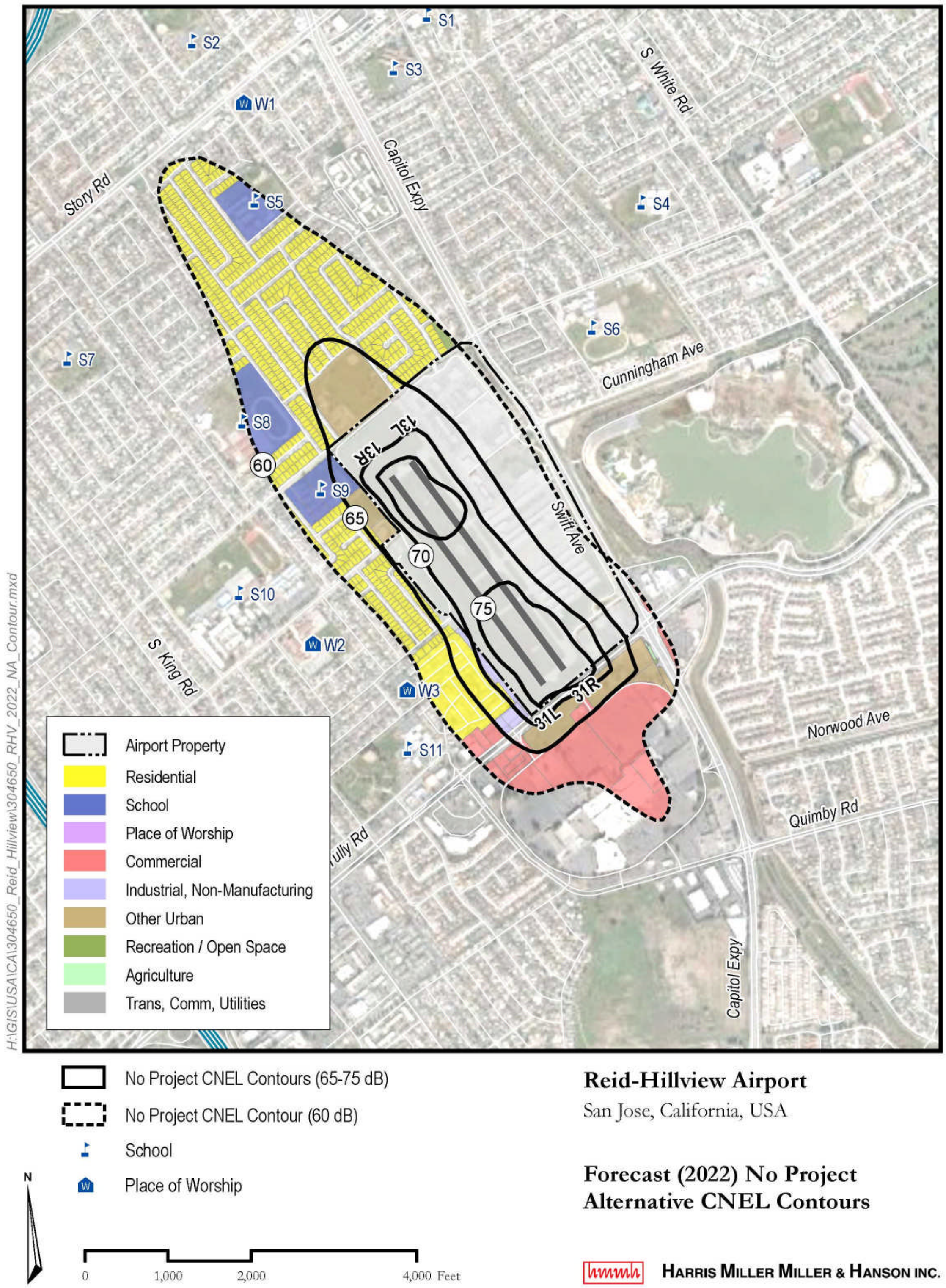


Figure 6 Reid-Hillview Airport Noise Exposure Contours – Forecast 2022 Project Alternative

Source: County of Santa Clara, HMMH

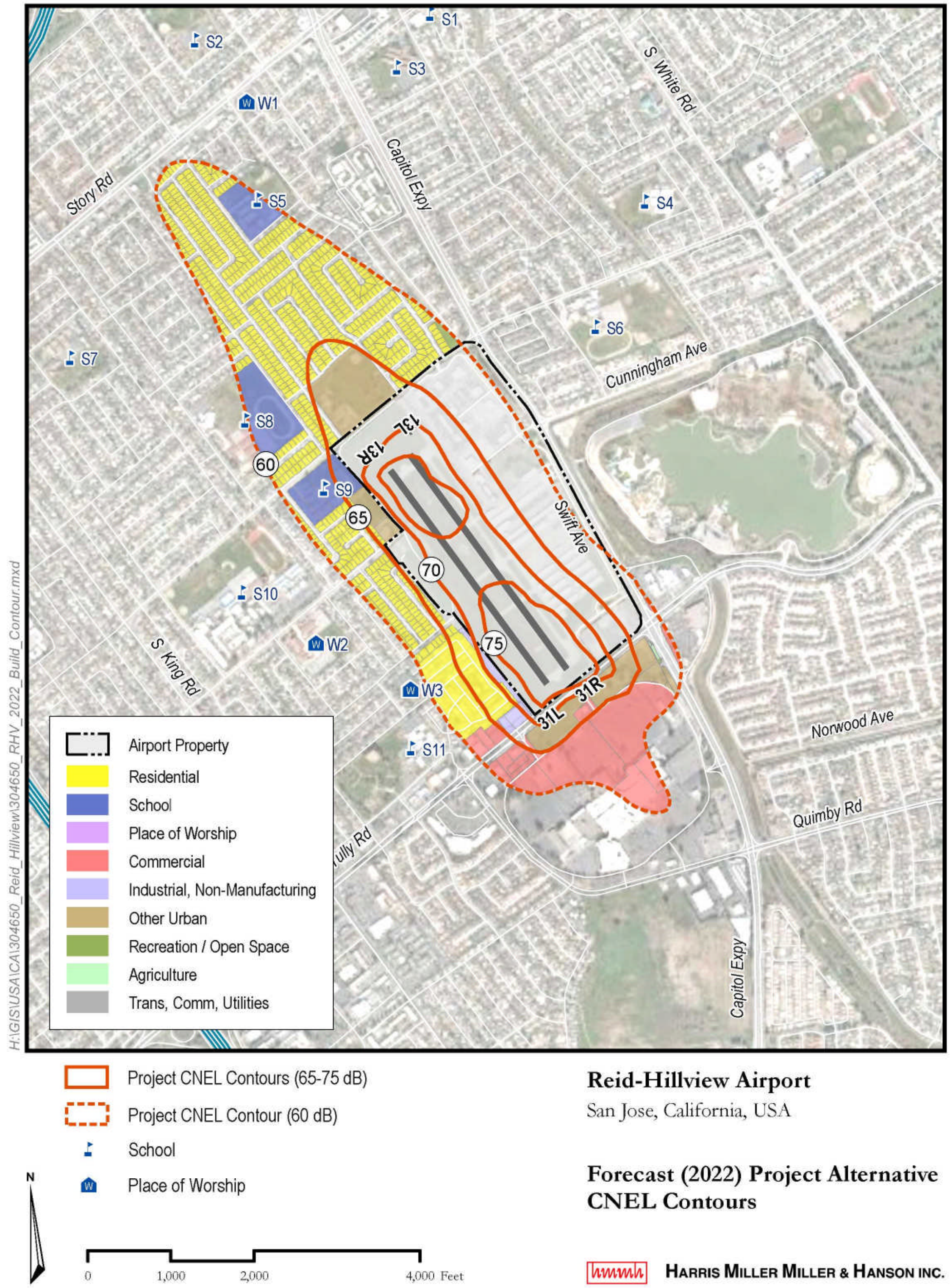


Figure 7 Comparison of Noise Exposure Contours - Forecast No-Project Alternative and Existing Conditions

Source: County of Santa Clara, HMMH

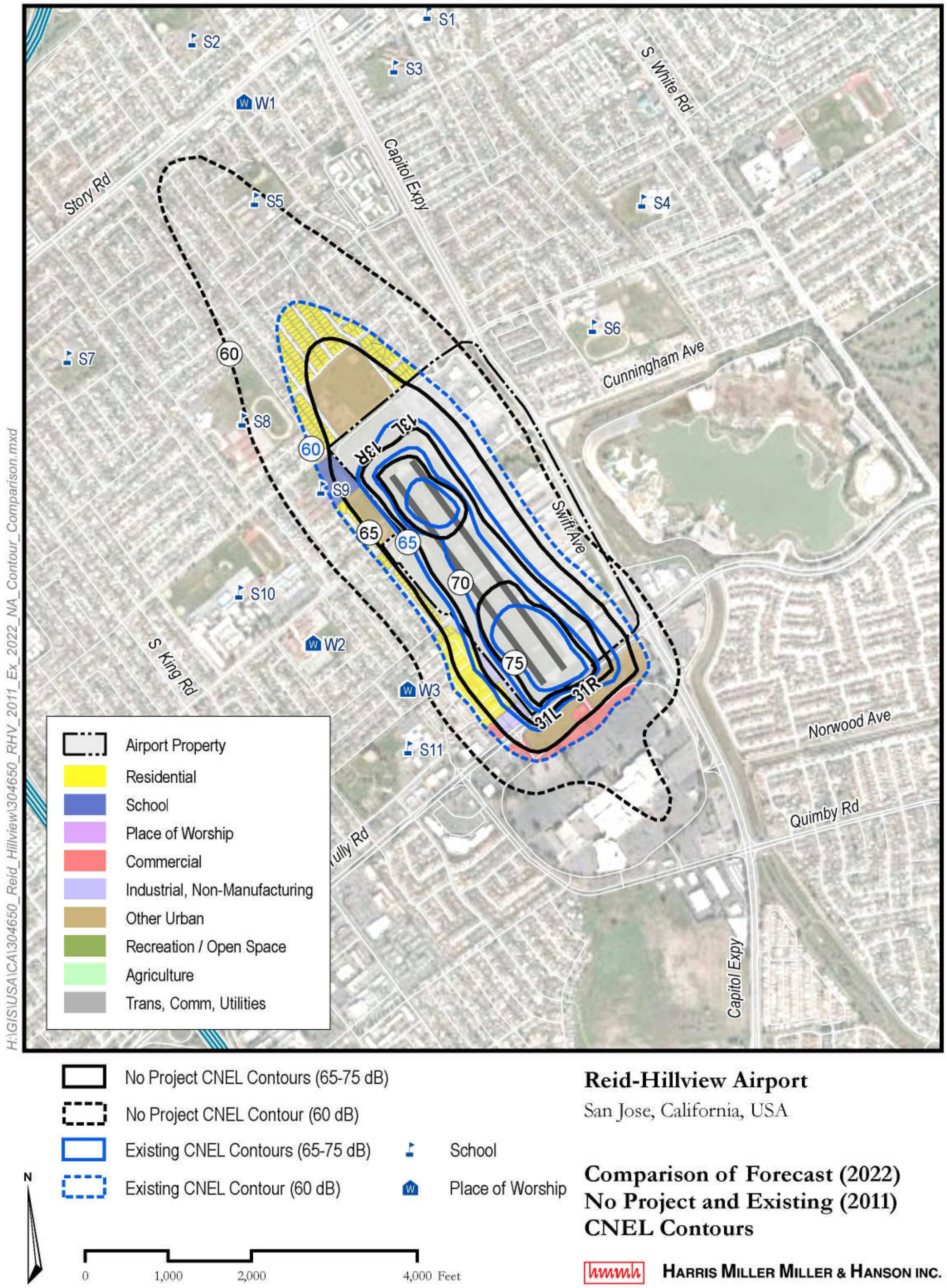


Figure 8 Comparison of Noise Exposure Contours – Forecast Project Alternative and Existing Conditions

Source: County of Santa Clara, HMMH

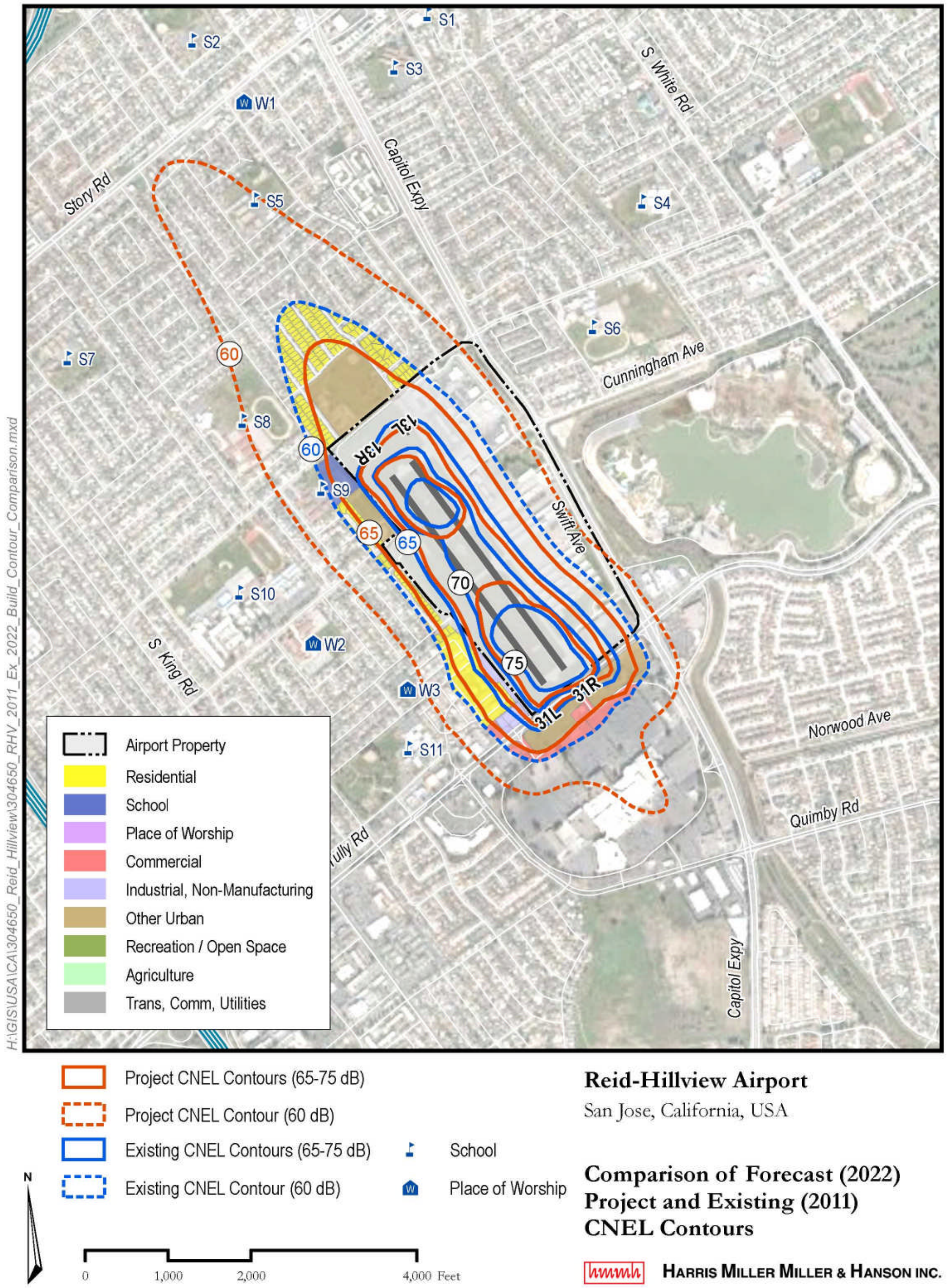
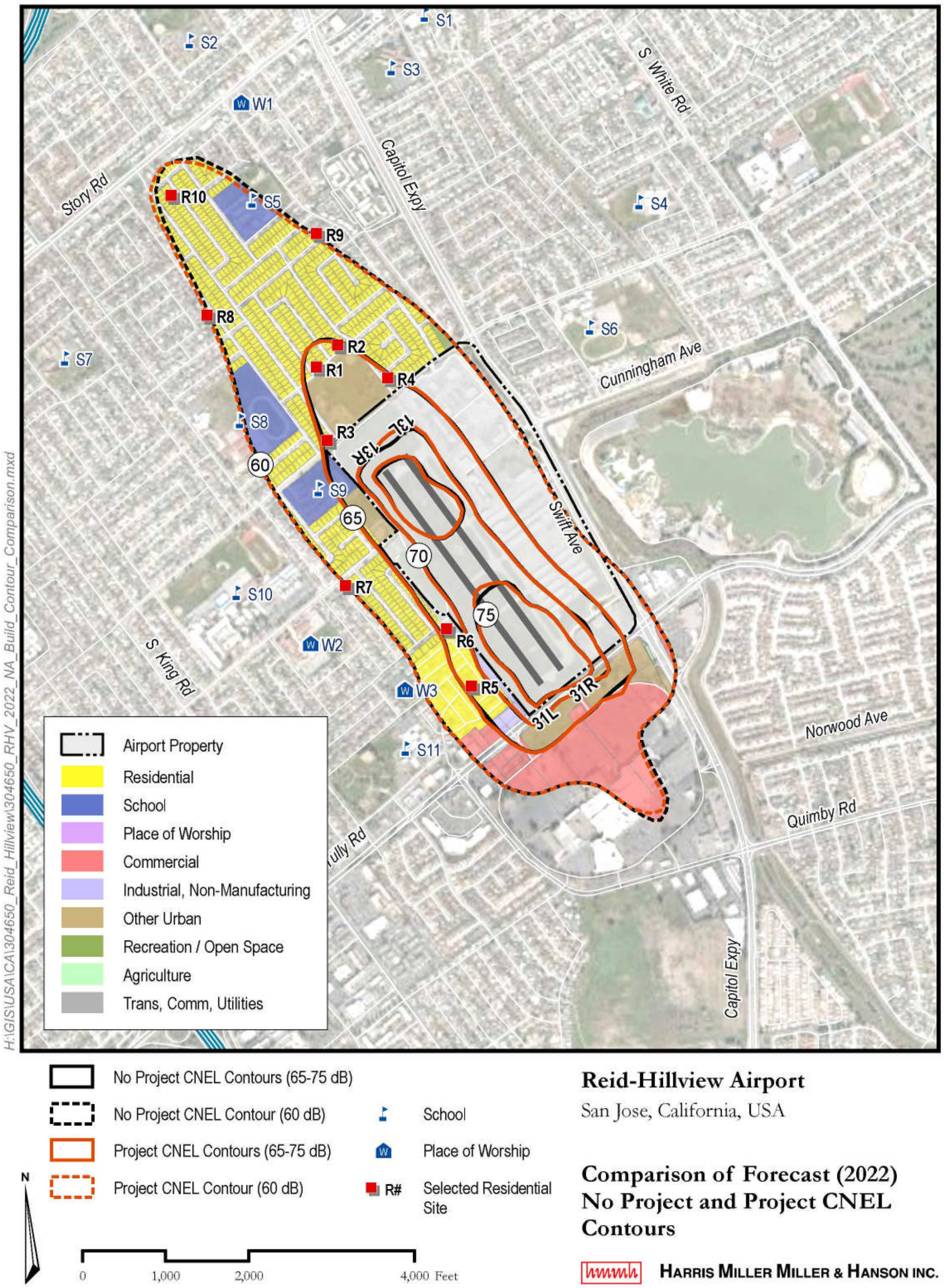


Figure 9 Comparison of Noise Exposure Contours – No-Project and Project Alternatives

Source: County of Santa Clara, HMMH



4.3 Grid Point Analysis within Study Area

To provide a more detailed analysis of the slight changes to the noise exposure within the study area for the forecast No-Project and Project alternatives, a grid point analysis was conducted to determine changes in CNEL. A 4 nautical mile (nm) by 4 nm grid centered on the airport reference point was input into the INM with grid points spaced approximately every 300 feet. During the contour modeling process the INM computed the CNEL value at each of the 6,724 grid points for each of the three scenarios. The CNEL at each of the grid points was compared among the three scenarios to derive an indication of whether there was an increase or decrease in noise exposure.

The CNEL differences when comparing the Existing conditions to either of the forecast alternatives showed the No-Project and Project alternatives had relatively the same increase in noise exposure of 3-4 dB CNEL at each grid point. For this greater increase, a grid point analysis is not required as the contours clearly show the difference in noise exposure.

The grid points for the No-Project and Project alternatives were also compared by subtracting the values of the No-Project alternative grid points from the values of the Project alternative grid points. These differences were then grouped into approximately 0.5 dB intervals, color-coded, and displayed over the base map in Figure 10. The color coding shows the general reduction in CNEL in the traffic pattern for the east runway, Runway 13L/31R, and the corresponding increase in CNEL in the traffic pattern for the west runway, Runway 13R/31L. Within the airport property boundary, slight CNEL increases due to the new West taxiway and the shift in the start of takeoff for Runways 13L/R are also shown.

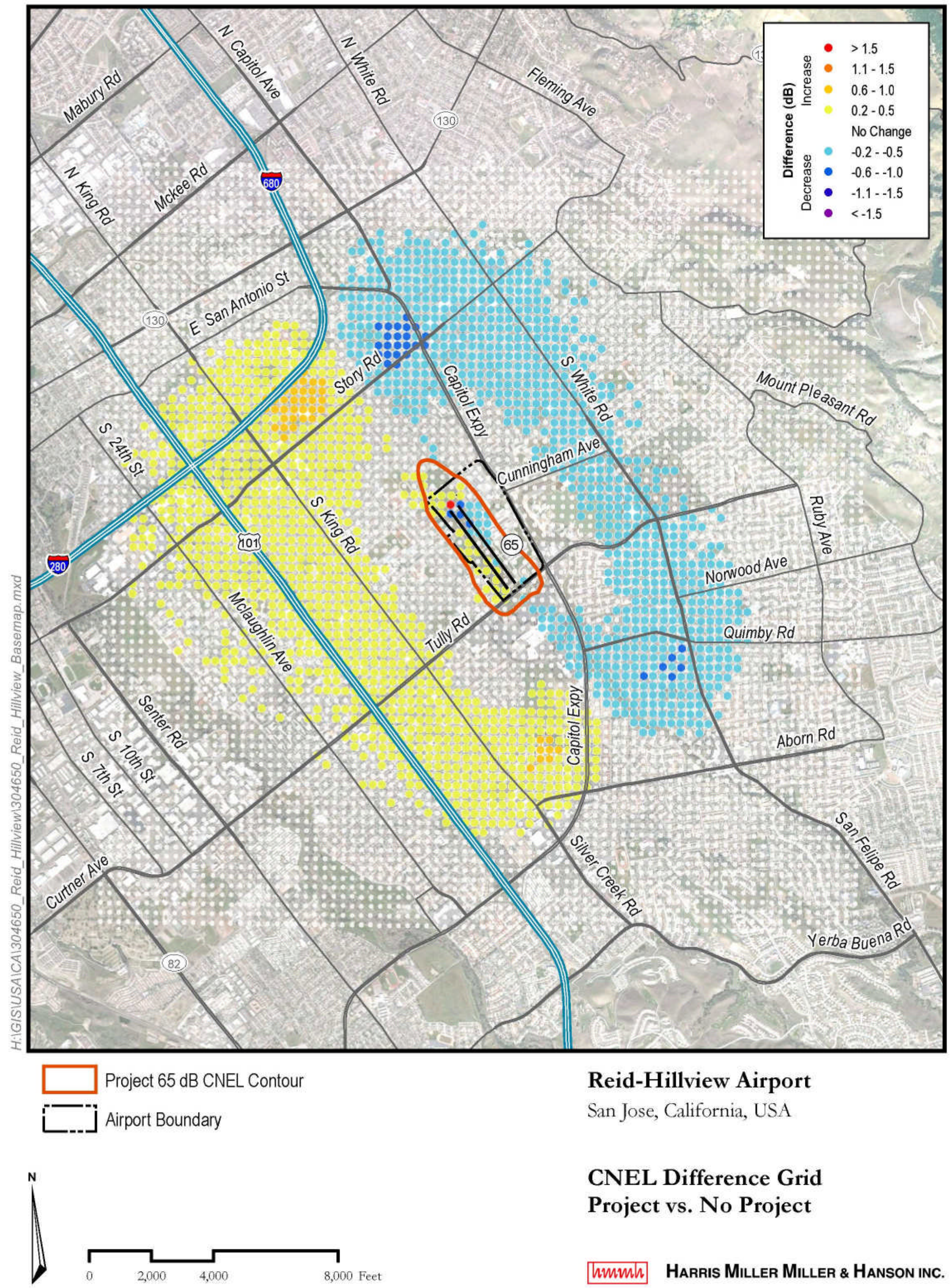
4.4 Aircraft Noise Impact Analysis Results

Federal [9]and state[10] regulations have established that all residential land use is compatible with cumulative noise exposure of aircraft noise less than 65 dB CNEL, which is based on percent of the population highly annoyed. A significant noise impact, as defined in FAA Order 1050.1E[11], "would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL[12] 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe." Furthermore, "if screening shows that noise-sensitive areas at or above DNL 65 dB will have an increase of DNL 1.5 dB or more, further analysis should be conducted to identify noise-sensitive areas between DNL 60-65 dB having an increase of DNL 3 dB or more due to the proposed action."[13]As shown in Figure 10 with the color-coded grid point differences for the No-Project and Project alternatives, the increases to CNEL in noise sensitive areas occur outside of the 65 dB CNEL contour and are less than 1 dB.

---

[9] Title 14,Part 150, Code of Federal Regulations, Appendix A – Airport Noise Compatibility Planning
[10] Title 14 – California Code of Regulations, Chapter 3 – Guidelines for Implementation of the California Environmental Quality Act, as amended September 7, 2004.
[11] FAA Order 1050.1E, "Policies and Procedures for Considering Environmental Impacts", Appendix A, "Analysis of Environmental Impact Categories, Section 14.3, June 8, 2004.
[12] DNL is the Day-Night Average Sound Level, which is equivalent to CNEL with the exception of not assessing a weighting factor for evening operations. CNEL is accepted by the FAA for California studies as the State has adopted CNEL as the standard for assessing cumulative community noise exposure.
[13] FAA Order 1050.1E, "Policies and Procedures for Considering Environmental Impacts", Appendix A, "Analysis of Environmental Impact Categories, Section 14.4c, June 8, 2004.

Figure 10 Noise Exposure Differences at Grid Points for Project and No-Project Alternatives
Source: HMMH



To further quantify any changes in the residential area around the airport, ten residential locations were identified in representative locations. The CNEL was modeled at these locations to determine the difference between the Project and No-Project scenarios. Table 3 lists the locations by address with the respective modeled CNEL values and differences. As shown, the differences were all 0.2 dB or less. Therefore, no significant noise impact, as defined in FAA Order 1050.1E, will occur for the residential locations.

Table 3 Comparison of Modeled CNEL for Selected Residential Locations for the No-Project Alternative and Project Alternative Scenarios

Source: County of Santa Clara, HMMH

Site #	Site Address	Modeled CNEL, dB		Difference
		No-Project	Project	Project minus No-Project
R1	1668 Chabot Way	65.5	65.5	0.0
R2	2421 Alfred Way	65.0	64.9	-0.1
R3	1769 Adrian Way	65.1	65.3	0.2
R4	1758 Vista Glen Dr	64.8	64.8	0.0
R5	East Ridge Estates Comm Ctr	64.2	64.3	0.1
R6	2202 Waverly Ave	65.9	66.1	0.2
R7	2080 Cunningham Ave	60.2	60.2	0.0
R8	1445 Karl St	59.8	59.9	0.1
R9	2453 Poplar Dr	59.4	59.3	-0.1
R10	1179 Gainsville Ave	60.4	60.5	0.1
Site # refers to designated location in Figure 9				

4.5 Non-Residential Noise Sensitive Sites

A review of the area in the vicinity of RHV determined there were 11 educational facilities and 3 places of worship that might be affected by noise from RHV aircraft operations for the Project and No Project alternatives. Table 4 lists those designated sensitive receptors and shows how each facility's location relates to the respective contour intervals (less than 60 dB CNEL, between 60 and 65 dB CNEL, and greater than 65 dB CNEL) for each of the two forecast scenarios. As shown in the previous figures, there are no facilities with exterior CNEL values above 60 dB for the Existing conditions and a total of two (2) noise-sensitive public facilities within the 60-65 dB CNEL noise contour interval for the No-Project and Project alternatives.

Table 5 lists the modeled CNEL at each site for each of the two scenarios along with the CNEL difference when comparing the No-Project alternative and Project alternative. The differences between the No-Project alternative and the Project alternative are all less than 1 dB and are primarily due to the change in concentrating more local operations in the traffic pattern to the west runway (Runway 13R/31L) thereby generally increasing the noise exposure level for sites under the flight pattern to the west and decreasing the noise exposure level for sites under the flight pattern to the east.

Table 4 Listing of Non-Residential Noise Sensitive Receptors in Vicinity of RHV

Source: County of Santa Clara, HMMH

Site #	Site Description	2022 No-Project Alternative			2022 Project Alternative		
		<60	60-65	>65	<60	60-65	>65
Educational Facilities							
S1	Achieve Kids School	X			X		
S2	Goss Elementary	X			X		
S3	Ryan Elementary	X			X		
S4	Rogers Elementary	X			X		
S5	Cassell Elementary		X			X	
S6	Ocala Middle	X			X		
S7	Dorsa Elementary	X			X		
S8	Renaissance Academy	X			X		
S9	Meyer School		X			X	
S10	Overfelt High School	X			X		
S11	Smith Elementary	X			X		
Places of Worship							
W1	Eastside Church of God	X			X		
W2	Most Holy Trinity Catholic	X			X		
W3	Palpung Lungtok Choeling Tibetan Buddhism	X			X		
Site # refers to designated location in Figure 1 and subsequent contour figures							

Table 5 Comparison of Modeled CNEL for Non-Residential Noise Sensitive Receptors for the No-Project Alternative and Project Alternative Scenarios

Source: County of Santa Clara, HMMH

Site #	Site Description	Modeled CNEL, dB		Difference
		No-Project	Project	Project minus No-Project
Educational Facilities				
S1	Achieve Kids School	53.6	53.2	-0.4
S2	Goss Elementary	56.1	55.6	-0.5
S3	Ryan Elementary	54.5	54.1	-0.4
S4	Rogers Elementary	52.0	51.8	-0.2
S5	Cassell Elementary	60.3	60.2	-0.1
S6	Ocala Middle	53.9	53.8	-0.1
S7	Dorsa Elementary	53.8	54.1	+0.3
S8	Renaissance Academy	59.7	59.8	+0.1
S9	Meyer School	63.3	63.4	+0.1
S10	Overfelt High School	54.8	54.9	+0.1
S11	Smith Elementary	56.1	56.2	+0.1
Places of Worship				
W1	Eastside Church of God	58.1	57.6	-0.5
W2	Most Holy Trinity Catholic	55.3	55.4	+0.1
W3	Palpung Lungtok Choeling Tibetan Buddhism	58.2	58.3	+0.1
Site # refers to designated location in Figure 1 and subsequent contour figures				

5 Non-Aviation Commercial Development Traffic Analysis

A screening-level analysis was conducted of potential traffic noise impacts resulting from the actions proposed under the RHV Master Plan. The study was conducted according to Federal Highway Administration (FHWA)[14] and California Department of Transportation (Caltrans)[15] standards. The project does not meet the definition of either a Type I or Type II project under FHWA regulations; therefore a traffic noise analysis is required only under the provisions of the California Environmental Quality Act (CEQA). Because the project is not expected to increase traffic noise levels during the worst traffic noise hour, no adverse environmental effects are expected to be caused by traffic noise under CEQA, and consideration of traffic noise mitigation is not warranted.

5.1 Criteria

Both the Federal and State have developed criteria for evaluating the effects of noise for projects with increased surface traffic. Since the State traffic noise policies are based in large part on FHWA noise policy, this study will briefly review the FHWA noise policy guidance.

5.1.1 Title 23, Part 772, Code of Federal Regulations

Under 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects. Noise abatement must be considered and evaluated for feasibility and reasonableness for Type I projects if the project is predicted to result in a traffic noise impact. A Type II project involves construction of noise abatement on an existing highway with no changes to highway capacity or alignment. A Type III project is a project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.[16]

Because no actions considered under the RHV Master Plan fall within the definition of a Type I or Type II project, for purposes of traffic noise analysis, this is a Type III project. As a result, the project does not require traffic noise analysis under 23 CFR 772.

5.1.2 California Environmental Quality Act (CEQA)

Under CEQA, a determination must be made as to whether the proposed project will result in significant adverse environmental effects (i.e., significant environmental impacts). A significant environmental effect under CEQA generally is defined as a substantial or potentially substantial adverse change in the physical environment. The increase in traffic noise caused by a project is the primary factor considered by Caltrans in assessing the significance of noise impacts under CEQA. The other key factor is the modeled absolute future noise level.[17]

5.2 Traffic Noise Impact Analysis

Caltrans and FHWA require traffic noise to be assessed using “traffic characteristics that would yield the worst traffic noise impact for the design year.”[18] According to FHWA guidance, “the ‘worst hourly traffic noise impact’ occurs at a time when truck volumes and vehicle speeds are the greatest, typically when traffic is free flowing and at or near level of service (LOS) C conditions. [. . .] In large urban areas,

---

[14] Title 23, Part 772, Code of Federal Regulations, Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010.
[15] California Department of Transportation, Division of Environmental Analysis, *Traffic Noise Analysis Protocol For New Highway Construction, Reconstruction, and Retrofit Barrier Projects*, May 2011.
[16] Title 23, Part 772.5 “Definitions.”
[17] California Department of Transportation, p. 37.
[18] Title 23, Part 772.9 “Traffic Noise Prediction.” and California Department of Transportation, p. 6.

this worst hourly traffic noise impact will usually not coincide with peak traffic periods, when LOS may drop to D or less."[19]

In situations where the LOS during peak traffic periods is D or less, the "worst hour traffic noise impact" typically will occur either before or after the peak traffic period when traffic is free flowing and at or near LOS C conditions. Under these conditions, increased peak traffic hour volumes, while perhaps extending periods of congestion, typically will not increase worst hour traffic noise impacts.

Hexagon Transportation Consultants, Inc. prepared a Transportation Impact Analysis Report (Traffic Study) in support of the RHV Master Plan.[20] The Traffic Study provided LOS calculations for each intersection within the project area under both existing and with-project conditions. The evaluation included a total of seven signalized intersections designated under the County Congestion Management Program (CMP) on Capitol Expressway between Interstate 680 and US Route 101 and on Tully Road between US Route 101 and Capitol Expressway.

Table 6 lists the seven CMP intersections and provides the LOS at each during both AM and PM peak traffic hours for these four scenarios[21]:

Scenario 1: *Existing Conditions.* Existing traffic volumes were obtained from the City of San Jose and supplemented with new turning-movement counts conducted in November and December 2010.

Scenario 2: *Existing Plus Project Conditions.* Existing plus project peak-hour traffic volumes were estimated by adding to existing traffic volumes the additional traffic generated by the project.

Scenario 3: *Background Conditions.* Background traffic volumes were estimated by adding to existing peak-hour volumes the projected volumes from approved but not yet completed developments.

Scenario 4: *Background Plus Project Conditions.* Projected near-term peak-hour traffic volumes with the project were estimated by adding to background traffic volumes the additional traffic generated by the project.

Table 6 Existing and Projected Levels of Service at CMP Intersections
Source: Hexagon, 2011, Table ES-1

Intersection	Peak Hour	Level of Service (LOS)			
		Existing	Existing + Project	Background	Background + Project
Capitol Expressway and Story Road	AM	E	E	F	F
	PM	E	E	F	F
Capitol Expressway and Tully Road	AM	D	D	E	E
	PM	D	D	E	E
Capitol Expressway and Quimby Road	AM	D	D	D	D
	PM	E	E	F	F
Capitol Expressway and Aborn Road	AM	D	D	D	D
	PM	E	E	E	E
Silver Creek Road and Capitol Expressway	AM	D	D	E	E
	PM	D	D	E	E
King Road and Tully Road	AM	D	D	D	D
	PM	D	D	D	D
Quimby Road and Tully Road	AM	D	D	D	D
	PM	D	D	D	D

[19] U.S. Department of Transportation, Federal Highway Administration, *Highway Traffic Noise: Analysis and Abatement Guidance*, June 2010, Revised January 2011, p. 21.
[20] Hexagon Transportation Consultants, Inc., *Reid Hillview Airport Master Plan Draft Transportation Impact Analysis*, Prepared for: Santa Clara County, April 15, 2011.
[21] Hexagon, p. 4.

Table 6 shows that under each of the four scenarios, both AM and PM peak hour conditions are LOS D, E, or F at each of the seven CMP intersections. This indicates that worst hour traffic noise impacts most likely occur under LOS C free flow conditions at a time other than the AM or PM peak traffic hours. Increases in traffic volume will not result in increased noise levels, but instead will lower the LOS during the current worst noise hour. As a result, increased traffic related to the project is unlikely to increase worst hour traffic noise levels. Based on this screening-level analysis, no substantial or potentially substantial increases in traffic noise levels are expected as a result of this project. Therefore, this project will cause no significant adverse environmental effects related to traffic noise and consideration of traffic noise mitigation is not warranted.

This page intentionally left blank

Appendix A Noise Terminology

To assist reviewers in interpreting the complex noise metrics used in evaluating noise events, we present below an introduction to relevant fundamentals of acoustics and noise terminology.

A.1 Introduction to Acoustics and Noise Terminology

Six acoustical descriptors of noise are introduced here in increasing degree of complexity:

- Decibel, dB
- Weighted decibel;
- Maximum Noise Level, Lmax
- Single Event Noise Exposure Level, SENEL
- Equivalent Sound Level, Leq
- Community Noise Equivalent Level, CNEL

These noise metrics form the basis for the majority of noise analysis conducted at most airports throughout the U.S. In addition, a brief description of slant distance versus aircraft altitude is introduced.

A.1.1 Decibel, dB

All sounds come from a sound source -- a musical instrument, a voice speaking, an airplane passing overhead. It takes energy to produce sound. The sound energy produced by any sound source is transmitted through the air in sound waves -- tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear.

Our ears are sensitive to a wide range of sound pressures. Although the loudest sounds that we hear without pain have about one million times more energy than the quietest sounds we hear, our ears are incapable of detecting small differences in these pressures. Thus, to better match how we hear this sound energy, we compress the total range of sound pressures to a more meaningful range by introducing the concept of sound pressure level.

Sound pressure levels are measured in decibels (or dB). Decibels are logarithmic quantities reflecting the ratio of the two pressures, the numerator being the pressure of the sound source of interest, and the denominator being a reference pressure (the quietest sound we can hear).

The logarithmic conversion of sound pressure to sound pressure level (SPL) means that the quietest sound that we can hear (the reference pressure) has a sound pressure level of about 0 dB, while the loudest sounds that we hear without pain have sound pressure levels of about 120 dB. Most sounds in our day-to-day environment have sound pressure levels on the order of 30 to 100 dB.

Because decibels are logarithmic quantities, combining decibels is unlike common arithmetic. For example, if two sound sources each produce 100 dB operating individually and they are then operated together, they produce 103 dB -- not the 200 decibels we might expect. Four equal sources operating simultaneously produce another three decibels of noise, resulting in a total sound pressure level of 106 dB. For every doubling of the number of equal sources, the sound pressure level goes up another three decibels. A tenfold increase in the number of sources makes the sound pressure level go up 10 dB. A hundredfold increase makes the level go up 20 dB, and it takes a thousand equal sources to increase the level 30 dB.

If one noise source is much louder than another, the two sources operating together will produce virtually the same sound pressure level (and sound to our ears) that the louder source would produce alone. For example, a 100 dB source plus an 80 dB source produce approximately 100 dB of noise when operating together (actually, 100.04 dB). The louder source "masks" the quieter one. But if the quieter source gets louder, it will have an increasing effect on the total sound pressure level such that, when the two sources are equal, as described above, they produce a level three decibels above the sound of either one by itself.

Conveniently, people also hear in a logarithmic fashion. Two useful rules of thumb to remember when comparing sound levels are: (1) a 6 to 10 dB increase in the sound pressure level is sometime described to be about a doubling of loudness, and (2) changes in sound pressure level of less than about three decibels are not readily detectable outside of a laboratory environment.

A.1.2 The Weighted Decibel

Frequency of sound is the rate of repetition of the sound pressure oscillations as they reach our ear. The rate of oscillations is reported in cycles per second or Hertz (Hz). When analyzing the total noise of any source, acousticians often break the noise into frequency components (or bands) to determine how much is low-frequency noise (distant thunder or rumble), how much is middle-frequency noise (speech), and how much is high-frequency noise (whistle). This breakdown is important for two reasons:

(1) People react differently to low-, mid-, and high-frequency noise levels. This is because our ear is better equipped to hear mid and high frequencies but is quite insensitive to lower frequencies. Thus, we find mid- and high-frequency noise to be more annoying.

(2) Engineering solutions to a noise problem are different for different frequency ranges. Low-frequency noise is generally harder to control.

The normal frequency range of hearing for most people extends from a low frequency of about 20 Hz to a high frequency of about 10,000 to 15,000 Hz. People respond to sound most readily when the predominant frequency is in the range of normal conversation, typically around 1,000 to 2,000 Hz. Psycho-acousticians have developed several filters or weightings which roughly match this sensitivity of our ear and thus help us to judge the relative loudness of various sounds made up of many different frequencies.

The most common of these weightings are the A- and C-weightings. These scales differ from each other mostly in the amount each discriminates against sound at lower frequencies. The A scale is most discriminating and emulates the response of the human ear to relatively low-level sounds, i.e., typical community sound levels. The C scale is nearly flat or uniform over the range of hearing. Therefore, the C scale often provides a baseline for comparison with other scales. For example, in industrial noise applications, engineers have determined the amount of low-frequency energy from a measured noise source by subtracting the A-weighted level from the C-weighted level. The C scale emulates the response of the human ear to high-level sounds, much higher than those typically experienced in communities, whether urban or suburban. Figure A1 provides a comparison of these two weightings in the 20 Hz to 20,000 Hz frequency range.

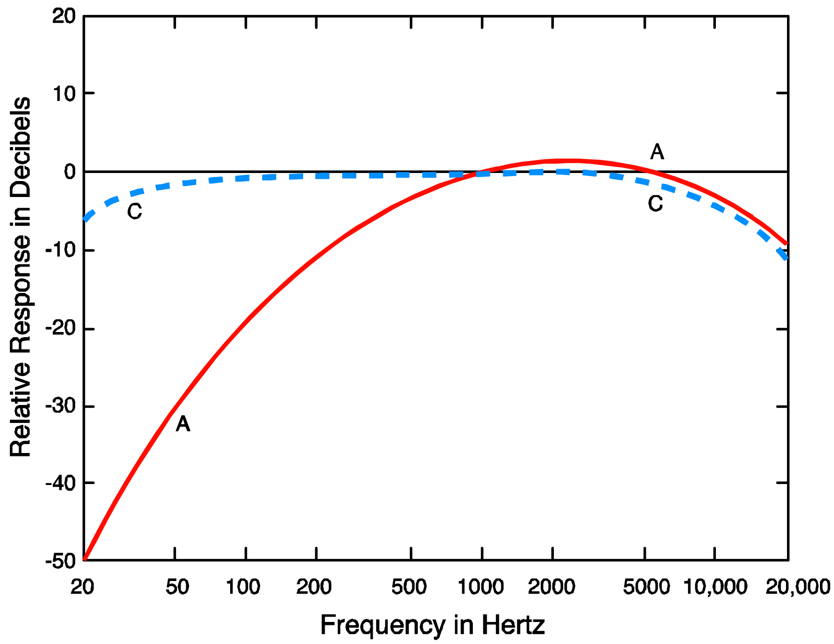


Figure A1 Frequency Response Comparison of A- and C-Weightings
Source: HMMH

The Environmental Protection Agency (EPA) adopted A-weighted sound levels to describe how people hear sound and to determine any impacts of environmental noise on public health and welfare.[22] The A-weighted sound level was recommended for use because it is convenient to use in noise measurement equipment, accurate for most purposes, and is used extensively throughout the world. A-weighted sound levels (measured in A-weighted decibels) are sometimes denoted dBA.

In addition, the A-weighting network significantly discounts those parts of the total noise that occur at lower frequencies (those below about 500 Hz) and also at very high frequencies (above 10,000 Hz) where we do not hear as well. The network has very little effect, or is nearly "flat," in the middle range of frequencies between 500 and 10,000 Hz where our hearing is most sensitive. Because this network generally matches our ears' sensitivity, sounds having higher A-weighted sound levels are judged to be louder than those with lower A-weighted sound levels, a relationship which otherwise might not be true. It is for this reason that A-weighted sound levels are normally used to evaluate environmental noise sources. Figure A2 presents typical A-weighted sound levels of several common environmental sources.

[22] "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," EPA/ONAC 550/9-74-004, March, 1974

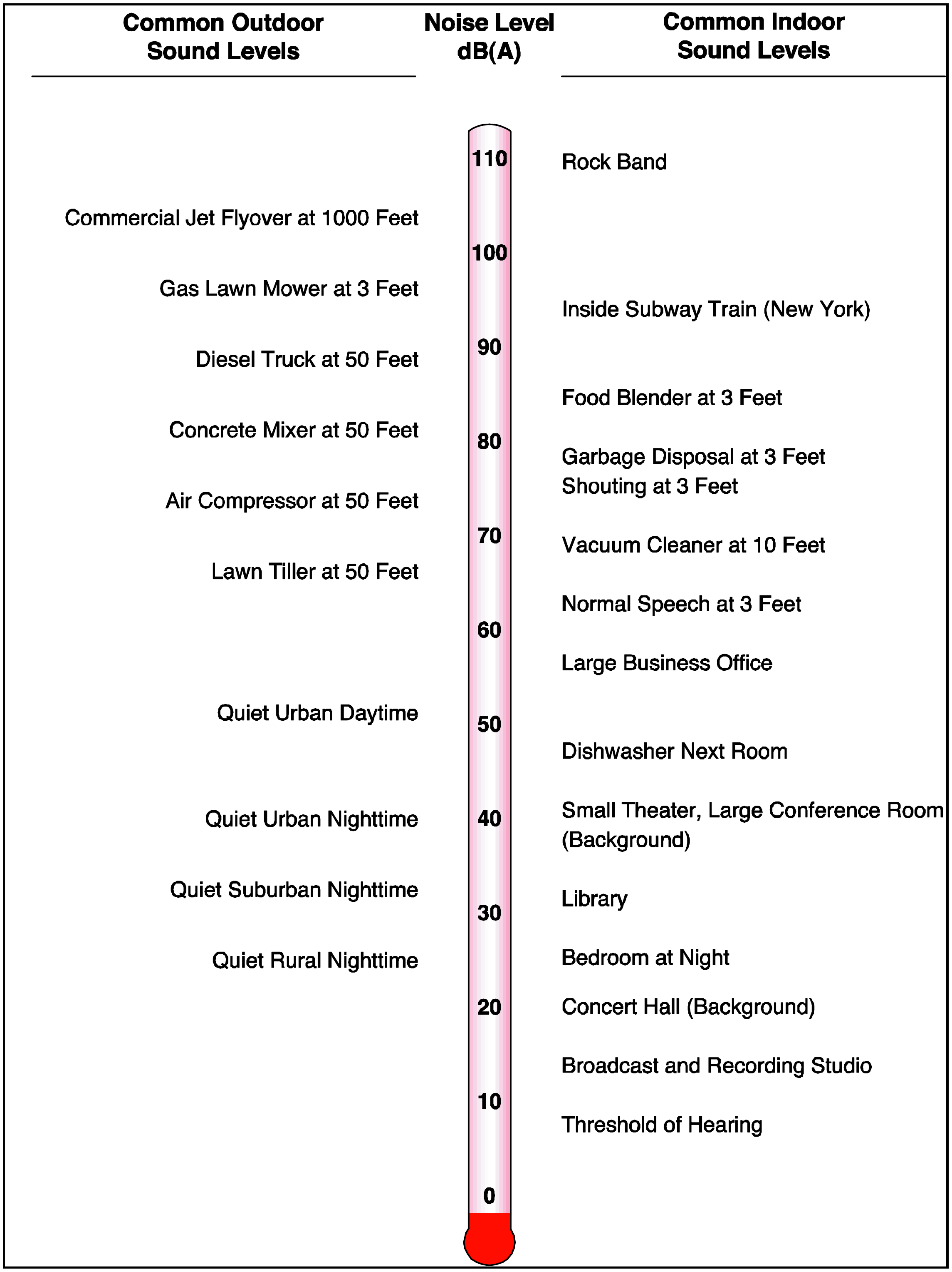


Figure A2 Common A-Weighted Environmental Sound Levels, in dB
Source: HMMH

A.1.3 Maximum Noise Level, Lmax (A-weighted))

An additional dimension to environmental noise is that A-weighted levels vary with time. For example, the sound level increases as an aircraft approaches, then falls and blends into the background as the aircraft recedes into the distance (though even the background varies as birds chirp, the wind blows, or a vehicle passes by). This is illustrated in Figure A3.

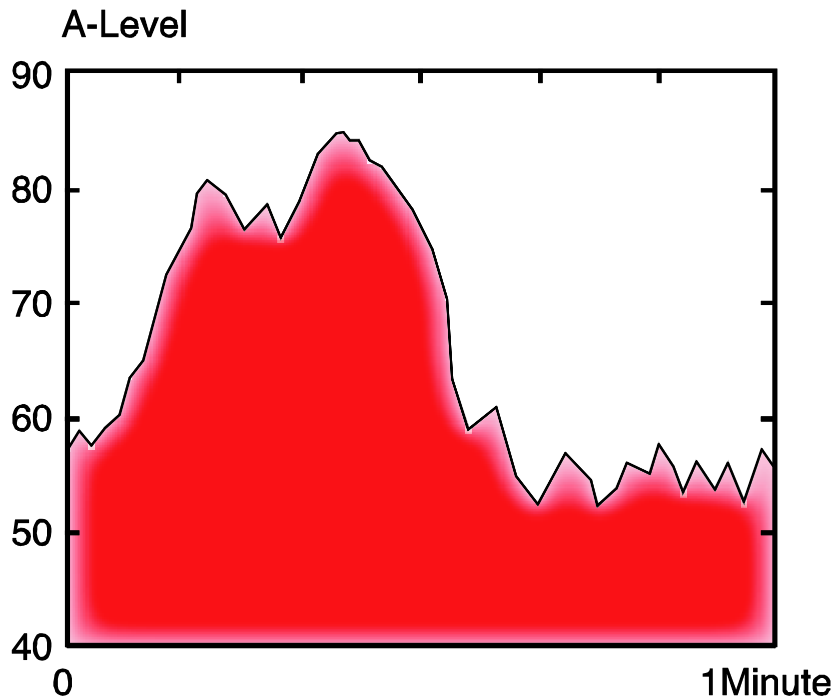


Figure A3 Variation in the A-Weighted Sound Level over Time
Source: HMMH

Because of this variation, it is often convenient to describe a particular noise "event" by its maximum sound level, abbreviated as Lmax. In Figure A3, the Lmax is approximately 85 dB. However, the maximum level describes only one dimension of an event; it provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical maximum levels may produce very different total exposures. One may be of very short duration, while the other may continue for an extended period and be judged much more annoying. The next section introduces a measure that accounts for this concept of a noise "dose."

A.1.4 Single Event Noise Exposure Level

The measure of cumulative noise exposure for a single noise event in California is the Single Event Noise Exposure Level, or SENEL. SENEL may be thought of as an accumulation of the sound energy over the duration of an event, where duration is defined as the period from when the A-weighted sound level first exceeds a threshold level to when the sound level drops back below the threshold.

SENEL is similar to the Sound Exposure Level (SEL) metric. For SENEL measurements, the threshold is 30 dB below an upper SENEL limit which depends on the aircraft type and distance from either the start of the take-off roll or the landing threshold[23]. For the SEL, the threshold is referenced to the background noise level. These two metrics are functionally equal.

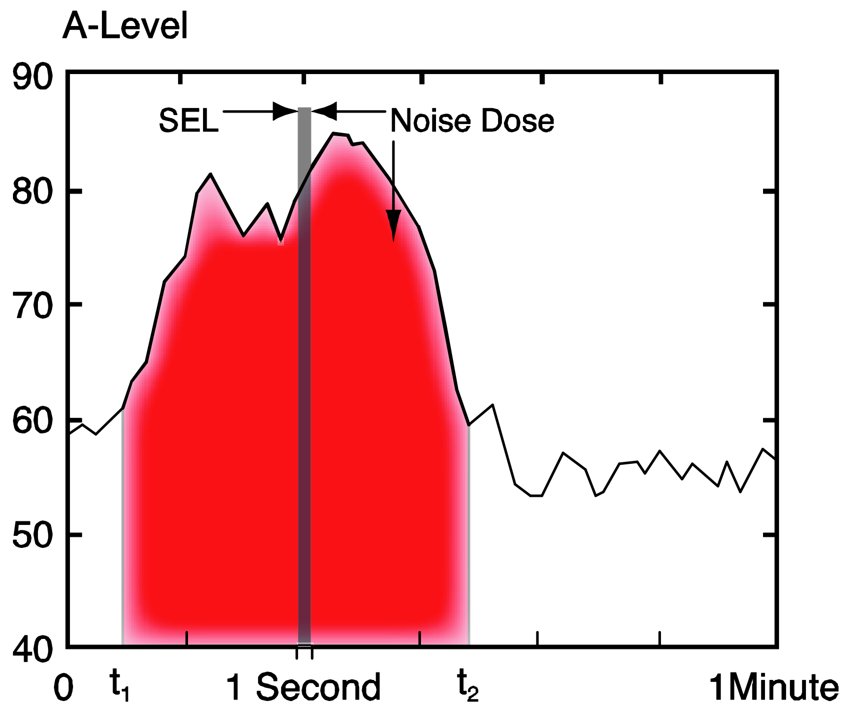


Figure A4 Sound Exposure Level or Single Event Noise Exposure Level
Source: HMMH

The lightly shaded area in Figure A4 illustrates the portion of the sound energy included in this dose. To account for the variety of durations that occur among different noise events, the noise dose is normalized (standardized) to a one-second duration. This normalized dose is the SENEL or SEL; it is shown as the darkly shaded area in Figure A3. It has exactly the same sound energy as the longer event.

Note that because the SENEL is normalized to one second, it will almost always be larger in magnitude than the maximum A-weighted level for the event. In fact, using aircraft overflights as an example, the SEL is on the order of 7 to 12 dB higher than the Lmax. Also, the fact that it is a cumulative measure means that not only do louder aircraft fly-overs have higher SENEL than do quieter ones, but also fly-overs with longer durations have greater SENEL than do shorter ones.

With this metric, we now have a basis for comparing noise events that generally matches our impression of the sound -- the higher the SENEL, the more annoying it is likely to be. In addition, SENEL provides a comprehensive way to describe a noise event for use in modeling noise exposure.

[23] California Department of Aeronautics, "Noise Standards," California Code of Regulations, Title 21 §5025 and §5040 (Register 78, No. 22—6-3-78).

A.1.5 Equivalent Sound Level, Leq

The Equivalent Sound Level, abbreviated Leq, is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest -- for example, an hour, an eight-hour school day, nighttime, or a full 24-hour day. However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example L_{eq1h}, or $L_{eq(24)}$.

Leq may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level. This is illustrated in Figure A5. The equivalent level is, in a sense, the total sound energy that occurred during the time in question, but spread evenly over the time period. It is a way of assigning a single number to a time-varying sound level. Since Leq includes all sound energy, it is strongly influenced by the louder events.

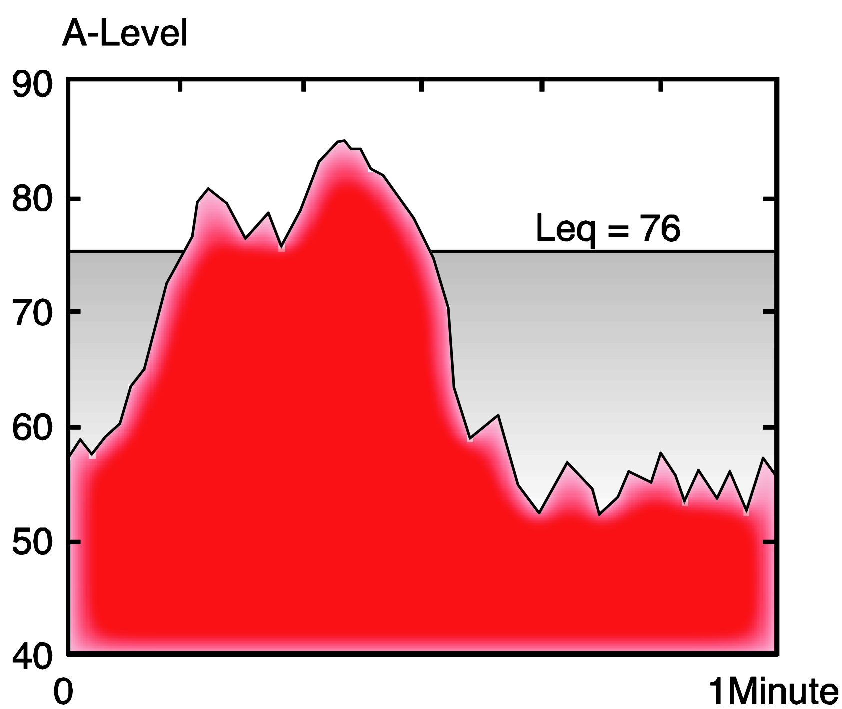


Figure A5 Example of a 1-Minute Equivalent Sound Level
Source: HMMH

A.1.6 Community Noise Equivalent Level, CNEL

In the previous sections, we have been addressing noise measures that account for the moment-to-moment or short-term fluctuations in A-weighted levels as sound sources come and go affecting our overall noise environment. The Community Noise Equivalent Level (CNEL) represents a concept of noise dose as it occurs over a 24-hour period. The State of California developed the CNEL and promulgated "Noise Standards" in 1970.[24]

Earlier, we illustrated the A-weighted level due to an aircraft event. The example is repeated in the top frame of Figure A6. The level increases as the aircraft approaches, reaching a maximum of 85 dB, and then decreases as the aircraft passes by. The ambient A-weighted level around 55 dB is due to the background sounds that dominate after the aircraft passes. The shaded area reflects the noise dose that a listener receives during the one-minute period of the sample.

The center frame of Figure A6 includes this one-minute interval within a full hour. Now the shaded area represents the noise dose during that hour when sixteen aircraft pass nearby, each producing a single event dose represented by an SENEL. Similarly, the bottom frame includes the one-hour interval within a full 24 hours. Here the shaded area represents the noise dose over a complete day. Note that several overflights occur at night, when the background noise drops some 10 decibels, to approximately 45 dB.

An important note here is that CNEL treats evening (7:00 PM - 9:59 PM) and nighttime (10:00 PM - 6:59 AM) noise differently from daytime (7:00 AM - 6:59 PM) noise. CNEL multiplies each evening operation by 3 and each nighttime operation by 10. This weighting of the operations effectively adds 4.8 decibels to the A-weighted levels of each evening operation and 10.0 decibels to the A-weighted levels occurring at night. These penalties are applied to account for people's greater sensitivity to evening and nighttime noise. In addition, events during the evening and night are often more intrusive because the ambient sound levels during those times are usually lower than daytime ambient sound levels.

The CNEL noise metric is very similar to the Day-Night Level Average Sound (DNL) metric required by the FAA for aircraft noise studies. The difference is that the CNEL metric applies a weighting factor to evening operations; the DNL metric treats the evening hours the same as the daytime hours. For an airport with evening operations, the noise measured as CNEL will be slightly higher than the noise measured as DNL.

Values of CNEL are normally measured with standard monitoring equipment or are predicted with computer models. Measurements are practical for obtaining CNEL values for only relatively limited numbers of locations, and, in the absence of a permanently installed monitoring system, only for relatively short time periods. Thus, most airport noise studies utilize computer-generated estimates of CNEL, determined by accounting for all of the SENEL from individual aircraft operations which comprise the total noise dose at a given location on the ground. This principle is used in all airport noise modeling.

Computed values of CNEL are usually depicted as noise contours that are lines of equal exposure (much as topographic maps have contour lines of equal elevation). The contours usually reflect long-term (annual average) operating conditions, taking into account the average noise events per day.

[24] California Department of Aeronautics, "Noise Standards," California Code of Regulations, Title 21 §5000 and §5090 (Register 90, No. 10—3-10-90).

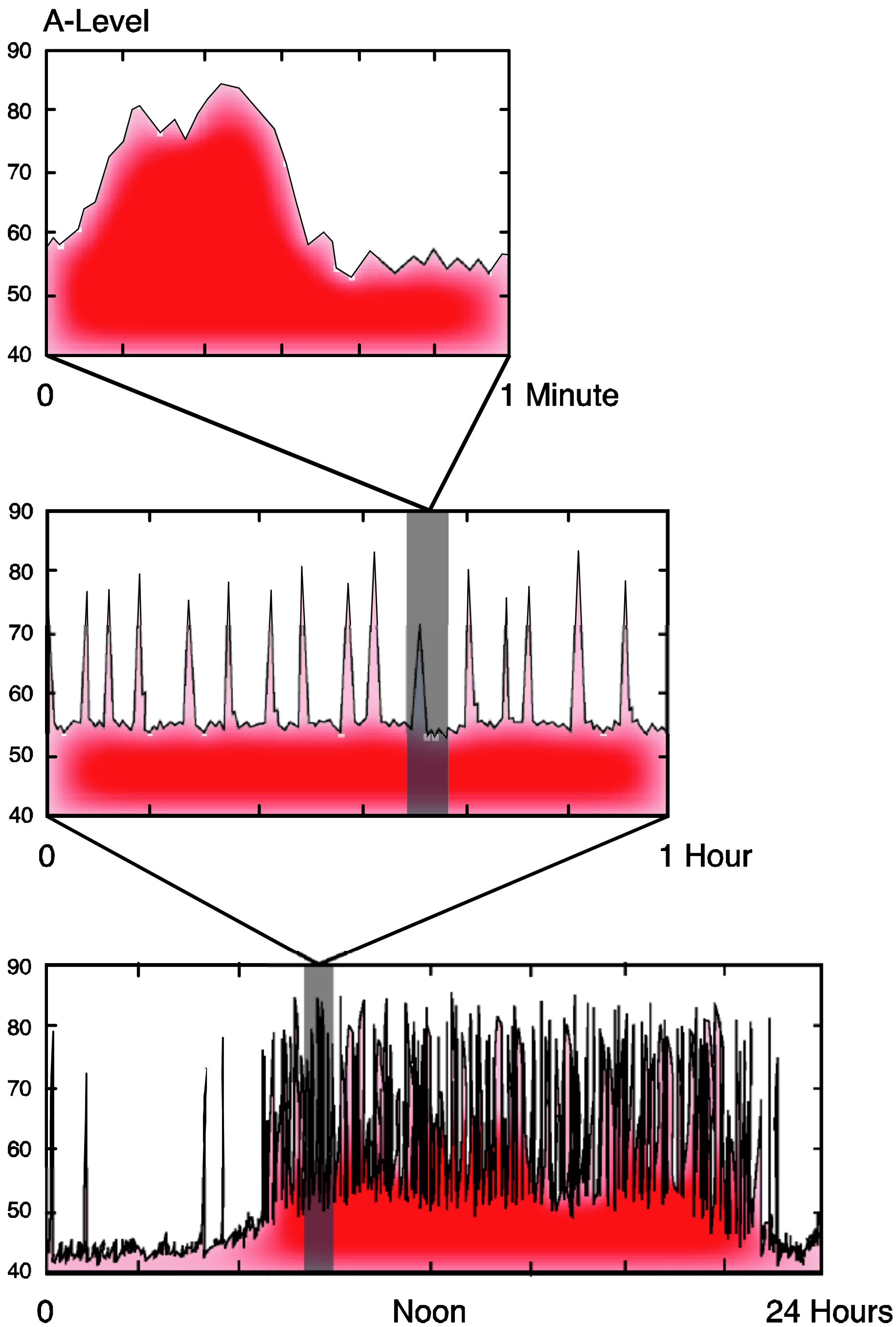


Figure A6 A-Weighted Level Fluctuations and Noise Dose
Source: HMMH

Figure A7 shows that representative values of DNL (or CNEL) in our environment range from a low of 40 to 45 decibels in extremely quiet, isolated locations, to highs of 80 or 85 decibels immediately adjacent to a busy truck route or off the end of a runway. More typical values would be in the range of 50 or 55 decibels for a quiet residential community to 60 or 65 decibels in an urban residential neighborhood.

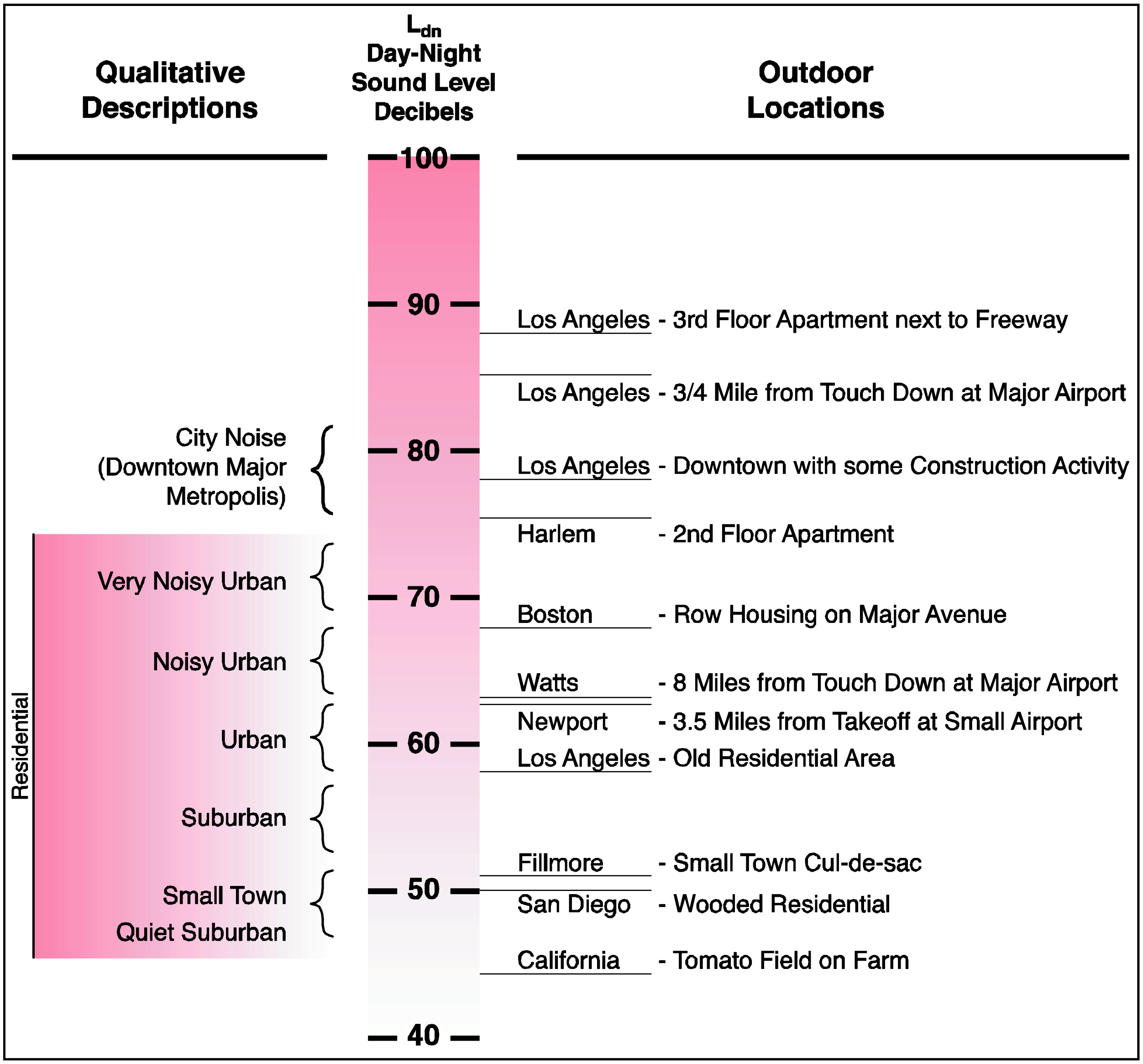


Figure A7 Representative Examples of Measured Community Noise Equivalent Levels
Source: United States Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974, p.14

A.1.7 Slant Distance and Aircraft Altitude

When determining the distance between the observer or measurement location and an overflying aircraft, several factors need to be considered. As shown in Figure A8, aircraft altitude is normally given as height in feet above mean sea level (MSL) or above ground level (AGL). The slant distance is the line of sight distance in feet from the observation point to the aircraft. If the aircraft were flying directly over the observation point, then the slant distance would be the same as the aircraft's altitude AGL. This slant distance at the aircraft's point-of-closest-approach will vary with each aircraft overflight and will have an affect on the sound level heard or measured.

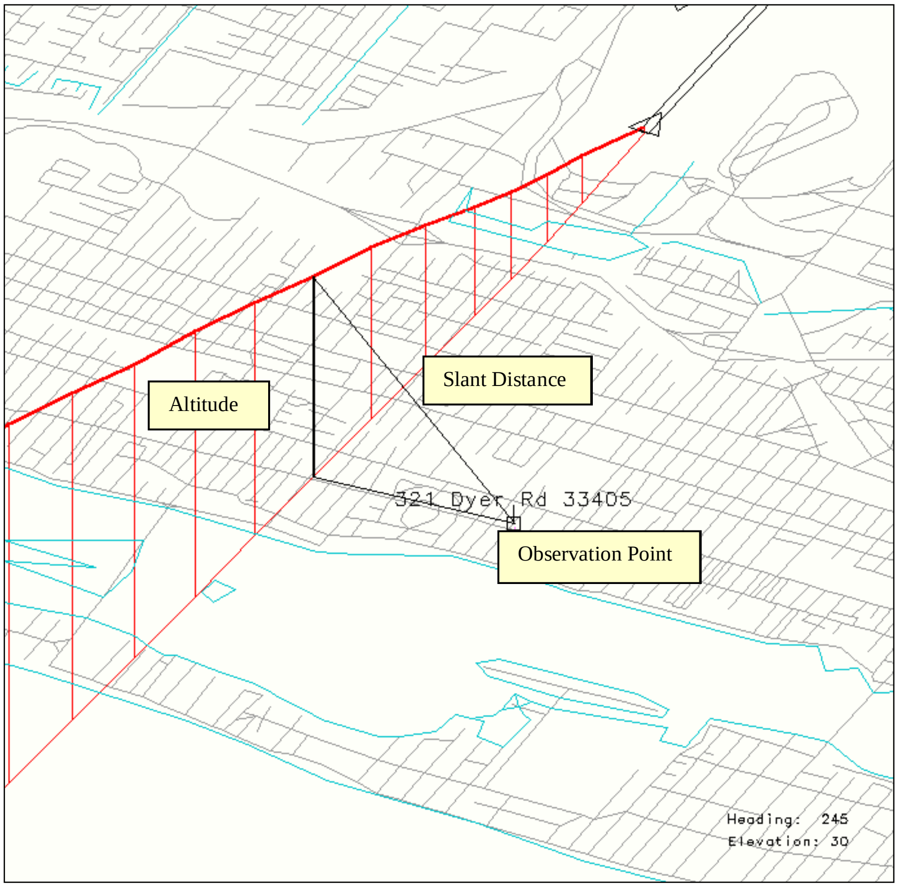


Figure A8 Relationship Between Altitude and Slant Distance
Source: HMMH

This page intentionally left blank

Appendix B FAA Air Traffic Activity System (ATADS) and Terminal Area Forecast (TAF) Excerpts

ATADS : Airport Operations : Standard Report

From 05/2010 To 04/2011 | Facility=RHV

	IFR Itinerant					VFR Itinerant					Itinerant					Local			
Date	Air Carrier	Air Taxi	General Aviation	Military	Total	Air Carrier	Air Taxi	General Aviation	Military	Total	Air Carrier	Air Taxi	General Aviation	Military	Total	Civil	Military	Total	Total Operations
05/2010	0	0	232	0	232	0	0	3,641	0	3,641	0	0	3,873	0	3,873	5,621	0	5,621	9,494
06/2010	0	0	183	0	183	0	0	4,000	0	4,000	0	0	4,183	0	4,183	6,223	0	6,223	10,406
07/2010	0	0	214	0	214	0	0	4,235	0	4,235	0	0	4,449	0	4,449	6,207	0	6,207	10,656
08/2010	0	2	177	0	179	0	114	3,811	0	3,925	0	116	3,988	0	4,104	6,906	0	6,906	11,010
09/2010	0	1	228	0	229	84	8	3,654	12	3,758	84	9	3,882	12	3,987	5,191	0	5,191	9,178
10/2010	0	24	298	1	323	81	61	3,127	7	3,276	81	85	3,425	8	3,599	5,218	0	5,218	8,817
11/2010	0	14	204	0	218	0	45	3,289	5	3,339	0	59	3,493	5	3,557	4,642	0	4,642	8,199
12/2010	0	28	297	0	325	0	38	1,924	3	1,965	0	66	2,221	3	2,290	4,362	0	4,362	6,652
01/2011	0	17	267	2	286	0	112	3,051	9	3,172	0	129	3,318	11	3,458	5,889	0	5,889	9,347
02/2011	0	11	163	0	174	61	135	2,665	5	2,866	61	146	2,828	5	3,040	4,572	0	4,572	7,612
03/2011	2	24	209	0	235	0	106	2,486	7	2,599	2	130	2,695	7	2,834	5,479	0	5,479	8,313
04/2011	0	20	230	0	250	0	85	3,726	9	3,820	0	105	3,956	9	4,070	6,231	0	6,231	10,301
Total:	**2**	**141**	**2,702**	**3**	**2,848**	**226**	**704**	**39,609**	**57**	**40,596**	**228**	**845**	**42,311**	**60**	**43,444**	**66,541**	**0**	**66,541**	**109,985**

Report created on Mon Sep 26 13:31:01 EDT 2011
Sources: Air Traffic Activity System (ATADS)

APO TERMINAL AREA FORECAST DETAIL REPORT
Forecast Issued December 2010

RHV

AIRCRAFT OPERATIONS

REGION:AWP **STATE:**CA **LOCID:**RHV
CITY:SAN JOSE **AIRPORT:**REID-HILLVIEW OF SANTA CLARA COUNTY

	Enplanements			Itinerant Operations					Local Operations					
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Total Tracon Ops	Based Aircraft
1990	0	0	0	0	0	60,145	8	60,153	98,027	0	98,027	158,180	0	637
1991	0	0	0	0	211	71,656	2	71,869	122,812	0	122,812	194,681	0	551
1992	0	0	0	0	0	67,402	2	67,404	117,127	0	117,127	184,531	0	554
1993	0	0	0	0	0	63,019	4	63,023	108,204	0	108,204	171,227	0	554
1994	0	0	0	0	6,042	59,094	16	65,152	104,293	12	104,305	169,457	0	554
1995	0	0	0	0	0	55,767	33	55,800	98,531	32	98,563	154,363	0	554
1996	0	0	0	0	0	55,163	0	55,163	101,303	0	101,303	156,466	0	554
1997	0	0	0	2	54	62,450	41	62,547	117,290	18	117,308	179,855	0	554
1998	0	0	0	0	8	65,114	38	65,160	141,612	0	141,612	206,772	0	554
1999	0	0	0	0	15	71,861	6	71,882	143,127	28	143,155	215,037	0	554
2000	0	0	0	1	15	76,625	76	76,717	150,033	52	150,085	226,802	0	554
2001	0	0	0	13	6	83,103	65	83,187	149,595	13	149,608	232,795	0	554
2002	0	0	0	49	3	88,174	45	88,271	142,579	31	142,610	230,881	0	554
2003	0	0	0	0	0	80,801	64	80,865	138,245	12	138,257	219,122	0	567
2004	0	0	0	0	1	77,226	2	77,229	127,792	0	127,792	205,021	0	697
2005	0	0	0	0	0	70,887	0	70,887	129,598	2	129,600	200,487	0	697
2006	0	0	0	406	225	59,149	0	59,780	108,138	512	108,650	168,430	0	697
2007	0	0	0	0	0	54,504	102	54,606	96,808	0	96,808	151,414	0	697
2008	0	0	0	0	0	51,761	0	51,761	88,181	316	88,497	140,258	0	321
2009	0	0	0	0	0	50,356	0	50,356	77,551	198	77,749	128,105	0	321
2010*	0	0	0	84	125	43,998	12	44,219	69,550	56	69,606	113,825	0	329
2011*	0	0	0	84	125	39,638	12	39,859	62,971	56	63,027	102,886	0	337
2012*	0	0	0	84	125	39,994	12	40,215	63,730	56	63,786	104,001	0	345
2013*	0	0	0	84	125	40,354	12	40,575	64,498	56	64,554	105,129	0	353
2014*	0	0	0	84	125	40,717	12	40,938	65,275	56	65,331	106,269	0	361
2015*	0	0	0	84	125	41,083	12	41,304	66,061	56	66,117	107,421	0	368
2016*	0	0	0	84	125	41,453	12	41,674	66,856	56	66,912	108,586	0	375
2017*	0	0	0	84	125	41,826	12	42,047	67,661	56	67,717	109,764	0	382
2018*	0	0	0	84	125	42,202	12	42,423	68,476	56	68,532	110,955	0	389
2019*	0	0	0	84	125	42,582	12	42,803	69,300	56	69,356	112,159	0	396

APO TERMINAL AREA FORECAST DETAIL REPORT
Forecast Issued December 2010

RHV

AIRCRAFT OPERATIONS

Enplanements Itinerant Operations Local Operations

Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Total Tracon Ops	Based Aircraft
2020*	0	0	0	84	125	42,965	12	43,186	70,135	56	70,191	113,377	0	403
2021*	0	0	0	84	125	43,352	12	43,573	70,980	56	71,036	114,609	0	410
2022*	0	0	0	84	125	43,742	12	43,963	71,835	56	71,891	115,854	0	417
2023*	0	0	0	84	125	44,136	12	44,357	72,700	56	72,756	117,113	0	424
2024*	0	0	0	84	125	44,533	12	44,754	73,576	56	73,632	118,386	0	431
2025*	0	0	0	84	125	44,934	12	45,155	74,462	56	74,518	119,673	0	439
2026*	0	0	0	84	125	45,338	12	45,559	75,358	56	75,414	120,973	0	447
2027*	0	0	0	84	125	45,746	12	45,967	76,265	56	76,321	122,288	0	455
2028*	0	0	0	84	125	46,158	12	46,379	77,183	56	77,239	123,618	0	464
2029*	0	0	0	84	125	46,574	12	46,795	78,113	56	78,169	124,964	0	473
2030*	0	0	0	84	125	46,993	12	47,214	79,053	56	79,109	126,323	0	482

This page intentionally left blank

Appendix C Existing Conditions (2011) and Master Plan 20-Year Forecast (2022) Operations, Runway and Flight Track Utilization for Noise Modeling

Table C-1 Existing Conditions (2011) Operations
Source: FAA ATADS, RHV Airport Master Plan

Aircraft (INM Type)	Operations						
	Type	Annual	%	Day	Evening	Night	Total
Single-Engine, Propeller (GASEPF)	Itinerant	6,269	5.71%	14.0838	2.5763	0.5153	**17.1753**
	Local	9,978	9.09%	23.2364	4.1005	0.0000	**27.3370**
Single-Engine, Propeller, (CNA172)	Itinerant	29,254	26.65%	65.7213	12.0222	2.4044	**80.1479**
	Local	46,566	42.43%	108.4414	19.1367	0.0000	**127.5781**
Twin-Engine Propeller, Piston (BEC58P)	Itinerant	1,672	1.52%	3.7563	0.6871	0.1374	**4.5808**
	Local	2,661	2.42%	6.1968	1.0936	0.0000	**7.2904**
Single-Engine, Turboprop (GASEPV)	Itinerant	4,179	3.81%	9.3884	1.7174	0.3435	**11.4493**
	Local	6,652	6.06%	15.4910	2.7337	0.0000	**18.2247**
Business Turboprop (Twin) (CNA441)	Itinerant	1,224	1.12%	2.7498	0.5030	0.1006	**3.3534**
Helicopter (H500D)	Itinerant	556	0.51%	1.4928	0.0305	0.0000	**1.5233**
	Local	375	0.34%	1.0068	0.0205	0.0000	**1.0274**
	Hovers	240	0.22%	0.6444	0.0132	0.0000	**0.6575**
Helicopter (B206L)	Itinerant	62	0.06%	0.1665	0.0034	0.0000	**0.1699**
	Local	42	0.04%	0.1128	0.0023	0.0000	**0.1151**
	Hovers	27	0.02%	0.0725	0.0015	0.0000	**0.0740**
TOTAL		**109,757**	**100.00%**	**252.5610**	**44.6419**	**3.5012**	**300.7041**

Note: Itinerant operations are equally split into arrivals and departures; each are half the listed number. Local operations include pattern activity and two operations listed is one local pattern (touch and go). Numbers may not add exactly due to rounding.

Table C-2 Master Plan 20-Year Forecast (2022) Operations
Source: RHV Airport Master Plan

Aircraft (INM Type)	Operations						
	Type	Annual	%	Day	Evening	Night	Total
Single-Engine, Propeller (GASEPF)	Itinerant	12,451	5.06%	28.0940	5.0180	1.0000	**34.1120**
	Local	24,016	9.76%	55.8290	9.9690	0.0000	**65.7980**
Single-Engine, Propeller, (CNA172)	Itinerant	58,103	23.62%	131.1100	23.4140	4.6620	**159.1860**
	Local	112,076	45.56%	260.5340	46.5240	0.0000	**307.0580**
Twin-Engine Propeller, Piston (BEC58P)	Itinerant	3,320	1.35%	7.4920	1.3380	0.2660	**9.0960**
	Local	6,404	2.60%	14.8880	2.6580	0.0000	**17.5460**
Single-Engine, Turboprop (GASEPV)	Itinerant	8,300	3.37%	18.7300	3.3440	0.6660	**22.7400**
	Local	16,010	6.51%	37.2190	6.6450	0.0000	**43.8640**
Business Turboprop (Twin) (CNA441)	Itinerant	2,432	0.99%	5.5960	1.0000	0.0680	**6.6640**
Helicopter (H500D)	Itinerant	1,105	0.45%	2.9700	0.0580	0.0000	**3.0280**
	Local	903	0.37%	2.4280	0.0470	0.0000	**2.4750**
	Hovers	578	0.23%	1.5530	0.0300	0.0000	**1.5830**
Helicopter (B206L)	Itinerant	123	0.05%	0.3300	0.0060	0.0000	**0.3360**
	Local	101	0.04%	0.2700	0.0060	0.0000	**0.2760**
	Hovers	65	0.03%	0.1730	0.0040	0.0000	**0.1770**
TOTAL		**245,988**	**100.00%**	**567.2160**	**100.0610**	**6.6620**	**673.9390**

Note: Itinerant operations are equally split into arrivals and departures; each are half the listed number. Local operations include pattern activity and two operations listed is one local pattern (touch and go). Numbers may not add exactly due to rounding.

Table C-3 Existing Conditions and No-Project Alternative Runway Utilization
Source: RHV Airport Master Plan

Aircraft Type		Percentage of Takeoffs and Landings						
		Runway 13L	Runway 31R	Runway 13R	Runway 31L	Helipad X	Helipad Y	Helipad H
Fixed-Wing	Day	9.8	55.2	5.2	29.8			
	Evening	9.8	55.2	5.2	29.8			
	Night	15.0	85.0	0.0	0.0			
	Locals	7.5	55.0	7.5	30.0			
Helicopter	Day					0.0	100.0	0.0
	Evening					0.0	100.0	0.0
	Night					0.0	100.0	0.0
	Locals					0.0	0.0	100.0
	Hovers					0.5	1.0	98.5

Table C-4 Project Alternative Runway Utilization
Source: RHV Airport Master Plan, RHV ATCT

Aircraft Type		Percentage of Takeoffs and Landings						
		Runway 13L	Runway 31R	Runway 13R	Runway 31L	Helipad X	Helipad Y	Helipad H
Fixed-Wing A*	Day	9.8	55.2	5.2	29.8			
	Evening	9.8	55.2	5.2	29.8			
	Night	15.0	85.0	0.0	0.0			
	Locals	7.5	55.0	7.5	30.0			
Fixed-Wing B*	Day	9.8	55.2	5.2	29.8			
	Evening	9.8	55.2	5.2	29.8			
	Night	15.0	85.0	0.0	0.0			
	Locals	6.0	34.0	9.0	51.0			
Helicopter	Day					0.0	100.0	0.0
	Evening					0.0	100.0	0.0
	Night					0.0	100.0	0.0
	Locals					0.0	0.0	100.0
	Hovers					0.5	1.0	98.5

Note: * Fixed-Wing A includes single-engine turboprop and twin-engine piston and turboprop aircraft; Fixed-Wing B includes single-engine piston propeller aircraft (CNA172, GASEPF) with increased local flights on West runway (13R/31L).

Table C-5 Fixed-Wing Flight Track Utilization
Source: RHV Airport Master Plan

Percentage of Track Use by Runway									
Departures									
Runway 13L		Runway 31R				Runway 13R		Runway 31L	
Straight Out	Left turn to Downwind	Right turn	Left turn	Left turn to Left Downwind	Right turn to Right Downwind	Straight Out	Right turn to Downwind	Left turn to Downwind	Straight Out
50.0	50.0	25.0	25.0	25.0	25.0	50.0	50.0	50.0	50.0

Arrivals						
Runway 13L	Runway 31R		Runway 13R	Runway 31L		
Left Downwind	Straight In	Right Downwind	Right Downwind	Straight In	Right Downwind	Left Downwind
100.0	50.0	50.0	100.0	33.4	33.3	33.3

Table C-6 Helicopter Flight Track Utilization

Source: RHV Airport Master Plan

Operation	Percentage of Track Use						
	Helipad Y					Helipad H	
	Straight Out	North Arrival, Circle North, Land South	North Arrival, Circle South, Land North	South Arrival, Circle North, Land South	South Arrival, Circle South, Land North	Right Downwind to Land South	Left Downwind to Land North
Departure	100.0						
Arrival		25.0	25.0	25.0	25.0		
Local						15.0	85.0

Appendix D Proposed Use of West Taxiway – Coordination with RHV ATCT

Page 1 of 1

Robert D. Behr

From: David Dietz [david.dietz@meadhunt.com]
Sent: Friday, January 20, 2006 10:19 AM
To: Robert D. Behr
Subject: RVH west side taxiway

Carl and I finally connected telephonically this morning. Here is our official concept of how to allocate traffic to the west side taxiway.

We propose assuming that once the west side taxiway is available, 60% of the local operations by CASEPF and CNA172 will be on the west runway. Of these operations, 80% will use the west side taxiway.

We anticipate that there will be limited use by other fixed-wing aircraft. We assume that 10% of the local operations by BEC58P and GASEPV will result in use of the west side taxiway. These aircraft will have been shifted to the left runway due to congestion on the east runway.

Please call to discuss or if you have questions.

David Dietz, AICP
Senior Airport Planner
Aviation Services Department

Mead & Hunt, Inc.
707 Aviation Boulevard
Santa Rosa, CA 95403
Phone 707/526-5010
Fax 707/526-9721
www.meadhunt.com

Confidentiality statement: This e-mail message, including any attachments, is intended only for the use of the recipient(s) and may contain privileged and confidential information, including information that is protected under the HIPAA privacy rules. Any unauthorized review, disclosure, copying, distribution or use is prohibited. If you have received this e-mail by mistake, please notify us immediately by reply e-mail and destroy all copies of the original message. Thank You.

3/31/2006

FILE No.687 01/24 '06 AM 11:28 ID:MEAD & HUNT FAX:5269721 PAGE 1

MEAD & HUNT **Fax transmittal**

To:	Bob Behr & Brad Nicholas Cc: Carl Honaker	HMMH Santa Clara County Airports	Fax:	916 / 568 -1201 408 / 929-8617
From:	David Dietz	Mead & Hunt, Inc. 707 Aviation Boulevard Santa Rosa, CA 95403	Fax: Phone:	707 / 526-9721 707 / 526-5010
Date:	January 24, 2006	M&H project no. 08230-00-02001		
Subject:	*Use of Proposed West Side Parallel Taxiway*		Page 1 of 3	

Confidentiality statement: The information contained in this facsimile is privileged and confidential information and is intended only for the use of the addressee. If you are not the addressee or the person responsible for delivering it to the addressee, you may not copy or deliver this to anyone else. If you receive this facsimile by mistake, please notify us immediately by telephone and return the original message to us at our mailing address via US Postal Service. *Thank you.*

Message:

Attached is the allocation of landing aircraft to the various exit taxiways provided by the Reid-Hillview ATC staff. The taxiway names are shown on the attached sketch. Call if you have questions.

FILE No.687 01/24 '06 AM 11:29 ID:MEAD & HUNT FAX:5269721 PAGE 2

Jan 24 06 09:07a RHV ATCT ADMIN (408)254-0817 p.2

FILE No.684 01/23 '06 PM 03:06 ID:MEAD & HUNT FAX:5269721 PAGE 1

MEAD & HUNT **Fax transmittal**

To:	Ms. Karen Prijatel and her insightful staff	Reid-Hillview Air Traffic Control	Fax: Phone:	408/254-0817
From:	David Dietz	Mead & Hunt, Inc. 707 Aviation Boulevard Santa Rosa, CA 95403	Fax: Phone:	707 / 526-9721 707 / 526-5010
Date:	January 23, 2006	M&H project no. 08230-00-02001		
Subject:	Use of Proposed West Side Parallel Taxiway		Page 1 of 2	

Message:

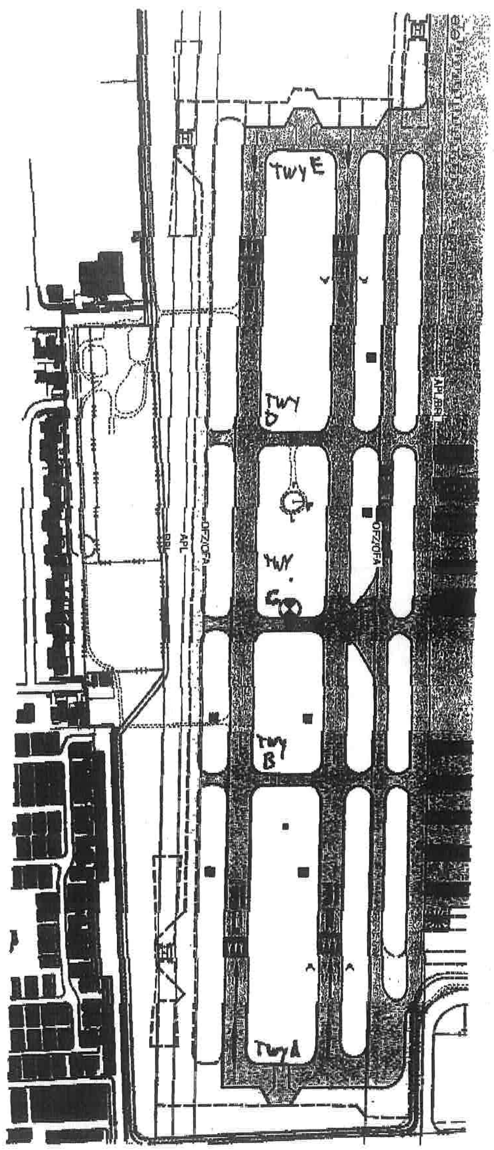
As part of the documentation of environmental effects of the proposed Airport Master Plan, the consulting team is developing noise contours for the proposed westside parallel taxiway. We could use your assistance in defining how we expect this taxiway to be used once it is constructed. Specifically, we would like your expectations on the percentage of use that each exit taxiway will receive by training aircraft that land and taxi to the proposed westside taxiway. For example, for training aircraft landing on Runway 31L we would expect few (if any) to exit at Taxiway B, a small number at Taxiway C, and most at Taxiway D and E.

We ask that you fill in the chart below and fax it back to us. If you would like to discuss this, please call. Thank you for your assistance.

Anticipated Use of Exit Taxiways by Training Aircraft Intending to Use West Side Parallel Taxiway		
	For Landings on Runway 31L What % Will Exit on:	For Landings on Runway 13R What % Will Exit on:
Taxiway A	0	20
Taxiway B	10	20
Taxiway C	20	50
Taxiway D	50	10
Taxiway E	20	0
TOTAL	100%	100%

David.
While noise abatement is a large area of consideration, the safety issue with aircraft crossing 31R to taxi back for departure is significant especially with the large amount of foreign speaking student pilots. We really need this taxiway and if can do anything else to help, just let me know – Thanks Karen

FILE No.687 01/24 '06 AM 11:29 ID:MEAD & HUNT FAX:5269721 PAGE 3



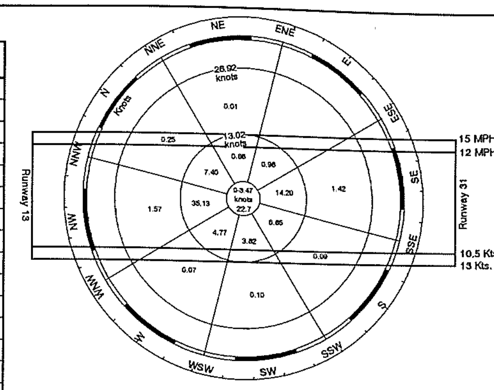
Appendix E RHV Airport Layout Plan

RUNWAY END DATA

APPROACH END OF RUNWAY:			13L	31R	13R	31L
RUNWAY END COORDINATES (a)	Latitude	Existing	37° 20' 11.46" N	37° 19' 47.01" N	37° 20' 09.66" N	37° 19' 45.23" N
		Future	37° 20' 12.20"N	No Change	37° 20' 10.29"N	No Change
	Longitude	Existing	121° 49' 21.36" W	121° 48' 58.20" W	121° 49' 24.33" W	121° 49' 01.17"W
		Future	121° 49' 22.06" W	No Change	121° 49' 24.92"W	No Change
RUNWAY END ELEVATIONS (a)		Existing	124'	136'	123'	134'
		Future	No Change	No Change	No Change	No Change
RUNWAY MARKINGS		Existing	Visual	Visual	Visual	Visual
		Future	No Change	No Change	No Change	No Change
RUNWAY TOUCH DOWN ZONE ELEVATION		Existing	133'	130'	131'	128'
		Future	No Change	No Change	No Change	No Change
NAVIGATION AIDS		Existing	None	None	GPS	None
		Future	No Change	No Change	No Change	No Change
VISUAL AIDS		Existing	VASI 4°, REIL	VASI 4°, REIL	None	VASI 4°
		Future	No Change	No Change	No Change	No Change
APPROACH TYPE (FAR Part 77 Category)		Existing	Visual [A(V)]	Visual [A(V)]	Visual [A(NP)]	Visual [A(V)]
		Future	No Change	No Change	No Change	No Change
APPROACH VISIBILITY (Minimums)		Existing	Visual	Visual	1 1/4 Mi. Straight-in	Visual
		Future	No Change	No Change	No Change	No Change
APPROACH SLOPE (Required/Clear)		Existing	20:1/42:1	20:1/37:1	20:1/39:1	20:1/33:1
		Future	No Change	No Change	No Change	No Change
RUNWAY SAFETY AREA (Width)		Existing	120'	120'	120'	120'
		Future	No Change	No Change	No Change	No Change
RUNWAY SAFETY AREA (Length Beyond Runway End)		Existing	684'	147' (c)	688'	161' (c)
		Future	No Change	No Change	No Change	No Change
OBSTACLE FREE ZONE (Width)		Existing	250'	250'	250'	250'
		Future	No Change	No Change	No Change	No Change
OBSTACLE FREE ZONE (Length Beyond Runway End)		Existing	200'	200'	200'	200'
		Future	No Change	No Change	No Change	No Change
OBJECT FREE AREA (Width)		Existing	250'	250'	250'	250'
		Future	No Change	No Change	No Change	No Change
OBJECT FREE AREA (Length Beyond Runway End)		Existing	684'	147' (c)	688'	161' (c)
		Future	No Change	No Change	No Change	No Change
HOLD LINE (DISTANCE FROM RUNWAY CL)		Existing	125'	125'	125'	125'
		Future	No Change	No Change	No Change	No Change

RUNWAY DATA

		RUNWAY 13L-31R		RUNWAY 13R-31L	
		EXISTING	FUTURE	EXISTING	FUTURE
AIRPORT REFERENCE CODE		B-I (small)	No Change	B-I (small)	No Change
CRITICAL AIRCRAFT	AIRCRAFT	Baron 58	No Change	Baron 58	No Change
	WINGSPAN	37.8'	No Change	37.8'	No Change
	UNDERCARRIAGE WIDTH	>7'	No Change	>7'	No Change
	APPROACH SPEED (kts.)	96	No Change	96	No Change
	MAX. TAKEOFF WT. (lbs.)	5,500	No Change	5,500	No Change
PHYSICAL LENGTH AND WIDTH		3,101' x 75'	3,194' x 75'	3,099' x 75'	3,178' x 75'
RUNWAY HIGH POINT		133'	No Change	131'	No Change
RUNWAY LOW POINT		121'	No Change	120'	No Change
VERTICAL LINE OF SIGHT PROVIDED		Yes	No Change	Yes	No Change
EFFECTIVE GRADIENT (%)		0.48%	No Change	0.48%	No Change
MAXIMUM GRADIENT (%)		0.75%	No Change	1.25%	No Change
RUNWAY/TAXIWAY SURFACE TYPE		Asphalt	No Change	Asphalt	No Change
PAVEMENT STRENGTH (1,000#) - S/D/DT		17/-/-	No Change	17/-/-	No Change
RUNWAY EDGE LIGHTING		MIRL	No Change	None	No Change



ALL WEATHER WIND ROSE

WIND COVERAGE

Runway	12 M.P.H. (10.5 Knots)	15 M.P.H. (13 Knots)
13L-31R	98.75%	99.61%
13R-31L	98.75%	99.61%
Combined	98.75%	99.61%

SOURCE: RECORDS OF SAN JOSE WEATHER STATION, DEPARTMENT OF PUBLIC WORKS, COOPERATIVE STATION OF THE U.S. WEATHER BUREAU, 1937-1947.

PROPOSED DECLARED DISTANCES

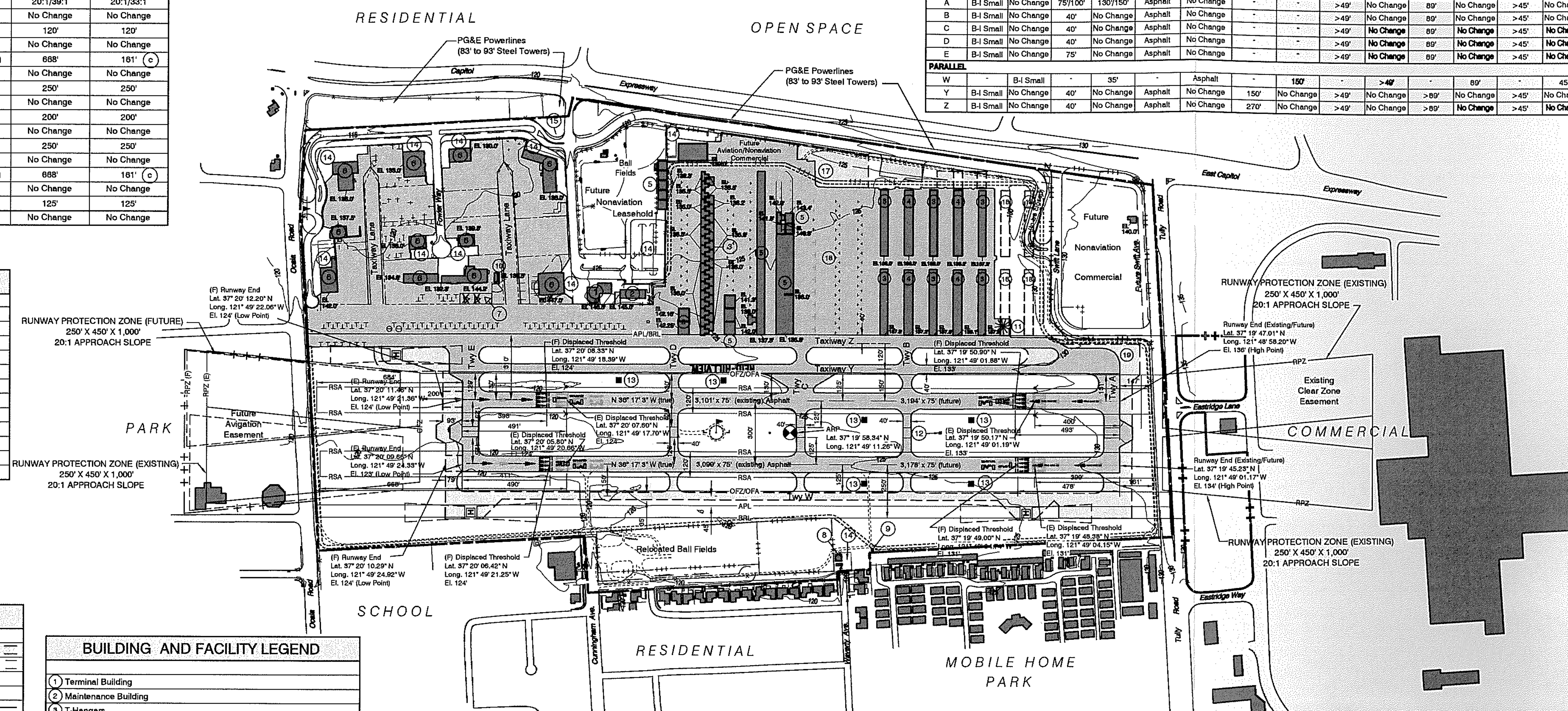
		13L	31R	13R	31L
TAKEOFF RUN AVAILABLE	TORA	3,194'	3,194'	3,178'	3,178'
TAKEOFF DISTANCE AVAILABLE	TODA	3,194'	3,194'	3,178'	3,178'
ACCELERATE-STOP DISTANCE AVAILABLE	ASDA	3,101'	3,194'	3,099'	3,178'
LANDING DISTANCE AVAILABLE	LDA	2,703'	2,701'	2,609'	2,700'

TAXIWAY DATA

TAXIWAY	DESIGN GROUP		WIDTH		SURFACE TYPE		RWY CL. to TWY CL.		TAXIWAY SAFETY AREA WIDTH		TAXIWAY OBJECT FREE AREA WIDTH		TWY. CL. to FIXED or MOVEABLE OBJECT		TAXIWAY WINGTIP CLEARANCE	
EXIT	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
A	B-I Small	No Change	75'/100'	130'/150'	Asphalt	No Change	-	-	>49'	No Change	89'	No Change	>45'	No Change	20'	No Change
B	B-I Small	No Change	40'	No Change	Asphalt	No Change	-	-	>49'	No Change	89'	No Change	>45'	No Change	20'	No Change
C	B-I Small	No Change	40'	No Change	Asphalt	No Change	-	-	>49'	**No Change**	89'	**No Change**	>45'	**No Change**	20'	**No Change**
D	B-I Small	No Change	40'	No Change	Asphalt	No Change	-	-	>49'	**No Change**	89'	**No Change**	>45'	**No Change**	20'	**No Change**
E	B-I Small	No Change	75'	No Change	Asphalt	No Change	-	-	>49'	**No Change**	89'	**No Change**	>45'	**No Change**	20'	**No Change**
PARALLEL																
W	-	B-I Small	-	35'	-	Asphalt	-	**150'**	-	**>49'**	-	89'	-	45'	-	20'
Y	B-I Small	No Change	40'	No Change	Asphalt	No Change	150'	No Change	>49'	No Change	>89'	No Change	>45'	No Change	20'	No Change
Z	B-I Small	No Change	40'	No Change	Asphalt	No Change	270'	No Change	>49'	No Change	>89'	**No Change**	>45'	**No Change**	20'	**No Change**

AIRPORT DATA

		EXISTING	FUTURE
AIRPORT REFERENCE CODE		B-I (small)	No Change
AIRPORT REFERENCE POINT (a)	Latitude	37° 19' 58.343" N	No Change
	Longitude	121° 49' 11.262" W	No Change
AIRPORT ELEVATION (Above Mean Sea Level)		136'	No Change
MEAN MAX. TEMP. (Hottest Month)		84.0° F (July)	No Change
AIRPORT AND TERMINAL NAVIGATIONAL AIDS		Beacon, VOR/DME	No Change
GPS APPROACH ESTABLISHED		Yes	No Change
AIRPORT ACREAGE	Fee Simple	179	186
	Avigation Easement	19	27
AIRCRAFT PARKING SPACES	Tiedowns	460	No Change
	Hangar Units	185	222
	Helicopter	5	No Change



DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
OTHER PAVEMENT IN USE		
AIRPORT PROPERTY LINE		
OTHER PROPERTY LINES		
AVIGATION EASEMENT		
INTERNAL BOUNDARY (lease, R.O.W., etc.)		
CRITICAL AIRFIELD AREAS *	XYZ	XYZ
BUILDING		
FENCE		
VEHICLE GATE		
WIND CONE		
AIRFIELD LIGHTS: SINGLE/GROUP/FLASHING		
BEACON		
UTILITY POLE / POWER LINE		
TOPOGRAPHIC CONTOURS	XXX	
WATERWAY / CULVERT		
CHANNEL		
AIRPORT REFERENCE POINT		
SECTION CORNER (b)		

* Applicable to the following:

- APL - Aircraft Parking Limits
- BRL - Building Restriction Line
- OFA - Object Free Area
- OFZ - Obstacle Free Zone
- RPZ - Runway Protection Zone
- RSA - Runway Safety Area

BUILDING AND FACILITY LEGEND

1. Terminal Building
2. Maintenance Building
3. T-Hangars
4. Aircraft Shelters
5. Aircraft Box Hangars
6. Fixed Base Operator
7. Helicopter Parking
8. Air Traffic Control Tower (el. 170', top of handrail)
9. Electrical Vault
10. Fuel Island
11. Compass Rose
12. Ceilometer
13. VASI
14. Automobile Parking
15. Beacon Tower
16. (Not Used)
17. Future Fuel Farm
18. Future Storage Hangars
19. Future Compass Rose
20. Future Aircraft Parking

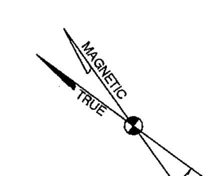
Note: Elevations of structures shown in the drawing.

ALP NOTES

(a) Airport coordinate data source: National Oceanic and Atmospheric Administration (NOAA) Obstruction Chart dated May 4, 1992. Data is NAD 83 and NAVD 88. NOAA's VERTCON program used to convert original NGVD 29 data to NAVD 88.

(b) The airport is in Township 7 South, Range 1 East. This quadrangle has not been sectioned.

(c) Nonstandard Conditions:
- Runway Safety Area and Object Free Area for Runway 31L & Runway 31R is less than 300'.
- Declared distances established.



DECLINATION:
14° 37' E
MARCH 2005
ANNUAL RATE OF CHANGE
0° 5' W

300'
0 FEET 600'

SUBMITTED BY:
County of Santa Clara

By ______________ Date

FAA Approval Space

NO.	REVISION	SPONSOR	DATE

REID-HILLVIEW AIRPORT
SAN JOSE, CALIFORNIA

AIRPORT LAYOUT PLAN

MEAD & HUNT
ENGINEERS ARCHITECTS SCIENTISTS PLANNERS
707 Aviation Blvd., Santa Rosa, California 95403 - (707) 526-5010

DESIGN: DD/MT	DRAWN: TE/GJ	DATE: JULY 2005	SHEET 1 OF 1

The preparation of these documents was financed in part through a planning grant from the Federal Aviation Administration as provided under Section 505 of the Airport and Airway Improvement Act of 1982, as amended. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.