



PALO ALTO AIRPORT

PUBLIC WORKS DEPARTMENT

2021 ANNUAL NOISE COMPLAINTS REPORT

(January 1st 2021 to
December 31st 2021)

Vision: Palo Alto Airport strives to balance the rights of Pilots to fly with the rights of neighbors to a peaceful living environment. This document is a report of the noise complaints received by the airport in 2021. Airport staff uses this information to identify trends in neighboring communities. These trends inform communications between Airport staff and Pilots on the issue of noise.



Introduction:

The following is a report of noise complaints received by Palo Alto Airport (PAO) in 2021. The Federal Aviation Administration (FAA) defines air travel routes and procedures, including defining separation distances between aircraft, determining hazards to aviation and all other safety criteria for aircraft, and is responsible for directing and enforcing the movement of aircraft in flight. Although organizations can petition the FAA regarding flight procedures, the FAA has the final say in what is safe and acceptable. The Airport Noise and Capacity Act (ANCA) of 1990 federally prohibits public-use Airports from restricting airspace in any way.

The FAA measures noise based on the Yearly Day and Night Average Sound Level (DNL) and the Community Noise Equivalent Level (CNEL). While both are essentially the same, Airports in California use the CNEL method to measure noise. CNEL is a method of averaging single event aircraft noise into a weighted 24-hour average. The system adds penalties to all events occurring during the evening (7pm – 10pm) and the night (10pm – 7am). The Santa Clara County Airport Land Use Commission (SCC ALUC) performed a noise study for the Palo Alto Airport using the CNEL to determine the noise contours for 55, 60, 65, and 70 decibels. The contour map is included as **Attachment A**.

Regarding safety and altitude, the FAA has in place Federal Aviation Regulations (FARs) that establish Minimum Safe Altitudes (MSAs) for aircraft. For fixed wing aircraft, the MSA is 1,000 feet above ground when over congested areas and 500 feet when not over congested areas. These MSAs apply to all fixed wing aircraft except when necessary for landing and takeoff operations. Helicopters are exempt from these altitude restrictions due to the nature of their flight. These minimum altitudes are enforced by the FAA Flight Standards District Office in San Jose, not by Palo Alto Airport. Palo Alto Airport cannot tell Pilots when or where to fly; the Airport, however, does have voluntary noise abatement procedures that Palo Alto Airport recommends that Pilots follow. (See the Noise Abatement Procedures section below.)

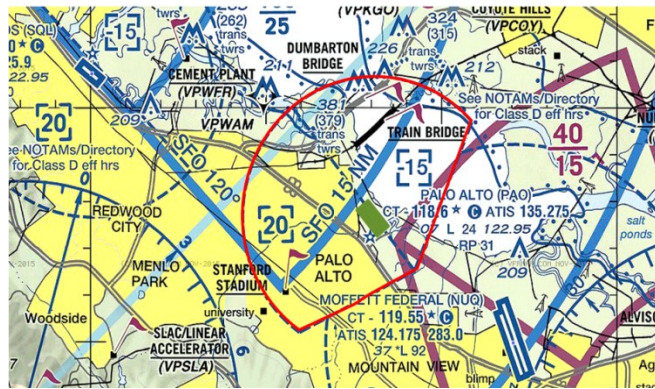
The Airport receives noise complaints via email at pao@cityofpaloalto.org and a noise complaint hotline (650) 329-2405. Airport staff review and timely respond to all complaints, ascertaining as much information from complainants, including contact information, date, time, and description of the occurrence. Various flight trackers can be used to help identify the aircraft involved and verify if FAA regulations or Palo Alto Airport procedures were violated. The Airport staff reviews and compiles all data to determine trends with flying activities.

Purpose:

The purpose of the Palo Alto Airport Annual Noise Report is to identify noise trends in the surrounding areas and determine compliance with established voluntary noise abatement procedures.

Airspace:

The Palo Alto Airport airspace is unique. The congested Bay Area airspace is dominated by SFO Class Bravo airspace, which encompasses a 30 nautical mile radius around SFO. Underneath the Class Bravo airspace lays the Class Charlie airspace of Oakland and San Jose international Airports. Finally, Moffett Airfield lies approximately 4 nautical miles to the southeast of Palo Alto Airport.



Palo Alto Airport Sectional Map
Palo Alto Airport in Green
PAO Airspace highlighted in Red

Source: <http://vfrmap.com/?type=vfrc&lat=37.461&lon=-122.115&zoom=10>

As a result, Palo Alto Airport airspace ends only 1.5 nautical miles southeast of the Palo Alto Airport's single runway (Runway 13/31). To land at Palo Alto Airport, aircraft must turn before entering Moffett's airspace, resulting in aircraft having to space themselves in traffic patterns over the Peninsula when take-off/landing volumes peak. The FAA's Air Traffic Control Tower (ATCT) at Palo Alto Airport has a letter of agreement with Moffett's ATCT providing Palo Alto Airport aircraft with extensions into Moffett airspace when Moffett airfield is not in use. The additional airspace is a useful mitigation tool during busy times.

Further restrictions in Palo Alto Airport airspace come from San Jose Class C airspace, starting at 1,500 feet Mean Sea Level, just southeast of Palo Alto Airport and SFO Class B airspace, starting at 2,500 feet Mean Sea Level, just northeast of the Palo Alto Airport. Both are identified on the Palo Alto Airport Sectional Map: San Jose Class C is shown with thick magenta lines and SFO Class B is shown with thick blue lines. These restrictions play a vital role in aircraft departures, in turn influencing noise abatement procedures for the Palo Alto Airport.

Noise Abatement Procedures:

Noise abatement procedures are voluntary procedures that the Airport asks pilots to follow. The Airport is prohibited from restricting airspace. Palo Alto Airport staff will speak with individual Pilots and educate them about the voluntary noise abatement procedures. The Palo Alto Airport cannot levy fines on Pilots that violate the voluntary noise procedures. For illustrated noise abatement procedures reference Palo Alto Airport Pilots Handout included as **Attachment B**.

The noise abatement procedures depend on the runway that is in use at the time. Depending on weather patterns, aircraft can depart on Runway 31 to the northeast or Runway 13 to the south east. Approximately 90% of the time, weather conditions require the use of Runway 31. Pilots are asked to not make a left crosswind departure from Runway 31, but instead make a "Left Dumbarton Departure" (fly to the Dumbarton Auto Bridge before making a left turn and flying over East Palo Alto) or a right 270 degree turn before departing to the outh or west. When aircraft are using Runway 13, Pilots are asked to make a

left 270-degree turn. In addition to these procedures, Pilots are asked to climb to 1,500 feet or above ground before crossing Highway 101 and reduce power when safely able.

For arrivals, it is standard practice and necessary for Pilots to descend to pattern altitude before entering the traffic pattern around PAO, sometimes requiring aircraft to descend below the 1,500 feet minimum of departing aircraft over Palo Alto. As these aircraft are descending to land the engines are generally powered back and quieter than ascending aircraft.

Airport staff continuously engages with Airport tenants and Pilots about the voluntary noise abatement procedures, always noting that safety always supersedes noise.

Findings:

The Palo Alto Airport remains one of the busiest general aviation airports in the Bay Area with an average of 158,280 operations per year since 2011. The year 2021 marks the second year of the Covid-19 Pandemic and during this time, operations increased by 45,856 which is a 34% increase during 2021 compared to the 2020 calendar year and it's the highest amount of operations since 2015. An operation is defined as either a takeoff or a landing and a touch-and-go procedure will account for two operations.

Table 1. Airport Operations for Palo Alto Airport

Year	Air Taxi	Military	Total	Year	Air Taxi	Military	Total
2002	62	1	208,755	2012	1,700	16	176,564
2003	17	1	212,981	2013	1,628	14	172,653
2004	619	12	199,453	2014	1,518	22	179,900
2005	2,397	28	184,821	2015	1,082	118	172,132
2006	1,932	17	176,570	2016	708	52	153,238
2007	1,440	318	181,883	2017	872	146	148,769
2008	1,697	280	174,332	2018	760	133	146,181
2009	1,650	301	155,556	2019	920	63	150,266
2010	2,077	6	158,217	2020	620	45	112,712
2011	1,572	8	170,389	2021	566	23	158,568
Avg	1346.3	97.2	182295.7	Avg	1037.4	63.2	157098.3

During the 2021 Calendar year, the Airport logged 253 total noise complaints from 27 households. **Table 2** shows the number of complaints by quarter and includes the totals from 2020.

Table 2. Complaints Received

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total 2021	Total 2020
Complaints	143	60	36	14	253	514
Households	10	11	23	10	27	29

Table 3 sorts the complaints logged into three sections. The first one is PAO which includes all complaints that involve aircraft that performed an operation at the Airport. The next section is General which includes complaints that did not include a specific aircraft or incident of noise. These complaints may or may not involve aircraft from PAO. The last section is Non-PAO, which include aircraft that are not based or did not operate at the Airport. These flights may include California Highway Patrol, Coast Guard, Air Taxis, Pipe Surveys, Stanford Life Flight, Angel Flights, and or banner towing operations. Also included in Table 3 are the totals for 2020.

Table. 3 Aircraft Assosiation

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total 2021	Total 2020
PAO	138	59	31	14	242	262
General	4	0	6	1	11	96
Non-PAO	1	1	6	13	21	104

Table 4 below provides a detailed breakdown of the 253 complaints by city. Most complaints came from the city of Los Gatos, with 171 complaints logged from 1 household and most of the complaints on the first and second quarter of this year. The City of Palo Alto had a total of 39 complaints from 8 households.

Table 4. Noise Complaints by City

City	Q1		Q2		Q3		Q4		Total 2021		Total 2020	
	C	H	C	H	C	H	C	H	C	H	C	H
Palo Alto	4	2	10	4	19	9	6	3	39	8	38	4
Sunnyvale	1	1			1	1			2	1	85	1
Menlo Park			3	2	2	2			5	2	28	3
Saratoga									0	0	232	2
Los Gatos	129	1	42	1	1	1			171	1	77	1
Los Altos					1	1			1	1	37	3
Portola Valley	1	1			1	1			2	1	2	2
East Palo Alto	1	1	2	1	6	4	3	3	12	3	3	2
Santa Cruz					1	1			1	1	2	2
Santa Clara					1	1			2	1	1	1
Fremont	1	1	1	1					2	1	0	0
NA	1	1	1	1					2	1	9	8
San Jose	4	1					2	2	6	1	0	0
Woodside	1	1							1	1	0	0
Moutain View			1	1	2	1	2	1	5	2	0	0
Atherton					1	1			1	1	0	0
Pescadero							1	1	1	1	0	0
	143	10	60	11	36	23	14	10	253	27	514	29

Table 5 below shows the general type of aircraft identified as causing noise complaints at the airport. There are 2 types of engines for aircraft utilizing PAO. The first is reciprocating which is similar to an automobile engine, and the second is turboprop which is a turbine engine with a propeller that produces thrust. Aircraft are further differentiated by “multi” and “single” which denotes the number of engines for the aircraft. As Table 5, shows single reciprocating aircraft produced the largest portion of noise complaints. This class of aircraft represents most of the fleet at PAO and usually consists of Cessna, Pipers and Cirrus aircraft.

Table 5. Aircraft Type

	Helicopter	Multi Reciprocating	Multi Turbo Prop	Single Reciprocating	Single Turbo Prop	Unknown
2020 Complaints	9	11	11	347	22	10
2021 Complaints	8	8	4	200	24	9

Table 6 below shows the number of violations of the established noise abatement procedures. Airport staff makes every effort to talk to all pilots that violate these procedures, but it is difficult to talk to all transient Pilots about noise abatement procedures. It is not the role of the FAA Air Traffic Control Tower to advise Pilots of the noise abatement procedures, but the City has developed a working relationship with the Air Traffic Control Tower (ATCT) and Air Controllers do advise Pilots of the noise abatement procedures when they have the ability to do so.

Table 6. Observed violations of voluntary noise abatement procedures

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Tenant	4	3	3	1	11
Transient	0	1	3	0	4
Unknown	0	0	0	0	0
Total	4	4	6	1	15
Complaints	143	60	35	14	153
Operations	34,500	41,100	45314	30644	158568
% Compliance	99.90%	99.90%	99.90%	99.99	99.99

Attachment A

PAO Noise Contour Map

Following is a noise contour map for PAO, adopted by the Santa Clara County Airport Land Use Commission (SCC ALUC) in their 2008 Comprehensive Land Use Plan, reflecting the forecasted noise contours for Palo Alto Airport in 2022.

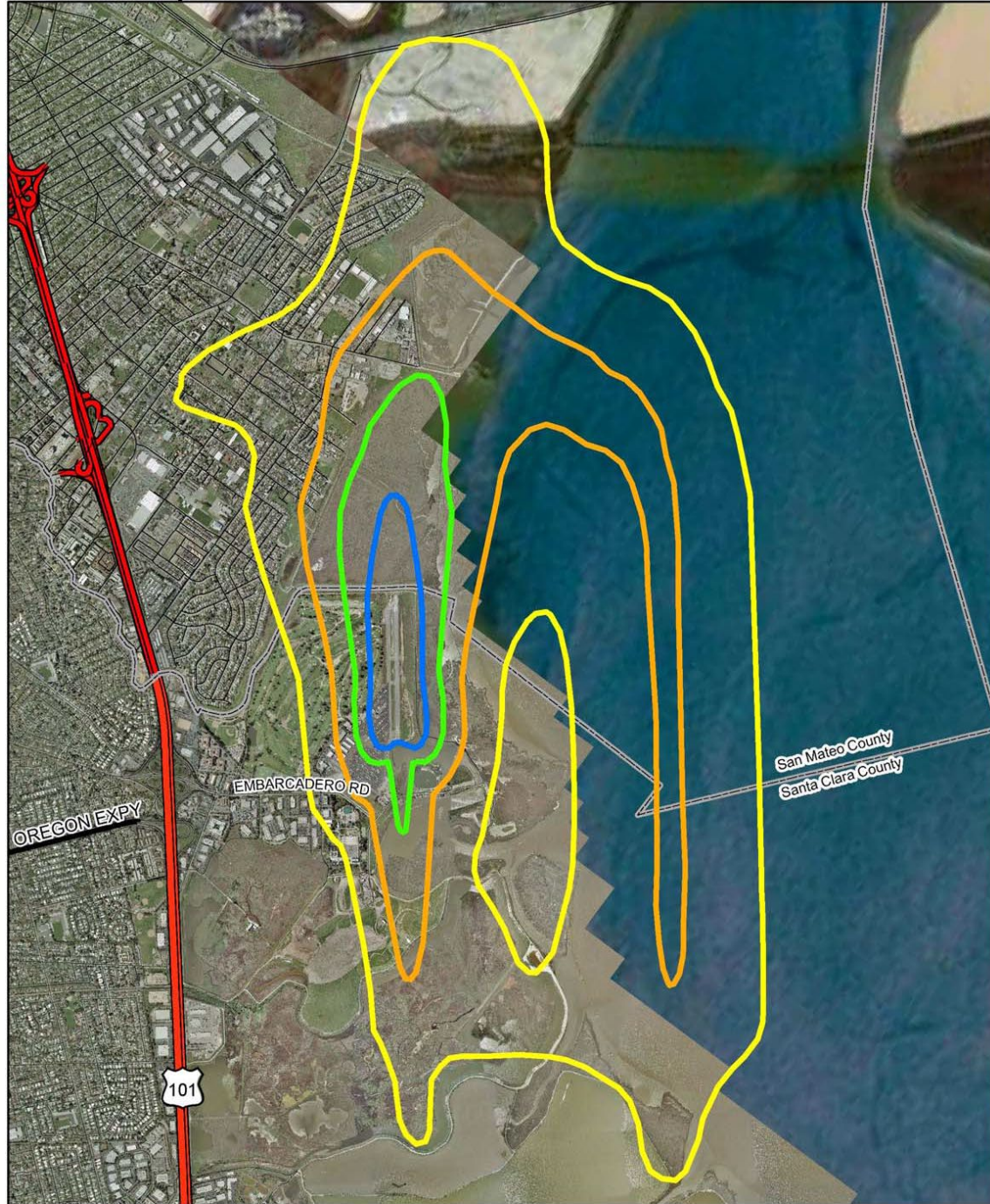
SCC ALUC used the Integrated Noise Model which considers airport altitude, mean temperature, runway configuration, aircraft flight track definition, aircraft departure and approach profiles, aircraft traffic volume and fleet mix, and flight track utilization by aircraft types. All data is entered into the CNEL formula to prepare the noise contours for Palo Alto Airport.

The 65 decibel (db) noise level of the Airport extends beyond the Airport boundaries, but is only over Palo Alto Golf Course, Palo Alto Baylands Nature Preserve, and the salt marshes in San Mateo County.

Refer to https://www.sccgov.org/sites/dpd/DocsForms/Documents/ALUC_20081119_PAO_CLUP.pdf, for a more detailed description of how the SCC ALUC prepared this map.

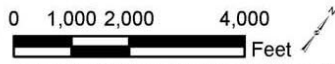
2022 Forecasted Palo Alto Airport Noise Contour Map

Palo Alto Airport



Noise Contours (CNEL)
55 60 65 70

2022 Aircraft Noise Contours
Figure 5



This map created by Santa Clara County Planning Office. The GIS data was compiled from various sources. While deemed reliable, the Planning Office assumes no liability. 3/25/2022 - Y:\M&P\ALU\projects\PAAP\figure_5_v4.mxd

Attachment B

PAO Pilot Handout

Santa Clara County created a Pilot Handout for Palo Alto Airport that described the noise abatement procedures. When the City of Palo Alto assumed control of the Airport, the existing noise abatement procedures were adopted, with one exception, “pilots must maintain 1,500 feet or above across Highway 101” was replaced with “Aircraft are asked to climb to and maintain at least 1,500 feet before crossing Highway 101.” The change is consistent with the voluntary nature of noise abatement procedures as Airports are federally prohibited from instructing Pilots how to fly.



CITY OF PALO ALTO

Palo Alto Airport General Information
 Bayside Pattern Alt - 800 feet
 Peninsula Side Pattern Alt – 1000 feet MSL
 ATCT hours of operation – 0700 – 2100 hrs
 ATC / CTA Frequency – 118.600
 ATC Ground Frequency – 125.000
 Fuel Frequencies – 122.85 or 122.95
 Airport Office Phone # – (650) 329-2444

Palo Alto Airport asks for your cooperation in reducing the noise impact of aircraft on the neighboring communities.

CAUTION

The Palo Alto Baylands preserve is located immediately to the north of the airport. Watch for birds on or near the airport.

Be alert for bikes & pedestrians crossing a levee road 290' from departure end to Runway 31.

Noise Abatement Procedures

Please fly neighborly and be aware of the surrounding communities. There are noise sensitive areas to the west and south of the Airport. Aircraft are asked to climb and maintain at least 1500 feet before crossing Highway 101.

Fly over the bay whenever possible.

Please use reduced power setting whenever possible to reduce noise impacts. Even a reduction in a 200 RPM can significantly reduce noise.

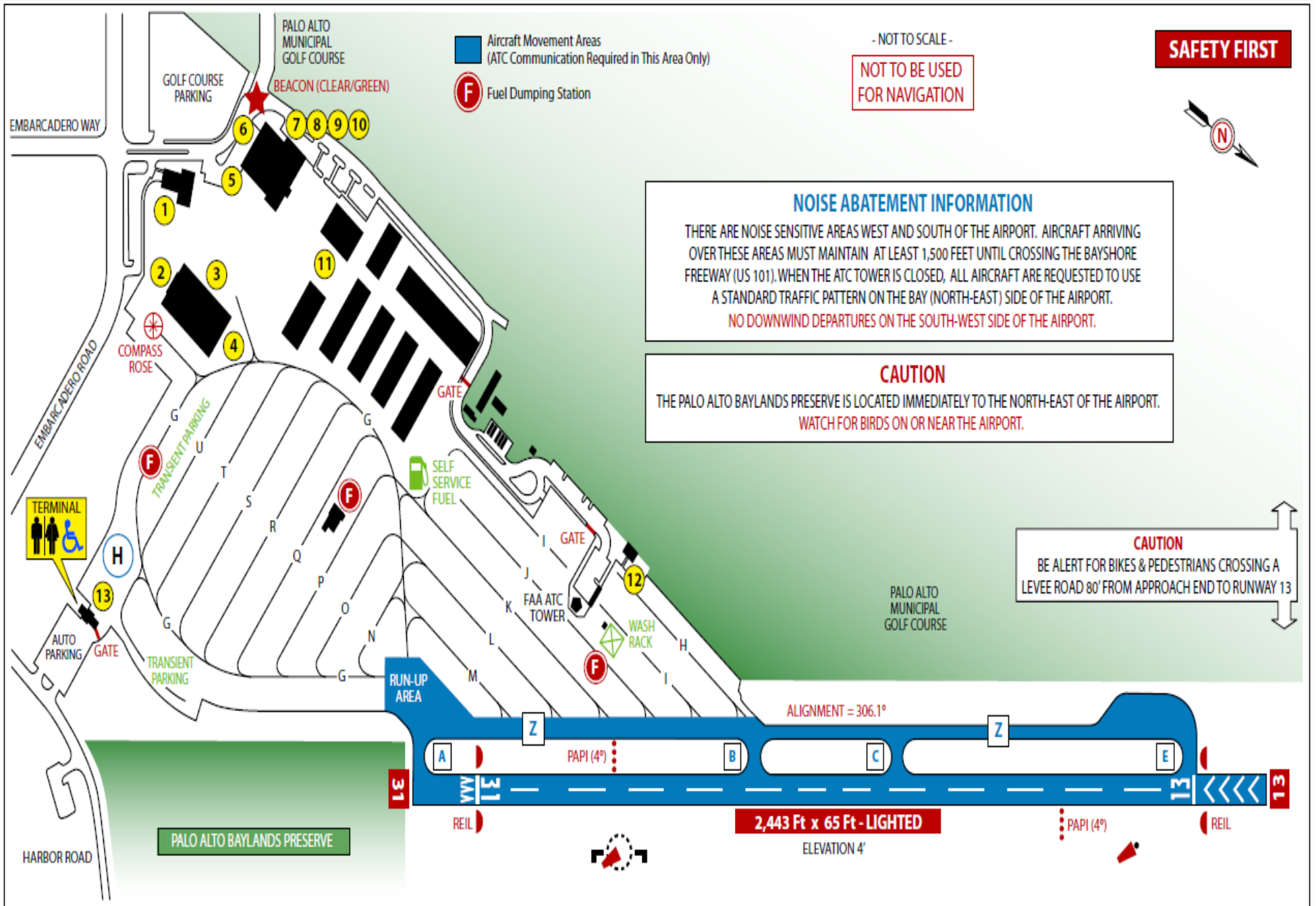
Safety Always Supersedes Noise Abatement

Preferred West Bound Departures

Runway 31
Left Dumbarton Departure
 When departing runway 31 turn right 10° on takeoff and climb over the bay. Fly straight to Dumbarton Auto Bridge before making a left turn to fly over the peninsula or to the south. Cross Highway 101 at or above 1500 feet.

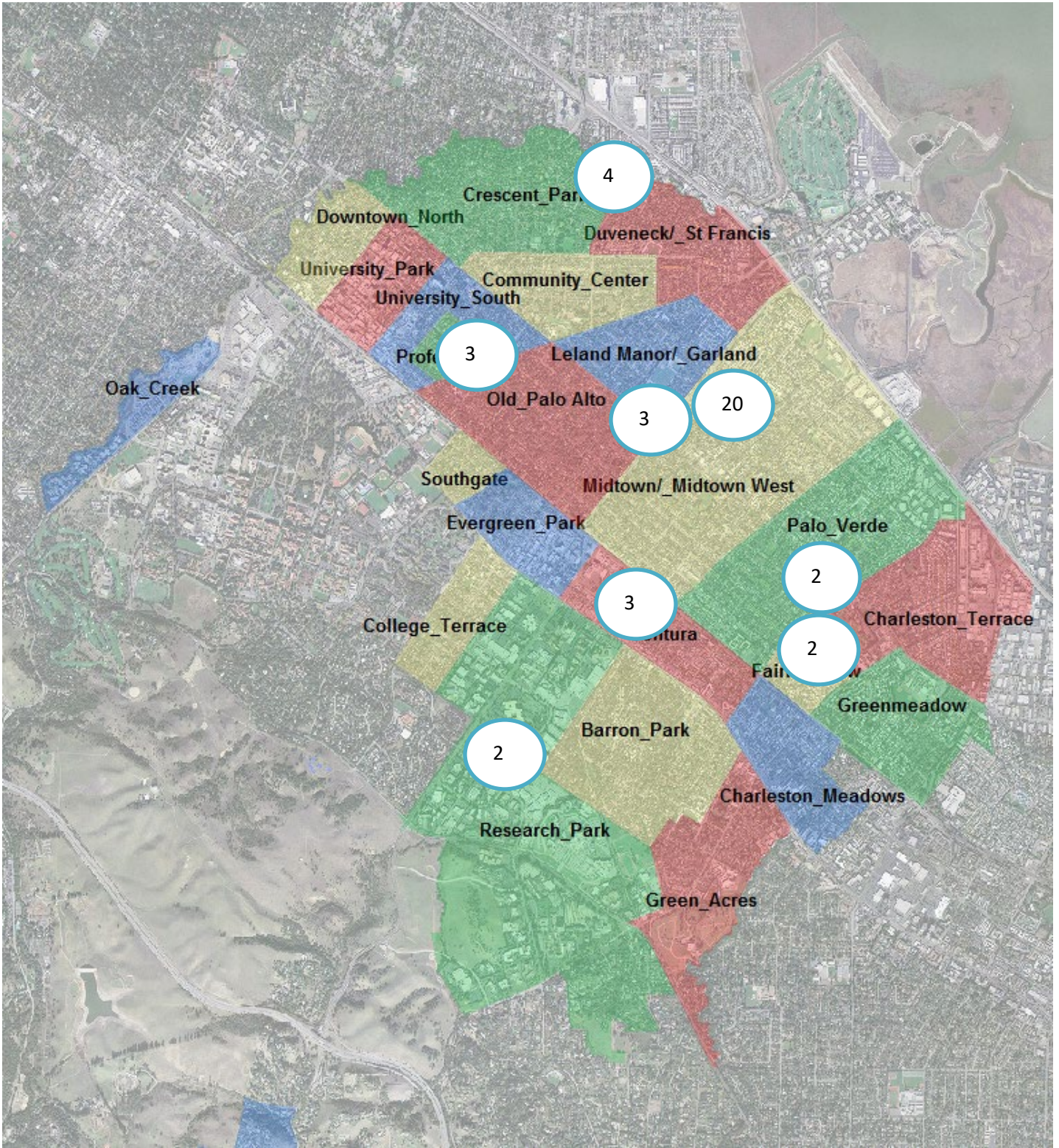
Left 270 Departure
 After takeoff climb over the bay while making a 270° turn and heading west or south over the peninsula. Cross Highway 101 at or above 1500 feet.

Runway 13
Right 270 Departure
 After takeoff turn right over and climb over the bay while making a 270° turn and heading west or south over peninsula. Cross Highway 101 at or above 1500 feet.



Attachment C

Map of Palo Alto households



This map shows the approximate location and number of complaints from households within Palo Alto. This map was generated using GIS by Airport staff.