

APPENDIX 3.13

Aviation Noise Technical Report



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ENVIRONMENTAL SERVICES
AUGUST 28, 2019

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
AIRPORT NOISE OVERVIEW
DRAFT

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1. INTRODUCTION

This report has been prepared for the Southern California Association of Governments (SCAG) to provide support for the 2020-2045 Connect SoCal Regional Transportation Plan (RTP)/Sustainable Communities Strategies (SCS) Program Environmental Impact Report (PEIR). The purpose of the report is to assess aviation noise impacts at a regional scale. SCAG is a metropolitan planning organization and does not have planning authority over airports but is primarily a regional surface transportation planning agency focused on airport activity as it affects the traffic accessing the airports. The seven commercial airports located in the SCAG region are the subject of this report, as these are the airports where employees, passengers, and cargo are traveling the region's transit systems. Detailed airport-specific noise analysis was not performed for this report due to SCAG's focus in ensuring adequate ground transportation access to the region's airports, as well as the limitation of available data to forecast future airport operations and potential changes in technology.

The report sections below refer to the noise metric Community Noise Exposure Level (CNEL). CNEL is a cumulative noise metric that reflects the noise exposure at a location over a 24-hour period for the average day of the year. For this report, the CNEL is reported on the basis of annual aircraft operations. An entire year of flight operations are examined utilizing specialized aircraft noise modeling programs. To account for the higher sensitivity to noise during the evening hours of 7:00 pm to 10:00 pm, CNEL adds a 4.77 dBA penalty, equivalent to multiplying the number of aircraft events by three in the noise modeling program. CNEL also adds a 10 dBA penalty for noise occurring during the sensitive nighttime hours of 10:00 pm to 7:00 am, equivalent to multiplying the number of aircraft events by ten¹. Title 21 of the *California Code of Regulations* contains the State of California Airport Noise Standards which identifies the noise impact boundary of airports to be a noise exposure of CNEL 65 or greater².

This report also refers to airport runway nomenclature such as Runway 15/33. Runways are numbered between 01 and 36 representing the magnetic heading of the runway in degrees divided by ten. Runway 09 heads 90 degrees clockwise from magnetic north, or due east, Runway 27 is directed 270 degrees or due west, and Runway 36 (360 degrees, not 0 degrees) points north.³ Runway 15/33 heads 150 degrees from magnetic north or southwest. If the runway operates in the opposite direction, 180 degrees difference, the heading is 330 degrees and the runway number is 33. Some airports have parallel runways with identical headings, and the letters L, R, and C are added to distinguish between the left, right, and center runways.

2. SCAG REGION

The SCAG Region includes the six counties of Ventura County, Los Angeles County, Orange County, San Bernardino County, Riverside County, and Imperial County, making it the largest metropolitan planning organization (MPO) in the nation. The region covers 191 cities, over 19 million residents, and 38,000 square miles. The area contains an expansive multiple airport system with seven commercial airports, seven government/military fields, and over 30 reliever and general aviation airports.

¹ https://www.faa.gov/regulations_policies/policy_guidance/noise/community/; 8-29-2019

² Title 21, Chapter 6 *Noise Standards*, Article 1 Section 5012 *Airport Noise Standard*, 9/12/2019

³ <https://worldwide-aviation.blogspot.com/2016/03/naming-for-runways.html>; 8-29-2019

3. AIRPORT DESCRIPTIONS

Hollywood-Burbank Airport (BUR)

Location

The Hollywood-Burbank Airport, or Bob Hope Airport, is located three miles northwest of downtown Burbank in the western portion of Los Angeles County. It is closer to Downtown Los Angeles than Los Angeles International Airport, located in the northern Los Angeles area, one mile south of Interstate 5, three miles north of State Highway 134, and three miles east of State Highway 170. The airport is surrounded by single family and multi-family residential land use within 0.2 miles of the runway on the north side and within 0.33 miles of the runway on the south side. The airport has some adjacent noise buffers including commercial land use directly east and west of the east-west runway and a cemetery to the south. [Figure 1, Hollywood-Burbank Airport Location](#), indicates the airport general location and relationship to these adjacent uses.

Physical and Operational Characteristics

The airport is categorized as a medium-hub primary airport (serving between 0.25 percent and 1.0 percent of total national enplanements) utilizing two intersecting runways. Runway 15/33 is 6,886 feet long by 150 feet wide and runs in the northwest-southeast direction while cross Runway 8/26 is 5802 feet long by 150 feet wide and runs east-west⁴. Aircraft operations include general aviation aircraft, scheduled commercial flights and military operations. Aircraft generally take off to the south on Runway 15 due to prevailing winds, and most landings occur on Runway 8. There is no currently no limit on the number of aircraft operations at the airport, but the commercial airlines have agreed verbally to abide by a voluntary curfew on operations between 10 p.m. and 7 a.m. and the current plans are to maintain this voluntary curfew⁵.

In 2014 a Regional Intermodal Transportation Center (RITC) was built adjacent to the airport providing the only area airport with a direct rail connection to Los Angeles. The Amtrak Pacific Surfliner and the Metrolink Ventura County Line provide service to the RITC as do the Metro Bus and BurbankBus. The Metrolink Antelope Valley Line provides service to the Burbank-Airport North Train Station where a complimentary airport shuttle service provides access to the airport.⁶ The airport plans a replacement terminal in the future.

⁴ www.airnav.com/airport/KBUR; 8/7/2019

⁵ Mark Hardyment, Director Transportation & Environmental Programs, Hollywood Burbank Airport; phone call 8/6/2019

⁶ <https://hollywoodburbankairport.com/ground-transportation/buses-trains/>; 8/29/2019



Figure 1 – Hollywood-Burbank Airport Location⁷

⁷ Google Earth; 8/29/2019

Existing Conditions

BUR operations for 2018 included 5.3 million annual passengers (MAP) and 54,700 tons of cargo with 132,023 total aircraft operations⁸. The airport is closely located to single family and multi-family residential land use within 0.2 miles of the runway on the north side and within 0.33 miles of the runway on the south side. The airport completed a Residential Acoustical Treatment Program to sound insulate approximately 2,450⁹ dwellings within the 65 CNEL noise impacted area¹⁰. Burbank-Glendale-Pasadena Airport Authority (BGPAA) operates a permanent noise monitoring system utilizing 20 noise monitors located in Burbank and the City of Los Angeles to assist in updating aircraft noise exposure on a quarterly basis¹¹. The Airport provides access to the noise monitoring real-time measurements, flight tracking, and submission of noise complaints through the online *WebTrack* system¹². The 65 CNEL and 70 CNEL contours from the *Quarterly Noise Monitoring at Hollywood Burbank Airport First Quarter 2019*¹³ (updated airport noise report based on average airport operations over the preceding 12 months) are shown on Figure 2, *Burbank Airport – 70 CNEL Contour for 1st Quarter 2019*, and Figure 3, *Burbank Airport – 65 CNEL Contour for 1st Quarter 2019*. Contour information for the remainder of 2019 is not yet available at the time of this assessment. The flight operations data through May 2019¹⁴ indicates operations are currently running approximately 4% higher than the operations included in the contours presented. However, the contours represent an annualized average and operations adjust seasonally; current operations include peak summer travel months that may be consistent this year with last year or may be slightly higher. Therefore, annualized operations may average out to be similar to or possibly slightly greater, resulting in similar or slightly larger assuming the same aircraft fleet mix. In the near term it is expected the aircraft fleet mix will remain similar; the fleet mix changes as air carriers replace aircraft with newer models or swap existing aircraft to accommodate changes in passenger demand.

⁸ <https://hollywoodburbankairport.com/about-us/airport-statistics/>; 8/7/2019

⁹ https://hollywoodburbankairport.com/wp-content/uploads/2019/04/BUR-NCP-Revision-032816-Final-Revised-Part-1_compressed.pdf, 9/12/2019; Mark Hardymont, Director, Transportation & Environmental Programs, Hollywood Burbank Airport, email 9/12/2019

¹⁰ <https://hollywoodburbankairport.com/noise-environment/noise-issues/>; 8/29/2019

¹¹ <https://hollywoodburbankairport.com/wp-content/uploads/2019/07/1Q-2019-Quarterly-Noise-Report.pdf>; 8/29/2019

¹² <https://webtrak.emsbk.com/bur1>; 8/29/2019

¹³ <https://hollywoodburbankairport.com/wp-content/uploads/2019/07/1Q-2019-Quarterly-Noise-Report.pdf>; 8/7/2019

¹⁴ <https://hollywoodburbankairport.com/about-us/airport-statistics/>; 8/7/2019

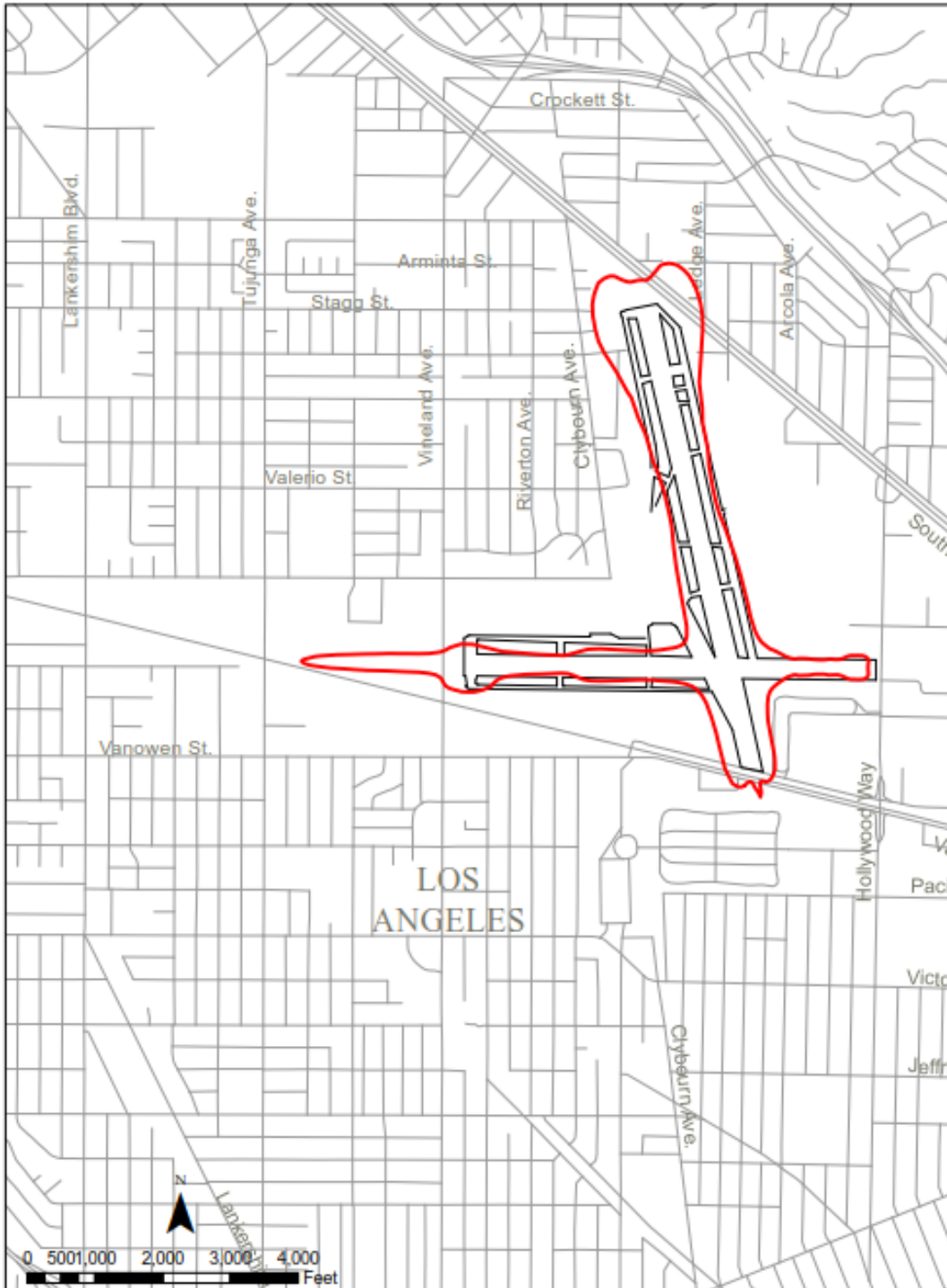


Figure 2 – Burbank Airport – 70 CNEL Contour for 1st Quarter 2019

Source: Quarterly Noise Monitoring at Hollywood Burbank Airport First Quarter 2019
by Acoustical Analysis Associates, Incorporated; AAI Report 1550

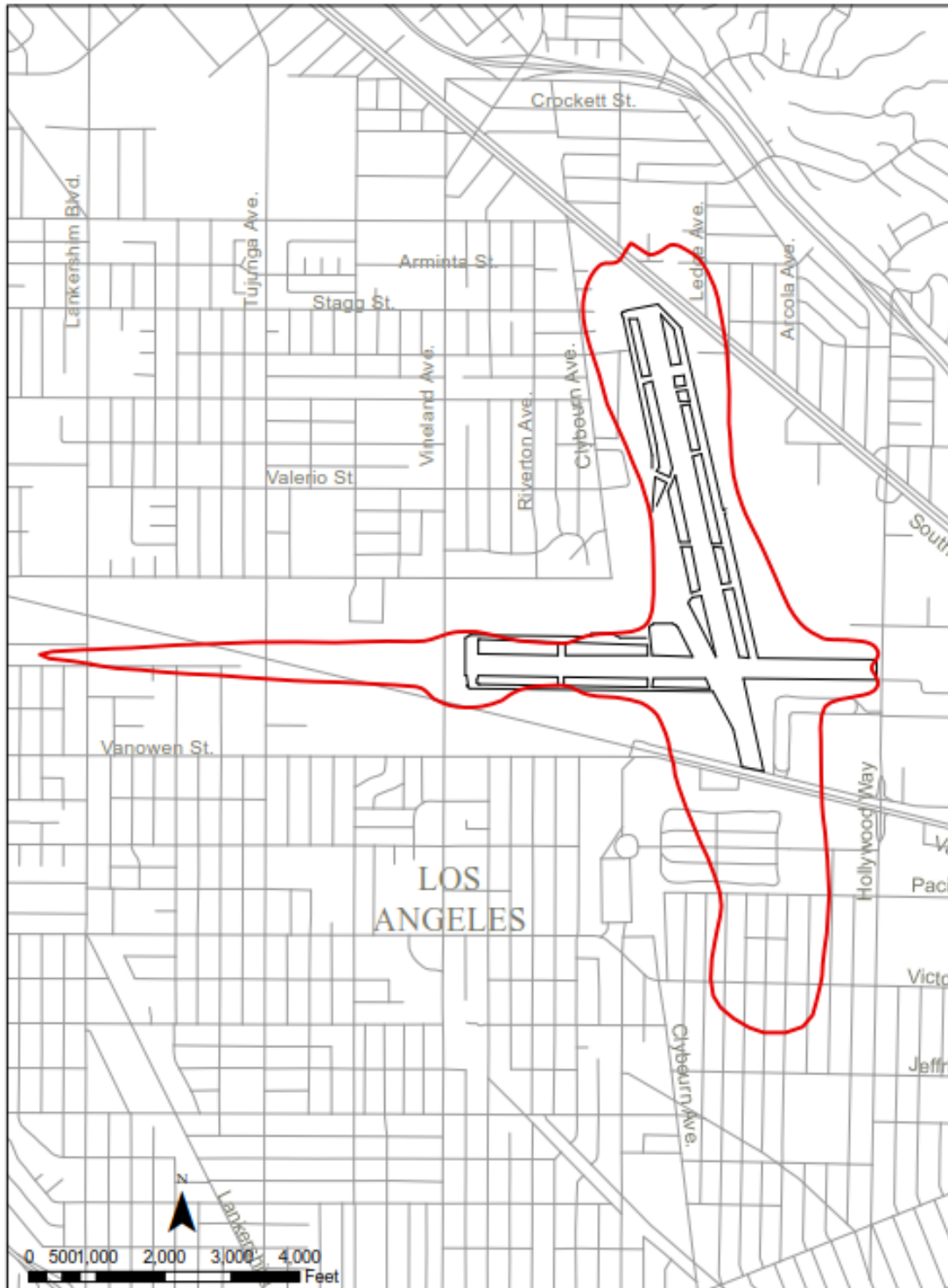


Figure 3 – Burbank Airport – 65 CNEL Contour for 1st Quarter 2019

Source: Quarterly Noise Monitoring at Hollywood Burbank Airport First Quarter 2019
by Acoustical Analysis Associates, Incorporated; AAAI Report 1550

Imperial County Airport (IPL)

Location

Imperial County Airport is located one-half mile south of the center of the business district of the City of Imperial and three miles north of El Centro, approximately 95 miles east of San Diego and 12 miles north of the California-Mexico border. It is north of Interstate 8 and west of State Highway 111. The airport is located partially in the City of Imperial and partially in the unincorporated area of Imperial County. The airport is surrounded by single family residential land use as close as 0.1 miles from the runway at the northeast, some agricultural land use to the north and west, and commercial/industrial land use to the south and east. [Figure 4, Imperial County Airport Location](#), illustrates the airports relationship to these land uses. There are no residences within the 65 CNEL noise impact contour of the airport.

Physical and Operational Characteristics

The airport is a small public-use airport categorized as a non-hub primary commercial service airport (serving less than 0.05 percent of total national enplanements) with two asphalt runways: 8/26 runs east-west and measures 4,501 feet by 75 feet and 14/32 northwest-southeast and measures 5,308 feet by 100 feet¹⁵. Aircraft operations include general aviation aircraft, scheduled commercial flights and military operations. There is currently no limit on the number of aircraft operations at the airport.

Existing Conditions

IPL operations for 2018 included approximately 0.0133 million passengers per year (MAP) with 14,573 aircraft operations and cargo operations totaled 1,448 tons¹⁶. Imperial County adopted an updated *Airport Land Use Compatibility Plan, Imperial County Airport*¹⁷, in 1996, which indicated projected future noise contours for use in land use planning. The earlier compatibility plan included noise contours based on more than double the number of operations considered plausible in the updated plan, and the aircraft mix included aircraft and business jets much noisier than those in use at the time of the update. Therefore, these earlier predicted noise contours were much larger than the actual noise contours of the airport. The future predicted noise contours for the 1996 update indicating the 55, 60, and 65 CNEL contours are shown in [Figure 5, Imperial County Airport Future Noise Contours](#)¹⁸. These future noise contours were developed considering a 20-year projection (i.e., theoretically through the year 2016) for 102,000 aircraft operations. As aircraft operations are well below this projected number, the current noise contours are significantly smaller than those indicated and no update to the ALUP is needed.

¹⁵ www.airnav.com/airport/KIPL; 8/7/2019

¹⁶ Sandra Gutierrez-Carver, IPL Airport Manager; 8/12/2019

¹⁷ <http://www.icpds.com/CMS/Media/ALUC-Compatibility-Plan-1996-Part-I.pdf>; 8/7/2019

¹⁸ <http://www.icpds.com/CMS/Media/ALUC-Compatibility-Plan-1996-Part-I.pdf>; 8/7/2019



Figure 4 – Imperial County Airport Location¹⁹

¹⁹ Google Earth; 8/29/2019

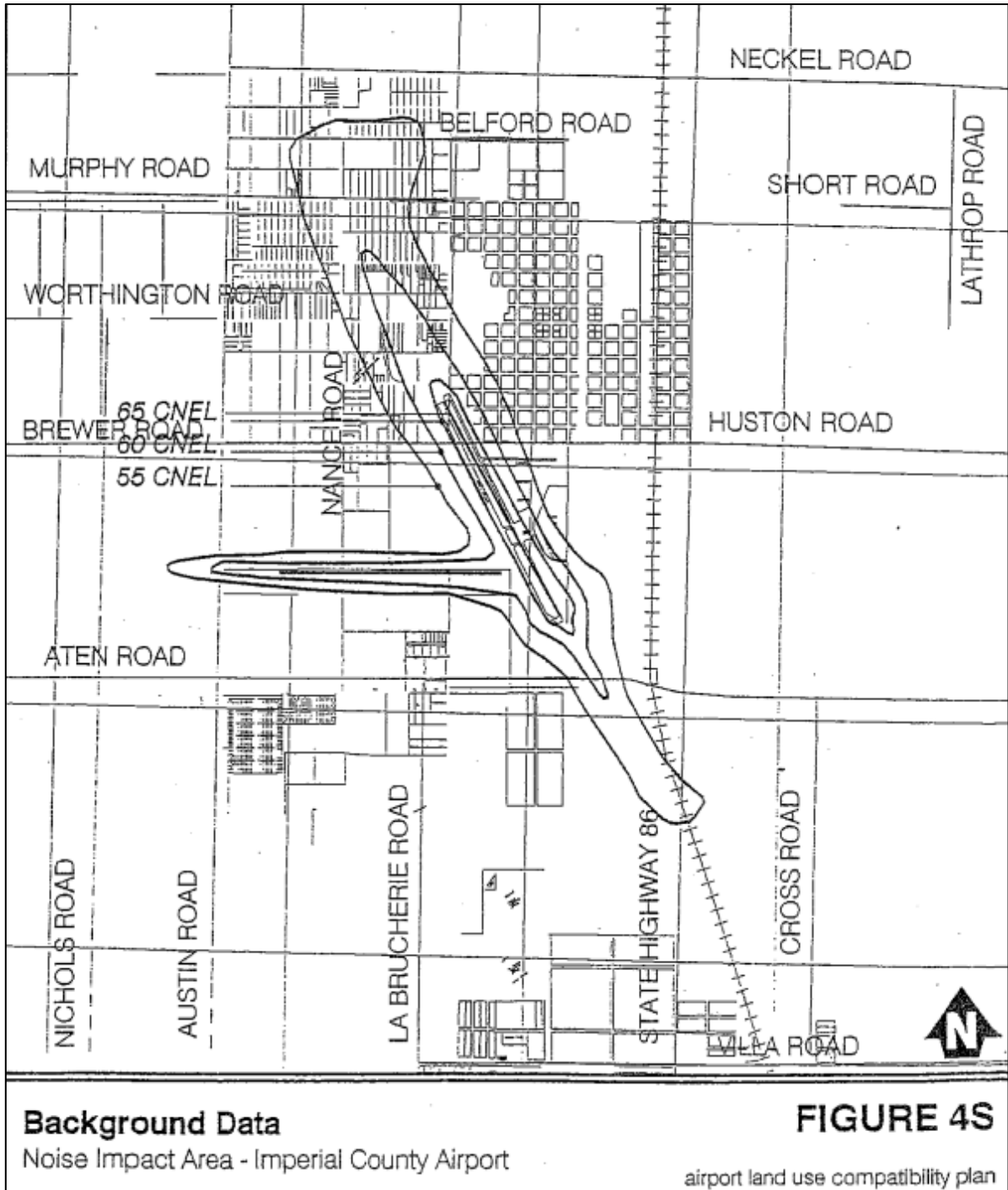


Figure 5 - Imperial County Airport Future Noise Contours

Source: *Airport Land Use Compatibility plan, Imperial County Airport*; <http://www.icpds.com/?pid=2202>

John Wayne Airport (SNA)

Location

John Wayne Airport is located on unincorporated land in Orange County approximately 0.5 miles southeast of the intersection of Interstate 405 and State Highway 55 with the north end of the airport abutting Interstate 405 and the south end of the airport adjacent on the east side of State Highway 73. The airport is surrounded by the cities of Irvine, Costa Mesa and Newport Beach with commercial land use adjacencies to the north, east and west. There is residential land use interspersed among the commercial use with multi-family land use 0.25 west of the runway, and residential land use (single family and multi-family) beyond the commercial land use approximately 0.75 miles to the north, 0.5 miles to the west, 1 mile to the east, and approximately 0.25 miles to the south. [Figure 6, John Wayne Airport Location](#), illustrates the airports relationship to these land uses.

Physical and Operational Characteristics

The airport is categorized as a medium-hub primary airport (serving between 0.25 percent and 1.0 percent of total national enplanements) and utilizes two parallel north-south runways. Runway 2L/20R is 5,701 feet long by 150 feet wide and is used for commercial aircraft activity, and Runway 2R/20L is 2,887 feet long and 75 feet wide and serves general aviation aircraft²⁰. Aircraft operations include general aviation aircraft, scheduled commercial flights and military operations. Due to the short length of the commercial runway and the proximity of residential land use, commercial aircraft typically depart at or near full power to reach takeoff speed and larger/heavier aircraft may require a steep climb to allow for a power reduction to quiet the overflight of residential land one-half mile from the airport. Aircraft types and number of passengers are limited to meet the community noise levels agreed to in the 1985 Settlement Agreement²¹ and in the updated *Phase 2 Commercial Airline Access Plan and Regulation*²² (Phase 2 Access Plan) amended through December 2, 2015. These plans limit aircraft to 200,000 pounds gross weight for aircraft with dual gear main landing gear-type and to 300,000 pounds gross weight for aircraft with dual tandem gear main landing gear-type. They also classify the noise of the aircraft into Type A and Type E, and they require compliance with the noise levels set forth in Table 1, *Class A Aircraft Energy Averaged SENEL Levels*, and Table 2, *Class E Aircraft Energy Averaged SENEL Levels*.

The airport has a limit of 10.8 MAP through December 31, 2020 but no limit on the number of aircraft flights²³. While the amount of cargo is not limited, there is a limit of four cargo arrival

²⁰ www.airnav.com/airport/KSNA; 8/7/2019

²¹ <https://www.ocair.com/communityrelations/settlementagreement/docs/1985%20Settlement%20Agreement.pdf>; 8/8/2019

²² https://www.ocair.com/reportspublications/AccessNoise/AccessPlan_2015-12-4.pdf; 8/30/2019

²³ Anthony Cangey, Airport Access & Noise Specialist II, John Wayne Airport, email 8/9/2019

flights and four cargo departure flights in effect until 2030 with no current plan for expansion²⁴. The MAP limit increases to 11.8 in January 2021 and to either 12.2 or 12.5 in January 2026 through December 2030, depending on passenger demand experienced between 2021 and 2025. The Phase 2 Access Plan terminates December 31, 2030 without further action from the County of Orange Board of Supervisors. Commercial flights are restricted by County Ordinance to departure hours of 7:00 am to 10:00 pm Monday through Saturday and 8:00 am to 10:00 pm on Sunday, and arrival hours of 7:00 am to 11:00 pm Monday through Saturday and 8:00 am to 11:00 pm on Sunday. General aviation aircraft are allowed to operate 24 hours a day as long as the aircraft meets the general aviation noise limits for daytime/nighttime operations as measured at specified airport noise monitoring stations²⁵. General aviation passengers are not

**CLASS A AIRCRAFT
ENERGY AVERAGED SENEL LEVELS**

NOISE MONITORING STATION	ENERGY AVERAGED DECIBELS
NMS1S:	102.5 dB SENEL
NMS2S:	101.8 dB SENEL
NMS3S:	101.1 dB SENEL
NMS4S:	94.8 dB SENEL
NMS5S:	95.3 dB SENEL
NMS6S:	96.8 dB SENEL
NMS7S:	93.7 dB SENEL

included in the airport MAP counts.

Table 1 – Class A Aircraft Energy Averaged SENEL Levels

**CLASS E AIRCRAFT
ENERGY AVERAGED SENEL LEVELS**

NOISE MONITORING STATION	ENERGY AVERAGED DECIBELS
NMS1S:	94.1 dB SENEL
NMS2S:	93.5 dB SENEL
NMS3S:	90.3 dB SENEL
NMS4S:	86.6 dB SENEL
NMS5S:	87.2 dB SENEL
NMS6S:	87.2 dB SENEL
NMS7S:	86.6 dB SENEL

²⁴ Anthony Cangey, Airport Access & Noise Specialist II, John Wayne Airport, email 9/3/2019

²⁵ Anthony Cangey, Airport Access & Noise Specialist II, John Wayne Airport, email 8/9/2019

Table 2 – Class E Aircraft Energy Averaged SENEL Levels

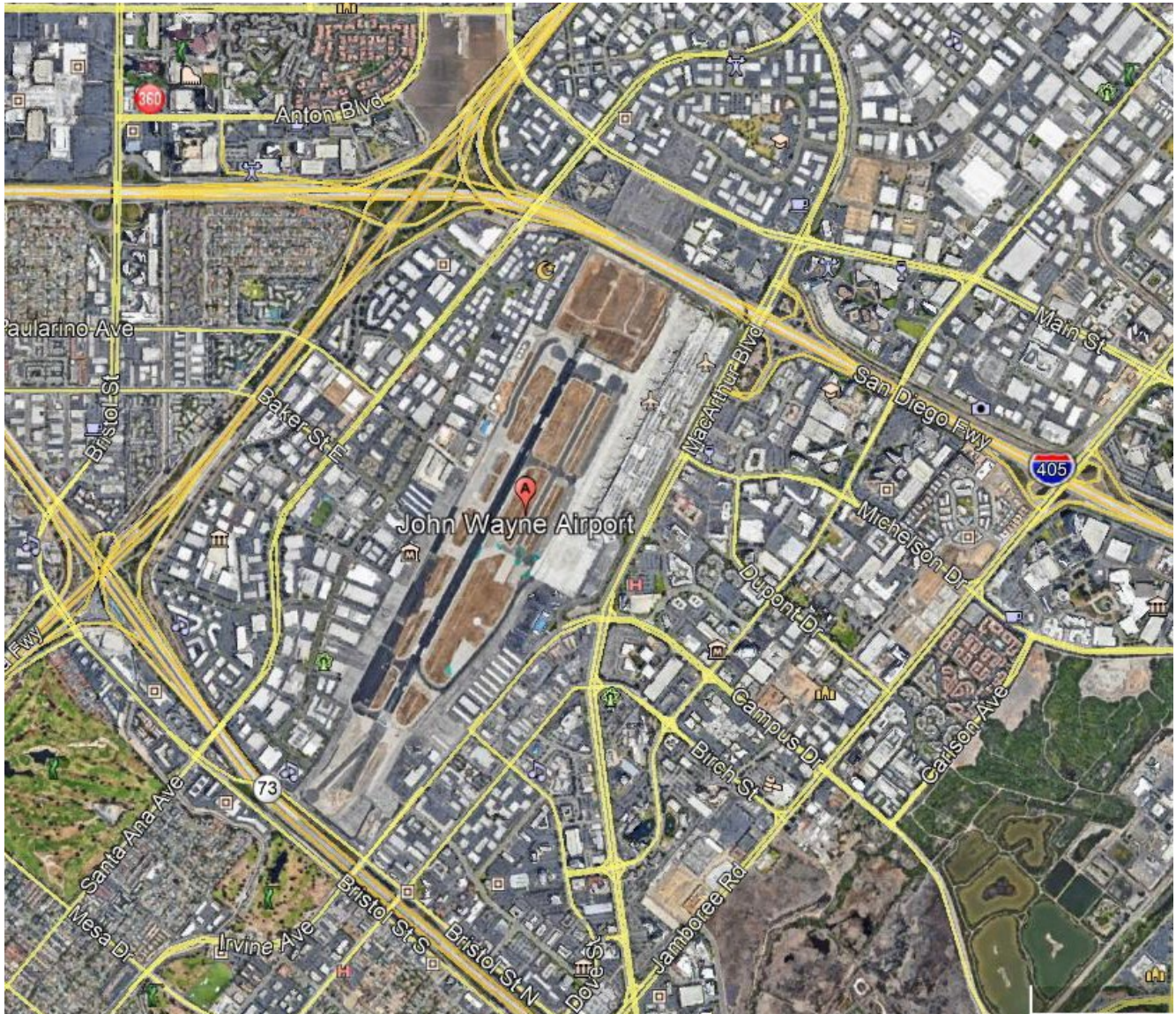


Figure 6 – John Wayne Airport Location²⁶

²⁶ Google Earth; 8/30/2019

Existing Conditions

SNA 2018 operations consisted of 10.7 million annual passengers (MAP), 19,552 tons of cargo, and 316,783 aircraft operations²⁷. The airport is closely located to residential land use (as noted above multi-family residential is located 0.25 miles west and multi-family/single family residential use surrounds the airport within 0.25 to 1.0 miles), and the airport completed a residential sound insulation program to sound insulate 418 dwellings²⁸ within the 65 CNEL noise impacted area²⁹. The John Wayne Airport Access and Noise Office operates a permanent noise monitoring system with 10 monitors to monitor individual aircraft compliance with airport-permitted noise levels (as indicated in Tables 1 and 2 above), commercial carrier compliance with the allowable quarterly average noise level per aircraft type, and to assist with updating quarterly noise contours. The noise monitor locations and the respective residential area is shown on [Figure 7, John Wayne Airport Noise Monitors and Residential Area](#). The 65 CNEL contour from the first quarter of 2019 (updated airport noise report based on average airport operations over the preceding 12 months) is shown on [Figure 8, John Wayne Airport Noise Contours 1st Quarter 2019](#)³⁰. The residential properties highlighted on this figure represent the remaining incompatible land use. Contour information for the remainder of 2019 is not yet available at the time of this assessment. Operations measured for April and May³¹ indicate a slight decrease in operations due to air carriers utilizing larger capacity aircraft and maintaining a higher percentage of passengers which would tend to reduce the noise contour area. Operations for the remainder of 2019³² are anticipated to be similar to operations included in the contours presented in Figure 8 so that the contours are anticipated to also be similar assuming the same aircraft fleet mix. In the near term it is expected the aircraft fleet mix will remain similar; the fleet mix changes as air carriers replace aircraft with newer models or swap existing aircraft to accommodate changes in passenger demand.

²⁷ www.ocair.com/newsroom/news/airportstats; 8/7/2019

²⁸ <https://www.ocair.com/reportspublications/AccessNoise/noiseabatementquarterly/2019/na2019-q1.pdf>; 9/12/2019

²⁹ <https://www.ocair.com/reportspublications/AccessNoise/noiseabatementquarterly/2018/na2018-q1.pdf>; 8/30/2019

³⁰ <https://www.ocair.com/reportspublications/AccessNoise/noiseabatementquarterly/2019/na2019-q1.pdf>; 8/12/2019

³¹ www.ocair.com/newsroom/news/airportstats; 8/7/2019

³² www.ocair.com/newsroom/news/airportstats; 8/7/2019



Figure 7 – John Wayne Airport Noise Monitors and Residential Areas³³

³³ <https://www.ocair.com/reportspublications/publications/ganoguide.pdf#page=2>; 8/30/2019



Figure 8 – John Wayne Airport Noise Contours 1st Quarter 2019

Source: www.ocair.com/reportspublications/AccessNoise/

Los Angeles International Airport (LAX)

The Los Angeles International Airport is currently in the middle of an *Airfield & Terminal Modernization Project* study with plans to complete environmental documents in the 4th quarter of 2020. These environmental documents will assess aviation noise impacts in detail.

Location

Los Angeles International Airport is located in the Westchester district in the southwestern portion of the City of Los Angeles, with residential and commercial areas of the El Segundo to the south, Westchester and Playa del Rey to the north, and Inglewood and unincorporated portions of Los Angeles County to the east. It is bordered by Interstate 105 to the south, Interstate 405 to the east, and State Highway 42 to the north. [Figure 9](#), *Los Angeles International Airport Location*, illustrates the airports relationship to these land uses.

Physical and Operational Characteristics

The airport is categorized as a large-hub primary airport (serving between 1.0 percent or more of total national enplanements), it is the busiest airport in the Los Angeles area, and it is the second busiest airport in the U.S.³⁴ The airport utilizes two sets of parallel runways running in the east-west direction. Runways 24R/06L and 24L/06R are north of the airport terminals, running 8,926 feet long by 150 feet wide and 10,885 feet long by 150 feet wide, respectively. Runways 7L/25R and 7R/25L are south of the airport terminals and measure 12,923 feet long by 150 feet wide and 11,095 feet long by 200 feet wide, respectively³⁵. Aircraft operations include general aviation aircraft, scheduled commercial flights and military operations. Due to prevailing winds, aircraft generally depart to the west and approach from the east. The Los Angeles World Airports (LAWA) department of the City of Los Angeles is currently constructing an Automated People Mover (APM) electric train to reduce ground traffic congestion and provide a direct rail connection to Los Angeles and adjacent cities³⁶. The APM is planned to open for passenger services in 2023. There is currently **no limit** on the number of aircraft operations at the airport.

Existing Conditions

LAX operations for 2018 included 87.5 million annual passengers (MAP) with 641,460 flight operations and 2.4 million tons of cargo³⁷. As noted above, the airport is located in close proximity to residential land use. The airport completed a residential sound insulation program for City of Los Angeles dwellings within the 65 CNEL noise impacted area, sound insulating over 7,300 dwelling units³⁸. Inglewood and the County of Los Angeles are currently managing a

³⁴ <https://www.worldatlas.com/articles/busiest-airports-in-united-states.html>; 8/30/2019

³⁵ www.airnav.com/airport/KLAX; 8/7/2019

³⁶ <https://www.lawa.org/en/connectinglax/automated-people-mover>; 8/30/2019

³⁷ <https://www.lawa.org/-/media/ac4d82d736aa468da1a4a43357c94f28.pdf> ; 8/7/2019

³⁸ <https://www.lawa.org/en/lawa-environment/noise-management/sound-insulation-grant-program/residential-sound-insulation-program>; 8/30/2019

residential sound insulation program for dwellings in their jurisdictions, and have sound insulated over 7,832 and 4,084 dwellings, respectively, while the El Segundo program was suspended in 2016³⁹ after completing 1,943 dwellings⁴⁰. The Noise Management Bureau of LAWA maintains a permanent noise monitoring system utilized to assist in updating aircraft noise exposure on a quarterly basis. The 65 CNEL, 70 CNEL and 75 CNEL contours from the first quarter of 2019 (updated airport noise report based on average airport operations over the preceding 12 months) are shown in [Figure 10](#), *LAX First Quarter 2019 Noise Contours – Western Area*, and in [Figure 11](#), *LAX First Quarter 2019 Noise Contours – Eastern Area*. Contour information for the remainder of 2019 is not yet available at the time of this assessment. Operations have measured approximately 2% lower during recent months as compared than the operations during the same months of 2019 included in the contours presented. Due to the large number of operations at LAX, this slight decrease in operations is expected to produce similar noise contours assuming the same aircraft fleet mix. In the near term it is expected the aircraft fleet mix will remain similar; the fleet mix changes as air carriers replace aircraft with newer models or swap existing aircraft to accommodate changes in passenger demand.

³⁹ <https://www.lawa.org/en/lawa-environment/noise-management/sound-insulation-grant-program>;
8/30/2019

⁴⁰ Kathryn Pantoja, Airport Environmental Manager, LAWA noise Management and SIG Program, 9/6/2019 email

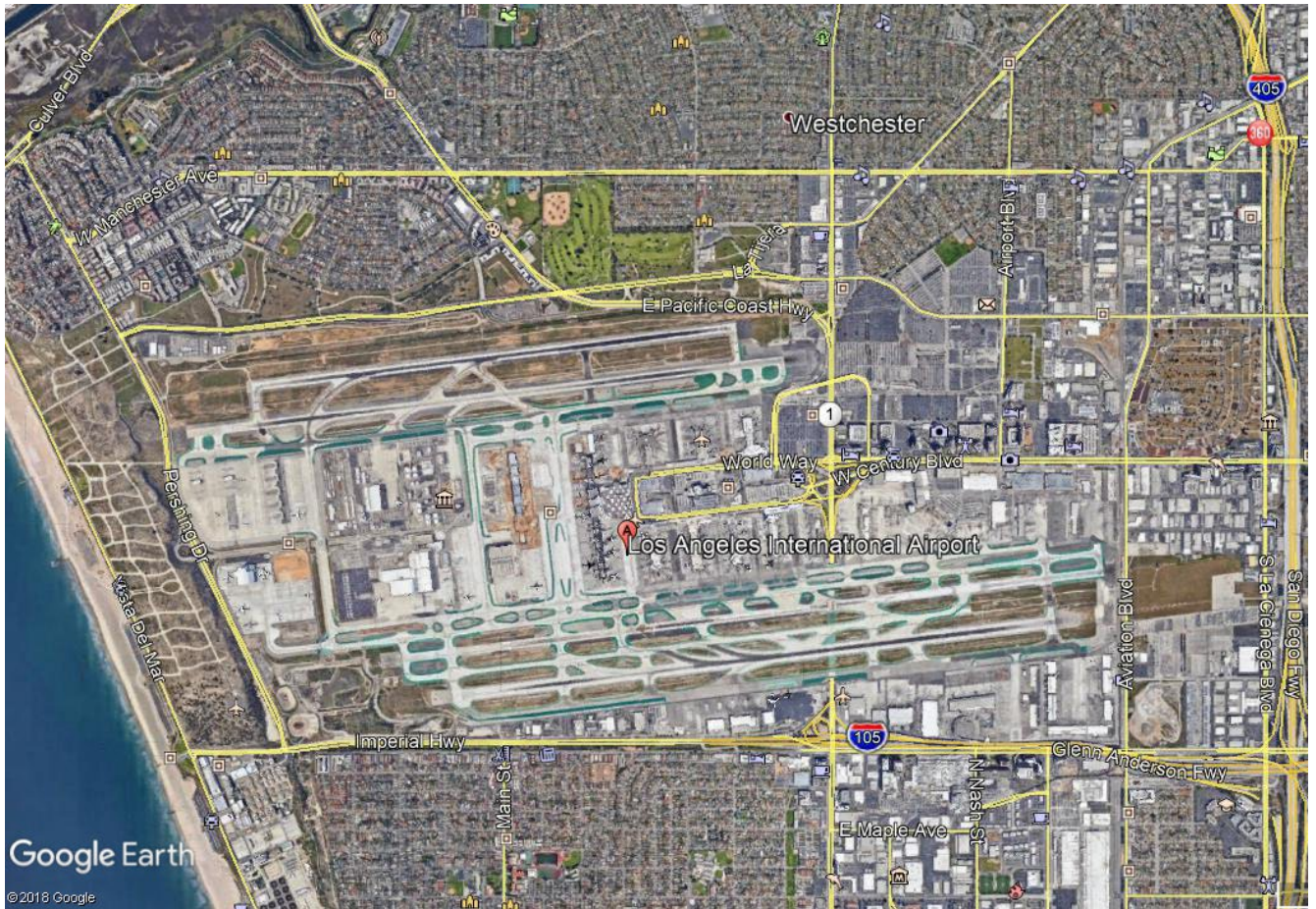


Figure 9 – Los Angeles International Airport Location⁴¹

⁴¹ Google Earth; 8/30/2019



Figure 10 - LAX First Quarter 2019 Noise Contours – Western Area

Note: Current operations have measured approximately 2% lower than the operations included in the contours presented
 (Source- www.lawa.org/en/lawa-environment/noise-management/lawa-noise-management-lax/quarterly-noise-reports-and-contour-maps)



Figure 11 – LAX First Quarter 2019 Noise Contours – Eastern Area

Note: Current operations have measured approximately 2% lower than the operations included in the contours presented
(Source- www.lawa.org/en/lawa-environment/noise-management/lawa-noise-management-lax/quarterly-noise-reports-and-contour-maps)

Long Beach Airport (LGB)

Location

Long Beach Airport is located three miles northeast of downtown Long Beach in the southern part of Los Angeles County near the Los Angeles County and Orange County borders. It is just north of Interstate 405, three miles east of Interstate 710, and three miles west of Interstate 605. The airport borders commercial land use to the north, east, and south, and borders single family residential land use to the southeast. Outside the bordering commercial land use there is single family and multi-family residential land use approximately 0.33 miles north, 0.33 miles east, 0.1 miles south and 0.25 miles to the west. [Figure 12](#), *Long Beach Airport Location*, illustrates the airport location and its relationship to the adjacent land uses.

Physical and Operational Characteristics

The airport is categorized as a non-hub primary commercial service airport (serving less than 0.05 percent of total national enplanements) served with a pair of parallel east-west runways and one northwest-southeast runway. Runways 8R/26L and 8L/26R measure 3,918 feet long by 100 feet wide and 6,192 feet long by 150 feet wide, respectively. Runway 12/30 is 10,000 feet long by 200 feet wide⁴². Aircraft operations include general aviation aircraft and scheduled commercial flights. Due to the airport's location near dense residential housing, the airport operates within a strict noise budget to keep aircraft operations limited and noise controlled. There is no currently no limit on the number of aircraft operations at the airport as long as the maximum noise levels of the noise budget are not exceeded. The LGB noise budget by City law allows the airport to add aircraft operations if the noise level with the additional operations does not exceed the noise levels from the baseline year of 1989-1990⁴³.

Existing Conditions

⁴² www.airnav.com/airport/KLGB; 8/7/2019

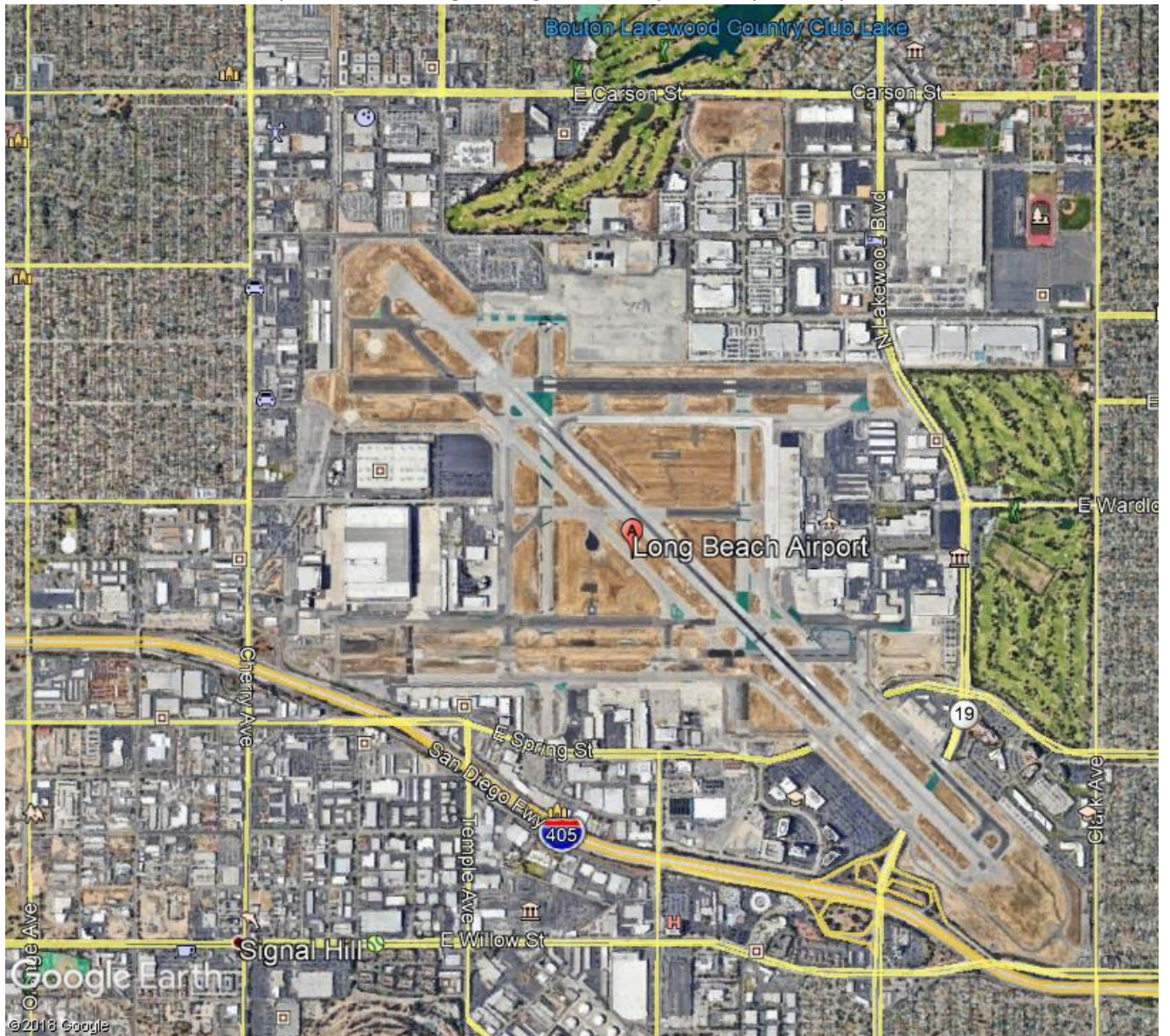
⁴³ http://www.lgb.org/information/noise_abatement/frequently_asked_questions.asp; 8/7/2019

LGB operations for 2018 included 3.9 million annual passengers (MAP) with 33,906 flight operations and 23,849 tons of cargo with 1,060 flights⁴⁴. The Long Beach Airport Noise Office maintains a permanent noise monitoring system with 18 noise monitors utilized to assist in updating aircraft noise exposure on a quarterly basis⁴⁵. The 60 CNEL, 65 CNEL and 70 CNEL contours applicable to the allowable noise budget are shown in [Figure 13](#), *Long Beach Airport Noise Contours*. These contours are slightly larger than the realized noise contours as LGB operations typically do not reach the allowable operations of the noise budget. To ensure the airport does not exceed these levels, two of

⁴⁴ http://www.lgb.org/information/noise_abatement/monthlyreport.asp; 8/7/2019

⁴⁵ http://www.lgb.org/information/noise_abatement/default.asp; 8/30/2019

the noise monitors are calibrated for this purpose and the data is checked periodically⁴⁶. Due to the low number of aircraft operations and the strict noise budget, the 65 CNEL noise impact contour does not extend very far into the neighboring community and only encompasses a few residential



units at the south end of the airport runway. The airport completed a small residential sound insulation program to sound insulate 27⁴⁷ dwellings.

⁴⁶ Ron Reeves, Operations and Facilities Manager, Long Beach Airport; phone call 8/5/2019

⁴⁷ <https://klgb.blogspot.com/2009/10/lb-airport-announces-quieter-home.html>; 9/12/2019

Figure 12 – Long Beach Airport Location⁴⁸

⁴⁸ Google Earth; 8/30/2019



Figure 13 – Long Beach Airport Noise Contours

Source: <http://www.lgb.org/civicax/filebank/blobload.aspx?BlobID=3357>

Ontario International Airport (ONT)

Location

Ontario International Airport is located two miles east of downtown Ontario in southwest San Bernardino County, approximately 38 miles east of Downtown Los Angeles. It is positioned north/south between Interstate 10 and State Highway 60, and east/west between Interstate 15 and State Highway 83. The airport was owned and operated by the City of Los Angeles and controlled by Los Angeles World Airports prior to November 2016 when ownership was turned over to and operated by the Ontario International Airport Authority, formed under a joint-powers agreement between the city of Ontario and San Bernardino County. The airport is bordered on all sides by commercial land use, but residential land use is located within one-half mile of the west end of the airport runways to the north and south and three-quarters of a mile due west from the end of the runway. [Figure 14](#), *Ontario International Airport Location*, shows the airport location with the neighboring land uses.

Physical and Operational Characteristics

Ontario is categorized as a medium hub airport (serving between 0.25 percent and 1.0 percent of total national enplanements) served with a pair of parallel east-west runways. Runways 8R/26L and 8L/26R measure 10,200 feet long by 150 feet wide and 12,197 feet long by 150 feet wide, respectively⁴⁹. Aircraft operations include general aviation aircraft and scheduled commercial flights. Aircraft typically depart towards the west and arrive from the east. There is no currently no limit on the number of aircraft operations at the airport.

Existing Conditions

ONT operations for 2018 included 5.1 million annual passengers (MAP) and 751,529 tons of cargo⁵⁰. As noted above, the airport is located near single family and multi-family residential land use (within one-half to three-quarters of a mile), and the airport completed a residential sound insulation program to sound insulate 1,599 dwellings within the 65 CNEL noise impacted area⁵¹. ONT maintains a permanent noise monitoring system with 15 noise monitors utilized to assist in updating aircraft noise exposure on a quarterly basis. The 65 CNEL, 70 CNEL and 75 CNEL contours from the third quarter 2016 Quarterly Noise Report are shown in [Figure 15](#), *Ontario International Airport Noise Contours, 3rd Quarter 2016*. These contours were the last noise contours developed while LAWA operated the airport and the 2019 baseline contours would be slightly larger as operations in 2016 were lower at 4.2 MAP, assuming the same aircraft fleet mix. In the near term it is expected the aircraft fleet mix will remain similar; the fleet mix changes as air carriers replace aircraft with newer models or swap existing aircraft to accommodate changes in passenger demand.

⁴⁹ www.airnav.com/airport/KONT; 8/7/2019

⁵⁰ <http://www.flyontario.com/corporate/statistics>; 8/7/2019

⁵¹ https://www.flyontario.com/sites/default/files/part_150_updateworkshop_presentation_-_20140501.pdf 9/12/2019

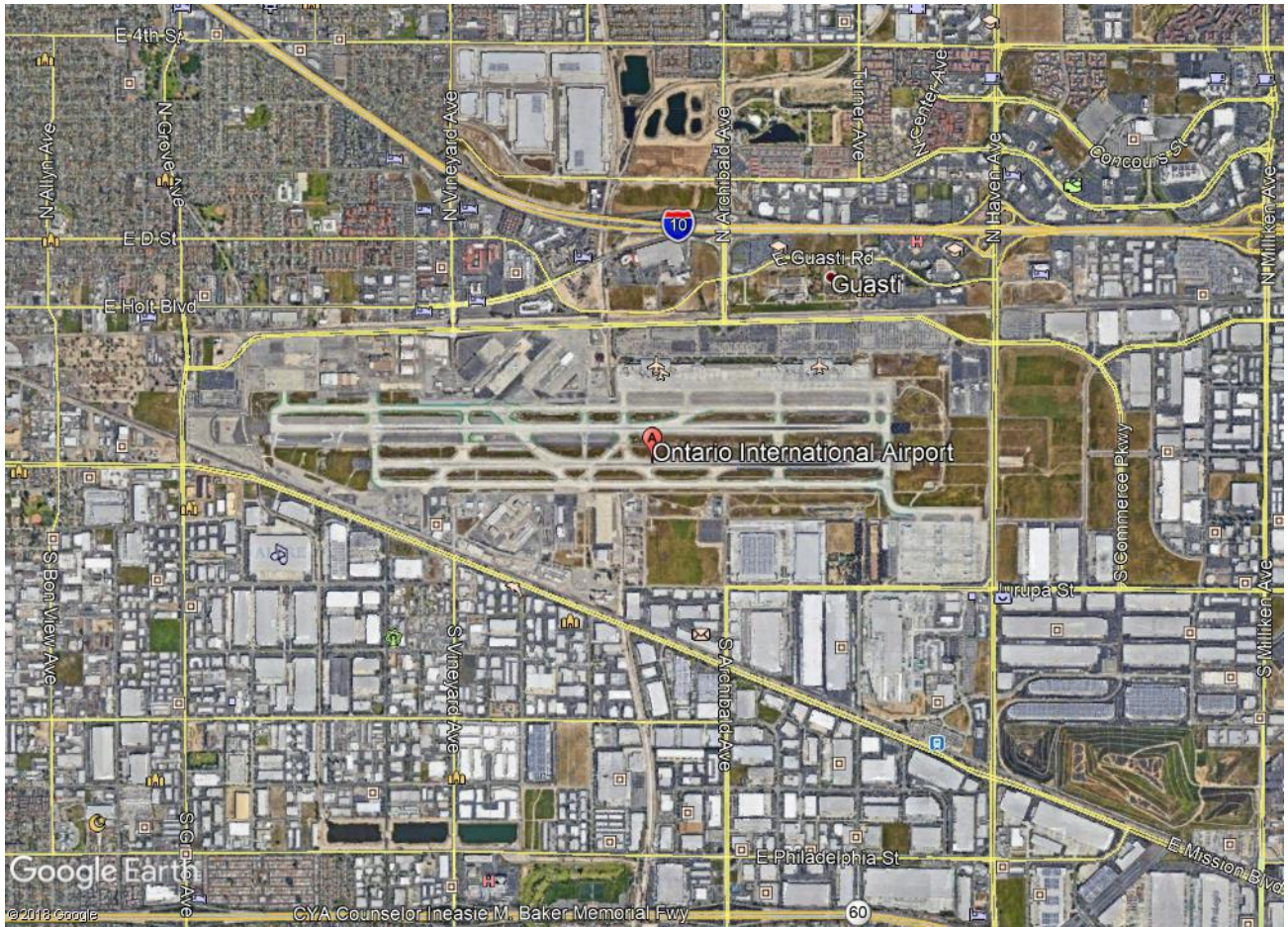


Figure 14 – Ontario International Airport Location⁵²

⁵² Google Earth, 8/30/2019

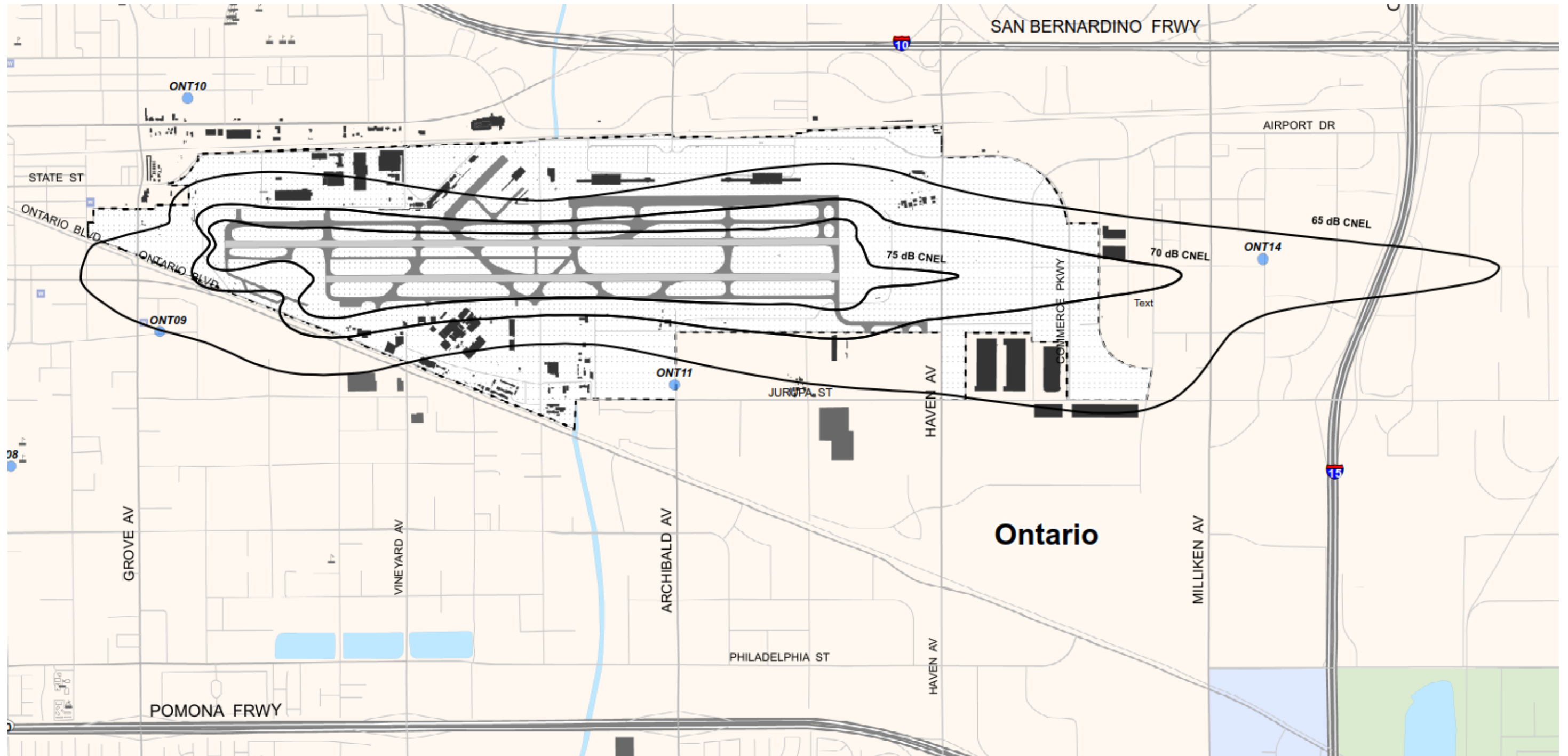


Figure 15 – Ontario International Airport Noise Contours, 3rd Quarter 2016
Source: www.flyontario.com/corporate/environment/noise-management/countour-map

Palm Springs International Airport (PSP)

Location

Palm Springs International Airport is located two miles east of downtown Palm Springs in the central portion of Riverside County. It borders State Highway 111 on the east and is 2.5 miles southwest of Interstate 10. The airport borders commercial land use to the east and has some adjacent vacant land buffers but is closely surrounded by single family residential land use approximately 0.1 miles away. [Figure 16](#), *Palm Springs International Airport Location*, indicates the relative location of the airport to its surrounding land uses.

Physical and Operational Characteristics

PSP is categorized as a small-hub primary airport (serving between 0.05 percent and 0.25 percent of total national enplanements) served with a pair of parallel northeast-southwest runways. Runways 13R/31L and 13L/31R measure 10,000 feet long by 150 feet wide and 4,952 feet long by 75 feet wide, respectively⁵³. Aircraft operations include general aviation aircraft and scheduled commercial flights. There is no currently no limit on the number of aircraft operations at the airport.

Existing Conditions

PSP operations for 2018 included 2.3 million annual passengers (MAP) with 57,665 flights⁵⁴. The airport as noted above has residential land use within 0.1 miles of the airport. PSP has completed a residential sound insulation program to sound insulate 128⁵⁵ dwellings within the noise impacted area. The 2015 existing 65 CNEL, 70 CNEL and 75 CNEL contours from the Airport Master Plan Mitigated Negative Declaration CEQA Appendix C, Noise Modeling Technical Report Figure C-6⁵⁶ are shown in [Figure 17](#), *Palm Springs International Airport 2015 Noise Contours*. This document also included a forecast for 2020 future conditions, shown in Figure 18, *Palm Springs International Airport 2020 Noise Contours*, which indicated that with a 9% increase in operations, the 65 CNEL contour lobes at the north and south of the runways enlarge slightly assuming the same aircraft fleet mix. In the near term it is expected the aircraft fleet mix will remain similar; the fleet mix changes as air carriers replace aircraft with newer models or swap existing aircraft to accommodate changes in passenger demand.

⁵³ www.airnav.com/airport/KPSP; 8/7/2019

⁵⁴ [http:// www.palmspringsca.gov/government/departments/aviation-palm-springs-international-airport-ppsp/doing-business-at-ppsp/airport-administration/statistical-data](http://www.palmspringsca.gov/government/departments/aviation-palm-springs-international-airport-ppsp/doing-business-at-ppsp/airport-administration/statistical-data); 8/7/2019

⁵⁵ www.palmspringsca.gov/home/showdocument?id=36824; 9/12/2019

⁵⁶ www.palmspringsca.gov/home/showdocument?id=36824; 8/7/2019

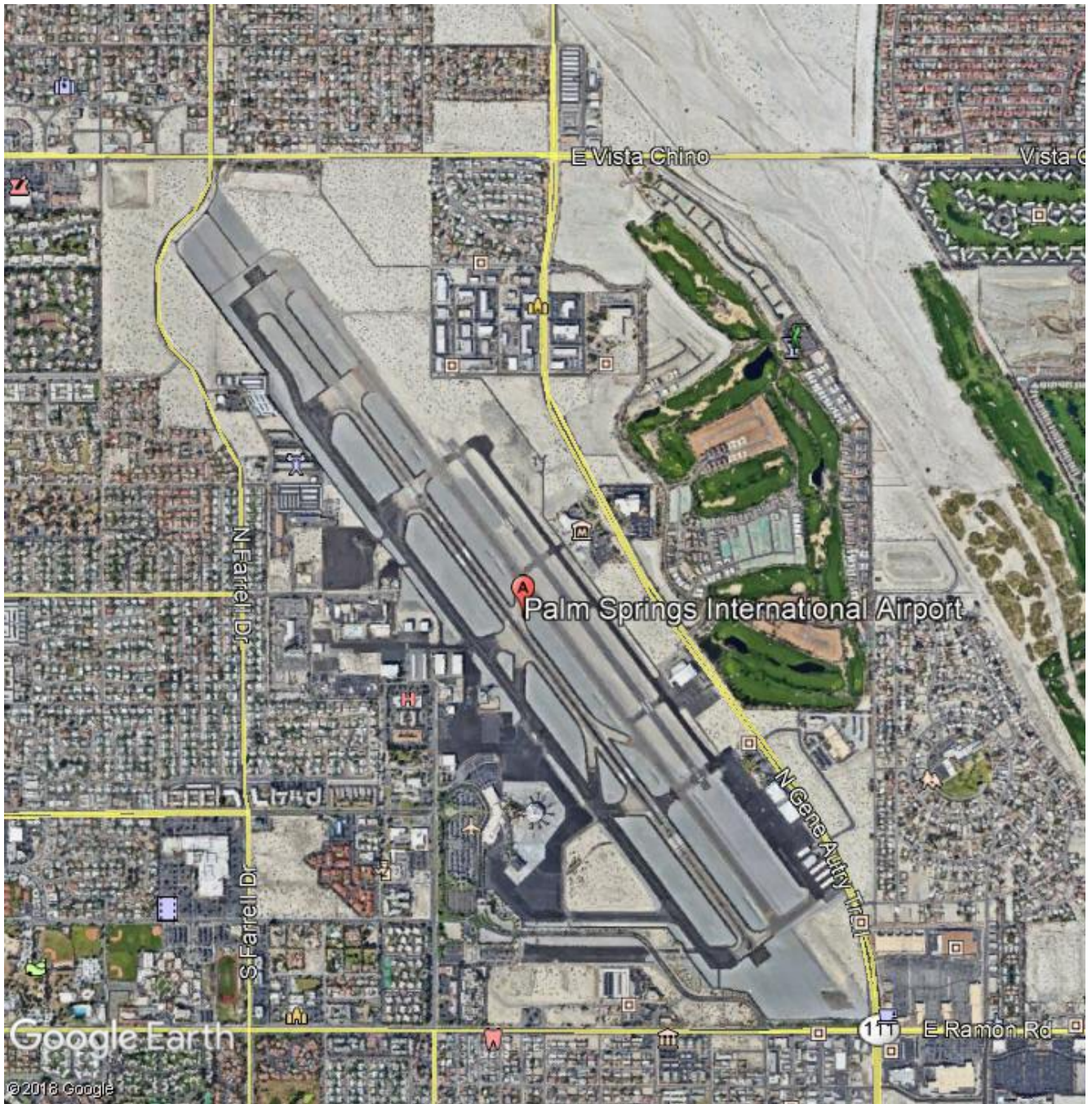
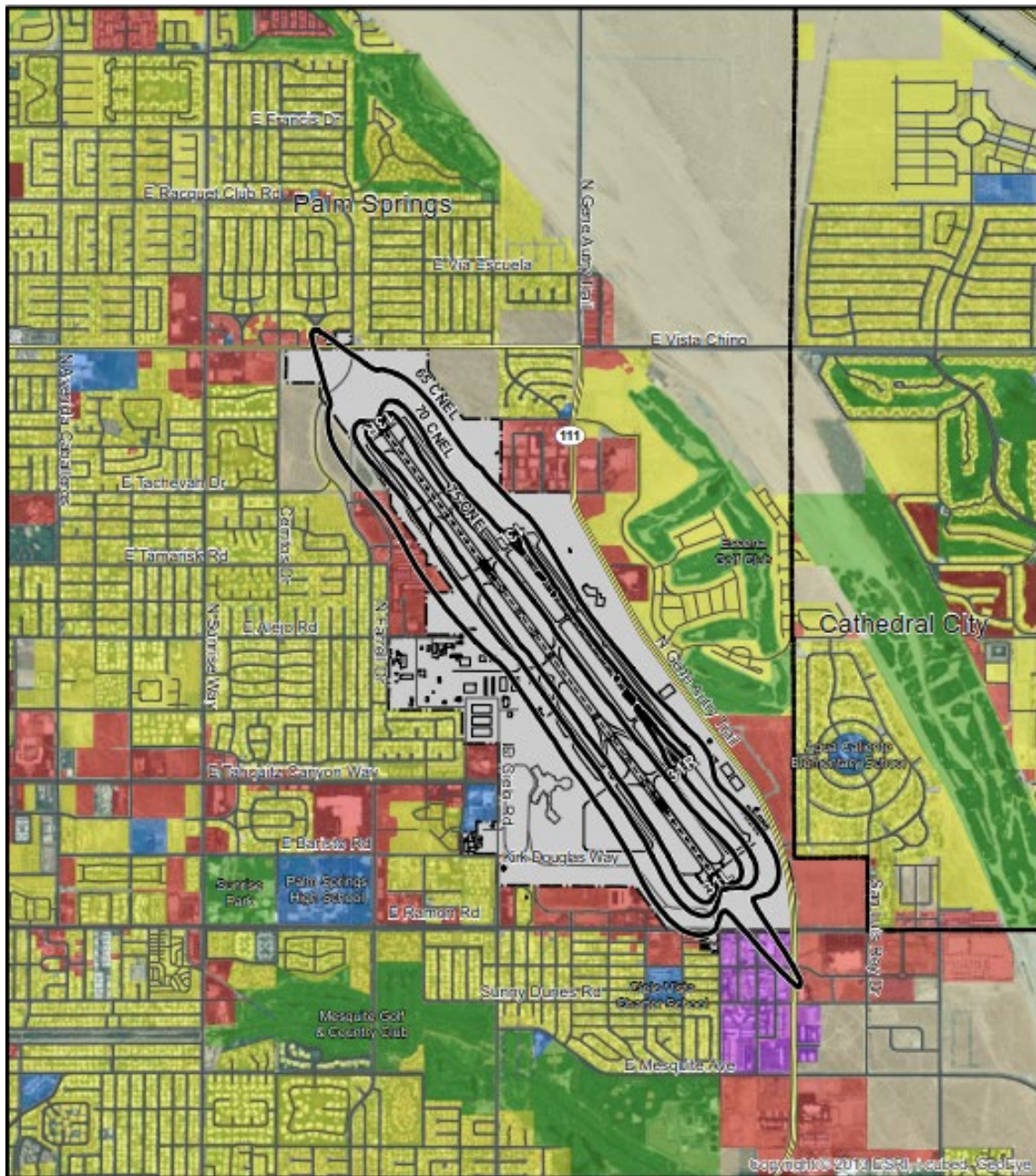


Figure 16 – Palm Springs International Airport Location⁵⁷

⁵⁷ Google Earth; 8/30/2019



LEGEND

-  Existing (2015) CNEL Noise Exposure Contours
-  Residential
-  Agricultural
-  Park / Open Space
-  Commercial
-  Industrial
-  Public / Institutional
-  Vacant
-  Airport Property

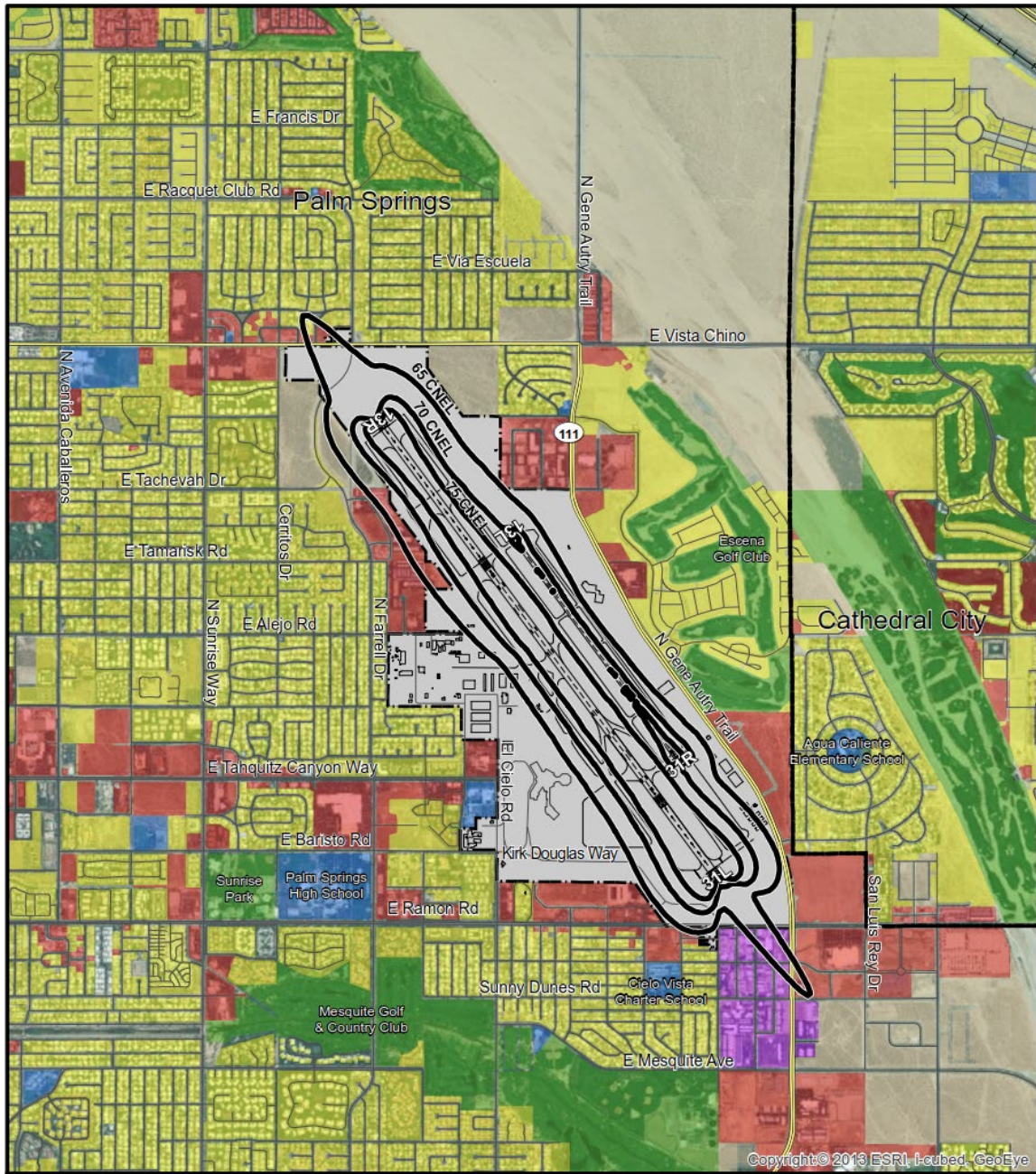
Figure C-6
Existing (2015) CNEL Noise Exposure Contours

Sources: Riverside County GIS, ESRI, HNTB 2015.



Figure 17 – Palm Springs International Airport 2015 Noise Contours

Source: Palm Springs International Airport Noise Modeling Technical Report; Thomas Nolan, Airport Director



LEGEND










-  Future (2020) CNEL Noise Exposure Contours
-  Residential
-  Agricultural
-  Park / Open Space
-  Commercial
-  Industrial
-  Public / Institutional
-  Vacant
-  Airport Property

Figure C-7
Future (2020) CNEL Noise Exposure Contours

Sources: Riverside County GIS, ESRI, HNTB 2015.



Figure 18 – Palm Springs International Airport 2020 Noise Contours

Source: Palm Springs International Airport Noise Modeling Technical Report; Thomas Nolan, Airport Director

4. AIRPORT GROWTH FORECAST

As noted above, SCAG does not have any regulatory, developmental, operational, or planning authority over the airports. Rather, SCAG is primarily a regional surface transportation planning agency that maintains a list of airport ground access projects and a consultative relationship with the airports. Therefore, SCAG is focused on air and passenger cargo activity from the perspective of how the traffic coming and going from the airports affects the region's roads, highways, and transit system. One critical aspect of SCAG's role in aviation systems and transportation planning is the Aviation Element of the Draft 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (2020 RTP/SCS) (Connect SoCal).

The 2020-2045 Connect SoCal Aviation appendix references a comprehensive review of various forecasts for aviation growth in the SCAG Region. This review concluded with the following forecasts:

- Regional air passenger transportation is anticipated to grow by an average of 2.1% annually; from 110.17 MAP in 2017 to 197.1 MAP in 2045
- Regional air cargo transportation is anticipated to grow by an average of 3.3% annually, from 3.14 million in 2017 to 7.77 million tons in 2045
- Total regional aircraft operations are not anticipated to grow as fast as passenger and/or cargo growth. Regional aircraft operations are anticipated to grow by an average of 0.74% annually, from 3.7 million operations in 2017 to 4.58 million operations in 2045

As mentioned above, LAX is the only regional large-hub primary airport, and the operational data listed for each regional airport indicates most regional airport operations are associated with LAX. Recent statistics show that while passenger traffic has increased by approximately 1% in 2019, aircraft operations have reduced by approximately 2%. This reduction in operations, if continued, would reduce airport noise levels in the surrounding community. The LAWA department of the City of Los Angeles is also currently constructing an Automated People Mover (APM) electric train to reduce ground traffic congestion, accommodate future operational growth, and provide a direct rail connection to Los Angeles and adjacent cities⁵⁸. The APM is planned to open for passenger services in 2023, and APM operation will reduce ground traffic and ground traffic noise.

The 2020-2045 Connect SoCal RTP/SCS addresses growth between 2017 and the horizon year 2045. The PEIR addresses impacts compared to existing conditions (2019) to the extent that data is available. Region-wide growth between 2017 to mid-year 2019 is estimated to be up to approximately 2% for air passengers and less than 0.5% for aircraft operations. For the purposes of assessing regional noise impacts from aviation, the above bulleted forecasts reasonably approximate the 2019 to 2045 time period.

As noted above, the aircraft operations growth forecast is significantly smaller than the air passenger and air cargo percentages. This is anticipated because newer aircraft carry a higher volume of passengers and carriers are running at a higher load factor than in the past. When the airlines carry more passengers per flight, the flights are more profitable and fewer flights are needed to carry the

⁵⁸ <https://www.lawa.org/en/connectinglax/automated-people-mover; 8/30/2019>

same volume of passengers to a specific location. This allows the airlines to schedule some of these flights to other locations and/or reduce their airport operations.

5. AIRPORT OPERATION GROWTH AND IMPACT ON AIRCRAFT NOISE LEVELS AND NOISE CONTOURS

Aircraft Operations

The noise propagating from airports is directly related to the number of aircraft operations as well as the size, aircraft type, and number and type of engines, with additional contributions from other airport activities and ground transportation (noise from ground transportation is separately addressed in the 2020-2045 Connect SoCal RTP/SCS PEIR).

In general, if the mix of aircraft remains constant, the aviation noise contours grow larger or shrink smaller as the operations increase or decrease. Noise levels do not increase algebraically as the noise sources increase but increase in a logarithmic fashion. For example, two noise sources each emitting a noise level of 60 dB add together to produce noise of 63 dB, not 120 dB. Doubling the number of noise sources increases the overall noise level by 3 dB and doubling the number of aircraft operations would also increase the overall airport noise level by 3 dB and expand the area inside the noise contours, assuming all other factors such as aircraft type, engines, flight pathstracks, etc., remain the same.

The formula for the relative increase in aircraft noise as the noise sources increase is:

$$\Delta \text{ dB} = 10 * \text{Log}(S_H/S_B)$$

S_H is the number of sources (aircraft) for the Horizon year

S_B is the number of sources (aircraft) for the base year.

Considering the growth of SCAG Region airport operations from 3.7 million to 4.58 million, if all aircraft types and operational characteristics were to remaining equal, the forecasted increase in noise would equate to 0.9 decibels. However, this average increase in aircraft operations is not the same expected increase at all airports, as different airports will experience different changes and noise contours may grow or shrink independently at each airport. The airport noise levels are expected to increase more at the popular airports such as LAX, ONT, PSP and BUR, while noise levels at airports currently with noise and/or operations restraints as well as less popular airports are expected to increase less. The details needed to computer model the airport noise level changes over the forecast period are not available to provide specific changes. Additionally, airports across the nation have received an increase in noise complaints since implementation in 2015 of FAA's NextGen program to modernize the nation's air transportation system⁵⁹. One aspect of NextGen utilizes satellite navigation that precisely direct aircraft flight tracks for more efficient performance,

⁵⁹ <https://www.faa.gov/nextgen/. 9/20/2019>

reducing fuel costs and associated carbon emissions, and to increase overall flight capacity⁶⁰. Aircraft flight track changes in some cases moved flights over areas that previously did not experience overflights or concentrated aircraft over areas that already experienced overflights, and airport noise complaints increased⁶¹. As the FAA and SCAG region airports such as LAX and BUR⁶² wrestle with the contending issues of an efficient airspace and noise complaints, it is unclear whether aircraft flight tracks will remain constant, further complicating the details needed for forecasting airport noise level changes over the forecast period.

Changes to Size of Planes (Change to Fleet Mixes) and Technological Changes to Aircraft Engines

The aircraft industry continues to develop aircraft with higher capacity, lower fuel consumption, and lower carbon emissions, but as it does, the industry must also comply with FAA and international aircraft compliance requirements. One of these requirements regards the aircraft noise. The noise of aircraft is classified into various Stages, with current Stage 3 and 4 aircraft operating quieter than previously used Stage 2 aircraft. Stage 3 aircraft measure between 7 and 20 EPNdB (Effective Perceived Noise Level, decibels) quieter than State 2 aircraft, while Stage 4 aircraft are an additional 10 EPNdB quieter than Stage 3 aircraft. Stage 2 aircraft no longer fly in the U.S., with some exceptions for lighter weight aircraft, taking the noisiest aircraft out of service. As airlines replace older and noisier Stage 3 aircraft with quieter Stage 4 aircraft, the aircraft fleet becomes quieter. As a recent example, American Airlines retired the last of its Stage 3 compliant McDonnell Douglas MD-80 aircraft in September 2019, and looks to replace the aircraft with more fuel-efficient aircraft with lower maintenance costs⁶³.

Even as the aircraft fleet mix changes to include more larger planes with more powerful engines, the requirements to comply with the quieter Stage 4 noise levels will result in a quieter aircraft fleet. The FAA in 2018 adopted regulations requiring newly designed aircraft to meet even quieter Stage 5 requirements with a reduction of 7 EPNdB, and as these aircraft come into service (and some aircraft currently in operation already meet this standard), this will lower the aircraft noise level further.

It is possible that in the long term, as aircraft operations grow over the next 25 years, the lower noise levels of aircraft will offset the increased operations to maintain or even reduce the aircraft noise contour footprints around SCAG Region airports. This has been the general trend in aviation noise over the previous 40 years. It may also be possible that the growth in operations at some airports may overtake the trend toward a quieter aircraft fleet and cause aircraft noise and the noise contours to increase. These issues will continue to be the focus of the airport noise offices to ensure

⁶⁰ https://www.faa.gov/nextgen/how_nextgen_works/; 9/20/2019

⁶¹ https://www.washingtonpost.com/local/trafficandcommuting/advances-in-airport-technology-mean-sleepless-nights-for-some/2016/03/04/7b8eb936-e098-11e5-9c36-e1902f6b6571_story.html; 9/20/2019

⁶² <https://www.latimes.com/california/story/2019-09-16/hollywood-burbank-airport-noise-rattles-residents-who-want-flights-spread-over-wider-area; 9/20/2019>

⁶³ <https://www.nbcsandiego.com/news/california/American-Airlines-Retires-the-Last-of-Its-Iconic-MD-80-Jets-560489551.html; 9/20/2019>

the continued success of the airport economy considers the environmental health of the community surrounding it.

Conclusion Regarding Changes to Noise Contours and Regional Aviation Noise Impact

As aircraft operations increase, it is expected that noise contours would grow and receptors close to airport could experience a higher cumulative noise level. While the individual aircraft operational noise level is not louder, the increased operations causes more noise events which, in turn, increases the CNEL. However, as the fleet mix changes to include quieter aircraft (even though aircraft may be bigger), these changes are anticipated to somewhat offset noise level increases caused by the increased operations. Because the noise profiles of future aircraft types and their engines are unknown, as is the timeframe for phasing out older aircraft and replacing them with newer aircraft, we cannot speculate on the overall impact of the forecasted increase in operations with a future aircraft fleet mix. Conservatively we conclude that sensitive receptors may experience greater noise impacts than at present in the vicinity of airports.

In summary, aircraft noise would increase in the vicinity of most regional airports due to increased operations causing noise contour growth. However, over time decreases in aircraft noise could occur due to a quieter fleet mix as new aircraft are incorporated, causing noise contours to shrink.