

TRANSPORTATION SYSTEM

AVIATION AND AIRPORT GROUND ACCESS

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS



TECHNICAL REPORT

ADOPTED ON SEPTEMBER 3, 2020

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TRANSPORTATION SYSTEM

Aviation and Airport Ground Access

EXECUTIVE SUMMARY

The SCAG region is home to seven commercial airports with scheduled passenger service, seven government/military air fields, and over 30 reliever and general aviation airports. On a daily basis, the region's airports provide service to hundreds of thousands of air passengers, and thousands of tons of cargo. Moreover, the airports in the SCAG region employ approximately 60,000 people onsite. Therefore, thousands of passengers, employees, and goods are traveling the region's roads, highways, and transit systems to get to and from the airports.

As a metropolitan planning organization (MPO), 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 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (2020 RTP/SCS) (Connect SoCal).

In preparing the Aviation Technical Report of Connect SoCal, SCAG staff gathered data from the airports and multiple sources, conducted analyses and engaged the Aviation Technical Advisory Committee (ATAC). Based on information and data collected for Connect SoCal, the following key activities and trends related to the SCAG region's airports, and air passenger and cargo

demand can be highlighted:

- In 2017, the seven commercial service airports in the SCAG region combined to accommodate 110.17 million annual passengers (MAP) to 200 destinations, including service to almost 50 countries and over 40 states.
- The SCAG region is one of the busiest and fastest growing in terms of air passenger activity in the nation.
- The majority of passengers traveling to the airports arrived via private vehicle, whether they were being dropped off or driving themselves.
- Only a small percentage of air passengers used transit to travel to and from the region's airports.
- In 2017, there were over one million Transportation Network Company (TNC) (e.g. Uber, Lyft) pick-ups and drop-offs at the SCAG region's airports.
- The majority of air passengers in the region are traveling from Los Angeles County.
- The majority of air passengers in the region are traveling to and from Los Angeles International Airport.
- In 2017, the SCAG region airports moved 3.14 million tons of cargo to 114 destinations in approximately 23 countries and over 30 states.
- Five of the SCAG region airports are ranked in the top 100 nationally for the movement of cargo.
- Although air passenger travel grew from 88.5 MAP in 2000 to 110.17 MAP in 2017 at 1.3 percent annual growth, the overall growth during this seventeen-year time period reflects downturns that occurred following 9/11 and the Great Recession. Following the dips in 2002 and 2009, air travel in the region has grown at a steady rate, with a noticeable total increase of 28 percent, or 5.12 percent compounded annual growth, from 85.8 MAP in 2012 to 110.17 MAP in 2017.
- The growth in air passenger demand globally can be explained in part due to the health of the economy and an ongoing trend of decreasing airfare.

- Due to significant downturns in the global economy, the overall growth in regional air cargo traffic has been relatively flat. From 2000 to 2017, air cargo grew at an annual rate of 0.52 percent per year, going from 2.87 million tons of cargo in 2000 to 3.14 million tons in 2017. However, the steady to low growth in air cargo is a reflection of the depressions caused by 9/11 and the Great Recession. Similar to air passenger travel, air cargo experienced a boom post-2010. From 2012 to 2017, air cargo grew at an increased annual rate of 4.6 percent from 2.5 million tons in 2012 to 3.14 million tons in 2017.
- Despite increases in air passenger and cargo activity, aircraft operations (i.e. number of aircraft take-offs and landings) have actually decreased due to larger aircraft and higher load factors. Overall, aircraft operations in the region decreased by an annual rate of 1.8 percent from 2000 to 2017.
- Based on historic and current trends, and an analysis of the economy, airfare, population, and other factors, regional air passenger and cargo forecasts are calculated by different organizations, including the Federal Aviation Administration (FAA)-Terminal Area Forecast (TAF), FAA Aerospace Forecast, and the University of California, Institute of Transportation Studies.
- The FAA-TAF and other sources informed the Connect SoCal regional forecast.
- Based on historic and current air passenger and cargo activity data, and air passenger and cargo forecasts, airports and transportation agencies are working to manage and transform the ground access to and from the airports to meet the increased demand.

INTRODUCTION

The six-county SCAG region is home to an expansive multiple airport system that includes seven commercial airports with scheduled passenger service, seven government/military air-fields, and over 30 reliever and general aviation airports. All of these airports play a critical role in the movement of people and goods throughout the region. The seven commercial service airports in the

region with scheduled service are: Hollywood-Burbank, Imperial, Long Beach, Los Angeles, Ontario, Palm Springs, and Santa Ana. Sixteen of the airports in the region are designated by the Federal Aviation Administration (FAA) as reliever airports, which means that they could provide congestion relief for any of the commercial service airports in the region. Furthermore, of the reliever and general aviation airports, several have the capacity to include scheduled commercial air service in the future if needed.

In spite of the magnitude of the aviation system, SCAG does not have a role in the regulation or operations of the airports. As a metropolitan planning organization (MPO), SCAG's mandate is surface transportation system planning. SCAG has no authority over the daily operations, development, regulation, or planning of the region's airports. However, SCAG is invested in aviation from the perspective of how air passenger and cargo traffic influences, impacts, and interplays with the surface transportation system, and how to improve ground transportation to and from airports. Therefore, SCAG's focus in aviation planning is to ensure adequate ground transportation planning and improving ground access to the region's airports in response to potential future aviation demands.

In order to assess the existing and potential impact of air passenger and cargo traffic in the region, SCAG incorporates an aviation element to Connect SoCal. As the designated MPO, SCAG is required to include an airport ground access improvement program as part of Connect SoCal. A significant part of addressing airport ground access improvement is maintaining an updated list of airport ground access projects. However, beyond the list of ground access projects, the MPOs, including SCAG, have some discretion as to how they address aviation in their regional plans. Due to the interdependent relationship between the air passenger and cargo activity traveling on the roads, highways, and transit systems, planning for the region's surface transportation system also includes analyzing historic and current airport passenger and cargo activity, as well as forecasting and planning for that future activity.

REGIONAL SIGNIFICANCE

As illustrated on the airports map (**EXHIBIT I**), the SCAG region is home to a

system of over 50 airports (over 60 if you include other private and government airports closed to the public). Of these airports, seven are primary commercial service airports. In addition to the primary commercial service airports, there are also general aviation, government/military, private, and other public-use airports in the SCAG region.

COMMERCIAL SERVICE AIRPORTS IN THE SCAG REGION (FAA CODE)

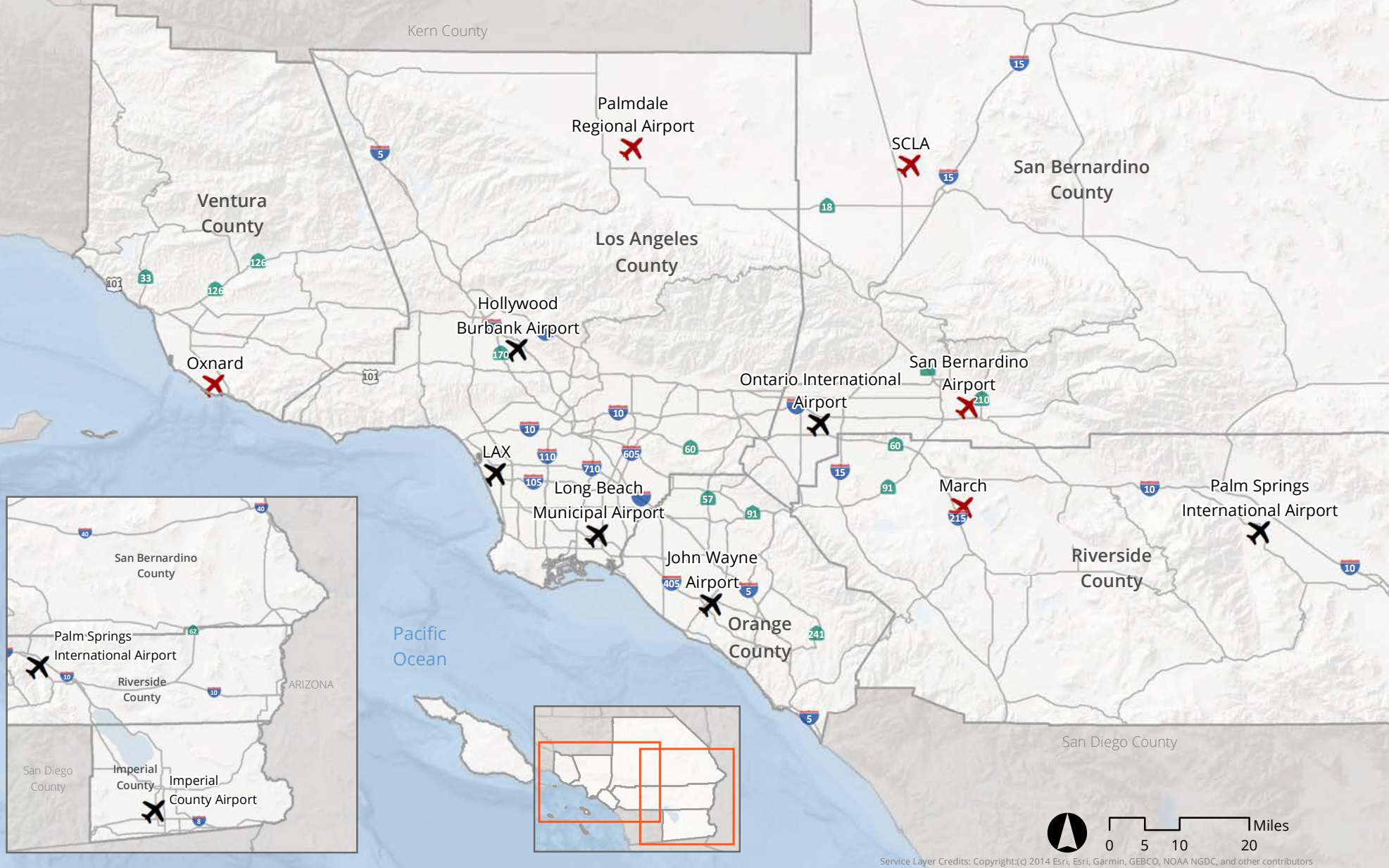
HOLLYWOOD BURBANK/BOB HOPE AIRPORT (BUR)

Located in the San Fernando Valley northwest of downtown Burbank in Los Angeles County, the Hollywood Burbank Airport (also known as the "Bob Hope Airport") (BUR) is a publicly owned airport. The airport is owned and operated by the Burbank-Glendale-Pasadena Airport Authority, which is controlled by the governments of the cities of Burbank, Glendale, and Pasadena. While "Hollywood Burbank" has been the branding name since 2016, "Bob Hope" has been the legal name of the airport since 2003. The building and facilities date back to 1930. Rather than use jet bridges, passengers board commercial airlines at Hollywood Burbank via portable boarding steps on the tarmac.

Burbank Airport is currently in the project planning process for a new, relocated, terminal. Although modernization is one factor, the primary reason for the new terminal is safety. The current terminal building is located too closely to the runways. Although the new terminals will enable faster processing in and out of the airport, it will not be increasing capacity.

Burbank Airport has infrastructure and facilities dedicated to transit and rail passengers coming to and from the airport. In addition to housing rental cars, the ground level of the Regional Intermodal Transportation Center (RITC), which opened in June of 2014, serves as a transit hub for bus riders. Metro Bus and Burbank Bus stop in the bus turn-around area on the ground level of the RITC. Currently, Hollywood Burbank is the only airport in the SCAG region with a direct rail connection to Downtown Los Angeles. Additionally, Amtrak

EXHIBIT 1 SCAG Region Airports



Legend

- County Boundaries
- City Boundaries
- Freeway
- ✈ Commercial Service Airport
- ✈ Reliever Airport

Source: SCAG, 2019

Service Layer Credits: Copyright (c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

and Metrolink passengers stopping at the Burbank Airport-South Train Station are able to access the RITC via an Empire Avenue street crossing that leads straight to elevator and escalator access to the elevated walkway. Metrolink also stops at the Burbank Airport-North Station located on San Fernando Road and Hollywood Way. The Airport Authority provides complimentary SuperShuttle service between the Burbank Airport-North Station and the Airport terminal.

BUR Major Carriers and Destinations: Alaska, American Eagle, Delta, JetBlue, United, and Southwest fly out of Hollywood Burbank Airport. However, Southwest has the most flights out of Hollywood Burbank, serving mainly cities in the western United States. Popular destinations out of Hollywood Burbank Airport include San Francisco, Portland, Oregon, Las Vegas, Nevada, Oakland, California, Phoenix, Arizona, and Denver, Colorado. Recently, JetBlue added a flight to Boston, Massachusetts.

AirNet Express, Ameriflight, FedEx, and UPS are the cargo carriers flying out of Hollywood Burbank Airport.

BUR Operational Breakdown (2017 data):

Aircraft operations: average 354/day

- 38 percent commercial
- 29 percent transient general aviation
- 17 percent local general aviation
- 15 percent air taxi
- <1 percent military

In recent years, passenger traffic at the airport has significantly declined from 6.0 million passengers in 2007 to 3.9 million passengers in 2014. However, from 2015 to 2017, Burbank saw a 20% increase from 3.9 million annual passengers (MAP) to 4.7 MAP.

IMPERIAL COUNTY AIRPORT (IPL)

Imperial County Airport (IPL) is located in the city of Imperial in Imperial County,

California, approximately twelve miles north of the California-Mexico border. The airport provides limited scheduled air service and also serves the general aviation needs of the surrounding communities.

Imperial County Airport is currently part of the Essential Air Service (EAS) program through the United States Department of Transportation, providing the residents of Imperial County a connection to the national aviation system. Passenger traffic peaked in 2001, with approximately 30,000 annual passengers, before gradually decreasing following the events of 9/11. Traffic began rebounding in 2006 before declining again after the global financial crisis. The airport participates in the federal Essential Air Service (EAS) program, which subsidizes air service to eligible small community airports.

IPL Major Carriers and Destinations: Currently, only one scheduled passenger airline operates out of Imperial County Airport, Mokulele Airlines. Headquartered in Hawaii, Mokulele airlines generally flies passengers from Imperial County to either Los Angeles International or Hollywood Burbank Airport.

The two cargo carriers in Imperial County Airport at Ameriflight and FedEx Feeder, both of which supply service to Ontario, California.

IPL Operational Breakdown (2017 data):

- Aircraft operations: average 38/day
- 43 percent local general aviation
- 25 percent military
- 24 percent transient general aviation
- 9 percent commercial

Due to being served by only one commercial airline, Mokulele, the passenger traffic out of Imperial is relatively small, generally staying below 10,000 passengers a year. In 2017, however, 11,812 passengers traveled to or from the Imperial County Airport.

LONG BEACH AIRPORT/DAUGHERTY FIELD (LGB)

Long Beach Airport (LGB) is located northeast of the city of Long Beach in Los Angeles County. The arrival of low-cost carrier JetBlue in 2001 led to a rapid increase in air traffic, and solidified LGB's position as an alternative to LAX for flights to the East Coast. However, in recent years, JetBlue has begun to scale back its service at Long Beach Airport.

Built in 1941, the Long Beach Airport Terminal is a Cultural Historic Landmark. In the fall of 2017, a new concourse was opened, which includes an updated security screening area and boarding lounge. Currently, a ground transportation center, which will serve as an intermodal transportation facility for buses, taxis, and shuttles is being constructed. Furthermore, in order to better address traffic flow in and around the airport, Long Beach Airport is currently undergoing different terminal roadway improvements, as well as constructing a new parking facility.

LGB Major Carriers and Destinations: Currently, JetBlue is one of the most active carriers out of Long Beach Airport. The other major carriers are American Eagle, Delta, Hawaiian, and Southwest Airlines. Although Hawaiian Airlines maintains a partnership with JetBlue that has stops in Las Vegas, San Jose, and San Francisco, when arriving and departing to Hawai'i, Hawaiian Air only maintains one direct arrival from and departure to Honolulu a day. Other popular destinations from Long Beach include Las Vegas, Oakland, and Salt Lake City.

FedEx Express and UPS are the major cargo carriers out of Long Beach Airport.

LGB Operational Breakdown (2017 data):

- Aircraft operations: average 811/day
- 51 percent local general aviation
- 34 percent transient general aviation
- 12 percent commercial
- 2 percent air taxi
- <1 percent military

Traffic levels have been relatively steady at Long Beach Airport, hovering around 3 million annual passengers (MAP) per year. In 2017, passenger traffic hit 3.8 MAP. As for cargo, in recent years, Long Beach normally averages 25,000 tons per year. However, in the early 2000s, Long Beach averaged 55,000 tons of cargo per year

LOS ANGELES INTERNATIONAL AIRPORT (LAX)

Located 18 miles southwest of Downtown Los Angeles, the Los Angeles International Airport (LAX) is the publicly owned (City of Los Angeles) primary airport serving the Greater Los Angeles Area. LAX is owned and operated by the Los Angeles World Airports (LAWA), formerly the Department of Airports, an agency of the City of Los Angeles, and governed by the LAWA Board of Commissioners. As the largest airport in the region, LAX plays a critical role in the movement of people and cargo throughout the region.

As one of the largest airports in the world, LAX plays a critical role for domestic and international travelers, and air cargo, in the region. LAX is a hub for the major US legacy carriers American Airlines, Delta, and United, in addition to Alaska Airlines and Virgin America. In addition to being a major domestic hub, LAX is also a key international gateway, with flights to six continents. In 2018, LAX ranked as the fourth busiest airport in the world for passenger traffic, just behind Atlanta, Beijing, and Dubai (CNN, 2019). However, when one factors out connecting flights, LAX is the busiest origin and destination (O&D) airport. The O&D passengers represent about 38 percent of LAX's total passengers (Forbes, February 22, 2018). LAX is also a major cargo airport, ranking 13th in the world and fourth in the U.S. in air cargo tonnage processed (LAX website). A majority of the daily passenger flights that fly through LAX carry at least some cargo, and there are also approximately 30 dedicated cargo airlines operating out of LAX.

Currently, in order to accommodate the passenger traffic coming to and from the airport, LAX is undergoing a major renovation known as the Landside Access Modernization Program (LAMP). The LAMP will include an elevated Automated People Mover (APM); two Intermodal Transportation Facilities (ITF) with parking areas allowing for drop-offs and pick-ups from personal vehicles, buses, shuttles, taxis, and ride-sharing services; a Consolidated Rental Car Facility

(CONRAC), which will consolidate the rental car agencies near the airport at one location; and a comprehensive series of roadway improvements to alleviate traffic congestion in and around airport facilities.

In addition to the LAMP, LAX is constantly undertaking safety and modernization improvements. For instance, the LAX Airfield and Terminal Modernization Project (ATMP) is designed to reduce levels of risk while maintaining/enhancing airfield operational efficiency. The ATMP will include a reconfiguration of the North Airfield, a new concourse, a new terminal (terminal 9), and LAX road reconfiguration to provide direct access to the new terminal, as well as improve traffic flow in and around LAX.

LAX Major Carriers and Destinations: The major domestic carriers at LAX include American Airlines, Delta Airlines, Southwest, and United. Major international carriers at LAX include British Airways, Carthay Pacific, Norwegian Air Shuttle, and Volaris.

As for air cargo, FedEx flies the most cargo in and out of LAX. Other major cargo carriers out of LAX include UPS, China Southern, Atlas Air, and Asiana.

LAX Operational Breakdown (2017 data):

- Aircraft operations: average 1603/day
- 92 percent commercial
- 5 percent air taxi
- 3 percent transient general aviation
- <1 percent military

Following a decline in passenger travel following 9/11, and then another dip in passenger travel in 2008 due to the housing recession of 2007, passenger traffic at LAX has increased at a steady rate from 59 million annual passengers (MAP) in 2010 to 84.56 MAP in 2017, a 43 percent increase. Over 70 percent of the air passenger travel in the region is accommodated by LAX. Cargo has also increased steadily from 1.9 million tons in 2010 to 2.4 million tons in 2017.

ONTARIO INTERNATIONAL AIRPORT (ONT)

The Ontario International Airport (ONT) is located in the City of Ontario in San Bernardino County. Los Angeles World Airports (LAWA) owned and operated the Ontario International Airport from 2006 to 2016. In 2015, LAWA agreed to terms and conditions for the transfer of the airport to a new airport sponsor, the Ontario International Airport Authority (OIAA).

ONT Major Carriers and Destinations: Southwest is the largest carrier operating at the airport. The air service pattern is mostly focused on cities in western United States as well as the main hubs of the legacy airlines. Other airlines flying out of Ontario include Alaska, United, China, and American Airlines, with American Airlines accommodating the most flights after Southwest.

The airport is also a major cargo hub for UPS, facilitated by its geographic position, long runways, and relatively limited noise restrictions allowing for 24/7 operations. Along with UPS, other cargo carriers at Ontario include Amazon Air, FedEx, and Ameriflight.

ONT Operational Breakdown (2017 data):

- Aircraft operations: average 267/day
- 63 percent commercial
- 18 percent air taxi
- 12 percent transient general aviation
- 6 percent local general aviation
- <1 percent military

Currently, ONT averages approximately 4 million annual passengers (MAP) a year. Although passenger travel at ONT is currently around 4 MAP, at one point in the early 2000s that number went as high as 7 MAP. However, following the global financial crisis, passenger traffic at the airport dropped sharply from 7.2 million in 2007 to just under 4 million in 2013. Eventually, passenger traffic recovered from the housing recession, although not to its early 2000 levels. Passenger traffic increased by 3.4 percent between 2013 and 2014 from 3.9

MAP to 4.1 MAP. In 2017, passenger traffic had increased to 4.55 MAP.

Given the current passenger and cargo traffic to ONT, there is plenty of room for growth. The airport has a potential capacity of over 33 MAP. Therefore, ONT is currently working over 25 MAP below capacity. Although passenger travel at ONT is currently around 4 MAP, at one point in the early 2000s that number went as high as 7 MAP. As for air cargo, Ontario Airport cargo activity has been steadily increasing since the Great Recession of 2008, reaching 654,000 tons in 2017.

PALM SPRINGS INTERNATIONAL AIRPORT (PSP)

Palm Springs International Airport (PSP) is located in the desert resort city of Palm Springs in the Coachella Valley in Riverside County. The airport mainly caters to seasonal leisure travelers visiting the area during the winter.

Except for a few setbacks following the events of 9/11 as well as the global financial crisis, passenger traffic at the airport has increased steadily throughout the 2000s. In 2014 the airport handled 1.9 million passengers, which was a 9 percent increase compared to the previous year.

PSP Major Carriers and Destinations: The main US carriers, such as United, Alaska, Southwest, and American all operate at PSP. Some carriers only provide service during the peak season. The two most active carriers out of Palm Springs are United and American Airlines. Air Canada, Alaska, Allegiant, Delta, Frontier, JetBlue, Sun Country, and Westjet also fly out of Palm Springs. Popular destinations include Calgary, San Francisco, and Phoenix.

Ameriflight is the only cargo carrier to fly out of Palm Springs. Ameriflight provides cargo service to and from Ontario, California.

PSP Operational Breakdown (2017 data):

- Aircraft operations: average 142/day
- 37 percent commercial
- 34 percent transient general aviation

- 20 percent air taxi
- 6 percent local general aviation
- 3 percent military

The airport is generally quieter during the warmer summer months, with the peak travel occurring during the fall. Passenger travel to the airport in recent years (2010 to 2017) has averaged 1.8 million annual passengers (MAP) per year, hitting 2.1 MAP in 2017. Air cargo is not a major factor at Palm Springs Airport.

JOHN WAYNE/ORANGE COUNTY AIRPORT (SNA)

Owned and operated by the County of Orange, the John Wayne Airport (SNA) is located near the cities of Santa Ana, Irvine, Newport Beach and Costa Mesa. However, due to the airport not being located in an incorporated city, the actual mailing address for SNA is in Santa Ana, California, Orange County headquarters. Originally named the Orange County Airport, the Orange County Board of Supervisors renamed the airport John Wayne Airport in 1979 in order to honor the actor who had lived in Newport Beach nearby and had passed on that same year.

SNA operates as an “enterprise fund” and is completely self-supporting. Although SNA pays taxes into the general fund, SNA receives no general fund/ tax revenues. The annual budget is proposed and considered part of the County’s regular budget cycle. Federal law mandates that airport revenues can be used only for airport purposes.

SNA Service Partners: Orange County Fire Authority (Aircraft Rescue and Firefighting), Orange County Sheriff’s Department (Airport Police Services), Federal Aviation Administration (FAA), Transportation Security Administration (TSA), and US Customs and Border Protection (CBP).

SNA Service Providers: Airlines (Commercial and Commuter), Terminal Concessions (Food and Beverage, News and Gift, Specialty), Ground Transportation (Rental Car, Taxi, TNCs, Shuttle, Valet, Parking), Fixed Based Operators (FBOs), Hangar Operations, and Aircraft Support (Fueling, Maintenance, Catering, etc.).

SNA Major Carriers and Destinations: In 2018, Southwest was the largest and most active carrier operating at the airport, followed by Delta, Alaska, United, and American Airlines. The air service pattern is mostly focused on cities in western United States as well as the main hubs of the legacy airlines. Popular destinations out of John Wayne include Chicago, San Francisco, and Denver.

FedEx Express and UPS are the two cargo carriers that fly out of John Wayne. The late night curfews severely impacts when cargo flights can fly in and out of John Wayne.

SNA Operational Breakdown (2017 data):

- Aircraft operations: average 803/day
- 34 percent local general aviation
- 31 percent commercial
- 29 percent transient general aviation
- 6 percent air taxi
- <1 percent military

The John Wayne Airport is 503 acres with 20 gates for commercial airlines and two commuter terminals. There are two runways, one for commercial aviation (5,700 feet) and one for general aviation (2,887 feet). General aviation outnumber commercial operations. As a result, there are several facilities at the airport that serve general aviation and corporate aviation.

Located off of the 405 and 73 freeways, the airport is the second busiest airport in the SCAG region. Passenger traffic at the airport has been more resilient to exogenous shocks than the other airports in the area. Demand recovered quickly after 9/11; however, the global financial crisis negatively affected demand for air travel in Orange County. Total passenger traffic in 2014 was 9.3 million annual passengers (MAP), below the high of 10.0 (MAP) in 2007. However, in 2016, SNA hit 10.5 MAP, with a slight decrease to 10.4 MAP in 2017.

COMMERCIAL AVIATION

The SCAG region continues to be one of the busiest and most diverse

commercial aviation systems in the world. In 2017, the seven commercial service airports in operation (Hollywood-Burbank, Imperial, Los Angeles, Long Beach, Ontario, Palm Springs, and Santa Ana) combined to accommodate over 110 million annual passengers (MAP) to 200 destinations, including service to almost 50 countries and over 40 states in the United States. More than 80 passenger airlines offered scheduled service to at least one of the region's commercial airports. On average, the airports in the region supported over 1,200 commercial air carrier departures, and over 300,000 arriving and departing passengers per day. In 2017, over 25 million of the 110.17 MAP were international travelers. A majority of the air passengers in the region are traveling for personal or leisure/pleasure, with approximately a quarter of the air travel in the region being business related.

In addition to the passenger service, the airports in the SCAG region are also critical for the movement of goods to and from the SCAG region. In both 2017 and 2018, over three million tons of air cargo were flown to and from the region's airports. Over 30 carriers in the region serve over 100 cargo destinations. Therefore, the airports in the SCAG region support hundreds of air carriers who are responsible for the movement of over a 100 million people, and over three million tons of goods to hundreds of destinations across the country and the world. As a critical part of the network to move people and goods, as well as generators of employment directly and indirectly related to the airports, the regional aviation system has a significant impact on the economic health of the region.

GENERAL AVIATION IN THE SCAG REGION

Along with scheduled passenger service and cargo, the SCAG region aviation system supports thousands of general aviation pilots. In addition to general aviation flights being operated out of the seven commercial airports in the SCAG region, there are also over 40 reliever, general aviation, and other public use airports that support general aviation. While the commercial, reliever, and general aviation airports are recognized as part of the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS) airports, the other public use airports operate independent of the NPIAS. Of note, Catalina Airport is a popular public-use, non-NPIAS, airport, as it provides

TABLE 1 Commercial Air Carriers (and Destinations) Operating in the SCAG Region Airports

Airlines	Destinations
Aer Lingus	Dublin
Aeroflot	Moscow-Sheremetyevo
Aeromexico	Guadalajara, Mexico City
Aeroméxico Connect	León/Del Bajío, Monterrey
Air Canada	Calgary, Montréal-Trudeau, Toronto-Pearson, Vancouver
Air Canada Rouge	Seasonal: Toronto-Pearson
Air China	Beijing-Capital, Shenzhen[27]
Air France	Papeete, Paris-Charles de Gaulle
Air New Zealand	Auckland, London-Heathrow, Rarotonga
Air Tahiti Nui	Papeete, Paris-Charles de Gaulle
Alaska Airlines	Albuquerque, Anchorage, Baltimore, Boston, Chicago-O'Hare, Dallas-Love, Fort Lauderdale, Guadalajara, Honolulu, Ixtapa/Zihuatanejo, Kahului, Las Vegas, Liberia (Costa Rica), Loreto, Mammoth Lakes (ends November 30, 2018),[28] Manzanillo, Mazatlán, Mexico City, New York-JFK, Newark, Orlando (ends July 5, 2018),[29] Philadelphia, Portland (OR), Puerto Vallarta, Salt Lake City, San Francisco, San Jose (CA), San José del Cabo, San José de Costa Rica, Santa Rosa, Seattle/Tacoma, Sun Valley (ends October 18, 2018), Washington-Dulles, Washington-National
Alitalia	Rome-Fiumicino[30]
All Nippon Airways	Tokyo-Haneda, Tokyo-Narita
Allegiant Air	Bellingham, Billings, Boise, Cedar Rapids/Iowa City, Cincinnati, Des Moines, Eugene, Fargo, Fayetteville-Bentonville, Grand Junction, Great Falls, Idaho Falls, Kalispell, Little Rock, McAllen, Medford, Memphis, Missoula, Montrose, Oklahoma City, Provo, Springfield (MO), Sioux Falls, Tri-Cities (WA), Tulsa, Wichita
American Airlines	Anchorage, Atlanta,Auckland, Austin, Beijing-Capital, Belize City, Boston, Buenos Aires-Ezeiza (begins December 19, 2018),[31] Charlotte, Chicago-O'Hare, Columbus-Glenn, Dallas/Fort Worth, Denver, Eagle/Vail, Hartford, Hong Kong, Havana (Charter), Honolulu, Indianapolis, Jackson Hole, Montego Bay, Kahului, Kailua-Kona, Las Vegas, Lihue, London-Heathrow, Mexico City, Miami, Nashville, New Orleans, New York-JFK, Orlando, Philadelphia, Phoenix-Sky Harbor, Raleigh/Durham, St. Louis, San José del Cabo, São Paulo-Guarulhos, Shanghai-Pudong, Sydney, Tokyo-Haneda, Tokyo-Narita, Toronto-Pearson, Washington-Dulles, Washington-National
American Eagle	Albuquerque, Aspen, Bozeman, Denver, Durango (CO), El Paso, Eugene, Fayetteville/Bentonville, Flagstaff, Fresno, Grand Junction, Houston-Intercontinental, Jackson Hole, Mazatlán, Medford, Montrose, Oklahoma City, Omaha, Phoenix-Sky Harbor, Portland (OR), Puerto Vallarta, Redmond/Bend, Reno/Tahoe, Sacramento, Salt Lake City, San Antonio, San Diego, San Francisco, San Jose (CA), Seattle/Tacoma, Tucson, Vancouver
Asiana Airlines	Seoul-Incheon
Austrian Airlines	Seasonal: Vienna
Avianca	Bogotá

TABLE 1 Commercial Air Carriers (and Destinations) Operating in the SCAG Region Airports - Continued

Airlines	Destinations
Avianca Costa Rica	Guatemala City, San José de Costa Rica, San Salvador
Avianca El Salvador	San Salvador
Boutique Air	Inyokern,[34] Merced
British Airways	London–Heathrow
Cathay Pacific	Hong Kong
China Airlines	Taipei–Taoyuan
China Eastern Airlines	Nanjing, Shanghai–Pudong
China Southern Airlines	Guangzhou
Copa Airlines	Panama City
Delta Air Lines	Amsterdam (begins June 17, 2018),[35] Atlanta, Austin, Belize City, Boston, Bozeman, Cancún, Cincinnati, Columbus–Glenn, Dallas/Fort Worth, Denver, Detroit, Guatemala City, Honolulu, Indianapolis, Kahului, Kailua–Kona, Kansas City, Las Vegas, Liberia (CR), Lihue, Memphis, Mexico City,[36] Miami, Minneapolis/St. Paul, Nashville, New Orleans, New York–JFK, Oakland, Orlando, Paris–Charles de Gaulle (begins June 16, 2018),[35] Phoenix–Sky Harbor, Portland (OR), Puerto Vallarta, Raleigh/Durham, Sacramento, Salt Lake City, San Diego, San Francisco, San Jose (CA), San José del Cabo, San José de Costa Rica, San Salvador, Seattle/Tacoma, Shanghai–Pudong, Sydney, Tampa, Tokyo–Haneda, Washington–National
Delta Connection	Albuquerque, Aspen, Austin, Boise, Dallas/Fort Worth, Bozeman, Denver, Jackson Hole, Kalispell, Kansas City, Las Vegas, Missoula, Oakland, Phoenix–Sky Harbor, Portland (OR), Sacramento, Salt Lake City, San Antonio, San Diego, San Jose (CA), Seattle/Tacoma, Spokane, Sun Valley, Tucson
El Al	Tel Aviv–Ben Gurion
Emirates	Dubai–International
Ethiopian Airlines	Addis Ababa
Etihad Airways	Abu Dhabi
EVA Air	Taipei–Taoyuan
Fiji Airways	Nadi
Frontier Airlines	Atlanta, Austin (begins August 14, 2018), Cincinnati, Denver, Orlando, San Antonio (begins August 13, 2018)
Hainan Airlines	Changsha, Chengdu,[37] Chongqing[37]
Hawaiian Airlines	Honolulu, Kahului, Kailua–Kona, Lihue
Hong Kong Airlines	Hong Kong[38]

TABLE 1 Commercial Air Carriers (and Destinations) Operating in the SCAG Region Airports - Continued

Airlines	Destinations
Iberia	Madrid[39]
Interjet	Cancún, Guadalajara, León/Del Bajío, Mexico City, Puerto Vallarta, San José del Cabo[40]
Japan Airlines	Osaka-Kansai, Tokyo-Narita
JetBlue Airways	Austin, Boston, Bozeman (begins December 13, 2018), Buffalo, Fort Lauderdale, Hayden/Steamboat Springs (begins December 15, 2018), Las Vegas, New York-JFK, Oakland, Orlando, Portland (OR), Reno/Tahoe, Sacramento, Salt Lake City, San Francisco, San Jose (CA), Seattle/Tacoma
JetSuiteX	Concord (CA), Las Vegas, Oakland, San Jose (CA)
KLM	Amsterdam
Korean Air	Seoul-Incheon
LATAM Chile	Lima, Santiago de Chile
LATAM Perú	Lima
LEVEL	Seasonal: Barcelona[41]
LOT Polish Airlines	Warsaw-Chopin[42]
Lufthansa	Frankfurt, Munich
Mokulele Airlines	El Centro[43], Los Angeles
Norwegian Air Shuttle	Barcelona,[44] Copenhagen, London-Gatwick, Madrid (begins July 15, 2018),[45] Oslo-Gardermoen, Paris-Charles de Gaulle, Rome-Fiumicino,[46], Stockholm-Arlanda
operated by Delux Public Charter	Seasonal: Mammoth Lakes
Philippine Airlines	Manila
Qantas[a]	Brisbane, Melbourne, Sydney
Qatar Airways	Doha
Saudia	Jeddah, Riyadh
Scandinavian Airlines	Stockholm-Arlanda
Sichuan Airlines	Chengdu, Hangzhou, Jinan[48]
Singapore Airlines	Seoul-Incheon,[49] Singapore, Tokyo-Narita

TABLE 1 Commercial Air Carriers (and Destinations) Operating in the SCAG Region Airports - Continued

Airlines	Destinations
Southwest Airlines	Albuquerque, Atlanta, Austin, Baltimore, Cancún, Chicago–Midway, Dallas–Love, Denver, El Paso, Houston–Hobby, Indianapolis, Kansas City, Las Vegas, Milwaukee, Nashville, New Orleans, Oakland, Omaha,[50] Phoenix–Sky Harbor, Pittsburgh, Portland (OR), Puerto Vallarta, Reno/Tahoe, Sacramento, St. Louis, Salt Lake City, San Antonio, San Francisco, San Jose (CA), San José del Cabo, Tampa (begins August 7, 2018),[50] Tucson
Spirit Airlines	Atlanta, Baltimore, Cleveland, Chicago–O'Hare, Dallas/Fort Worth, Denver, Detroit, Fort Lauderdale, Houston–Intercontinental, Kansas City, Las Vegas, Minneapolis/St. Paul, New Orleans, Oakland, Philadelphia, Pittsburgh, Tampa[51]
Sun Country Airlines	Honolulu, Minneapolis/St. Paul
Swiss International Air Lines	Zürich
Turkish Airlines	Istanbul–Atatürk
United Airlines	Austin, Baltimore, Boston, Cancún, Chicago–O'Hare, Cleveland, Dallas/Fort Worth, Denver, Hilo, Honolulu, Houston–Intercontinental, Kahului, Kailua–Kona, Las Vegas, Lihue, London–Heathrow, Los Angeles, Melbourne–Tullamarine, Mexico City (ends October 4, 2018),[53] Newark, Orlando, Puerto Vallarta, Sacramento, San Diego, San Francisco, San José del Cabo, Seattle/Tacoma, Shanghai–Pudong, Singapore, Sydney, Tokyo–Narita, Washington–Dulles
United Express	Albuquerque, Aspen, Austin, Boise, Bozeman, Colorado Springs, Dallas/Fort Worth, Denver, Eureka, Fresno, Hayden/Steamboat Springs, Jackson Hole, Kalispell, Las Vegas, León/Del Bajío (ends October 4, 2018),[53] Medford,[54] Missoula, Monterey, Montrose, Palm Springs, Phoenix–Sky Harbor, Redmond,[54] Reno/Tahoe, Sacramento, Salt Lake City, San Antonio, San Diego, San Francisco, San Luis Obispo, Santa Barbara, Seattle/Tacoma, St. George (UT), Tucson, Vancouver
Virgin Atlantic	London–Heathrow, Manchester (UK)(begins May 26, 2019)
Virgin Australia	Brisbane, Melbourne–Tullamarine, Sydney
VivaAerobus	Guadalajara[56]
Volaris	Aguascalientes, Durango, Guadalajara, León/Del Bajío, Mexico City, Morelia, Oaxaca, Uruapan, Zacatecas
Volaris	Guadalajara
Volaris Costa Rica	Guatemala City, San José de Costa Rica, San Salvador
WestJet	Calgary, Edmonton, Toronto–Pearson, Vancouver, Winnipeg
XiamenAir	Qingdao, Xiamen
Total Airlines	81
Total Destinations	200

Source: SCAG Region Commercial Airport Websites

TABLE 2 SCAG Region Cargo Airlines and Destinations

Airlines	Destinations
AeroUnion	Guadalajara, León/El Bajío, Mexico City, Monterrey
AirBridgeCargo Airlines	Amsterdam, Anchorage, Hong Kong, Shanghai–Pudong
Air China Cargo	Beijing–Capital, Quito, Shanghai–Pudong
AirNet Express	Columbus–Rickenbacker
Aloha Air Cargo	Honolulu
Amazon Air	Allentown, Baltimore, Charlotte, Chicago/Rockford, Cincinnati, Dallas/Fort Worth, Denver, Honolulu, Houston–Intercontinental, Providence (ends July 31, 2018),[32] San Antonio–Lackland, Stockton, Tampa
Ameriflight	Bakersfield, Blythe, Burbank, Fresno, Imperial, Lancaster, Oakland, Ontario, Oxnard, Palm Springs, San Diego, San Luis Obispo, Tijuana, Visalia
Asiana Cargo	Anchorage, San Francisco, Seoul–Incheon
Cargolux	Anchorage, Calgary, Glasgow–Prestwick, Luxembourg, Mexico City, Milan–Malpensa, Seattle/Tacoma
Cathay Pacific Cargo	Anchorage, Hong Kong, Mexico City, Portland (OR)[65]
Centurion Air Cargo	Guadalajara, Mexico City, Miami, Tokyo–Narita
China Airlines Cargo	Anchorage, Osaka, San Francisco, Taipei–Taoyuan
China Cargo Airlines	Shanghai–Pudong
China Southern Cargo	Guangzhou, Hefei, Shanghai–Pudong, Tianjin, Vancouver, Zhengzhou
DHL Aviation	Anchorage, Calgary, Cincinnati, Guadalajara, Hong Kong, Honolulu, Huatulco, Leipzig/Halle, Mexico City, Phoenix–Sky Harbor, Portland (OR), San Francisco, San Jose (CA), San José (CR), Seattle/Tacoma, Seoul–Incheon, Tokyo–Narita, Tucson
Emirates SkyCargo	Copenhagen, Dubai–Al Maktoum, Mexico City, Zaragoza
EVA Air Cargo	Anchorage, Taipei–Taoyuan
FedEx Express	Boston, Burbank, Chicago–O’Hare, Dallas/Fort Worth, Edmonton, Fort Worth/Alliance, Fresno, Honolulu, Indianapolis, Los Angeles, Memphis, Minneapolis/St. Paul, Nashville, Newark, Oakland, Ontario, Orange County, Phoenix–Sky Harbor, Portland (OR), Reno/Tahoe, Salt Lake City, San Diego, Seattle/Tacoma, Sydney, Tulsa, Hartford (seasonal)
FedEx Feeder	Bakersfield, Bishop, Imperial, Inyokern, Ontario, Palmdale, San Diego, San Luis Obispo, Santa Barbara, Santa Maria
Kalitta Air	Seasonal: Philadelphia

TABLE 2 SCAG Region Cargo Airlines and Destinations - Continued

Airlines	Destinations
Korean Air Cargo	Anchorage, San Francisco, Seoul–Incheon, Tokyo–Narita
Lufthansa Cargo	Frankfurt, Manchester
MasAir	Campinas–Viracopos, Guadalajara, Mérida, Mexico City, Quito
National Airlines (N8)	Anchorage, Nagoya–Centrair, Shanghai–Pudong
Nippon Cargo Airlines	San Francisco, Tokyo–Narita
Qantas Freight	Auckland, Chongqing, Honolulu, Melbourne, Sydney
Qatar Airways Cargo	Doha, Luxembourg, Mexico City
Singapore Airlines Cargo	Amsterdam, Anchorage, Brussels, Hong Kong, Sharjah
Sky Lease Cargo	Miami, Tokyo–Narita
UPS Airlines	Albuquerque, Anchorage, Billings, Boise, Chicago/Rockford, Columbia (SC), Dallas/Fort Worth, Denver, Des Moines, El Paso, Fort Worth/Alliance, Fresno, Hartford, Hong Kong, Honolulu, Kailua–Kona, Kansas City, Las Vegas, Little Rock, Long Beach, Los Angeles, Louisville, Minneapolis/St. Paul, Newark, Oakland, Ontario, Orange County, Orlando, Philadelphia, Phoenix–Sky Harbor, Portland (OR), Reno/Tahoe, Sacramento–Mather, Salt Lake City, San Bernardino, San Diego, San Jose (CA), Seattle–Boeing, Spokane, Tokyo–Narita, Tulsa
Western Global Airlines	Hong Kong
Total Cargo Carriers	31
Total Cargo Destinations	114

Source: SCAG Region Commercial Airport Websites

an alternative to boat and ferry service to the island. Although not a scheduled service as is the case with commercial air carrier flights, general aviation flights do play a critical role in moving people throughout the SCAG region. Some airports, including a few of the larger commercial airports, such as John Wayne, and some of the reliever airports, including Chino and Camarillo airports, serve a high volume of general aviation operations. The number of passengers

traveling in the SCAG region via general aviation flights is substantial. Therefore, the potential closures of some of the general aviation and reliever airports, such as Santa Monica Airport, could have a significant impact on the region.

The largest percentage (44 percent) of general aviation flights flew out of the reliever airports. Furthermore, the number of general aviation pilots using non-FPIAS public-use airports was significant at 18 percent.

ECONOMIC BENEFITS

Airports play an integral role in the movement of people, goods, and services throughout the region, nation, and world. Furthermore, airport services also generate economic benefits for the residents and the regions where they

operate. Airports contribute to job creation, goods movement, facilitation of visitor spending, tax revenues, and other indirect and multiplier benefits. As is the case throughout the nation and world, the airports in the SCAG region provide multiple economic benefits.

TABLE 3 General Aviation and Reliever Airports in the SCAG Region

City Served	FAA	Airport Name	GA or Reliever
Apple Valley	APV	Apple Valley Airport	General Aviation
Banning	BNG	Banning Municipal Airport	General Aviation
Big Bear City	L35	Big Bear City Airport	General Aviation
Blythe	BLH	Blythe Airport	General Aviation
Brawley	BWC	Brawley Municipal Airport	General Aviation
Calexico	CXL	Calexico International Airport	General Aviation
Camarillo	CMA	Camarillo Airport	Reliever
Chemehuevi Valley	49X	Chemehuevi Valley Airport	General Aviation
Chino	CNO	Chino Airport	Reliever
Compton	CPM	Compton/Woodley Airport	Reliever
Corona	AJO	Corona Municipal Airport	General Aviation
Daggett	DAG	Barstow-Daggett Airport	General Aviation
El Monte	EMT	El Monte Airport (San Gabriel Valley Airport)	Reliever
Fullerton	FUL	Fullerton Municipal Airport	Reliever
Hawthorne	HHR	Hawthorne Municipal Airport (Jack Northrop Field)	Reliever
Hemet	HMT	Hemet-Ryan Airport	General Aviation
Imperial / El Centro	IPL	Imperial County Airport (Boley Field)	General Aviation
La Verne	POC	Brackett Field	Reliever

City Served	FAA	Airport Name	GA or Reliever
Lancaster	WJF	General William J. Fox Airfield	General Aviation
Los Angeles	WHP	Whiteman Airport	Reliever
Murrieta / Temecula	F70	French Valley Airport	General Aviation
Needles	EED	Needles Airport	General Aviation
Oxnard	OXR	Oxnard Airport	General Aviation
Palm Springs / Thermal	TRM	Jacqueline Cochran Regional Airport	General Aviation
Palmdale	PMD	Palmdale Regional Airport / USAF Plant 42	General Aviation
Redlands	REI	Redlands Municipal Airport	General Aviation
Riverside	RAL	Riverside Municipal Airport	Reliever
Riverside	RIV	March Air Reserve Base	Reliever
San Bernardino	SBD	San Bernardino International Airport	Reliever
Santa Monica	SMO	Santa Monica Municipal Airport	Reliever
Torrance	TOA	Zamperini Field	Reliever
Twentynine Palms	TNP	Twentynine Palms Airport	General Aviation
Upland	CCB	Cable Airport	Reliever
Van Nuys	VNY	Van Nuys Airport	Reliever
Victorville	VCV	Southern California Logistics Airport	Reliever

Sources: AirNav.com website and Caltrans Division of Aeronautics

The airports in the SCAG region are a significant job creator. Over 600,000 jobs are generated by airport services in the SCAG region, with at least 10 percent of jobs directly located on-site. Airport services have the ability to create direct, indirect, and induced employment. The California Airport Council's Economic Impact Study of California Airports (2017) suggests that on-site jobs at a commercial airport have a multiplier effect that creates three or more off-site jobs. Examples of direct employment include personnel hired by the airport administration and by the airlines, concessionaries, and other related companies in the ongoing operations of the airport, such as ticket agents, maintenance workers, and freight handlers. Indirect employment includes supplier industries that support airport operation, such as office product suppliers. Induced employment is created by the spending of earnings by direct and indirect employees. However, employment is just one of the benefits

associated with airports.

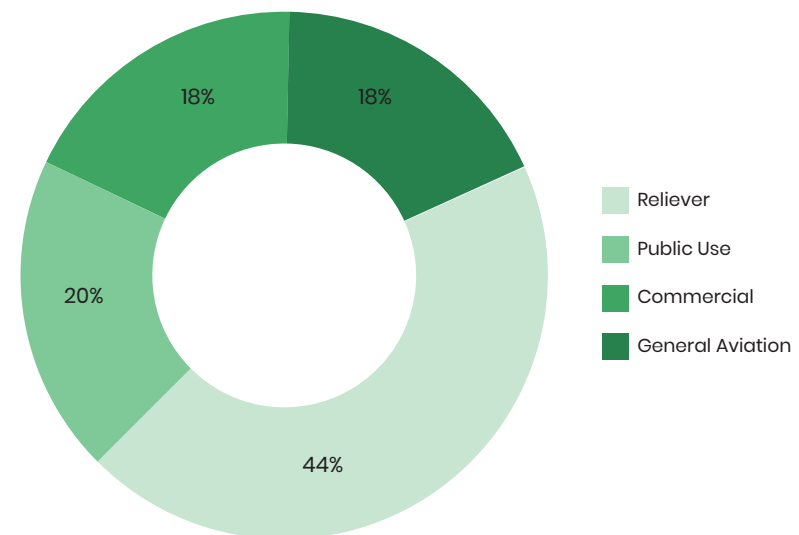
In addition to passenger and goods movement, and job creation, there are other economic benefits associated with the SCAG region airports. Airport operations also generate tax revenue, which are invested back into the region to support further economic activity, improve living standards, and alleviate poverty. Approximately, \$8 billion was generated from local, state, and federal taxes through airport operations annually. Furthermore, in addition to tax revenue, there are benefits associated with the tourists who travel to the SCAG region through the airports. As the SCAG region serves as a top tourist destination with its culturally rich areas, multiple theme parks and coastal beaches, it is no surprise that it attracts domestic and international visitors who contribute to the regional economy through spending. Spending

TABLE 4 Other Public-Use Airports in SCAG Region

City Served	FAA	Airport Name
Agua Dulce	L70	Agua Dulce Airpark (Agua Dulce Airport)
Avalon	AVX	Catalina Airport
Baker	002	Baker Airport
Calipatria	CLR	Cliff Hatfield Memorial Airport
Chiriaco Summit	L77	Chiriaco Summit Airport
Hesperia	L26	Hesperia Airport
Palm Springs	UDD	Bermuda Dunes Airport
Perris	L65	Perris Valley Airport
Riverside / Rubidoux	RIR	Flabob Airport
Salton City	SAS	Salton Sea Airport
Santa Paula	SZP	Santa Paula Airport
Yucca Valley	L22	Yucca Valley Airport

Source: AirNav.com website

FIGURE 1 Distribution of General Aviation Flights by Airport Type (2017)



Sources: FAA ATADS database and AirNav website

by visitors who arrive via commercial airports in the SCAG region totals \$8.5 billion or more. Visitor spending supports multiple industries, including retail trade, entertainment, accommodation and food services. The economic output associated with the SCAG region airports is significant. When it comes to the total value of all goods and services produced, commercial airports in the SCAG region generate more than \$145 billion in economic output, demonstrating how air transport is a major contributor to SCAG region and global economic prosperity.

REGULATORY FRAMEWORK

As a metropolitan planning organization (MPO), SCAG by definition is primarily a regional surface transportation planning agency. Therefore, SCAG is focused on air passenger and cargo activity from the perspective of how the traffic coming and going from the airports affects the region's roads, highways, and transit systems, and how to improve ground transportation access to the airports. Given the defined purpose and objectives of MPOs, beyond the analytical need for airport related data and analysis for surface transportation planning purposes, there are no firm airport and aviation-related state or federal requirements. The only required aviation-related feature of an MPO regional transportation plan is addressing airport ground access improvements. More specifically, California State Law (CA Government Code Section 65081.1) requires that regions that contain a primary air carrier airport (i.e. at least 10,000 annual scheduled passenger boardings) include an airport ground access improvement program within the MPO regional transportation plan. The SCAG region contains seven airports that exceed the minimum threshold for primary carrier status. Normally, the SCAG RTP addresses ground access improvements to the airports by discussing ongoing and proposed airport ground access projects, and maintaining an updated list of ongoing and proposed transportation projects, including airport ground access projects.

Beyond the ground access improvement program/list of airport ground access improvement projects, there is some flexibility in what can be included as part of the aviation element of an MPO regional transportation plan. The SCAG

Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) aviation element normally includes:

- Description of airports in the region
- Forecasts for regional air passenger and cargo demand
- A discussion of the economic benefits of the region's airports
- List of airport ground access improvement projects

However, SCAG and the RTP/SCS are not bound to past practice. Therefore, beyond the required list of updated airport ground access projects, there are no set requirements or features to the aviation element of the SCAG regional plan. Moreover, SCAG's role, as far as regional aviation systems planning is concerned, is more of a collaborative and consultative one, as opposed to a regulatory or authoritative one.

MPOS HAVE NO AUTHORITY OVER AIRPORT DEVELOPMENT

Although MPOs develop RTPs, which may include an aviation element, MPOs have no authority over airport development. Development authority rests with the airports (i.e. airport sponsors retain authority over planning and development decisions) and the Federal Aviation Administration (FAA), which makes airport funding decisions based on national priorities. Moreover, airports are not required to incorporate MPO planning recommendations into their capital plans, and FAA funding decisions are not necessarily tied to MPO RTP recommendations. Although 49 U.S.C. § 47106(a)(1) gives the FAA/Secretary of Transportation the option of approving project applications for FAA Airport Improvement Program (AIP) funds based on an application's consistency with plans prepared by state authorized public agencies, including MPO RTPs, the decision to apply those recommendations is ultimately at the FAA's discretion. Therefore, the planning conducted by MPOs is designed to complement, rather than guide, the planning conducted by the FAA, states and individual airports.¹

¹ U.S. Government Accountability Office. 2009. National Airport System: Regional Airport Planning Could Help Address Congestion if Plans Were Integrated with FAA and Airport Decision Making. GAO-10-120.

Communication, coordination, and collaboration between agencies is a critical element of transportation planning. Therefore, federal law regarding Metropolitan Transportation Planning in 23 U.S.C. §134 (g)(3)(A), encourages MPOs to consult with officials responsible for other types of planning activities that are affected by transportation in the area, including airport operations. Furthermore, in addition to language in the U.S. Code encouraging consultation between the MPOs and the airports, the FAA also encourages MPOs to work with the airports by providing assistance to airport planners regarding ground access to and from the airports. U.S. Department of Transportation (DOT) FAA Advisory Circular 150/5070-6B provides guidance to airports on how to prepare airport master plans, including working with MPOs. More specifically, FAA Advisory Circular 150/5070-6B, 810, b, recommends that airports seek “assistance” from MPOs in major urban areas. The FAA identifies that one of the key activities and responsibilities for airports regarding the implementation of the airport plans includes agency coordination activities.² Therefore, although not mandated, inter-agency coordination is highly encouraged by the FAA and a critical aspect of the Aviation Element of SCAG’s RTP/SCS. However, it is important to restate that the recommended coordination does not equate to any planning or operational authority on the part of the MPOs over the airports. Rather, the MPOs are interested in collaborating and working with the airports on regional surface transportation planning and analysis.

In order to best plan for and assess the impacts of air passenger and cargo activity on the region’s surface transportation system, SCAG takes a comprehensive and empirical analytical approach to regional transportation planning. SCAG is mindful that analyzing and planning for the region’s surface transportation system requires more than an inventory of airport ground transportation projects. Thus, the SCAG Aviation Program has utilized a variety of data sources and employed a variety of analytical techniques to prepare the aviation element of Connect SoCal.

² FAA DOT AC 150/5070-6B, 1104, a, p.94. KEY ACTIVITIES AND RESPONSIBILITIES

ANALYTICAL APPROACH

In order to prepare the aviation technical report of Connect SoCal, data were gathered from the airports, airport websites, airport activity reports, government websites, and other publicly available databases and information sources, and reviewed and employed different analytical methods. The airports have been instrumental in providing data, input, and feedback for the development of Connect SoCal. From the passenger, cargo, and operations data collected, regional passenger activity and trends were estimated. Furthermore, by surveying and reviewing different aviation forecasts, such as the Federal Aviation Administration-Terminal Area Forecast (FAA-TAF), and their methodologies, empirically sound and methodical air passenger and cargo forecasts for the region were generated.

DATA SOURCES

Data sources for the Connect SoCal analyses included:³

- Airport passenger, cargo, and operations data provided by the airports
- Airport passenger surveys (e.g. trip purpose, city of origin, modal choice to airport)
- Economic (e.g. income, gross domestic product), airfare, and demographic forecasts
- Academic and government reports and websites
- Comparative regional, national, and international aviation data
- Forecasts and forecast methodology for air passenger, cargo, and operations

Along with data provided directly from the airports, airport websites and activity reports, the following websites and reports have been particularly helpful resources for data on air passenger activity and operations, air cargo and aviation forecasts: Federal Aviation Administration (FAA), Air Traffic Activity Data

³ Please see References on pages 40-41.

Systems (ATADS) (aircraft operations); California Department of Transportation (Caltrans), Division of Aeronautics, California Air Traffic Statistical Reports (air passenger and cargo activity by county); FAA-Terminal Area Forecast (FAA-TAF) (forecasts for aircraft operations); FAA Aerospace Forecast (industry forecast, including cargo); and Statista (national and global air passenger forecasts). Much of the data for air cargo, operations and forecasts (passenger, cargo, operations) were obtained from the above sources.

In addition to websites, reports and databases, a critical data source has been the aviation stakeholders in the region. From the airports providing data on airport passenger, cargo, and operations data, to aviation stakeholders providing expertise at the Aviation Technical Advisory Committee (ATAC) meetings, our partnerships with the regional aviation community has been instrumental in our analytical and planning efforts.

SCAG AVIATION TECHNICAL ADVISORY COMMITTEE (ATAC)

As part of Connect SoCal, SCAG has reconvened the Aviation Technical Advisory Committee (ATAC). The ATAC is a group of aviation and transportation stakeholders who provide technical and subject matter expertise in the development of the aviation element of the RTP/SCS. Although the initial plan was for the ATAC to meet quarterly, most meetings were scheduled on an “as needed” basis. The meetings occurred on October 9, 2018, December 11, 2018, January 29, 2019, April 16, 2019 and June 25, 2019. Following the Connect SoCal cycle, it is anticipated that the ATAC will go to a quarterly or twice a year meeting schedule. In addition to the ATAC meetings, SCAG Aviation Program staff have met with the airports, and will continue to meet with the airports and other experts following the completion of Connect SoCal.

SCAG REGION AIR PASSENGER FORECAST

Along with historic and current air passenger trends, research and analysis has been conducted on regional air passenger demand forecasts. In order to develop regional air passenger and cargo forecasts for Connect SoCal,

a comprehensive review was conducted of different forecasts and their respective methodologies, including work done by the Federal Aviation Administration (FAA) and AECOM, for the 2016 RTP. Both the FAA and AECOM utilized logarithmic regression (i.e. natural log transformations of the dependent and independent variables) analysis to develop their forecasted growth rates. Logarithmic regression analysis is a commonly accepted method for forecasting aviation travel demand by academics, such as Geoffrey Gosling at the University of California Institute of Transportation Studies, and the Transportation Research Board.

The primary reason a logarithmic regression analysis is the industry and academic norm is because of the relative ease of interpreting the log-log regression coefficients. Logarithmic regression coefficients can be interpreted as elasticities, or in this case, elasticities of travel demand (e.g. a 0.0025 logarithmic regression coefficient for GDP means that a one percent increase in GDP is estimated to increase travel demand by 0.0025percent). Due to this reason (i.e. regression coefficients that can be interpreted as elasticities), similar to the practice of using economy and airfare as primary explanatory variables, logarithmic regression is the standard utilized by the FAA-TAF, AECOM, and other agencies and organizations.

How to interpret a log – log (i.e. logarithmic) regression coefficient

$$\ln(y) = \beta_0 + \beta_1 * \ln(x) + e$$

“If we change x by one percent, we would expect y to change by β_1 percent”

For instance, y = passenger travel and x = GDP. The logarithmic coefficient (i.e. elasticity) for x/GDP is 0.69. Therefore, a 1 percent increase in GDP would be correlated with a 0.69 percent increase in passenger travel.

In addition to logarithmic regression analysis being the standard method for aviation demand forecasting, utilizing the economy and airfare as key explanatory or independent variables for the response/dependent variable of passenger activity/demand is also the generally accepted industry and academic practice. Therefore, the economy and airfare are often used as the two primary explanatory factors or variables in passenger demand forecast modeling. The University of California, Institute of Transportation Studies,

and the FAA Terminal Area Forecast (TAF), also use economy and airfare as key variables in their aviation forecast modeling. A healthy economy (usually measured in GDP or personal income) is correlated with increased air traffic. Conversely, the price of airfare is said to be negatively correlated with air travel demand (i.e. as prices increase then demand decreases, as prices decrease then demand increases). Therefore, for the purposes of modeling and forecasting, economy and airfare have proven to be statistically and practically significant variables. Due to generally accepted industry and academic practice, both the FAA and AECOM focused their logarithmic regression analyses and forecasts on the impact that airfare and the economy (e.g. income, gross domestic product) have on air passenger demand.

After conducting a logarithmic (log-log) regression analysis, air passenger demand forecast growth rates are calculated by multiplying the estimated logarithmic regression coefficients or elasticities, in this case for economy (e.g. GDP) and airfare, to existing forecasts, in this case long-term forecasted growth rates for the economy and airfare. By multiplying the elasticity for GDP to the forecasted growth rate for GDP, multiplying the elasticity for airfare to the forecasted growth rate for airfare, and then adding those (i.e. GDP and airfare) growth rates together, both AECOM and the FAA-TAF calculated a projected annual passenger demand growth rate (please see formula below).

$$\text{Passenger Demand Rate of Change} = (\text{GDP Elasticity} * \text{GDP Forecast}) + (\text{Airfare Elasticity} * \text{Airfare Forecast})$$

Determining the forecasted annual rate of change is just part of the air passenger demand forecasting process. The projected annual growth rate is then applied to the base (i.e. starting) year (e.g. 2017) out to the horizon year (i.e. final year of the forecast) (e.g. 2045). For the 2016 RTP/SCS, the base year used by AECOM was 2013 at 88.4 million annual passengers (MAP), the projected compounded annual growth rate (CAGR) was 1.6 percent, and the horizon year was 2040 (i.e. 27 years). Applying the projected CAGR (1.6 percent) to the 2013 base year (88.4 MAP) out to the horizon year, in the 2016-2040 RTP/SCS, AECOM forecasted 136.2 MAP in 2040.

The FAA-TAF forecasted a growth rate of 2.1 percent for passenger enplanements at the commercial airports in the SCAG region from 2017 to

2045 (i.e. the base year and horizon year for the upcoming SCAG RTP/SCS). The AECOM 2016-2040 RTP forecasted annual growth rate of 1.6 percent was much more conservative in comparison. Due to the conservative projected growth rate, and the lower base year number of 2013/88.4 MAP caused by a region still recovering from the Great Recession, the 2040 projection from the 2016 RTP is relatively low in comparison to previous SCAG air passenger demand forecasts, the most recent FAA-TAF, and other regional, national, and international forecasts.

TABLE 5 Prior SCAG RTP/SCS Forecasts

RTP Year	Projection/Horizon Year	MAP
1998	2020	157.4
2001	2025	167
2004	2030	170
2008	2035	165.3
2012	2035	145.9
2016	2040	136.2

Source: Previous SCAG RTP/SCS reports

COMPARING GROWTH RATES (ACTUAL AND ESTIMATES)

In addition to the 2016-2040 RTP/SCS passenger demand forecast being lower than previous SCAG RTPs, the estimated growth rate for the 2016-2040 RTP is lower than observed trends in actual passenger travel in the region, as well being lower than the estimated FAA TAF growth rate.

Based on an assessment of projected growth rates for the SCAG region and other relevant points of comparison, which included dialogue with the commercial airports in the region and a consultant on aviation systems planning, a growth rate for Connect SoCal was selected. In particular to the SCAG region, the 2018 FAA-TAF forecast (2017 to 2045) and the AECOM forecast for the 2016 RTP (2016 to 2040) provided the most relevant growth

rates for Connect SoCal. Both were conducted using a similar methodology (i.e. logarithmic regression analysis), and focused on similar factors/variables (e.g. airfare and economy). In comparison to actual activity growth rates, especially from 2012 to 2017, as well as forecasted growth rates from around the world, both the FAA-TAF and AECOM were relatively conservative. Thus, to the extent that the forecast is informed by the AECOM and FAA-TAF projected growth rates in comparison to forecasts for other regions, one can conclude that the estimated growth rate for Connect SoCal errs on the side of being more conservative.

In comparison to the growth rates from around the world and the United States, both the AECOM projected growth rate for the 2016 RTP/SCS and the 2018 FAA-TAF growth rate for the SCAG region were relatively modest growth estimates. Thus, based on further research and discussion with experts and stakeholders, the decision was made to adopt the 2018 FAA-TAF projected growth estimate (2.1 percent) for passenger enplanements at the seven commercial airports in the region. The adopted growth rate of 2.1 percent for the SCAG region is still relatively low when compared to the forecasted growth rates for other comparable city (e.g. San Francisco), North American (e.g. United States), and international (e.g. Africa, Asia, the world), points of comparison. However, 2.1 percent is a slightly more reasonable estimate for the SCAG region when one factors in the airport-level forecasts and constraints, and the long forecast horizon (2017-2045).

A critical component of the analytical process involved in developing the Connect SoCal air passenger forecasts was working with the airports to sync the regional forecast with the individual airport forecasts and capacity constraints. Each of the commercial airports in the region have their own project timelines and internal passenger activity forecasts, as well as physical, institutional, and legal capacity constraints. Thus, in adopting a projected annual growth rate for the region, the Aviation Program was mindful of how airport-specific forecasts and constraints corresponded with the broader regional forecast. In other words, the total regional forecast, which was calculated based on the FAA-TAF growth rate, was also synced and adjusted based on the individual airport-level analyses and forecasts, and capacity constraints.

TABLE 6 Comparison of Actual and Forecasted Growth Rates

Source	Region/Country	Rate (Per Year)	Time Period
Statista (Forecast)	Africa	6%	Per Year (2018 to 2037)
Statista (Forecast)	Asia/Pacific	5.70%	Per Year (2018 to 2037)
Statista (Forecast)	World	4.70%	Per Year (2018 to 2037)
Statista (Forecast)	North America	3.10%	Per Year (2018 to 2037)
San Francisco Airport (Forecast)	San Francisco	2.70%	Per Year (2018 to 2023)
2018 FAA TAF (Forecast)	SCAG Region	2.10%	Per Year (2017 to 2045)
Airport Activity Reports (Actual)	SCAG Region	1.30%	Per Year (2000 to 2017)
Airport Activity Reports (Actual)	SCAG Region	5.12%	Per Year (2012 to 2017)
AECOM (2016 RTP) (Forecast)	SCAG Region	1.60%	Per Year (2016 to 2040)

Sources: Statista, San Francisco International Airport, FAA-TAF, SCAG region airport activity reports, AECOM/2016 SCAG RTP/SCS

BASE YEAR, ESTIMATED GROWTH RATE, AND HORIZON YEAR FOR CONNECT SOCAL

Based on the 2016 AECOM and the FAA-TAF analyses, with input from the airports and ATAC, a base year/passenger demand number of 2017/110.17 MAP and a growth rate of 2.1 percent for Connect SoCal was established. Determining the base (2017) and horizon (2045) years was relatively straightforward. The base year for the 2016-2040 RTP/SCS aviation demand forecast, conducted by AECOM, was 2013. Thus, the base year for the Connect SoCal demand forecast was moved forward by four years to 2017. Furthermore, 2017 was the most recent year available with complete airport passenger activity data. Although the base year for most of the analyses for Connect SoCal is 2016, 2017 empirically made the most sense for the Aviation Element. The horizon year of 2045 was already predetermined by the RTP/SCS development process. Much more complex was the determination of 2.1 percent as the projected annual growth. As discussed prior, the 2.1 percent projected annual growth, which is also the projected annual growth for the SCAG region from the 2018 FAA-TAF, was adopted based on research and analysis, and discussions with the airports and other experts. Once the methodological assumptions were discussed, vetted, and finalized, the base year of 2017 with the passenger demand of 110.17 MAP, was then compounded at an annual rate of 2.1 percent for a 28-year growth period (2017 to 2045) to project 197.14 MAP for 2045.

SCAG Region Air Passenger Forecast

- Base year (2017): 110.17 MAP
- Projected growth rate for air passenger demand: 2.1 percent
- Horizon year (2045): 197.14 MAP

SCAG REGION AIR CARGO FORECASTS

The regional cargo forecast for Connect SoCal was calculated using the Federal Aviation Administration (FAA) Aerospace Forecast. The 2019 FAA Aerospace Forecast estimates an annual growth rate for air cargo at 3.3 percent a year. Cargo forecasts are based on the assumptions that existing security restrictions will remain, most of the shift from air to ground transportation has occurred,

and that long-term cargo growth is driven by economic growth. As a result, most forecast models of cargo activity are linked to gross domestic product. Based on the FAA growth rate (3.3 percent), using a base year of 2017 and 3.14 million tons, the air cargo forecast for the SCAG region in 2045 is 7.7 million tons.

SCAG Region Air Cargo Forecast

- Base Year (2017): 3.14 million tons
- Projected growth rate for cargo demand: 3.3 percent
- Horizon Year (2045): 7.77 million tons

EXISTING CONDITIONS

Note: The air passenger and cargo data presented in Connect SoCal is most accurately interpreted in terms of passengers and cargo traveling to and from the region's airports on the surface transportation system, and not as aircraft operations arriving to and departing from the airports. The number of passengers and tons of cargo do not correlate with aircraft operations. Due to newer aircraft with higher passenger and cargo capacity, and airlines operating at higher load factors well above 80 percent, the rate of increased cargo and passenger traffic has not equated to increased aircraft operations. Rather, aircraft operations have actually decreased and then flattened from 2000 to 2017.

The SCAG region is a multiple airport system that includes commercial airports, reliever airports, general aviation, and government/military airports, which support numerous airlines that provide extensive air passenger and cargo service. All of these airports function as part of a system that provides a high level of air passenger and cargo service to the region. The seven commercial airports with scheduled passenger service in the region are Hollywood Burbank, Imperial, Los Angeles, Long Beach, Ontario, Palm Springs, and Santa Ana. Over 80 passenger airlines in the region provide service to 200 domestic and international destinations. As for cargo, the SCAG region airports support over 30 air carriers who provide cargo service to over 100 destinations. With such a large expansive system with service being provided by domestic and international airlines, the SCAG region is a leader when it comes to air passenger and cargo movement.

The SCAG region continues to be one of the most active in terms of air passenger and cargo activity. In 2017, the SCAG region airports served 110.17 million annual passengers (MAP) and 3.14 million tons of cargo. Translated to aircraft operations, in 2017, the SCAG region airports in the region handled more than 1.5 million aircraft operations (take-offs and landings), of which over 900,000 were commercial passenger (air carrier) operations. Of the 110.17 million annual passengers (MAP) in 2017, over 25 million of those passengers were international travelers. At the Los Angeles International Airport, the largest international service provider in the region, in 2017, approximately 29 percent of the passengers were international and 71 percent domestic. As for cargo, the SCAG region's airports provide service to over 40 countries. Approximately 36 percent of the cargo destinations are international. Thus, the SCAG region is a major point of origin and destination for passengers and goods traveling throughout the United States and the world.

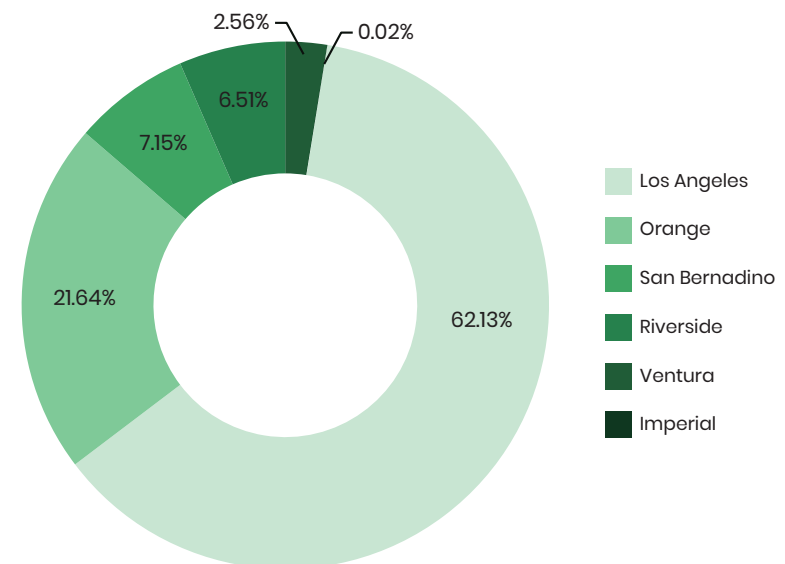
WHERE ARE AIR PASSENGERS COMING FROM AND HOW ARE THEY GETTING TO THE AIRPORT?

In 2017, there were on average over 300,000 passengers a day taking trips to and from the airports in the SCAG region. According to passenger surveys conducted by Los Angeles World Airports, Hollywood Burbank Airport, and John Wayne Airport, and an analysis by AECOM for the SCAG 2016 RTP, the majority of air passengers arrived to and departed from the airports via private vehicle. Relatively few air passengers used public transit to travel to and from the airports. The majority (estimated 62 percent) of air passengers in the region were coming from Los Angeles County, followed by Orange County. As the county with the highest population in the region, the majority of air passengers coming from Los Angeles County was not unexpected. However, Los Angeles County actually comprises closer to 50 percent of the total SCAG region population. Thus, there was a higher percentage of air passengers from Los Angeles County than the actual population. In addition to the larger overall population, the higher share of passengers coming from Los Angeles County is also likely due to there being three airports that provide commercial air service within Los Angeles County; Los Angeles International, Long Beach, and Hollywood Burbank. As the second most populated county in the region, with

approximately 17 percent of the total SCAG region population, an estimated 21.6 percent of the air passengers were coming from Orange County.

Despite increases in air passenger demand across the SCAG counties, not all air travelers are using the airports within closest proximity or even within their respective county. According to 2017 commercial passenger airport activity data, the majority (77 percent) of air passenger traffic in the region flew into or out of Los Angeles International Airport. Despite an estimated 20 percent of the passengers coming from Orange County, John Wayne Airport only provided 10 percent of the air service to air passenger traffic in the region. Similarly, despite an estimated 13 percent of the air passengers coming from Riverside and San Bernardino Counties, Ontario Airport only provided 4 percent of the air service in the region. From these figures, one can reasonably conclude that air passengers are venturing out of their counties and catchment areas (i.e. geographic area from which passengers are drawn to the air services of an

FIGURE 2 Estimated Trip Origin for Air Travelers in the SCAG Region (Percentage Breakdown by County)



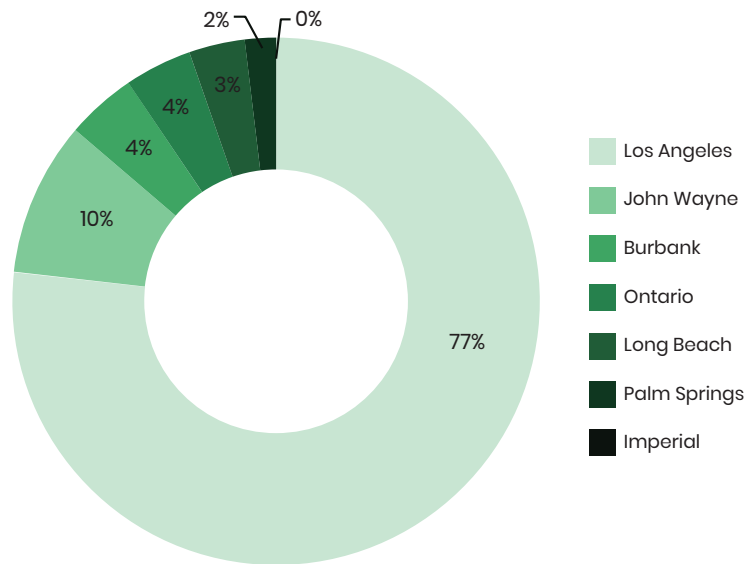
Source: Analysis conducted by AECOM for 2016 RTP using passenger survey data from LAWA, John Wayne, and Burbank Airports.

airport)⁴ to other airports, most notably Los Angeles International Airport. The primary factors for airport choice, besides proximity, include the number of airlines and flight options, and the price of airfare. According to a case study of the Los Angeles basin conducted in the Airport Cooperative Research Program report, "Understanding Airline and Passenger Choice in Multi-Airport Regions", LAX offers the most nonstop flight and airline options. Given that people are traveling considerable distances across county lines to the various regional airports, the impact on the surface transportation system can be significant.

Of particular concern to SCAG, as an MPO, is how the air passengers are traveling to and from the airports (i.e. trip mode). For instance, are air

4 Airport Cooperative Research Program. 2013. Understanding Airline and Passenger Choice in Multi-Airport Regions. The National Academies Press.

**FIGURE 3 Distribution of Passengers Across Airports (2017)
(Percentage Breakdown by Airport)**



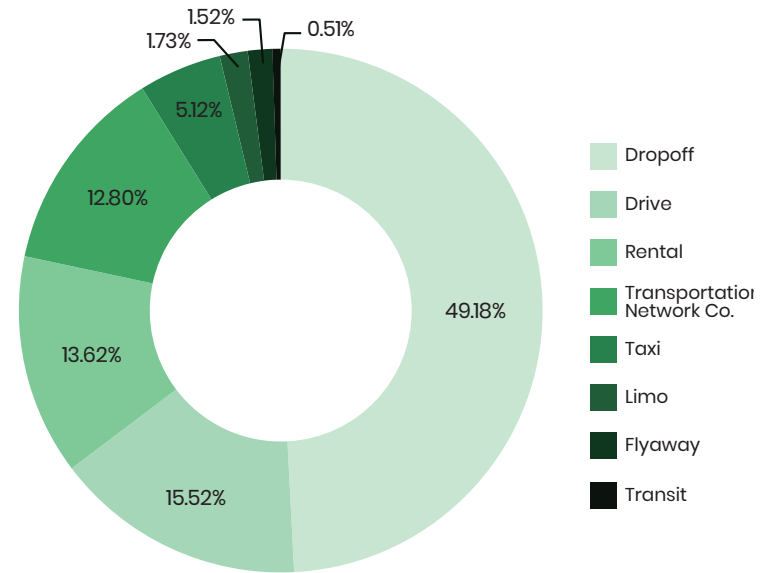
Source: Distribution of air passengers in the region for 2017 based on airport activity reports and data provided from the airports.

passengers driving themselves or using some form of mass transit? The following chart was constructed based off of an analysis of airport passenger survey data conducted by AECOM for the 2016-2040 RTP.

The analysis and the passenger surveys found that private vehicles, by drop-off/pickup and by travelers driving themselves, comprised the majority of the ground trips to and from the airports. Moreover, the AECOM analysis and the airport passenger surveys found that transit was the least preferred mode of travel to and from the region's airports. While it should be noted that the airport passenger surveys are dated to 2015 and 2017, and the AECOM analysis to 2016, one can reasonably conclude that the breakdown between private vehicle usage and public transit ridership to the airports has not changed significantly in the last few years.

Although the ground trip mode percentages (e.g. private vehicle versus public

FIGURE 4 Estimated Airport Ground Trips by Mode (Percentage Breakdown by Mode)



Source: Analysis of 2012 data by AECOM for 2016 RTP. Analysis used a combination of passenger data, modeling, and information from LAWA, Burbank, and John Wayne Airport passenger surveys.

transit) have likely not changed significantly since the various airport passenger surveys and the AECOM analysis were conducted, a recent change in ground transportation to and from the airports is the proliferation of transportation network companies (TNCs) (e.g. Uber, Lyft). In recent years, the advent of TNCs has had a significant impact on the passenger traffic coming to and from the region's airports. Based on the airport passenger surveys, private vehicles and TNCs (i.e. drivers also in private vehicles) combined comprised a majority of the passenger pickups and drop-offs to the region's airports. Based on data provided by the airports, in 2017, there were approximately one million TNC drop-offs and pickups combined at the region's airports. That number has most likely increased. The growth in TNC-based travel is likely substituting for the number of personal vehicle, and reducing the taxi and paid shuttle, drop-offs and pickups. However, the significant use of TNCs is likely doing little to mitigate or reduce congestion in and around the SCAG region airports.

According to the SCAG modeling program, based on the airport passenger activity numbers, the following auto trips were estimated to the top five busiest SCAG region airports. The estimated auto trip numbers do not include airport employees, however.

AIR CARGO TRAFFIC TO THE SCAG REGION AIRPORTS

Much like passenger air travel, the SCAG region is home to a robust air cargo industry. In 2017, the SCAG region moved 3.14 million tons of cargo. One of the airports in the region (Los Angeles International) is ranked in the top five nationally, and another four (Ontario, Hollywood Burbank, Long Beach, John Wayne) within the top 100. The SCAG region airports house over 30 air carriers who provide cargo service to over 100 destinations. Although FedEx and the United Parcel Service (UPS) continue to dominate the domestic market, there is a growing number of cargo carriers entering the market, particularly international carriers. Most of the international freight is carried in the cargo

holds of passenger aircraft⁵. As a result of the air cargo activity in the region, there is a high degree of freight truck traffic coming to and from airports. Based on existing cargo data, the SCAG modeling program estimated truck trips to the top five busiest SCAG region airports.

In addition to being a highly active region in terms of truck and auto traffic, the region has seen air passenger and cargo traffic increasing at a steady rate over the past two decades. Moreover, in recent years, the air passenger and cargo traffic has been increasing at a dramatic rate.

AIR PASSENGER TRENDS

Despite some downturns, air passenger traffic in the region has increased at a steady rate over the past two decades, with a particularly vigorous growth rate in recent years. While the air passenger growth from 88.5 MAP in 2000 to 110.17 MAP in 2017 appears relatively modest at 1.3 percent annual growth, the overall growth during this seventeen-year time period reflects downturns that

⁵ Caltrans. 2010. Freight Planning Fact Sheet: California – Air Cargo.

TABLE 7 2016 Estimated Auto Trips to Airports (Top 5 Busiest Passenger Airports in the SCAG Region)

Airport	Estimated Auto Trips 2016
Los Angeles International Airport	64,314
John Wayne Airport	11,490
Hollywood Burbank Airport	4,731
Ontario International Airport	4,697
Long Beach Airport	2,908

Source: SCAG Regional Travel Model

occurred following 9/11 and the Great Recession. After starting off the century at 88.5 MAP, air passenger travel experienced a significant decline following 9/11 going from 81.9 MAP in 2001 to 77.9 MAP in 2002. Air travel increased again until the Great Recession in 2006, which saw air travel demand go down as low as 79.1 MAP in 2009. However, following the dips in 2002 and 2009, air travel in the region has grown at a steady rate, with a noticeable increase following 2012. Post-Great Recession, the increase in air passenger traffic has been robust. The region saw an increase from 85.8 MAP in 2012 to 110.17 MAP in 2017, an increase of 28 percent or 5.12 percent per year growth, making the SCAG region one of the fastest growing for passenger traffic when compared to other metropolitan regions, such as New York/New Jersey and Washington, DC. Overall, the SCAG region is one of the most active in terms of air passenger traffic, as well as annual air passenger demand growth.

COMPARISON TO OTHER REGIONS

In 2017, the six-county SCAG region was one of the most active and fastest growing regions for air passenger traffic in the United States. At 110.17 MAP, SCAG was second only to the New York/New Jersey region for air passenger traffic, which saw a of 132.69 MAP. Moreover, the growth rate of 5.12 percent

for the SCAG region from 2012 to 2017 was second only to the Bay Area at 5.33 percent for the same time period. In general, the high air passenger activity and growing demand seen in the SCAG region is a trend occurring throughout the United States. Other major metropolitan regions in the United States saw significant air passenger activity and growth.

The recent upsurge in air passenger activity and growth across the country then begs the question why? As discussed earlier, the economy and airfare are commonly associated with air passenger demand. The University of California, Institute of Transportation Studies, and the Federal Aviation Administration (FAA) Terminal Area Forecast (TAF), use economy and airfare as key variables in their aviation forecast modeling. A healthy economy (usually measured in GDP or personal income) is assumed to be correlated with increased air traffic. Whereas, the price of airfare is said to be negatively correlated with air travel demand (i.e. as prices increase then demand decreases, as prices decrease then demand increases). Therefore, by observing past and recent trends in the economy and airfare, one can reasonably explain and track air passenger demand over the last 17 years.

TABLE 8 2016 Estimated Truck/Freight Trips to Airports (Top 5 Busiest Cargo Airports in the SCAG Region)

Airport	Estimated Truck Trips 2016
Los Angeles International Airport	1,903
Ontario International Airport	900
Hollywood Burbank Airport	175
Long Beach Airport	236
John Wayne Airport	121

Source: SCAG Regional Travel Model

FIGURE 5 Historic Passenger Demand in SCAG Region (2000 to 2017)



Source: Airport activity data provided by the airports and/or airport websites.

IMPACT OF ECONOMY AND AIRFARE ON AIR PASSENGER TRAVEL

Historically, a healthy economy and declining airfares have been associated with increased air travel demand. According to the U.S. Bureau of Economic Analysis, GDP (in real terms) has increased at a compound annual growth rate of 1.89 percent from 2000 to 2017. Conversely, airfare has been decreasing in real/adjusted terms.

While the economy has shown relatively steady growth over the past two decades, airfare, in real/adjusted terms, has decreased. According to the Bureau of Transportation Statistics, airfares in the region have decreased (in adjusted dollars) at a compound annual growth rate of -1.87 percent per year from 2000 to 2017.

It should be noted that one cannot assume that the current trends in the economy and airfare will continue indefinitely. The steady economic growth of the past decade was preceded by a downturn during the Great Recession. Similarly, although airfare (in inflation adjusted dollars) has declined steadily from 2000 to 2017, the trend will most likely not continue indefinitely. Despite ongoing changes and new entries in the market, eventually, within the next

TABLE 9 Air Passengers in the SCAG and Other Major Metropolitan Regions (2017)

Region	2017 Passenger Total (in millions)	Annual Growth Rate (2012 to 2017)
SCAG Region	110.17	5.12%
New York/ New Jersey	132.69	3.94%
Washington DC	73.19	2.43%
Chicago	95.93	1.95%
Bay Area	81.38	5.33%
Atlanta	103.9	1.71%

Source: Airport activity reports and websites

forecast horizon, airfare will likely stabilize and possibly increase in real and gross terms. Therefore, the economy and airfare can change, as they have changed in the past, which would impact air passenger demand. Air passenger and cargo activity are contingent upon the overall health of the economy in the past and going forward.

TABLE 10 U.S. GDP (2000 to 2017) (In Trillions) and Key Historic Events

Year	Nominal	Real	Growth Rate	Events Affecting GDP
2000	\$10.25	\$13.13	4.10%	Tech bubble burst.
2001	\$10.58	\$13.26	1.00%	9/11 attacks.
2002	\$10.94	\$13.49	1.70%	War on Terror.
2003	\$11.46	\$13.88	2.90%	Iraq War. JGTRRA.
2004	\$12.21	\$14.41	3.80%	
2005	\$13.04	\$14.91	3.50%	Katrina. Bankruptcy Act.
2006	\$13.82	\$15.34	2.90%	Fed raised rates.
2007	\$14.45	\$15.63	1.90%	Bank crisis.
2008	\$14.71	\$15.61	-0.10%	Financial crisis.
2009	\$14.45	\$15.21	-2.50%	Stimulus Act.
2010	\$14.99	\$15.60	2.60%	ACA. Dodd-Frank.
2011	\$15.54	\$15.84	1.60%	Japan earthquake.
2012	\$16.20	\$16.20	2.20%	Fiscal cliff.
2013	\$16.79	\$16.50	1.80%	Sequestration.
2014	\$17.52	\$16.90	2.50%	QE ends.
2015	\$18.22	\$17.39	2.90%	TPP. Iran deal.
2016	\$18.71	\$17.66	1.60%	Presidential race.
2017	\$19.49	\$18.05	2.20%	Trump Tax Act

Source: Bureau of Economic Analysis

AIR CARGO TRENDS

Although the air cargo activity in the region is currently operating at high levels, similar to or even more so than air passenger travel, air cargo can be sensitive to changes in the economy. Due to significant downturns in the air cargo industry caused by 9/11 and the Great Recession, the overall growth in regional air cargo traffic has been relatively flat. From 2000 to 2017, air cargo grew marginally at 0.52 percent annual growth, going from 2.87 million tons of cargo in 2000 to 3.14 million tons in 2017. However, the steady to low growth in air cargo is also a reflection of the depressions caused by 9/11 and the Great Recession. Following 2010, air cargo experienced a boom, with air cargo demand hitting especially robust growth from 2012 onwards.

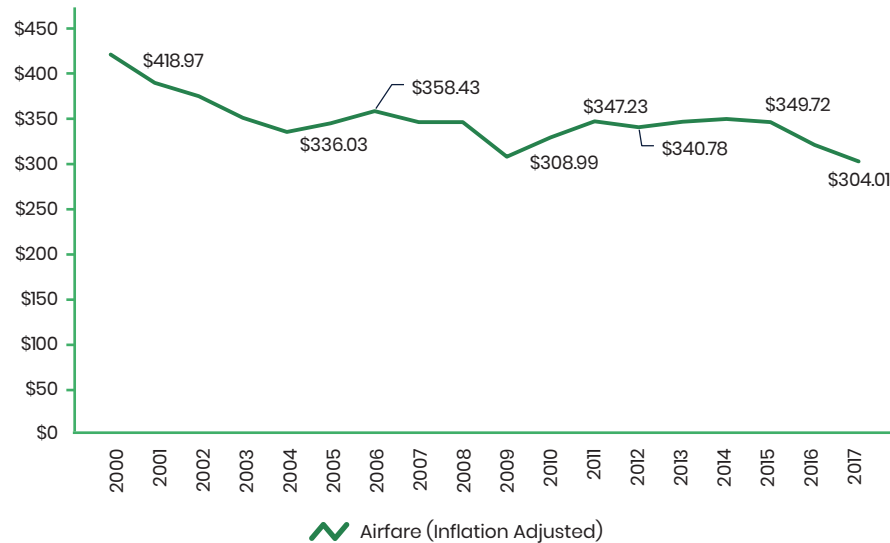
In recent years, air cargo activity in the region has experienced a dramatic upsurge. From 2012 to 2017, air cargo grew at an increased annual rate of 4.6 percent. The growth over the last decade is due in great part to a relatively

healthy post-Great Recession economy. Whether the recent upward trend for cargo will continue remains to be seen, but the FAA is fairly optimistic in its cargo industry forecast. In the 2019 FAA Aerospace Forecast, the FAA forecasted annual cargo demand growth at 3.3 percent. Given the current and the forecasted growth in air cargo, and the subsequent increase in truck traffic coming and going from the region's airports, planning and strategizing for the surface transportation system into the future will be critical.

GENERAL AVIATION TRENDS

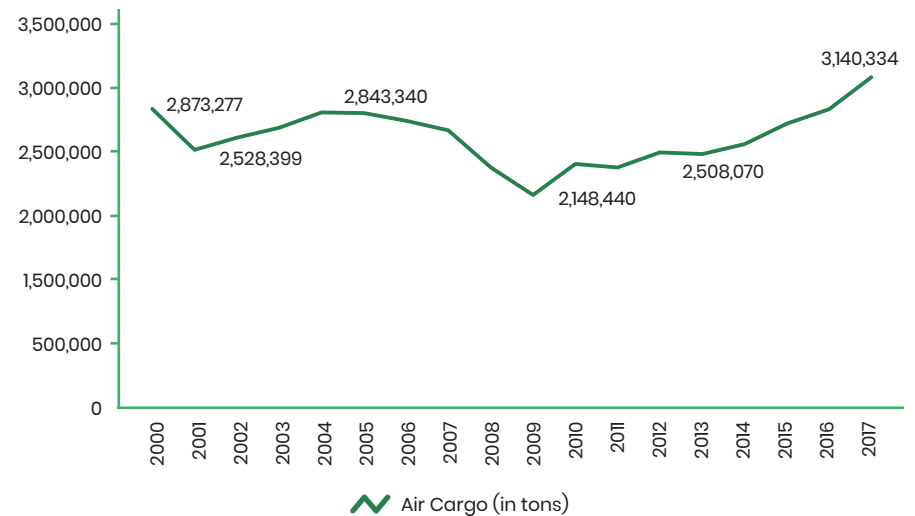
Despite high activity at some airports, general aviation operations in the region have experienced a steady decline overall from 2000 to 2017. Unlike air passenger travel, which saw a fairly steady increase, general aviation declined significantly from 2000 to 2017. In 2017, there were approximately 2.6 million local and itinerant general aviation operations in the SCAG region airports,

FIGURE 6 Airfare in the SCAG Region from 2000 to 2017 (in 2018 Adjusted Dollars)



Source: Bureau of Transportation Statistics

FIGURE 7 Historic Air Cargo Demand in the SCAG Region (in Tons) (2000 to 2017)



Sources: Airport data and activity reports, Caltrans, Division of Aeronautics, cargo and passenger reports

a 32 percent reduction from the 3.8 million general aviation operations in 2000. General aviation operations declined at an annual rate of -2.25 percent from 2000 to 2017. It should be noted that the decline in general aviation activity was an average across all airports in the SCAG region, and that some airports actually experienced an increase in general aviation activity. Moreover, despite the overall decline from 2000 to 2017, general aviation in the region did experience a slight uptick from 2012 to 2017 at an annual growth rate of 0.12 percent.

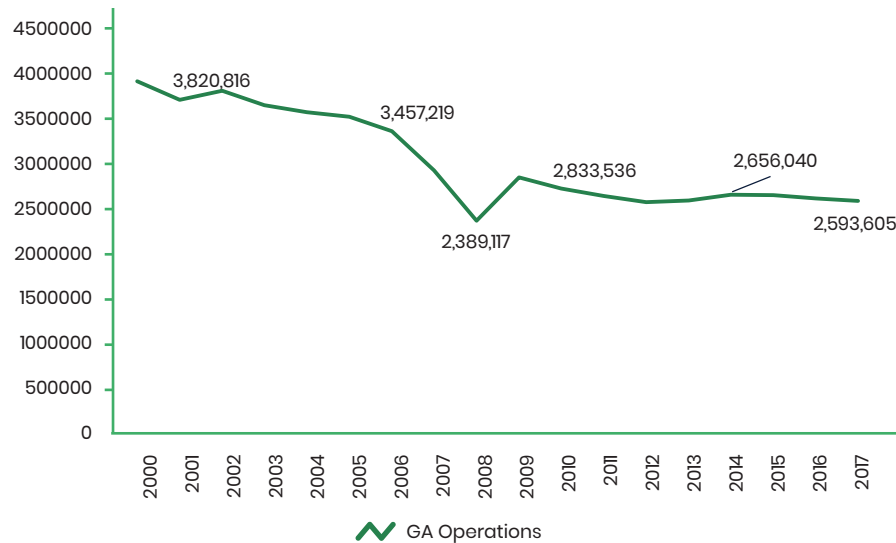
AIRCRAFT OPERATIONS

Overall growth in passenger and cargo demand has not resulted in increased aircraft operations. Although air passenger traffic has increased steadily from 2000 to 2017, and dramatically from 2012 to 2017, aircraft operations have

actually decreased overall from 2000 to 2017, and flattened from 2012 to 2017. The SCAG region commercial, reliever, and general aviation airports went from 5.1 million operations in 2000 to 3.7 million operations in 2017. After hitting a dip of 3.6 million operations in 2012, aircraft operations began to flatten out and slowly increase. Overall, aircraft operations in the region decreased by an annual rate of 1.8 percent, or 26.51 percent total, from 2000 to 2017, and then increasing slightly from 2012 to 2017 at an annual rate of 0.8 percent. Therefore, as evidenced by the data, increased passenger and cargo activity does not result in aircraft operations increasing at the same rate.

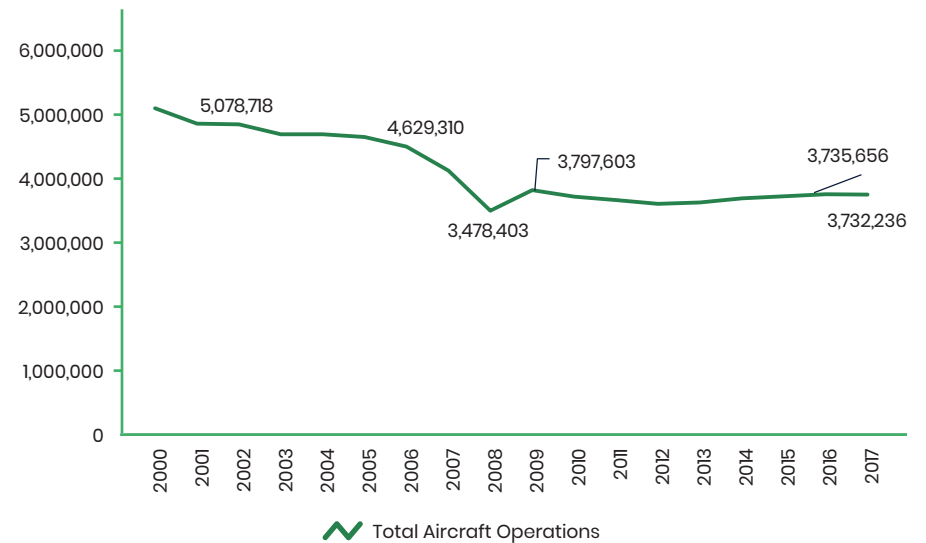
Due to various factors, the number of total aircraft operations did not grow as dramatically as the number of air passengers or cargo activity. Much of the discrepancy between air passenger traffic and aircraft operations annual growth rates can be explained by the newer model larger aircraft (e.g. Airbus A380, Boeing 747-8), planes with smaller seats and more rows,

FIGURE 8 General Aviation Trends in the SCAG Region (2000 to 2017)



Source: FAA ATADS database

FIGURE 9 Historic Aircraft Operations in the SCAG Region (2000 to 2017)



Source: FAA ATADS database

and airlines running at higher load factors (e.g. over 90 percent versus 70 percent) than in the past.⁶

STRATEGIES

Being capable of accommodating future air passenger and cargo demand is critical to the economic health of the region. In order to plan for the impact that passenger and cargo/freight traffic will have on the surface transportation system, Connect SoCal forecasts air passenger and cargo demand. Based on these forecasts, the region’s airport operators and transportation agencies will be able to better plan for ground transportation access to and from the airports. For instance, the Los Angeles World Airports is currently constructing an automated people mover (APM) and Intermodal Transportation Facility (ITF) to help mitigate forecasted surface transportation congestion coming into Los Angeles International Airport. Hollywood Burbank Airport recently constructed the Regional Intermodal Transportation Center (RITC) and the Burbank Airport-North Station for the Metrolink Antelope Valley Line. Air passenger and cargo forecasting and planning will provide a critical tool in assisting the airport and transportation agencies in developing projects and programs to address the future demands put on the ground transportation system by air passenger and cargo demand.

Disclaimer: As with historical and current air passenger and cargo activity, forecasted passenger demand does not translate directly to aircraft operations. One should not interpret the air passenger and cargo demand forecasts in terms of aircraft operations, and must be mindful of the context of evolving aircraft and airline practices. Finally, SCAG is not suggesting, recommending or directing airport planning and operations, as SCAG does not have any policy, planning, operations, or regulatory authority over the airports or airlines. Rather, the purpose of the passenger and cargo forecast is to anticipate and assist planning for future activity in the region’s surface transportation system.

⁶ Goldstein, Michael. 2018. “Meet the Most Crowded Airlines: Load Factor Hits All Time High.” Forbes.

AIR PASSENGER DEMAND FORECAST

A review of previous SCAG RTP/SCS passenger forecasts provided context for the Connect SoCal air passenger demand forecast.

It should be noted that the air passenger forecasts for previous years were higher than the 2016 RTP forecast for 2040 due to various factors. Most notably, the base year for the 2016 analysis (2013) was impacted by the Great Recession and thus lower than other base years, including the base year (2017) for this RTP. In 2017, the SCAG region was already at 110.17 million annual passengers (MAP), only 26 MAP less than the forecast for 2040. Furthermore, the estimated forecasted annual growth rate of 1.6 percent for the 2016 RTP was also relatively low in comparison to other comparable air passenger forecasts, and even in comparison to recent air passenger activity.

Methodology Summary: Establish base year/passenger demand and projected annual rate of change

- Establish a base year (e.g. 2017) and passenger demand number (110.17 MAP) to use as the basis for future (2045)

TABLE 11 Previous SCAG RTP Passenger Demand Forecasts

RTP Year	RTP Forecast Year	RTP passenger demand Forecast (in million annual passengers)
1998	2020	157.4
2001	2025	167
2004	2030	170
2008	2035	165.3
2012	2035	145.9
2016	2040	136.2

Source: Previous SCAG RTP/SCS reports

passenger demand forecast.

- Establish a projected annual rate of change (e.g. 2.1 percent) (usually via a log-log regression analysis paired with existing forecasts for the economy, airfare, and other key variables/factors)
- Apply annual rate of change compounded to the base year number (e.g. 2017 and 110.17 MAP) for as many years until the horizon year (e.g. 2017 to 2045 or 28 years).

The base year for the Connect SoCal air passenger demand forecast is 2017 (110.17 MAP), the projected growth rate is 2.1 percent, and the horizon year is 2045. In 2017, the SCAG region commercial airports provided service to 110.17 million arriving and departing passengers. The annual growth rate of 2.1 percent for the Connect SoCal region forecast is the 2018 Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) projected annual growth rate for air passenger enplanements at the seven commercial airports in the SCAG region from 2017 to 2045. In order to ensure that the overall regional forecast number was in sync with the airports' planning efforts, SCAG Aviation Program staff worked with the region's airports to incorporate individual airport forecasts, as well as institutional and physical airport capacity constraints. The commercial passenger and cargo airports, particularly those in dense urbanized areas, face constraints on their operations. Some of these constraints include, airspace conflicts, limitations due to runway configurations, terminal capacity, ground access congestion, and legal restrictions (e.g. curfews, caps on operations, noise control ordinances). Therefore, the regional aviation forecast involved two key elements, the FAA-TAF growth rate applied to regional passenger demand numbers, and airport-level numbers based on capacity constraints and analyses provided by the airports, which were then totaled up to a regional level.

SCAG Region Air Passenger Forecast

- Base Year (2017): 110.17 million annual passengers
- Projected growth rate for air passenger demand: 2.1 percent
- Horizon Year (2045): 197.14 million annual passengers

In addition to the FAA-TAF and airport activity based SCAG region

projection, using a collaborative planning method that emphasized ongoing communication with the airports and other stakeholders, SCAG staff was also able to drill down and incorporate airport level passenger forecasts into the regional forecast. The airport level forecasts, which were provided directly by the airports, are a reflection of many factors, including the existing physical and institutional constraints at the airports, and individual projections conducted by the airports. In summary, the overall SCAG region forecast for 2045 of 197.14 MAP was calculated using the 2017 base year 110.17 MAP compounded at an annual growth rate of 2.1 percent, but the individual airport forecasts were provided directly by the airports. Whereas the SCAG region forecast of 197.14 MAP provides a projection of unconstrained demand in the region, the airport-level forecasts represent more grounded estimates of airport growth based on airport operations and planning. Although, it was anticipated that there would be a discrepancy between the SCAG region passenger demand forecast of 197.14 MAP, and the total of the individual forecasts provided by the commercial and major reliever airports in the SCAG region, ultimately, the difference was relatively small at 0.94 MAP. Based on ongoing discussions with the airports and experts, the initial difference between the regional passenger demand forecast and the total of the individual airport forecasts was reconciled by making minor adjustments to the airport level numbers. SCAG staff, in consultation with airport operators and experts, concluded that the remaining 0.94 MAP in this projected scenario would likely distribute to Palmdale, San Bernardino, and March airports. In particular, Palmdale Regional Airport is currently exploring options for scheduled commercial passenger service, and San Bernardino International Airport has recently completed construction on new domestic and international passenger terminals. Palmdale, San Bernardino, and March airports confirmed their updated/adjusted 2045 forecast numbers.

FORECASTED AUTO TRIPS TO THE SCAG REGION AIRPORTS

The forecasted increase of air passenger travel to and from the airports will result in increased pressure on the region's surface transportation system. More specifically, given the expectation that the majority of air passengers will

continue to arrive and depart from the region's airports via private vehicles, the SCAG modeling program has projected that the number of auto trips to the airports will increase in 2045.

AIR CARGO DEMAND FORECAST

Air cargo movement has experienced a recent surge and is forecasted to grow in the coming years. The Federal Aviation Administration (FAA) 2019 Aerospace Forecast estimates an annual growth rate of 3.3 percent a year for air cargo.

TABLE 12 SCAG Region Airport Passenger Forecast for Connect SoCal

Major SCAG Region Airports	2017 (Base Year) Actual Activity (in millions)	2045 (Horizon Year) Projection
Total SCAG Region	110.17	197.14
BUR	4.74	9
IPL	0.012	0.3
LAX	84.56	127
LGB	3.783	5.5
ONT	4.552	33
OXR	0	0.3
PMD	0	1.82
PSP	2.1	5
RIV	0	0.61
SBD	0	1.81
SNA	10.423	12.5
VCV	0	0.3

Sources: 2017 activity numbers from airport activity reports and Caltrans Division of Aeronautics; 2045 airport forecasts provided by SCAG region airports

Cargo forecasts are based on the assumptions that existing security restrictions will remain, most of the shift from air to ground transportation has occurred, and that long-term cargo growth is driven by economic growth. As a result, most forecast models of cargo activity are linked to GDP. Based on the FAA Aerospace Forecast growth rate (3.3 percent), using a base year of 2017 and 3.14 million tons, the air cargo forecast for the SCAG region in 2045 is 7.77 million tons.

SCAG Region Air Cargo Forecast

- Base Year (2017): 3.14 million tons
- Projected growth rate for air cargo demand: 3.3 percent
- Horizon Year (2045): 7.77 million tons

FORECASTED TRUCK TRIPS TO THE SCAG REGION AIRPORTS

As was the case with air passenger traffic, it is anticipated that the increased air cargo demand will result in increased truck trips to the region's airports.

TABLE 13 2045 Forecasted Auto Trips to Airports (Top 5 Busiest Passenger Airports in the SCAG Region)

Airport	Estimated Auto Trips 2016	Forecasted Auto Trips 2045
Los Angeles International Airport	64,314	86,065
John Wayne Airport	11,490	18,367
Hollywood Burbank Airport	4,731	10,895
Ontario International Airport	4,697	30,516
Long Beach Airport	2,908	7,132

Source: SCAG Modeling Program

GENERAL AVIATION FORECAST

In contrast to the projected growth in passenger and cargo demand, general aviation operations are forecasted to grow at a much flatter pace. Due in part to the ongoing decline in general aviation operations, the Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) projects a relatively flat annual growth rate of 0.23 percent from 2017 to 2045 for general aviation operations. According to the 2018 FAA-TAF, the number of general aviation flights is not expected to change significantly from the 2.6 million operations in 2017, with a forecast of 2.77 million operations in 2045.

General Aviation Forecast (2017 to 2045)

- Base Year (2017): 2.6 million operations
- Growth rate for general aviation operations: 0.23 percent
- Horizon Year (2045): 2.77 million operations

TABLE 14 2045 Forecasted Truck/Freight Trips to Airports (Top 5 Busiest Cargo Airports in the SCAG Region)

Airport	Estimated Truck Trips 2016	Forecasted Truck Trips 2045
Los Angeles International Airport	1,903	3,422
Ontario International Airport	900	1,725
Hollywood Burbank Airport	175	296
Long Beach Airport	236	358
John Wayne Airport	121	210

Source: SCAG Modeling Program

AIRCRAFT OPERATIONS FORECAST

Unlike forecasted increases in air passenger and cargo activity, forecasted increases in aircraft operations are projected at a significantly lower rate. Given breakthroughs in technology and manufacturing, it is likely that newer aircraft with higher capacity (and lower emissions and sound) will be replacing the older planes in the airline fleets.⁷ Moreover, it is also likely that the airlines will continue to increase their load factors.⁸ In addition to changes in the commercial airline industry, the decline in general aviation operations has and will continue to impact the overall number of aircraft operations. Therefore, due in part to these key factors (e.g. larger planes, increased load factors, decreasing general aviation), the 2018 FAA-TAF estimates a relatively conservative annual growth rate of 0.74 percent for total aircraft operations in the SCAG region from 2017 to 2045.

SCAG Region Aircraft Operations Forecast (2017 to 2045)

- Base Year (2017): 3.7 million operations
- Projected growth rate for aircraft operations: 0.74 percent
- Horizon Year (2045): 4.58 million operations

NEW AIRPORT GROUND ACCESS AND MODERNIZATION PROJECTS

Despite flattening aircraft operations and general aviation, air passenger and cargo demand is forecasted to grow at a healthy rate, which will impact the SCAG region’s surface transportation system. Given the forecasted growth in passenger and cargo/freight traffic coming to the region’s airports, it is of utmost importance that the airports and transportation agencies work together to address critical ground access needs. The airports in the SCAG region have developed or are in the process of planning for transit and ground access improvements to facilitate easier access to the region’s airports.

⁷ Federal Aviation Administration (FAA). History of Noise.
⁸ Goldstein, Michael. 2018. “Meet the Most Crowded Airlines: Load Factor Hits All-Time High.”

As air passenger and cargo demand are forecasted to increase, so is the traffic coming and going from the SCAG region's airports. In 2017, over 300,000 passengers traveled to and from the SCAG region's airports a day. It is estimated that by 2045, over 500,000 passengers will be traveling to and from the SCAG region's airports on a daily basis. By 2045, trucks will be moving approximately 8,600 tons of cargo/freight per day to and from the region's airports. Between 2017 and 2045, Los Angeles will be hosting the Olympics in 2028, along with millions of tourists coming to Southern California to visit Disneyland, Universal Studios, the beaches, the mountains, deserts, and the numerous other sights and attractions of the region. Many of the people visiting California will be arriving via air and then traveling across the region on our roads, highways, and transit systems. Moreover, in addition to air passenger traveler and cargo traffic, an estimated 60,000 plus employees will also be coming and going from the region's airports via the surface transportation system. Thus, proper ground transportation planning will be critical for moving people and goods throughout the state and the nation.

Currently, the Los Angeles World Airports (LAWA) is completing the Landside Access Modernization Program (LAMP) project, and is in the initial stages of planning and environmental work for the Airfield and Terminal Modernization (ATM) program. Both the LAMP and ATM projects address ground access and airport modernization at the Los Angeles International Airport (LAX). The LAMP project will include the Automated People Mover (APM), two Intermodal Transportation Facilities (ITF), a Consolidated Rental Car Facility (CONRAC), and a series of comprehensive roadway improvements designed to alleviate traffic congestion in and around the airport. The recently announced ATM project will include airfield safety and efficiency improvements, terminal improvements, and new arrival and departure roadways that will improve access to and from the Central Terminal Area (CTA). Once completed, the LAMP and ATM projects should alleviate some of the congestion in and around the airports. Furthermore, in addition to the projects currently underway at LAX, other airports in the region have either completed or are in the process of developing ground access improvement projects.

Hollywood Burbank Airport has recently completed transit and rail infrastructure projects, which will help facilitate easier traffic flow into and out

of the airport, and is currently in the process of planning for a new terminal. Designed specifically to address ground access issues to the Burbank Airport, the Regional Intermodal Transit Center (RITC), which was completed in 2014, is a three-level structure housing a consolidated rental car facility, a rental car customer service building, and a ground-level bus station. The RITC is connected to the airport terminal building via a 1,100-foot-long, covered elevated walkway with automated moving walkways. In addition to the RITC, Hollywood Burbank is currently the only airport with direct rail access to Los Angeles via Metrolink and Amtrak. The Burbank Airport-South Station, currently located next to the RITC and current terminal building, is a stop for the Metrolink Ventura County Line and the Amtrak Pacific Surfliner. Located to the north, the Burbank Airport-North Station is a stop for the Metrolink Antelope Valley Line. In addition to the recently completed RITC and Burbank Airport-North Station, due to safety considerations, Burbank Airport is currently in the process of constructing a new terminal building. Although the new terminal will not increase airport capacity or add extensive transit related infrastructure, there will be new transit oriented development and services. The plan is to include shuttle service to and from the north and south Metrolink train stations, and the RITC, directly to the new terminal facility. Furthermore, besides being connected to the Metrolink stops and RITC via shuttle service, the new terminal facility will also include additional bus stops. Finally, in addition to the recently completed rail and transit projects, and the new terminal project, the California High Speed Rail Project includes proposed stations near the Hollywood Burbank Airport.

Although still in the planning and research stages, Ontario Airport is looking at potential connections to the Metro Gold Line and Metrolink. Currently, the closest train stations to Ontario Airport are the Upland and Rancho Cucamonga Metrolink San Bernardino Line stations, which are approximately five miles away, and the East Ontario Metrolink Riverside Line Station, which is approximately three miles southeast. Once completed, the Metro Gold Line Montclair Station will offer another option for a rail connection to the Ontario Airport. In addition to potential Metrolink and Metro connections, there is also discussion of extending the proposed Redlands Passenger Rail project west to the Ontario Airport. Ontario Airport and the San Bernardino County Transportation Authority (SBCTA) are currently in the process of exploring these different connecting options to the Metro, Metrolink, and Redlands Passenger

Rail lines. Furthermore, the SBCTA has formally initiated the planning and development process for a rail connection from the San Bernardino Line to the Ontario Airport.

The following table highlights some of the ground access projects in or around some of the region's busiest airports. Please see the Projects List section of Connect SoCal for a complete list of updated and ongoing ground access projects in the region, including project details (e.g. lead agency, cost, completion year). In addition to the Projects List, please see the Passenger Rail Technical Report for additional information on passenger rail service gaps, and proposed rail and transit projects, to the SCAG region's airports.

AIRPORT GROUND ACCESS IMPROVEMENTS, NEW TECHNOLOGIES, AND BEYOND

In addition to new transit facilities and road improvements, the airports are also looking at other options driven by emerging technologies, including transportation network companies (TNCs), vertical take-off and landing (VTOL) air taxis, and autonomous and automated vehicles, to get people and goods to and from the airports. As the air passenger and cargo traffic coming to and from the SCAG region's airports is poised to increase substantially, planning and next steps will be critical.

NEXT STEPS

Air passenger and cargo demand are tied to the economy. As long as the economy remains healthy, the SCAG region will continue to see growth in air passenger and cargo demand. Given the ongoing and forecasted growth in air passenger and cargo activity, proactive and collaborative regional planning will be instrumental. Therefore, it is critical that there is effective analysis and planning to address the future growth. Furthermore, collaboration between transportation agencies, airport planners, and other aviation stakeholders across jurisdictions and levels of government will foster more innovative and holistic regional planning and strategies.

EFFECTIVE ANALYSIS AND PLANNING FOR THE FUTURE

Rigorous data collection, research, and analysis is critical for effective regional planning, including planning for ground access to and from the region's airports. The ongoing development of the SCAG region's surface transportation system, especially as it relates to the airports in the face of growing air passenger and cargo demand, will require that all of the key partners maintain and have access to quality data on aviation passenger and cargo trends. Although the SCAG RTP/SCS will continue to play a key role in developing the regional transportation system to accommodate the growing air passenger and cargo demand, additional research and analysis is needed. Much of that research and analysis will continue to be provided by the aviation and transportation stakeholders in the region in the form of data, activity reports, passenger surveys, and other agency-initiated reports, studies and working groups. However, in addition to the agency-led efforts and the SCAG RTP/SCS, the SCAG Aviation Program will begin designing and initiating studies (e.g. air passenger surveys, airline airport choice studies) that will help inform airport and transportation planners in the region. To this end, in order to ensure that there is no unnecessarily overlap and that the research represents the interests and goals of the aviation stakeholders, SCAG will continue a discursive and collaborative planning approach. The data collection and analysis for the RTP/SCS and Aviation Program research projects will be an open, transparent and collaborative process. At the core of the SCAG Aviation Program's efforts will be to continue to facilitate effective research, analysis, and planning through information sharing and open communication.

ONGOING COMMUNICATION AND COLLABORATION BETWEEN AIRPORTS, TRANSPORTATION AGENCIES, AND GOVERNMENTS

Collaboration and communication among the SCAG region's airport and transportation stakeholders was a critical element in developing Connect SoCal, and will continue to be a critical strategy for regional aviation and surface

TABLE 15 Sample of Ongoing or Proposed Airport Ground Access Projects on SCAG Connect SoCal Project List

Airport	Project Name	Project Description	RTP ID
Burbank	Expand rail to Metro Red Line Extension to Burbank Airport	Metro Red Line Extension from Metro Red Line North Hollywood Station to Burbank Bob Hope Airport.	1120004
Burbank	Replacement Terminal	Replacement Passenger Terminal (RPT) and Associated Support Facilities (Aircraft Aprons/Ramps, Primary and Secondary Roads, Auto Parking, Replacement Airline Cargo Building, Replacement GSE Maintenance and a Replacement ARFF. Also includes is the demolition of the Existing Terminal Building and Elevated Parking Structure, and the construction of new taxiways to replace existing non-standard taxilanes.	12007004
Burbank	Replacement Terminal	355,000-square-foot replacement airline passenger terminal with aircraft gates and includes direct connections to Amtrak, Metrolink, LACMTA, Burbank Bus, and other intermodal transportation options; construction of a 413,000-square-foot aircraft parking apron; a new central utility plant; a storage and staging area for ground transportation vehicles (taxis, shared vans, Uber, Lyft, etc.) west of the North Hollywood Way/ Winona Avenue entrance.	Part of larger Replacement Terminal Project
Burbank	Replacement Terminal	A 200-space employee automobile surface parking lot north of the proposed replacement passenger terminal with additional employee parking using public parking facilities in the Southeast Quadrant; a seven-story public automobile parking structure that would not exceed 3,180 parking spaces, for a total of 6,637 spaces at BUR.	Part of larger Replacement Terminal Project
Burbank	Replacement Terminal	A new multi-lane road extending from the intersection of North Hollywood Way and Winona Avenue that would loop around the proposed parking structures to provide vehicle access to the replacement passenger terminal and parking structures; the realignment of Avenue A and an existing terminal loop road in the southeast quadrant of the Airport to permit the extension of Taxiways C and A while still allowing access to the Regional Intermodal Transportation Center and long-term parking in the Southeast Quadrant.	Part of larger Replacement Terminal Project
Burbank	Replacement Terminal	A 8,000-square-foot replacement airline cargo building adjacent to the replacement passenger terminal building; a replacement Aircraft Rescue and Fire Fighting (ARFF) station south of the replacement passenger terminal with the existing location (Northwest Quadrant) located in a hangar becoming available for general aviation uses; a new 8,000-square-foot Ground Support Equipment (GSE) and terminal maintenance building north of the replacement terminal building with about 2,000 square feet used for equipment and tool storage and office space for maintenance staff.	Part of larger Replacement Terminal Project
Burbank	Replacement Terminal	Extension of Taxiway A from Runway 08-26 south to the Runway 33 threshold, and extend Taxiway C between Taxiway G and the Runway 26 threshold providing full-length parallel taxiways; relocation of the airport service road.	Part of larger Replacement Terminal Project
Burbank	Replacement Terminal	Removal all parking Lots A, B; removal of tenant-leased pavement to allow for the development of the replacement passenger terminal; demolition and removal of the existing 232,000-square-foot passenger terminal, existing commercial aircraft ramp and adjacent taxilanes; removal of parking booth and employee parking lot; demolition of the existing 16,000-square-foot airline cargo and GSE maintenance building and demolition of the shuttle bus dispatch office and staging area.	Part of larger Replacement Terminal Project
Imperial	Reconstruct I-8 Interchange at Imperial Avenue	Reconstruct and realign Route I8 interchange at Imperial Avenue. Bowker Road to Bowker Road.	6120002
John Wayne	Paularino Avenue	Paularino northbound SR-55 and Paularino intersection improvement. Adding a northbound ramp to the 55 and a westbound right-turn lane.	ORA016

TABLE 15 Sample of Ongoing or Proposed Airport Ground Access Projects on SCAG Connect SoCal Project List – Continued

Airport	Project Name	Project Description	RTP ID
John Wayne	SR-55	Add one mixed-flow (MF) lane each direction on route 55 between Interstate 405 and Interstate 5.	2M0733
John Wayne	SR-73	Add one HOV lane on route 73 each direction between MacArthur and the 405.	2H0707
John Wayne	I-405	Add mixed-flow lane on I-405 from I-5 to SR-55.	2M0728
Los Angeles	Consolidated Rental Car Facility (ConRAC)	<p>A Consolidated Rental Car Facility (ConRAC) facility to provide a centralized location for rental car operations at LAX. This facility would include a customer service facility, ready/return garage, rental car storage, quick turnaround area, and maintenance support.</p> <p>The ConRAC will be located in between Aviation Blvd and the 405, and Century Blvd and W Arbor Vitae Street.</p>	1122003
Los Angeles	Intermodal Transportation Facilities (ITFs)	<p>The West ITF will be a facility providing remote passenger pick up and drop off areas, public parking, and other connections to public transit and other commercial vehicles (i.e. door-to-door shuttles and scheduled buses).</p> <p>The ITF-West (five level parking structure with 4,700 parking spaces) will be located between Westchester Parkway and 96th Street.</p> <p>The purpose of the ITF is to direct traffic away from the LAX oval.</p>	1122002
Los Angeles	Automated People Move System (APM)	<p>An above grade fixed guideway-based transportation system that moves passengers to and from the central terminal area (CTA) to the landside access facilities (ConRac and ITFs) and other mass transportation facilities. A total of six stations will be located along the alignment, with passenger walkways to connect the APM stations to the airport terminals and the landside access facilities.</p> <p>Automated people mover system will reduce vehicle traffic around LAX terminals. The APM will relocate the LAX central terminal area to Manchester Square (Bounded by Manchester Blvd, La Cienega Blvd, Aviation Blvd, and Century Blvd).</p>	1122001
Los Angeles	Airport Metro Connector	New light rail station and consolidate bus facilities providing transfer between the APM, buses, Metro Green Line, and Metro Crenshaw Line.	1TR0101
Los Angeles	Crenshaw/LAX Transit Corridor Project	Crenshaw/lax transit corridor - the crenshaw/lax transit corridor project is an 8.5-mile light rail transit (lrt) line extending from the intersection of crenshaw and exposition boulevards allowing for transfer to the exposition light rail transit line to a connection with the metro green line at the aviation/lax station.	LA0D198
Ontario	Airport Drive	Increase traffic flow by widening Airport Drive from Rochester Avenue to Etiwanda Drive.	4120145
Ontario	Ontario Airport Shuttle	Direct Shuttle bus connection from Rancho Cucamonga Metrolink Station to Ontario Airport.	4160048
Ontario	Passenger Rail Service to Ontario Airport	Connect Ontario Airport to the San Bernardino Metrolink Line via a passenger rail service.	4160049

TABLE 15 Sample of Ongoing or Proposed Airport Ground Access Projects on SCAG Connect SoCal Project List – Continued

Airport	Project Name	Project Description	RTP ID
Ontario	I-10 Corridor Express Lane Widening (phase 1)	Improve traffic flow on Interstate 10 by implementing express lanes from San Antonio Avenue to I-10/I-15.	4122004 4122004-20159902
Ontario	I-10 Corridor Express Lane Widening (phase 2)	Improve traffic flow on Interstate 10 by implementing express lanes from California St. to I-10/I-15.	4122005 4120005-20159903
Palmdale	Route 138	Acquisition of ROW for future Route 138.	LA962212
Palmdale	Improving Palmdale Transit Center	Expansion and improvement of Palmdale transit center.	LA0G270/ 1TDL04
March Inland	SR-60 (PM 14.84 TO 15.84)	Widen and reconstruct Route 60 offramps from Hemlock Avenue to Sunnymead Blvd.	3M04WT017
Palm Springs	Gene Autry Trail	Bridge connecting North and South Banks of the Whitewater Rivers.	3A07004
Palm Springs	Bus Rapid Transit	Implement Bus Rapid Transit on Highway 111 (Coachella Valley).	3TR04C
Palm Springs	Transit Centers	Construct 3 transit centers in Coachella Valley.	3TC04TR3
San Bernardino	I-10 Tippecanoe Interchange	Add eastbound off-ramp auxiliary lane on I-10 Tippecanoe interchange from waterman on-ramp to Tippecanoe off ramp.	44810

Source: Connect SoCal Projects List Technical Report

transportation planning in the coming years. While it is the hope that the dialogue and collaboration between the region’s transportation and aviation stakeholders will be self-initiated, the SCAG Aviation Program understands that these type of working relationships are more likely to occur when encouraged by a third party. The SCAG Aviation Program will act as a facilitator of working relationships and discourse between aviation and transportation planning agencies and officials in the region.

Although SCAG has no regulatory, planning, or operational authority over the airports, as a Metropolitan Planning Organization, SCAG is encouraged by

federal statute to consult and collaborate with transportation stakeholders, including airport officials. In an effort to encourage effective planning for the coming growth in air passenger and cargo demand, the SCAG Aviation Program has provided and will continue to provide a critical collaborative planning function. Whether it is through the Aviation Technical Advisory Committee (ATAC), attendance at conferences and working group meetings, and meeting with airports and government agencies, the SCAG Aviation Program will continue to play a critical role in building bridges and partnerships across the region.

CONCLUSION

The six-county SCAG region continues to be one of the most active in terms of air passenger and cargo demand in the country. After experiencing downturns following September 11, 2001 and the Great Recession, both air passenger and cargo activity have experienced robust growth in recent years. Although the increased passenger and cargo demand has not translated to increased aircraft operations due to larger planes operating at higher load factors, it has translated to increased ground traffic. Passenger auto and cargo truck trips to the airports continue to grow. Based on existing data and analyses of the economy and other factors, the historic and current growth in air passenger and cargo demand experienced in the SCAG region will likely carry over into the coming years. Therefore, it is of utmost importance that aviation and transportation stakeholders collaborate and work together in order to creatively plan for the future needs of the surface transportation system in and around the region's airports.

If the global economy remains healthy and airfares continue to trend downward, there will most likely be increased air passenger and cargo demand in the SCAG region and beyond for the foreseeable future. As a result, the growing air passenger and cargo traffic will impact the region's roads, highways, and transit systems, as people and goods travel across counties and catchment areas to the multiple airports in the region. While effectively managing and operating the ground access to the airports will be critical, it is equally, if not more, important that the current surface transportation system evolve and transform with the forecasted growth. Therefore, research, analysis and planning for the transportation system will ensure that the transportation needs of the SCAG region are met. The efforts of the airports and transportation agencies will be instrumental in bringing passenger and cargo airport ground access into the future. The SCAG Aviation Program intends to be a part of that effort through research, analysis, communication and information sharing. Collaborative and creative planning will play a critical role in fostering the movement of air passengers and cargo throughout the region's surface transportation system.

As the region's metropolitan planning organization (MPO), SCAG plays a

critical role in planning for air passenger and cargo travel throughout the region, whether that movement is by road, highway, rail, transit, or some new development. In order to advance this goal, the SCAG Aviation Program will continue to monitor and analyze trends and developments in air passenger and cargo surface transportation, particularly those aimed at managing and mitigating ground congestion. In addition to the data collection and analysis conducted for the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), SCAG will investigate additional opportunities for further study. The SCAG Aviation Program will always work, and share data and research, with the aviation stakeholders in the region. Critical to the ongoing work on the RTP/SCS and emerging work on new research ventures, are the relationships built with the partners at the airports, transportation agencies, government offices and agencies, and in private industry. In order to facilitate creative planning for ground access to the SCAG region's airports, the Aviation Program will continue to foster and build new relationships. Innovative, creative and collaborative planning will be at the heart of the future of the SCAG region surface transportation system.

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MAIN OFFICE

900 Wilshire Blvd., Ste. 1700
Los Angeles, CA 90017
Tel: (213) 236-1800

REGIONAL OFFICES

IMPERIAL COUNTY

1405 North Imperial Ave., Ste. 104
El Centro, CA 92243
Tel: (213) 236-1967

ORANGE COUNTY

OCTA Building
600 South Main St., Ste. 741
Orange, CA 92868
Tel: (213) 236-1997

RIVERSIDE COUNTY

3403 10th St., Ste. 805
Riverside, CA 92501
Tel: (951) 784-1513

SAN BERNARDINO COUNTY

1170 West 3rd St., Ste. 140
San Bernardino, CA 92410
Tel: (213) 236-1925

VENTURA COUNTY

4001 Mission Oaks Blvd., Ste. L
Camarillo, CA 93012
Tel: (213) 236-1960



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