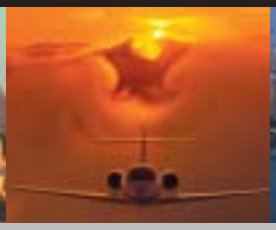
Aviation in California: Benefits to Our Economy and Way of Life


JUNE 2003

PUBLIC USE AIRPORTS BY FUNCTIONAL CLASSIFICATION

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Aviation in California: Benefits to Our Economy and Way of Life

FINAL REPORT

Prepared for

BUSINESS, TRANSPORTATION AND HOUSING AGENCY

CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF AERONAUTICS

Submitted by Economics Research Associates

JUNE 2003

ECONOMIC IMPACT STUDY ADVISORY COMMITTEE

Nancy Benjamin
Study Project Manager
California Department of Transportation
Division of Aeronautics

R. Austin Wiswell
Chief
California Department of Transportation
Division of Aeronautics

Michael Armstrong
Senior Lead Planner
Southern California Association of Governments
(SCAG)

Ryan Hall
Associate Planner
Southern California Association of Governments
(SCAG)

Christopher Kunze
Manager
Long Beach Municipal Airport

Gary Peterson
Manager
Nevada County Airport

John Pfeifer
California Representative
Aircraft Owners and Pilots Association (AOPA)

Dan Burkhart
Western Regional Representative
National Business Aviation Association (NBAA)

Alan R. Tubbs
District Field Services Manager
Airborne Express, Mather Field

Chuck Oldham
Robert Chung
California Transportation Commission

Carl Williams
Senior Policy Director
California Space Authority, Inc. (CSA)

Bonnie Cornwall
Program Manager
Division of Science, Technology and Innovation
California Technology, Trade & Commerce Agency

Mahmoud Mahdavi
Senior Economist
California Department of Transportation
Division of Transportation Planning

Patrick Tyner
Associate Transportation Planner
California Department of Transportation
Division of Transportation Planning

Mike Farmer
Chief, Office of Aviation Programs
California Department of Transportation
Division of Aeronautics

Terry Barrie
Chief, Office of Aviation Planning
California Department of Transportation
Division of Aeronautics

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Executive Summary

To examine and quantify the benefits of the entire aviation system to California, the California Department of Transportation (Department) Division of Aeronautics retained Economics Research Associates (ERA) in association with JD Franz Research, Incorporated. This report, prepared by ERA with assistance from JD Franz and Aeronautics staff, verifies the importance of aviation in this state by describing the state's system of public use airports and commercial space industry, reviewing the most significant recent trends in aviation, providing an estimate of the overall impact of aviation on the state's economy, and reviewing the many ways aviation contributes to life in California.

California has 250 public use airports that range from limited use landing strips to international gateways like Los Angeles International (LAX) and San Francisco International (SFO). These airports are categorized as commercial (scheduled passenger) service or general aviation airports. The state's 29 commercial service airports are further divided into large hubs, medium hubs, small hubs and nonhubs, and the 221 general aviation airports are classified as metropolitan, regional, community, or limited use.

RECENT TRENDS IN AVIATION

The California economy, the fifth largest in the world, grew very rapidly during the decade of the 1990s. Coupled with a vibrant national economy, this growth accelerated demand for air travel. However, by early 2001 the state and national economies had begun to slow as the "dot com" sector collapsed. Demand for air travel, already weakened by the slowing economy, received a major jolt with the September 11, 2001 terrorist attacks. This horrific act further weakened demand for air travel in two ways. Initially, passengers stayed away by the thousands due to fear of other acts of terrorism, and subsequently, the heightened security measures lengthened the time needed for, and the "hassle factor" of, airplane trips (particularly those flights originating from high-volume large hub airports).

In response to air passenger's reluctance to pay high fares (especially premium-priced business fares) in a weak economy and extended time required to fly out of busy large hub airports, traveling behavior changed in several ways. The underlying economic trends, further pushed by the events of September 11th, have impacted and continue to affect the aviation industry nationwide and in California. These changes include:

- Improved relative market position for the newer, lower-cost commercial carriers that concentrate on short-haul service from less impacted airports like Oakland and Long Beach
- Increased demand by the airlines for smaller 30–100 passenger aircraft (regional jets)
- Financial difficulties for the more established long-haul commercial carriers that served the large hub airports and charged premium fares
- Growing demand for business, corporate and chartered aircraft, strengthened by fractional ownership programs that spread a fixed cost over a larger user group

- Increased usage of smaller hub and metropolitan general aviation airports
- The growth of airports that specialize in cargo service

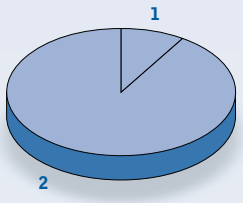
At some of the smaller airports, there is a need for increased airport capacity. Many airports in need of expansion face a number of issues including infrastructure and capacity constraints, encroachment of incompatible land uses, concerns over airport noise and safety, and congested or insufficient ground access to major urban, suburban and even rural airports.

ECONOMIC IMPACT ON CALIFORNIA

The aviation sector plays a substantial and vital role in California's economy. The overall contribution to the California economy (including their direct, indirect and induced impacts) amounts to nearly 9 percent of both total state employment and of total state output. In 2001, aviation contributed close to $111 billion of total output of goods and services to California's total Gross State Product (GSP) of over $1.3 trillion. Employment in California totaled 19.5 million in 2001, and 1.7 million jobs were supported by the aviation sector.

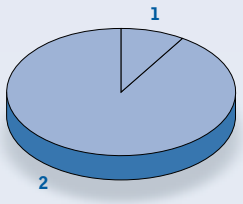
ECONOMIC IMPACT OF AVIATION ON CALIFORNIA GROSS STATE PRODUCT: AVIATION-RELATED OUTPUT IN CALIFORNIA — 2001

	Category	Output (in $)	Percent of Total
1	Aviation-Related Output	110.7 billion	9%
2	Rest of Gross State Product	1.2 trillion	91%
	Total	**1.3 trillion**	**100%**



AVIATION-RELATED EMPLOYMENT IN CALIFORNIA — 2001

	Category	Employment (in millions)	Percent of Total
1	Aviation-Related Employment	1.7	9%
2	Other Employment	17.8	91%
	Total	**19.5**	**100%**



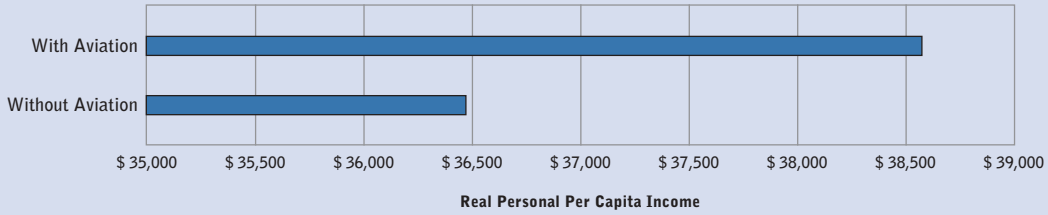
The key economic contributions of this sector can be summarized as follows:

- In today's international and technology-oriented economy, essentially every business sector gains operating efficiency because of air service. Trends such as just-in-time production and delivery and the fast-paced technology sector rely upon quick goods movement over long distances. Air transportation reduces the time and storage cost of doing business.
- A vast majority of long-haul tourists, conventioneers, and business travelers to California, who often have the highest per capita spending, arrive via commercial air service. The California tourism sector, including hotels, convention facilities, restaurants, retailers, and major amusement attractions, is substantially better off due to convenient and affordable air travel.

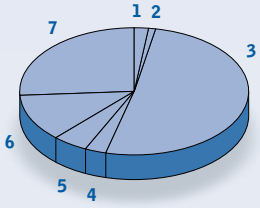
- With the increased integration of the global economy, California firms not only sell goods but also provide a wide variety of professional services to overseas clients. Face-to-face contacts made possible via air travel are essential to establishing the trust necessary to initiate a business relationship in several industries.
- The airlines, airports, and businesses that support airports provide jobs and income throughout the state.
- Several government agencies that are responsible for functions such as fire suppression, disaster response, and law enforcement rely upon air service and airports to effectively carry out their missions.
- California has a number of firms that manufacture aircraft components and provide aircraft repair service.
- California's commercial space sector, a leader in the nation, contributes high-level jobs and income in addition to the advancement of scientific knowledge.

Because of the aviation sector, the state economy is stronger and individual Californians, on average, earn more income.

IMPACT OF AVIATION ON REAL PERSONAL PER CAPITA INCOME — 2001



Aviation also generates tax revenue for the State through a variety of mechanisms, including personal property taxes, taxable aviation gasoline revenues, taxable aircraft jet fuel, excise tax revenues, possessory interest tax, and sales tax on general aviation aircraft. Total tax revenue generated as a result of aviation in FY 2002 was slightly over $250.2 million.



TAX IMPACT OF AVIATION IN CALIFORNIA — 2002

	Type of Tax	Tax Revenue Generated (in millions of $)	Percent of Total
1	Excise Tax Revenue – Aviation Gasoline	$ 5.2	2%
2	Excise Tax Revenue – GA Jet Fuel	$ 2.4	1%
3	Sales & Use Tax – Jet Fuel for Airlines	$ 128.3	51%
4	Sales & Use Tax – Jet Fuel for General Aviation	$ 7.0	3%
5	Sales & Use Tax – Aircraft Sales	$ 12.7	5%
6	Possessory Interest Tax – Airlines	$ 29.0	12%
7	Personal Property Taxes	$ 65.7	26%
	Total Tax Revenue Generated	**$ 250.2**	**100%**

IMPACT ON CALIFORNIA LIFE AND COMMUNITIES

In addition to tangible benefits, aviation greatly enhances the quality of business, personal and family life for all Californians. Air transportation allows an average citizen to reside anywhere around the world and still keep in touch by reaching their destination faster than any other mode. People travel to and from the state for various reasons including business, tourism, family vacations, reunions, weddings, other celebrations and events, funerals, work or just to keep in touch. All this can be accomplished quickly because of aviation.

Although the major economic impacts of the aviation sector come through the large and medium hub airports, aviation enhances many aspects of California life in smaller communities as well. Because of aviation, the agricultural products grown in the Central Valley reach overseas markets while still fresh. The wine-growing regions benefit from tourists flown in by aircraft, the use of remote sensing from aircraft and satellite for quality control, and pest control from crop dusters. The entertainment industry (so vital to the economy of Southern California), transports film stars and crew to remote locations all over the world to shoot movies or television shows. By providing time-efficient linkages to centers of technology growth, airports and air service allow many smaller communities, like Chico, Hollister, Auburn and San Luis Obispo, to participate in California's economic transformation. During off-peak periods, many smaller communities use airport grounds or buildings for local community events. Japan Airlines trains its pilots at Napa County Airport, and test pilots from around the world train at Mojave Airport's experimental flight and test training center.

Aviation affects life in California in numerous ways, including the following:

- **Catalyst for Economic Development**—California corporations continue to decentralize their operations by moving to smaller, more economical communities to be more competitive. Many companies locate in a community because of the presence of an airport, and adjacent industrial parks. An increasing number of companies and executives are avoiding the "hassle factor" of commercial airports and airlines by opting to use corporate charter air services for business travel, typically operating from smaller airports.
- **Convenient Venues for Business Activities**—Airports that offer convenient schedules to and from multiple destinations are efficient meeting venues for government officials, executives, managers and decision-makers to whom time is of great value. General aviation airports serve as offices to "briefcase businesses."
- **International Gateways**—California exported almost $107 billion in goods worldwide to 219 different countries and is the nation's top exporter to Asia. Air transport in California is critical for the increasing integration of the global economy, especially as a gateway to the Pacific Rim and Mexico. Computer and electronic products account for nearly half of all California exports by value.
- **Air Cargo Services**—In 2000, the value of air cargo moved through California's airports was $173 billion. Air cargo, consisting mainly of high-value, time-sensitive documents and goods plays a significant role in the vitality of the state's economy. Speedy delivery of goods and services is essential to many manufacturing, e-commerce, catalog and service businesses. Postal services depend on air transportation for timely delivery of mail and small packages, and dedicated air cargo carriers such as Federal Express, Airborne Express, DHL, and United Parcel Service provide air express service, often with overnight delivery.
- **California Agriculture**—California is the country's overall agriculture production leader (growing more than half of the nation's fruits, nuts and vegetables) with specialty crops such as almonds, clingstone peaches, olives, plums and walnuts, which are almost exclusively grown here. Annually,

$6.5 billion in food and agricultural commodities are shipped around the world (Canada and Japan being the top two destinations), much by air due to the perishable nature of the products. In 2001, the state's gross cash income from agriculture amounted to $27.6 billion. If California were a nation, it would be the sixth leading agricultural exporter in the world, shipping approximately 14 percent of the state's production to foreign countries. The top four counties in agriculture production are Tulare, Fresno, Monterey and Kern Counties. The leading export products are almonds, cotton, wine, table grapes, milk/cream, oranges, processed tomatoes, rice, beef, and lettuce. California's airports contribute greatly to the success of its agriculture industry, providing services for export shipment, corporate travel, crop dusting, crop storage facilities, and aerial photography.

- **The Wine Industry**—Wine is California's number one finished agricultural product in retail value, and its production ranks fourth in the world. With around 850 commercial wineries in the state, California boasts 98 percent of wine shipments from the United States. Large and small airports play important roles in the success of our "award-winning" wine industry, contributing to export shipments, pest control, local tourism and industry corporate travel. The industry employs 145,000 people in the state and pays $4.3 billion in wages. The majority of wineries are in Napa, Sonoma and San Luis Obispo Counties with a concentration also found in Mendocino, Santa Cruz, Santa Barbara, Monterey, and Alameda Counties.

- **The Entertainment Industry**—California's entertainment industry (movies, television production, recording studios, amusement parks and concerts) generates $28 billion in direct spending and directly employs 226,000 people. Though most of its economic impact is concentrated in Los Angeles County, other California counties also benefit from some of the industry's decentralized activities with several airports facilitating entertainment industry needs.

- **Tourism in California**—As the most visited state in the country, California has 12 percent of the U.S. travel market, which translated into approximately 317 million domestic and international travelers during 2001. Travel and tourism expenditures amount to $75 billion each year, providing employment for over one million residents. While much of the tourist travel is to the major metropolitan areas like Los Angeles, San Francisco, San Diego and Orange County, the state's system of airports has been critical to the success of California's tourism industry in less urbanized parts of the state. Because California is well known for its outdoor and recreational activities such as hiking, sightseeing, camping, fishing, skiing, and mountaineering, and venues for these activities are typically located outside of major urban areas, general aviation airports located in smaller communities play an important role in tourism.

- **Disaster Preparedness and Emergency Response**—California's airports are critical for providing emergency response services to natural disasters including fires and earthquakes. They also play an important role in disaster preparedness and response, both natural and terror-related. The 13 California Department of Forestry and Fire Protection (CDF) bases located at airports play a major role in fighting wildland fires.

- **Medical Services**—Many lives have been saved as a result of emergency and critical medical services provided through aviation, particularly in more remote communities. Examples include medical and life flights, flights carrying donated organs, and the retention of world-class medical professionals in smaller communities.

- **Law Enforcement and Public Safety**—Local, state, and federal law enforcement agencies rely upon aviation to enforce laws and maintain public safety in California. Agencies such as the California Highway Patrol, the U.S. Coast Guard, the U.S. Drug Enforcement Agency, the U.S. Border Patrol, and local county sheriff's departments rely upon aviation and airports to carry out their law enforcement duties.

- **Education and Training**—Many of California's smaller airports serve aviation-related training and education functions that are at the forefront of technological innovation. The students and visitors that take part in these training programs spend dollars in local hotels, restaurants, shops and service establishments. There are also several airports throughout the state that have aviation-related museums.
- **Airports as Important Civic Partners**—Many California airports provide services that contribute to their local communities in ways beyond transportation. Some hold annual air shows and organize fundraising events that benefit local charities. Others provide space for meetings and services for local non-profit and civic organizations, and several cooperate with local schools and youth groups providing educational aviation information and events for youth.
- **Managing Airports as a System**—When airports in a region are managed and operated as a system, there is opportunity to integrate the use of various sizes and types of airport facilities to meet the range of air transportation needs. The system of five airports managed by Sacramento County is a good example. Sacramento County's airport system serves the state capital and a region extending as far north as Redding, south to Modesto, east into the Sierra Nevada foothills and west into Yolo, Solano and Napa Counties. It provides a wide range of custom air services to several of the state's rapidly growing communities along the I-80, I-5, Highways 50 and 99 corridors. The region abuts the heavily used San Francisco Bay Area's network of airports and offers Bay Area travelers and shippers an attractive alternative to the congested Bay Area airports. The county airport system supports business from high technology manufacturing to small companies. It serves the agriculture and biotech industries, hospitals, universities, law enforcement, traffic reporting, medical evacuation, fire fighting, the California National Guard, U.S. Coast Guard, aircraft maintenance, flight training and recreation.
- **Redevelopment of Former Military Airfields**—The Department of Defense (DOD) closed 29 military installations in California during the four rounds of Base Closure and Realignment (BRAC) from 1992-2001. The economic impact of these closures on California's economy totaled $9.6 billion in annual revenue reduction, and the loss of almost 100,000 high-paying jobs throughout the state. In many cases, the closed military installations included an airfield that was converted to civilian aviation uses. By looking at former military air fields that are now public use airports, it can be seen how these new facilities are increasing the capacity of the state's airport system in addition to providing opportunities to improve the state's intermodal transportation system. Converted airfields also serve as catalysts for business and employment opportunities that stimulate economic revitalization and growth for their communities and the state.

THE ROLE OF AVIATION IN GOVERNMENT SERVICES

The government sector relies on and influences aviation in California. A number of government agencies have responsibilities and activities related to aviation that range from airport operations to the regulation of commercial and general aviation. Many government agencies are also finding that aircraft operations and aviation facilities are of increasing importance to their primary mission. For example, the U.S. Forest Service and the California Department of Forestry and Fire Protection use light aircraft to spot fires and aerial tankers and helicopters to suppress fires. Aircraft can respond to fires in remote and rugged mountainous areas much more quickly than ground personnel. The California Highway Patrol and federal agencies like the Customs Service, Drug Enforcement Administration, Border Patrol and Marshal Service all find that aircraft use is essential to the performance of their law enforcement functions.

Federal agencies use aircraft and aviation facilities for a number of activities including fighting fires, enforcing laws, and facilitating international trade. A major benefit of having these agencies located here is the economic return due to their presence. Federal agencies that rely on aviation to carry out their responsibilities or that are involved with aviation include the following:

- The Federal Aviation Administration
- National Aeronautics and Space Administration
- Transportation Security Administration
- U.S. Customs Service
- U.S. Forest Service
- U.S. Drug Enforcement Administration
- U.S. Border Patrol
- U.S. Coast Guard
- U.S. Marshal Service
- U.S. Postal Service

State government agencies also utilize aircraft and aviation facilities for a diverse group of responsibilities and needs from fire fighting, to law enforcement, to tracking wildlife. State agencies that rely on or are involved in aviation include:

- California Department of Fish and Game
- California Department of Forestry and Fire Protection
- California Department of Justice
- California Department of Transportation (Division of Aeronautics)
- California Highway Patrol

In addition, local government agencies are generally responsible for their own airport operations and planning and use airports for local law enforcement. Some governmental agencies use airports to help spur economic activity through promoting and expanding their airports.

CALIFORNIA'S SPACE INDUSTRY

California has more aerospace manufacturers than any other state. It has three of the six international satellite manufacturers, two of the five federal spaceports, and is one of four states to have a commercial spaceport. One of the most critical and dramatic aspects of the commercial space industry is the launching of satellites and other payloads on massive rockets. Spaceports house launch pads and runways as well as provide the equipment and fuel needed to prepare launch vehicles and their payloads prior to launch. California has the highest concentration of launch facilities and enjoys unique and unparalleled access to space. Vandenberg Air Force Base and Edwards Air Force Base in California are two of the five U.S. federal spaceports and the California Spaceport at Vandenberg is one of four commercial spaceports in the U.S. In addition, Sea Launch, based in Long Beach, is the world's only ocean-based launch services company providing a direct route to geosynchronous transfer orbit for commercial satellites.


SOUTHWEST

Introduction

In order to better understand the magnitude and significance of the quantitative and qualitative benefits provided by aviation in California, the Department of Transportation ("Department") Division of Aeronautics retained Economics Research Associates (ERA), in association with JD Franz Research, Inc., to conduct a study of the benefits of aviation on California's economy and way of life. This report reflects the results of the study. It describes:

- **California's system of public use airports**
- **Recent trends in aviation**
- **An estimate of the statewide economic impact of aviation**
- **How aviation contributes to life in California**
- **The role of aviation in government services**
- **California's space industry**

PROJECT BACKGROUND AND METHODOLOGY

The purpose of the study is to identify the economic and quality-of-life impacts of aviation-related activity, including aerospace, on communities, regions, and the state. In addition, the information in the study can be used by policy makers and planners, various segments of the aviation industry, and the general public to improve understanding of aviation impacts in California.

The study was initiated in December 2001. The project scope included the following tasks:

- Collect and review existing research related to aviation in California, including other airport economic impact studies, public policy reports, and other statewide transportation studies
- Examine the aircraft and aircraft parts manufacturing and repair industry in California
- Research and describe the contributions and role of commercial space flight in California
- Examine the connections between government and aviation in California, including the role of government in aviation and the importance of aviation to carrying out government services at the federal, state, and local levels
- Conduct a survey of airport managers for all public use airports in California (excluding military and limited use airports)
- For a more limited group of airports, conduct an airport business survey, and using data from the two surveys, estimate the impact of nonhub airports in California
- Review existing economic impact studies of the 13 primary hub airports
- Use the Regional Economic Models, Inc. (REMI) economic modeling system to estimate the total (direct, indirect, and induced) impact of aviation in California on Gross State Product (GSP) and employment

- Research other not easily quantified benefits of aviation including impact on quality of life

Working papers were prepared summarizing highlights of key tasks within the project scope. The following working papers are a part of this study as Technical Appendices:

- **Working Paper I**—Aircraft and Aircraft Components Manufacturing, Commercial Space Program, and Government Aviation
- **Working Paper IIA**—Summary of Existing Economic Impact Studies for 13 Primary Hubs and Highlights of Airport Manager Survey Results
- **Working Paper IIB Part 1**—Qualitative Contributions of Airports to Local Communities
- **Working Paper IIB Part 2**—Estimate of Quantitative Economic Impact of Airports by Category and Summary of Results from Airport Business Survey

ADVISORY COMMITTEE

An Advisory Committee was formed to provide guidance during the study process. The Advisory Committee included representatives from the following:

- California Transportation Commission's Technical Advisory Committee on Aeronautics (TACA)
- Regional Transportation Planning Agencies (RTPAs)
- Metropolitan Planning Organization (MPOs)
- Individual Airports
- Aircraft Owners and Pilots Association (AOPA)
- National Business Aviation Association (NBAA)
- Air Cargo Operators
- California Space Authority (CSA)
- Department's Transportation Economics and Goods Movement Offices

There were also several airports that agreed to serve as "case studies" within each airport category. Airport managers at these airports participated in further interviews, assisted with a survey of airport businesses, and collected additional information for the study. A list of these airports by category is as follows:

- **Primary Nonhub Airports**—McClellan–Palomar, Modesto City–County, and Redding Municipal;
- **Metropolitan General Aviation Airports**—Camarillo, Charles M. Schulz–Sonoma County, and Livermore Municipal;
- **Regional General Aviation Airports**—Auburn Municipal, Corona Municipal, Hanford Municipal, Hollister Municipal, Mojave, and Murray Field;
- **Community General Aviation Airports**—Calexico International, California City, Fall River Mills, and Lompoc.

California's System of Public Use Airports

California's 250 public use airports provide an air transportation system linking almost every Californian to destinations within the state and throughout the nation and world. To help understand how the system of airports is significant to the state's economy and quality of life, the California Aviation System Plan (CASP) identifies airports by Federal Aviation Administration (FAA) definitions and by the State's own classifications based on characteristics of each airport, the services provided and the roles played in the system. Although classifications are broken out by areas of emphasis, airports often include other types of services. For example, most commercial airports also have a contingent of charter and general aviation operators using their airport. Following are definitions of CASP classifications and examples of airports in each classification showing how the state's airports serve California and its residents (see Appendix B for a list of airports by category). Since scheduled passenger service fluctuates, especially at less active airports, some airport classifications change over time.

AIRPORTS WITH SCHEDULED AIR CARRIER PASSENGER SERVICE

The FAA considers an airport to be a Commercial Service airport when it receives scheduled air carrier passenger service and has 2,500 or more enplaned passengers annually. Currently there are 29 airports in California providing scheduled air carrier service. Airports receiving scheduled air carrier passenger service are further classified by the FAA based on the number of annual enplaned passengers. Since scheduled passenger service fluctuates with varying conditions, some less active airports move into and out of classifications over time with changes in scheduled air service.

♦ Commercial Service Airports (1)

Airports with 10,000 or fewer enplaned passengers per year are classified as Commercial Service Airports. Airports in this category provide minimal scheduled air service and primarily serve general aviation (described later). Currently **Merced Municipal Airport** is the only California airport in this category.

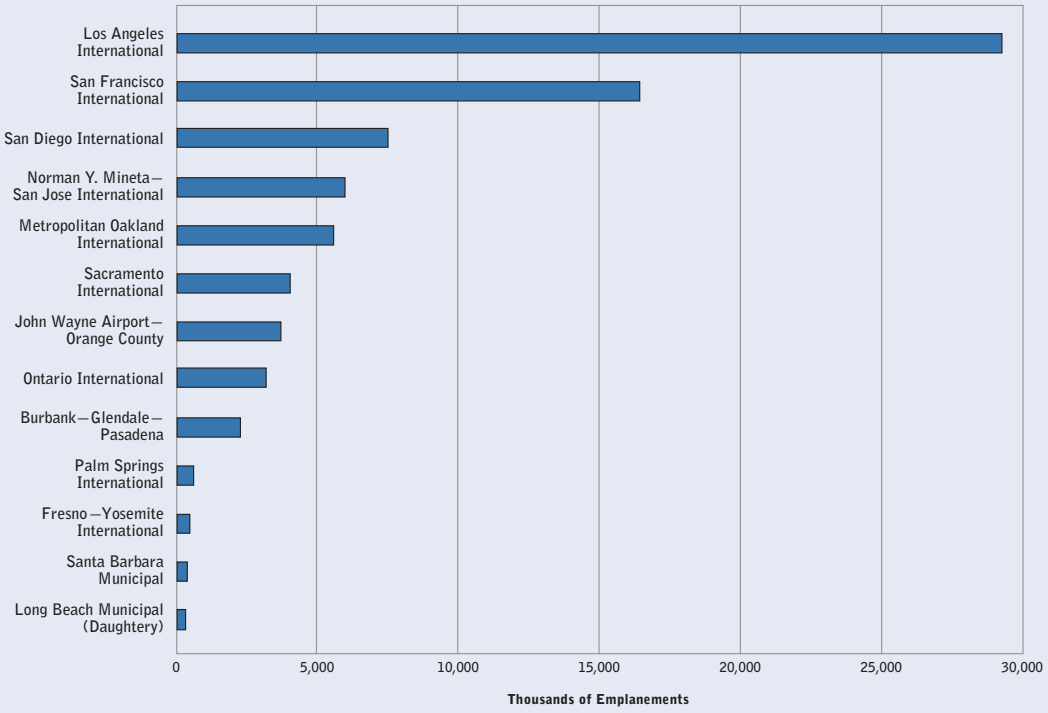
Merced Municipal Airport is regionally significant in Merced County providing commercial and cargo services. The runway is capable of handling turboprop and jet aircraft. With Yosemite National Park nearby, ground transportation is available. There is a flight training school and emergency aviation medical services at the airport. Eighty-nine percent of the activity is either local or transient general aviation.

♦ Primary Commercial Service Airports (28)

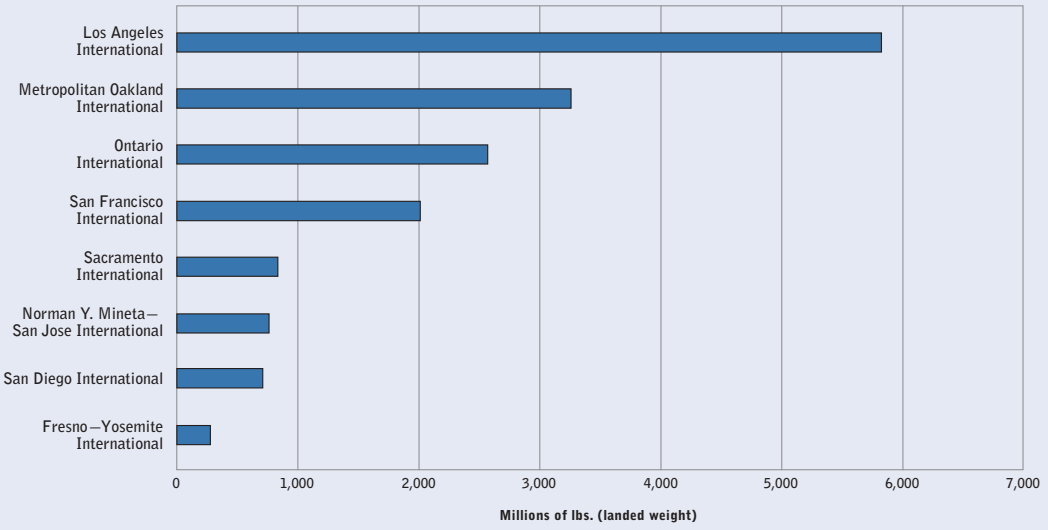
Commercial service airports with more than 10,000 enplanements are classified as Primary Airports. There are 28 Primary Airports in California.

The four Primary Airport sub-categories are Large Hubs, Medium Hubs, Small Hubs and Nonhubs, based on their passenger activity. Primary Airports provide the essential transportation infrastructure for scheduled air passengers and dedicated air cargo. In 2001, there were 80.7 million enplanements at California airports. By landed weight, eight of the state's Primary Airports were responsible for almost 12 percent (8.2 million tons) of the U.S. air cargo. **Los Angeles International** and **Metropolitan Oakland International** were responsible for 56 percent of the state's air cargo

EMPLANEMENTS AT CALIFORNIA PRIMARY HUB AIRPORTS — 2001



AIR CARGO LEVELS FOR CALIFORNIA PRIMARY HUB AIRPORTS — 2001



LARGE HUBS enplane one percent or more of total U.S. passengers. The three Large Hub airports are:

Los Angeles International . . . . . 29.5 million enplanements
San Francisco International . . . . . 16.5 million enplanements
San Diego International . . . . . 7.5 million enplanements

These airports provided annual scheduled passenger service for over 8 percent of the national total enplanements.

MEDIUM HUBS enplane between 0.25 percent and one percent of total U.S. passenger enplanements. The six Medium Hub airports are:

Norman Y. Mineta—San Jose International . . . . . 6.0 million enplanements
Metropolitan Oakland International . . . . . 5.6 million enplanements
Sacramento International . . . . . 4.0 million enplanements
John Wayne . . . . . 3.7 million enplanements
Ontario International . . . . . 3.2 million enplanements
Burbank—Glendale—Pasadena . . . . . 2.3 million enplanements

These Medium Hub airports accounted for more than 3.7 percent of the national total enplanements.

SMALL HUBS enplane 0.05 percent to 0.25 percent of the total U.S. passenger enplanements. The four Small Hub airports are:

Fresno—Yosemite International
Long Beach Municipal
Palm Springs International
Santa Barbara Municipal

These four Small Hub airports accounted for 1.7 million annual enplanements or two percent of the state total of 80.7 million annual enplanements in 2001. Air carrier service is a small percentage of operations at these Small Hubs. Up to 90 percent of the activity at these airports is general aviation, and they are home to over 1,000 based aircraft.

NONHUBS enplane less than 0.05 percent of all commercial passenger enplanements but more than 10,000 annually. In addition to commercial travel, Nonhub airports contribute significantly to the system by providing facilities that accommodate the fast growing corporate and business aviation segments. The 15 Nonhub airports are: **Arcata, Chico Municipal, Imperial County, Inyokern, Jack McNamara, McClellan–Palomar, Meadows Field, Modesto City–County, Monterey Peninsula, Oxnard, Redding Municipal, San Luis Obispo, Santa Maria, Stockton Metropolitan,** and **Visalia Municipal.**

The following three airports are examples of how Primary Nonhub airports serve Californians:

- **McClellan–Palomar Airport** in the City of Carlsbad is a gateway to north San Diego County. Proximity to business and recreation make it one of the busiest airports in the county as it serves both commercial travel and the general aviation community, including many business and corporate aircraft. Airline passengers using the airport avoid the commute to the congestion of downtown San Diego. America West Express and United Express provide non-stop service to Phoenix and Los

Angeles with connections to the world. Seven fixed based operators located on the airport provide fueling, aircraft maintenance and repair and charter flight and corporate jet services. The airport is an important part of the community with its $108 million annual contribution to the local economy. The airport has 73,000 enplaned passengers, 278,000 annual operations, and 377 based aircraft.

- **Modesto City–County Airport** is located in the fast growing San Joaquin Valley, one of the richest agricultural areas in the country. Skywest Airlines offers daily scheduled service to San Francisco International with 26,000 annual enplaned passengers. The airport is the base for corporate jets, twin and single engine aircraft, and helicopters. General aviation activity includes corporate and business charter, flight training, medical and law enforcement response, airfreight and recreational flying. Corporate jets based on the airfield are providing their owners with convenient point-to-point service to all corners of the world. Two airfreight companies are located in the area and have packaging businesses at the airport. The Modesto City–County Airport has 26,000 enplaned passengers, 90,000 annual operations, 170 based aircraft, and processes 591,000 pounds of airfreight annually.
- **Redding Municipal Airport** is located southeast of Redding in Shasta County. United Express and Horizon Air provide daily scheduled airline service to Portland, Seattle, Eureka and San Francisco. Within the airport's terminal, there are two car rental agencies, a gift shop and a restaurant featuring views of Mt. Lassen. Two fixed base operators are located on the airport offering fuel, aircraft rental, transient aircraft parking, aircraft maintenance, avionics, charters and flight instruction. This airport has 67,000 enplaned passengers, 113,000 annual operations, and 160 based aircraft.

GENERAL AVIATION AIRPORTS

General Aviation airports are defined by the CASP as airports that serve all facets of civil aviation except air carriers. There are 221 General Aviation airports in the California aviation system that provide interregional and interstate access and fall into four categories described below based on location, activities and available services.

▲ Metropolitan General Aviation Airports (20)

Metropolitan General Aviation airports are located in urbanized areas and emphasize business, charter and corporate flying. The state's 20 Metropolitan General Aviation airports accommodate business jet and turboprop aircraft with full services for pilots and aircraft, including jet fuel, published instrument approaches and control towers. Many Metropolitan airports "relieve" congested Hub airports by providing high capacity attractive alternative facilities for General Aviation activity. Camarillo, Charles M. Schultz–Sonoma County, and Livermore Municipal Airports provide good examples of how Metropolitan General Aviation airports serve Californians:

- **Camarillo Airport** is located near the City of Camarillo in Ventura County. The airport supports a wide range of general aviation activity and "relieves" busy Los Angeles area air carrier airports. With increasing congestion in the Los Angeles basin, pilots and owners of business, corporate and recreational aircraft find Caramillo's location, size and weather to be attractive attributes. Camarillo Airport is home to nearly 20 aviation-related businesses providing aircraft charter and rentals, aircraft maintenance, flight training, and pilot supplies. Also located throughout the airport's business park are other non-aviation businesses including engineering and technical services and high performance computer products. The airport hosts the Ventura County Fire Department's Headquarters and Dispatch Center, the Sheriff Department's Aviation Unit and Training Center and the U.S. Border Patrol. The airport has 550 based aircraft and 187,000 annual aircraft operations.

- **Charles M. Schultz–Sonoma County** Airport is located north of San Francisco in the City of Santa Rosa. Sonoma County is a tourist destination with world-class wineries and scenic vineyards nearby. For many years United Express provided feeder service to larger San Francisco Bay Area airports and Los Angeles International. However, United Express discontinued service in 2001. Buses and limousines now provide the feeder service previously provided by air. The airport supports heavy air taxi (services where an air carrier is hired to transport passengers or cargo), business and corporate activity and serves an adjacent business park. California Department of Forestry and emergency search and rescue aircraft are based there. The airport has 381 based aircraft and 138,000 annual operations.
- **Livermore Municipal Airport** is located three miles north of the City of Livermore in Alameda County. It serves private, business and corporate tenants and customers in and around the fast growing cities of Livermore, Dublin, Pleasanton and San Ramon. With all facilities to accommodate increasing business and corporate multi-engine and jet aircraft activity, Livermore Airport "relieves" general aviation operations from the three congested Bay Area air carrier airports. It has 570 based aircraft and 240,000 annual aircraft operations.

Regional General Aviation Airports (66)

Regional General Aviation airports offer most of the facilities and services provided by Metropolitan General Aviation airports but are located in areas with a smaller population base. There are 66 Regional airports in the state system. The following six airports are examples of how Regional General Aviation airports serve Californians:

- **Auburn Municipal Airport** is in the "Gold Country" of Placer County. Located above the valley fog, it provides services to all segments of the general aviation market in the region, including business, corporate, recreation, flight instruction and public safety. A business park and golf course are adjacent to the airport. The airport attracts businesses that employ approximately 4,000 people in surrounding communities, including high technology, warehouse distribution, electronic manufacturing and repair, and printing. It is the world headquarters for a medical equipment laser manufacturer. Auburn Municipal is a base for the California Highway Patrol and Placer County Sheriff and air ambulance, fire fighting and search and rescue operations. There are 69,000 annual operations and 217 based aircraft at this airport.
- **Corona Municipal Airport** is located in the City of Corona in Riverside County. The airport attracts primarily recreational users, particularly on weekends. Pilots and their passengers flying to and from the airport enjoy some of the most beautiful desert and mountain scenery in Southern California. The airport serves emergency police and fire fighting activities. This airport has 58,000 annual operations and 381 based aircraft.
- **Hanford Municipal Airport** is located in the City of Hanford, the County seat of Kings County, about 33 miles south of Fresno. The airport serves this rich agricultural region and the Naval Air Station (NAS) at Lemoore. It accommodates all general aviation, business and corporate aircraft and provides law enforcement and air ambulance services. An active chapter of the Experimental Aircraft Association (EAA) builds aircraft at the airport. A national weather forecasting station is located at the airport taking advantage of its strategic location. This airport has 27,500 annual operations and 75 based aircraft.
- **Hollister Municipal Airport** is located in San Benito County. With convenient proximity to the Bay Area and Silicon Valley, the airport attracts the growing corporate business travel markets. An airpark adjacent to the airport caters to businesses that use aviation as an integral part of their operations. These include electronics firms, tax accountants, stockbrokers, research and development operations,

and used aircraft parts and aircraft restoration companies. The airport is also home to a community pantry for the needy. The Red Cross stores supplies at the airport for quick delivery in emergencies and disasters, and California Department of Forestry fire attack aircraft are based there. As in the aftermath of the 1989 earthquake, the airport is ready to serve as the base for fire suppression and as the distribution station for emergency supplies. Hollister Airport is home to a year-round glider operation with 10 based gliders. It has 53,000 annual operations and 145 based aircraft.

- **Mojave Airport** is located on the east side of the Town of Mojave in southeastern Kern County about 100 miles north of Los Angeles. This unique airport, two freeways and a rail line form a transportation hub serving a community of over 140 airport tenants. Companies located at the airport employ over 1,250 highly skilled technical personnel involved in flight testing of major military and civilian aircraft, aircraft storage, and other related industries. Mojave Airport is home to some of the most unique and exotic aircraft ever built, such as the Voyager, Proteus and Derringer. Over 200 acres are available for large aircraft storage in a dry, non-corrosive environment. The airport's location, away from major metropolitan areas and near the Edwards and China Lake test ranges with supersonic corridors, is a natural setting for the Civilian Flight Test Center and National Test Pilot School. A number of companies offer flight test services. The airport serves all sectors from the lightest general aviation aircraft to the fastest fighters and heaviest transport aircraft. There are 10,500 annual operations and 183 based aircraft at this airport.
- **Murray Field** is located near the City of Eureka in Humboldt County. The airport provides general aviation, business, corporate, and recreational access to the remote north coast of California. Murray Field is designated as a "landing rights airport" allowing incoming international flights to land with prior permission and advance notice to U.S. Customs. The area's only pilot training facility is located there. It is a base for the California Highway Patrol's airplanes and helicopters. Murray Field provides access to the region for visitors attending events like the annual Redwood Coast Dixieland Jazz Festival. There are 65,500 annual operations and 100 based aircraft at Murray Field.

Community General Aviation Airports (102)

Community General Aviation airports provide access to small communities and rural locations to serve agriculture, recreation, flight training, fire fighting and local emergencies. Community airports accommodate predominately single-engine and small twin-engine aircraft and provide basic or limited services for pilots and aircraft. There are 102 Community General Aviation airports in the state system. The following four airports are examples of how Community General Aviation airports serve Californians:

- **Calexico International Airport** is located in the City of Calexico in Imperial County about 120 miles east of San Diego on the California–Mexico Border. The airport serves communities in both Calexico and Mexicali. Calexico International serves corporate businesses that have maquiladora manufacturing plants throughout Mexico. U.S. Customs inspectors are based at the airport to inspect over 25 aircraft arriving from Mexico daily. There are 27,000 annual operations and 23 based aircraft at the Calexico International Airport.
- **California City Municipal Airport** is located in the Kern County high desert. It is home to an industrial park and 20 small businesses serving aviation, recreation, light industry and other commercial needs. California City focuses on the airport to support the community's economic growth. The airport provides air rescue services and offers skydiving, glider instruction and rides, ground and flight instruction plus aircraft restoration and repair. Clear skies and west winds along the Tehachapi Mountains make California City a world-renowned soaring site. There are 36,000 annual operations and 91 based aircraft at this airport.

- **Fall River Mills Airport** is located in the middle of Fall River Valley, 70 miles northeast of Redding in Shasta County. The airport serves the agricultural community of Fall River Mills, including local businesses, residents, hospitals, and tourists. It provides access to blue ribbon trout fishing in the scenic Fall River and to a world-class golf course only minutes from the airport. There are 35,000 annual operations and 16 based aircraft at this airport.
- **Lompoc Airport** is located on the City of Lompoc's north side in western Santa Barbara County. The airport offers an aerial gateway to the Pacific Coast's Lompoc Valley with its scenic beauty, and space launches from Vandenberg Air Force Base. It serves business, agriculture, recreation, the military, law enforcement and air ambulances. Lompoc Airport is home to skydiving, a glider port, an active flying club and a branch of the Experimental Aircraft Association (EAA). This airport has 36,000 annual operations and 63 based aircraft.

Limited Use General Aviation Airports (33)

Limited Use General Aviation airports are located predominately in remote, non-urban areas. While Limited Use airports may have few or no based aircraft and no services for pilots or aircraft, they provide special or intermittent access to remote areas for agriculture, fire fighting, medical emergencies, disaster response, and recreation. There are 33 Limited Use airports throughout California.

The quality of life is greatly increased for communities that have Limited Use airports. Often, wild fires are fought from these remote airports. Doctors and medical supplies can be provided to these areas in a matter of minutes by air, and patients can be evacuated by air much more quickly than by ground transport. They provide access to larger communities and provide pilots with alternative landing sites in case of emergencies.

Some examples of Limited Use airports are:

- **Baker Airport** is used by pilots flying in the vast desert region of Eastern San Bernardino County in case of pilot or aircraft emergency, to transport parts for truck breakdowns, and by the California Highway Patrol as a fuel stop.
- **Blue Canyon Airport** is used for fighting wild fires in the Placer County region and provides a site for emergency landings between the Sacramento Valley and the Eastern Sierras.
- **Dinsmore Airport** provides Humboldt County with an area to stage fire fighting operations.
- Through the **Gravelly Valley Airport**, visitors have access to recreation areas in northern Lake County. It also provides an air attack base for the U.S. Forest Service.
- **Lee Vining Airport** provides access to the many recreation areas of Mono County and is an emergency landing facility.
- **Lodi Airpark** is used by crop dusters serving the agricultural industry in San Joaquin County. It also provides flight training.
- **Spaulding Airport** provides residents of this remote section of Lassen County with emergency medical evacuation services and recreational access to Eagle Lake.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Recent Trends in Aviation

During the first few years of the 21st century, aviation experienced a period of rapid change at the national, state, and local levels. There are several factors—some aviation-related and others not—which have fueled emerging trends in aviation. Examples include the growth of suburban population around metropolitan areas, technological advances in telecommunications that reduce the need for business travel, financial instability of major airlines, the growth of fractional ownership programs, and, of course, the tragic events of September 11, 2001, and subsequent security measures at airports. While many of these trends were already in existence prior to September 11th, the events of that tragic day accelerated the changes that were already emerging.

GROWTH OF LOW COST COMMERCIAL CARRIERS

Regional commercial air travel experienced tremendous growth within the United States, from approximately 9 million passengers in 1977 to 70 million in 2002. Low cost carriers currently account for 10 percent of all domestic airline passenger enplanements in the United States. The growth in this service is a result of a number of factors including the decreased competitiveness of major "legacy" commercial carriers.

The events of September 11th led to a sharp decrease in air traffic levels. Initially, demand for air transportation services declined sharply. This was followed by a period of slow, steady recovery. By March 2002, air traffic on a national level was 11 percent lower than in 2001, and major airports lost a higher percentage of their volume than smaller airports.

The economic impact of September 11th was felt particularly by major airlines, which were already facing financial challenges due to high operating costs, increased competition from low cost carriers, and a slowing national economy. Recent advances in telecommunications such as e-mail, cell phones, faxes, video conferencing, and the Internet contributed to weakened demand for business travel.

Between the end of 2000 and 2001, airline revenue had declined over 20 percent, even though air traffic grew 10 percent during the same period. In 2002, both US Airways and United Airlines filed Chapter 11 bankruptcy—these two airlines represented about 25 percent of all airline capacity in the United States. Other major commercial airlines such as American, Delta, Northwest, and Continental are also operating in red ink due to their high cost structure. According to the Aviation Consumer Action Project Director's Message, dated January 1, 2003, it is possible that one or more of these airlines will also face bankruptcy in 2003.

During this same period, low-cost air carriers experienced fewer cuts in service than major carriers, and by offering low fares were able to capture additional market share and remain profitable through the economic downturn. The market capitalization of Southwest Airlines is currently higher than the other top six airlines combined, and other low-cost carriers such as Jet Blue are continuing to be profitable. Within the California market, Southwest Airlines is the leading carrier.

GROWTH IN USE OF REGIONAL JETS

The demand characteristics of shorter haul service from medium hubs or secondary metropolitan airports greatly increased the popularity of "regional jets," and the events of September 11th accelerated the growth in the use of regional jets by existing and new carriers.

A typical regional jet will seat from 30 to 100 passengers and may have only one cabin crew. The advantages of the regional jets are numerous: 1) superior operating economics when compared to the likes of a Boeing 737; 2) cruising speeds comparable to larger commercial jets and far faster than turbo props historically used to serve smaller markets; 3) faster loading and unloading times when compared to larger commercial jets; 4) serving airports more convenient to passengers' origin and destination and where the "hassle factor" is lower; and 5) utilizing airports where the rental cars are within walking distance rather than a shuttle bus ride away.

EXPANSION OF BUSINESS, CORPORATE, AND CHARTER AVIATION TRANSPORTATION

Business aviation, corporate aviation, and the use of charter aircraft in the United States have also grown tremendously in recent years, and increased even more rapidly after the events of September 11th. There are currently 9,500 business jets and 9,200 business turboprops in service worldwide. Annual sales of new and used business and corporate aircraft currently exceed $10 billion.

This recent rapid growth has been a result of factors on both the demand and supply side of the industry. On the demand side, business travelers are facing higher airfares, decreased quality of services, an increased "hassle factor" at airports, reduced frequency of commercial flights, and increased overall travel times. While there has been a decrease in delays after September 11th, overall travel time has increased due to security procedures. On the supply side, business aircraft owner participation in charter service and fractional ownership programs are increasing. Offering one's aircraft for charter service offsets the fixed cost of ownership. In fractional programs, the fixed cost of corporate aircraft ownership can be spread over a larger pool of users.

SHIFT AWAY FROM DOMINANT HUB AIRPORTS

Another related trend in aviation, particularly in California, is a shift away from the dominant hub airports towards secondary hubs and smaller airports. During the 1980s and 1990s, the concentration of enplanements increased at the major hubs. However, recent data indicates a reversal of this trend with enplanements dispersing. Some of the major primary hub airports are losing market share to smaller airports within the metropolitan regions. This trend is due to a number of factors:

- **Population growth in outer suburbs around metropolitan areas**—Over the past decade, residential development has shifted to areas as far as two hours outside of major metropolitan cities into areas that were formerly rural. As a result, there is increased demand for commercial airline service in these formerly outlying areas.
- **Increased traffic congestion on California's urban highways**—The increased congestion on California's highways due to employment growth in the major job centers, residential development in outlying areas, and the lack of major ground and public transportation improvements have led to demand for increased commercial air service at smaller airports outside of the major primary hub airports.

- **Long waits at major airports due to increased security procedures**—Some of the major primary hub airports have experienced a disproportionate increase in waits at security checkpoints, which has provided an incentive for air travelers to fly out of medium-sized airports with less traffic and less time for security processing.
- **Increased corporate aviation and regional commercial air carrier activity**—Increases in business and charter aviation have led to a higher level of air traffic. These aircraft therefore seek airports with less air traffic congestion and more capacity to handle these increased flights.
- **Increased scheduled air service at outlying airports**—The success model for low cost carriers is in part reliant upon growing the scheduled air service at outlying airports, which has also contributed to the shift towards secondary hubs and smaller airports in California. An example of this trend is Jet Blue offering commercial air service to many locations throughout the United States out of Long Beach Municipal Airport.

RAPID GROWTH IN AIR CARGO

Air cargo grew very rapidly in the past decade. The factors that contributed to this growth included the decade of rapid global economic expansion and the increasing popularity of on-line purchases by consumers necessitating air shipments. From 1990 to 2000, average annual growth at the major air cargo airports was seven percent. Six of the top 12 air cargo airports in the country more than doubled their air cargo volumes during the preceding 10-year period. Furthermore, air cargo was not as dramatically affected as passenger travel by the events of September 11th. The Southern California Association of Governments (SCAG) *Regional Aviation Economic Analysis* discussion paper on the effects of September 11th indicated that air travel in Southern California dropped 47 percent since September 11th as compared to an only 10 percent decline for air cargo volume.

LOCAL ISSUES FACING AIRPORTS

As passenger and air cargo volumes grow and decentralize, many airports need to expand in order to accommodate the capacity needs of California's aviation system. While aviation planning has taken place on the state and regional levels, local airports commonly face challenges when trying to expand. The inevitable need for increased airport capacity due to the rapid growth in air travel is an issue that affects policy makers, planners, and airport administrators throughout California. The typical issues faced by airports in need of expansion include:

- Infrastructure and capacity constraints that limit growth and expansion to accommodate increased demand
- Encroachment of incompatible land development raising concerns over aircraft noise and safety
- Congested or inadequate ground access to major urban, suburban, and even rural airports

Estimate of Economic Impact

First and foremost, aviation serves an important transportation function in California. In addition, it is also an important industry in the state. The focus of ERA's economic impact analysis process was to quantify the importance of aviation as a transportation system that is highly integrated with other industries, not just as an isolated industry. In order to accomplish this, ERA used a forecasting and policy analysis model prepared by Regional Economic Models, Inc. (REMI).

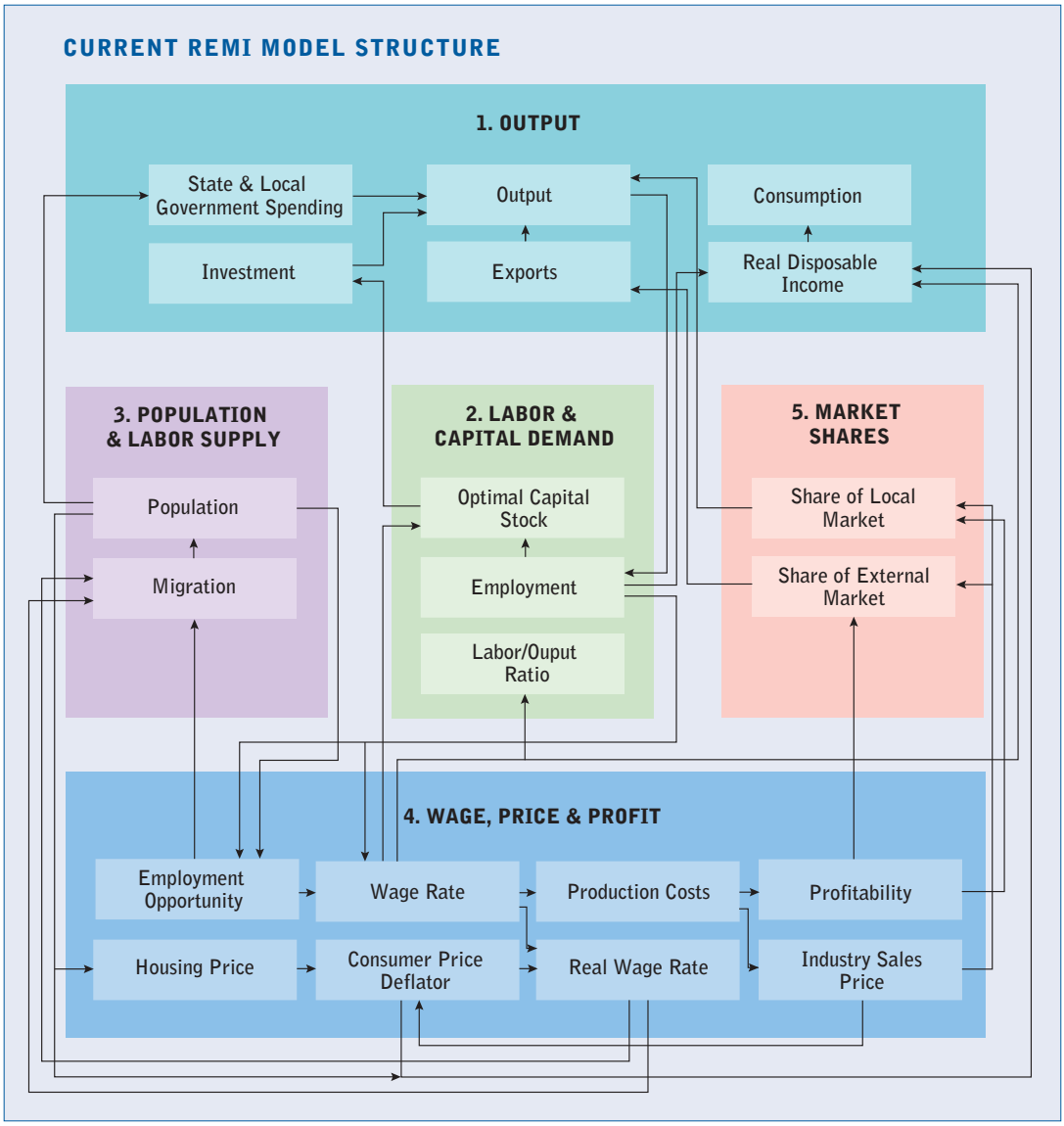
THE REMI MODEL

REMI has developed models since 1980 that allow users to analyze the impact of various public policies on the economy of local, state, and national regions. The model is based on past and current research and development, which is subject to peer review and published in academic journals. REMI economic models are currently used by hundreds of governmental agencies, universities, and others.

The forecasting and policy analysis system includes key econometric estimates and integrates interindustry transactions, long run equilibrium features, and the new economic geography. It includes: substitution among factors of production in response to changes in relative factor costs; migration responses to changes in expected income; labor participation rate responses to changes in real wage and employment conditions; wage rate responses to labor market changes; consumer consumption responses to changes in real disposable income and commodity prices; and local, regional, and market share responses to changes in regional production costs and agglomeration economics.

It was ERA's opinion that the REMI model was the most appropriate tool for analyzing the total (including direct, indirect, and induced) impacts of aviation in California. The REMI model allowed ERA to analyze the impacts of aviation as a transportation system that relates with other industries in addition to the impacts of aviation as an industry itself. Several unique features of the REMI model that separate it from other modeling systems include:

- It is calibrated to local conditions using a relatively large amount of local data, which is likely to improve its performance, especially under conditions of structural economic change.
- It has an exceptionally strong theoretical foundation.
- It combines several different kinds of analytical tools (including economic-base, input-output, and econometric models), allowing it to take advantage of each specific method's strengths and compensate for its weaknesses.
- It allows users to manipulate an unusually large number of input variables and gives forecasts for an unusually large number of output variables.
- The structure of the model incorporates interindustry transactions and endogenous final demand feedbacks.



METHODOLOGY

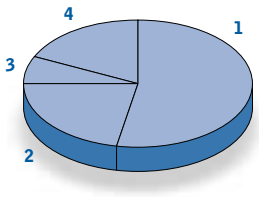
ERA identified four major categories of impacts of aviation in California. The alternative hypothesis was that all airports did not exist in California. While this is clearly not a realistic hypothesis, it allows the technical analysis to isolate the impact of aviation.

- Direct employment of the different components that make up the air transportation sector, including aircraft manufacturing and services, commercial space, government aviation, and other airport businesses.
- Transportation costs to the different industry sectors in California.
- Tourism to and within California.
- Demand for goods and services provided by firms in California.

Direct Employment

Aviation in California generates many direct jobs in firms such as airlines, aircraft manufacturing, repair and maintenance services, commercial space firms, airport administration and operations, and on-site airport businesses that provide critical services to airlines and passengers. These estimates were developed according to the following methodology:

- Employment in the air transportation sector was estimated through ERA's review of existing economic impact studies from the 13 primary hub airports and through ERA's survey of airport managers and survey of airport businesses at selected "prototype" airports in each sub-category. Detailed results can be found in Working Papers IIA and IIB. In addition, ERA compared the employment estimate developed through the airport manager and business surveys to the employment estimate for the air transportation sector in the REMI base model in order to test for reasonableness. The two numbers were within five percent of each other.
- The aircraft manufacturing and services sector employment level was estimated in Working Paper I.
- In order to estimate aviation-related government employment, ERA developed a list of all government agencies that either rely on aviation to provide services or are involved in the operations, planning, regulation, or management of airports or aviation in California. The important role of these federal and state government agencies are discussed further in Chapter 6.
- Local government employment was estimated through the survey of airport managers and review of existing economic impact studies.



AVIATION IN CALIFORNIA: DIRECT EMPLOYMENT BY CATEGORY — 2001

	Category	Estimated Jobs	Percent of Total
1	Air Transportation	143,300	53%
2	Aircraft and Parts Manufacturing and Repairs	60,000	22%
3	Government	18,500	7%
4	Other (hotel, rental car, restaurants, etc.)	50,000	18%
	Total Direct Employment	**271,800**	**100%**

Transportation Costs

Without aviation, an increase in production costs as a result of higher transportation costs would be experienced by nearly all industries to varying degrees. In order to estimate the level of this impact, ERA utilized the Bureau of Economic Analysis' Transportation Satellite Accounts mapped to the 53 sectors of the REMI model. These transportation cost factors indicate the relationship between total transportation cost (captive fleets as well as purchased services) and total production costs by individual REMI sectors. (Production costs by sector are defined as output by sector in the model.)

ERA went through each of the 53 sectors and estimated the degree to which transportation costs as a proportion of total production cost would increase if aviation were no longer available to firms within each sector. Factors that played a role in ERA's estimates include:

- Recent trends in technology such as "just-in-time" production and increased demand for quick delivery to market.

- The scale and size of the export component of California's agriculture industry. For example, California is the leading producer of several agricultural products that are exported throughout the United States and internationally. The perishable nature of many agricultural goods is another important factor.
- The extent to which various industries already rely upon aviation as a form of transportation.

Tourism

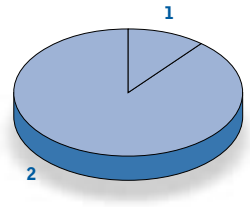
Tourism is an important industry to California that affects many businesses in large cities, small towns, and scenic areas. In order to estimate the impact of aviation on tourism to and within California, ERA utilized information from the California Department of Tourism and individual convention and visitor's bureaus. ERA examined a number of factors to determine what reduction in tourist expenditures would result if aviation did not exist. Some of these factors include:

- Number of person trips made by foreign visitors, California residents, and non-California United States resident visitors.
- The percentage of person trips within each category that used air transportation.
- The average length of stay by visitor origin.
- Average daily per capita spending by category (i.e. hotel, restaurants, local transportation, etc.)

Approximately 11 percent of total person trips made by all visitors were by air travel in 2000.

PERSON TRIPS TO AND IN CALIFORNIA BY MODE OF TRANSPORTATION — 2000

	Mode	Person Trips	Percent of Total
1	Air Travel	31,918,000	11%
2	All Other Transport Modes	263,782,000	89%
	Total Trips	**295,700,000**	**100%**



ERA used this information to calculate the total visitor expenditures that currently rely upon air travel and then estimated the decrease in trips that would likely occur if aviation did not exist by visitor origin. As part of this process, ERA also examined the potential for an increase in shorter trips within California and a decrease in outbound international trips by California residents.

ESTIMATED AVIATION-RELATED TOURISM EXPENDITURES IN CALIFORNIA — 2001

	Expenditures by Visitor Origin (2000 dollars)			
Industry	California	Other United States	Foreign Visitors	Total All Visitors
Accommodations	$ 28,227,000	$ 686,947,000	$ 3,125,307,000	$ 3,840,481,000
Eating and Drinking	$ 45,869,000	$ 808,173,000	$ 3,125,307,000	$ 3,979,349,000
Local Transportation	$ 21,170,000	$ 202,043,000	$ 1,339,417,000	$ 1,562,630,000
Entertainment	$ 31,755,000	$ 282,681,000	$ 1,339,417,000	$ 1,653,853,000
Retail Sales	$ 44,104,000	$ 646,538,000	$ 2,678,834,000	$ 3,369,476,000
Travel Arrangements	negligible	negligible	$ 148,824,000	$ 148,824,000
Total[1]	**$171,125,000**	**$2,626,382,000**	**$11,757,106,000**	**$14,554,613,000**

Source: California Department of Tourism, ERA.

Demand for Goods and Services

The absence of aviation services would result in some reduction in demand for goods and services from California firms. Based upon ERA's experience and discussions with REMI, ERA estimated the percentage reduction for each of the 53 REMI industry sectors. The critical question that ERA examined was what percentage of sales of goods or services could not occur without aviation.

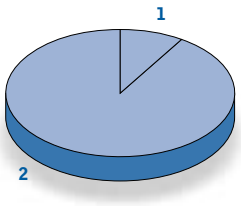
Local firms rapidly expanded business activities during the 1990s by tapping into the global market, particularly into the emerging Pacific Rim economies. Major cutbacks in flights to domestic and international destinations recently have hampered the ability of local firms to seek new business opportunities outside the state. Even with the Internet and advanced telecommunications innovations, many firms found that there is no substitute for face-to-face contact in developing new business relationships. This is particularly true in Asian countries, where a personal relationship is typically a prerequisite to a business deal. Another example is certain professional service companies may find it difficult or expensive to provide responsive personal service to clients in far away locations, because of flight reductions. While this is initially a production cost increase, it over time leads to lower demand because clients expect face-to-face contact or quick response time as part of their service.

OVERALL ECONOMIC IMPACT OF AVIATION

Without aviation, there would be several types of impacts on the California economy. There would be a reduction in direct employment in aviation-related industries, an increase in production cost for businesses that rely on air transportation, a decrease in aviation-dependent tourism expenditures, and a decrease in demand for goods and services for many California firms, particularly those that rely on air transportation for new business sales.

Gross State Product Impact

ERA estimated the impact of the previously mentioned categories of impacts and used the REMI model to analyze the total contribution of aviation to the California economy. The impact of aviation contributes over $110.7 billion of output, which represents approximately 8.6 percent of California's Gross State Product (GSP) in 2001. This $110.7 billion in aviation-related output exceeds the GSP of 23 of the 50 states in United States and is comparable to the entire GSP of states like Alabama, Kentucky or South Carolina.



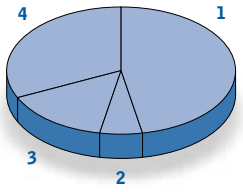
ECONOMIC IMPACT OF AVIATION ON CALIFORNIA GROSS STATE PRODUCT: AVIATION-RELATED OUTPUT IN CALIFORNIA — 2001

	Category	Output (in $)	Percent of Total
1	Aviation-Related Output	110.7 billion	9%
2	Rest of Gross State Product	1.2 trillion	91%
	Total	**1.3 trillion**	**100%**

ERA estimates that of the total output related to aviation, close to half (47 percent) is related to aviation sector industries such as the air transportation, aircraft and aircraft parts manufacturing, and government. The impact of aviation on production costs for firms that rely on airline transportation accounts for approximately six percent of the aviation-related output, and the tourism-related expenditures account for 15 percent of the total impact. The demand for goods and services enabled by aviation accounts for 32 percent of the total output attributable to aviation.

BREAKDOWN OF AVIATION-RELATED OUTPUT IN CALIFORNIA BY CATEGORY — 2001

	Category	Output (in billions of $)	Percent of Total
1	Aviation Industry	$ 52.1	47%
2	Production Costs	$ 6.4	6%
3	Tourism Expenditures	$ 16.4	15%
4	Demand for Goods and Services	$ 35.8	32%
	Total Aviation-Related Output	**$110.7**	**100%**

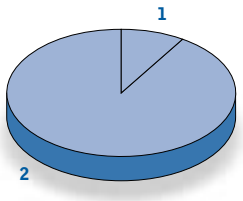


Employment Impact

In 2001, aviation-related employment accounted for approximately 1.7 million jobs in the state economy, representing approximately 8.8 percent of total employment. As a point of comparison, the 1.7 million jobs is about equal to the entire employed workforce in the state of Oregon.

AVIATION-RELATED EMPLOYMENT IN CALIFORNIA — 2001

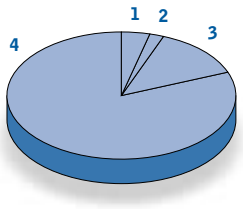
	Category	Employment (in millions)	Percent of Total
1	Aviation-Related Employment	1.7	9%
2	Other Employment	17.8	91%
	Total	**19.5**	**100%**



Over 1.6 million of these jobs are private, non-farm jobs, while 37,000 jobs are government jobs and another 65,000 jobs are in the farm sector. Of the private, non-farm jobs, approximately 87 percent are non-manufacturing jobs, while the remaining 13 percent are accounted for by manufacturing jobs.

AVIATION-RELATED EMPLOYMENT IN CALIFORNIA BY SECTOR — 2001

		Jobs in California		Aviation-Related Employment	
	Sector	With Aviation	Without Aviation	Employment	Percent of Total
1	Farm	326,443	261,154	65,290	4%
2	Government	2,571,988	2,534,628	37,360	2%
3	Manufacturing	1,911,201	1,685,592	225,610	13%
4	Non-Manufacturing	14,665,580	13,289,157	1,376,420	81%
	Total Jobs	**19,475,212**	**17,770,531**	**1,704,680**	**100%**



Source: Economics Research Associates, REMI.

The major manufacturing industries affected include transportation equipment, electrical equipment, machinery and computers, food products, and instruments. The non-manufacturing industries that would experience the greatest loss in employment without aviation are services, retail trade, transportation and public utilities, construction, and financial, insurance, and real estate.

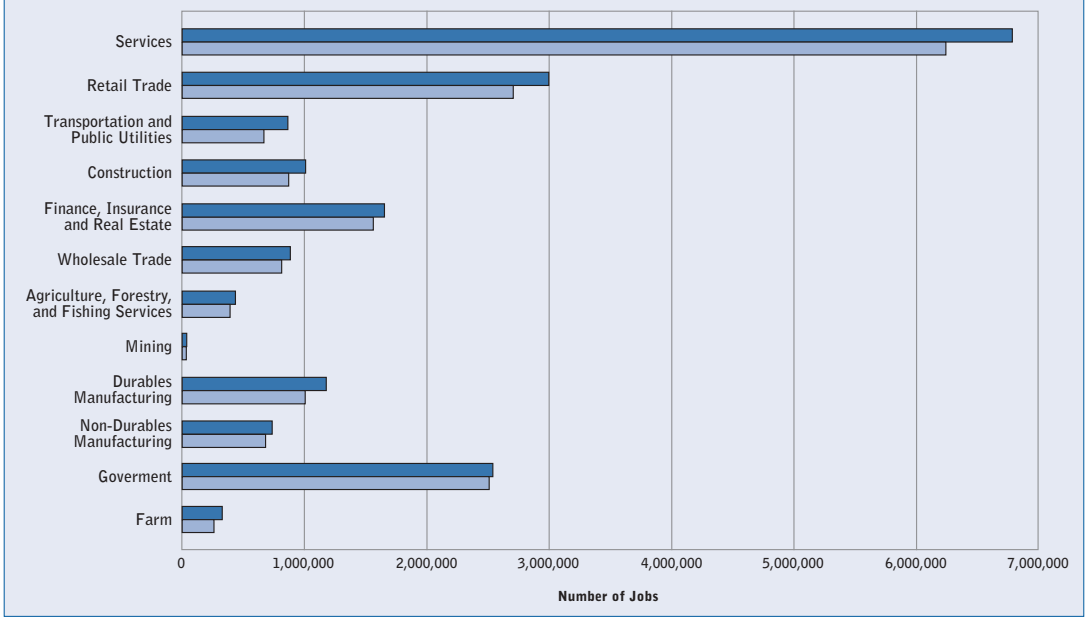
The non-manufacturing sector industries that would experience the greatest percentage decrease in jobs are transportation and public utilities (with a 22 percent decrease in total employment) and construction (13 percent decrease). Within the services industry, the specific industries that would experience the largest percentage decrease in employment if aviation did not exist would be hotels (22 percent decrease) and miscellaneous professional services (10 percent decrease).

IMPACT OF AVIATION-RELATED EMPLOYMENT IN CALIFORNIA BY MAJOR INDUSTRY — 2001

Industry	Jobs in California: With Aviation	Jobs in California: Without Aviation	Aviation-Related Jobs
Services	6,785,043	6,242,643	542,400
Retail Trade	2,996,992	2,706,592	290,400
Transportation and Public Utilities	862,284	666,884	195,400
Construction	1,008,120	871,720	136,400
Finance, Insurance and Real Estate	1,654,233	1,561,813	92,420
Wholesale Trade	885,083	812,453	72,630
Agriculture, Forestry and Fishing Services	436,574	391,884	44,690
Mining	37,250	35,168	2,080
Durables Manufacturing	1,175,805	1,003,712	172,090
Non-Durables Manufacturing	735,396	681,880	53,520
Government	2,571988	2,534,628	37,360
Farm	326,443	261,154	65,290
Total	**19,475,211**	**17,770,531**	**1,704,680**

Source: Economics Research Associates, REMI.

IMPACT OF AVIATION ON EMPLOYMENT BY MAJOR INDUSTRY — 2001



REAL PERSONAL INCOME IMPACT

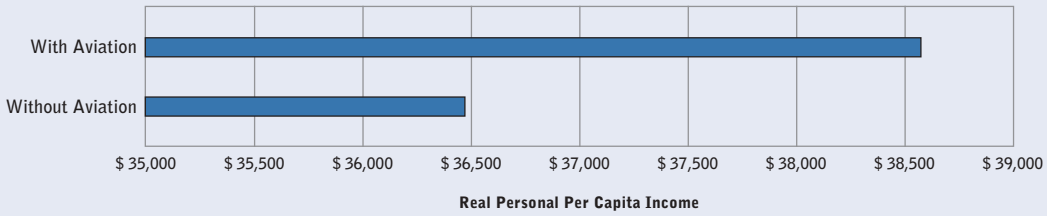
Aviation contributes to the amount of real personal income and the average real per capita income per person in California. During 2001, aviation accounted for $84 billion or 6.4 percent of total real personal income in California.

The impact of aviation on average real personal per capita income is over $2,000. Real average personal per capita income in 2001 was close to $38,600. Without aviation, it would have been approximately $36,500.

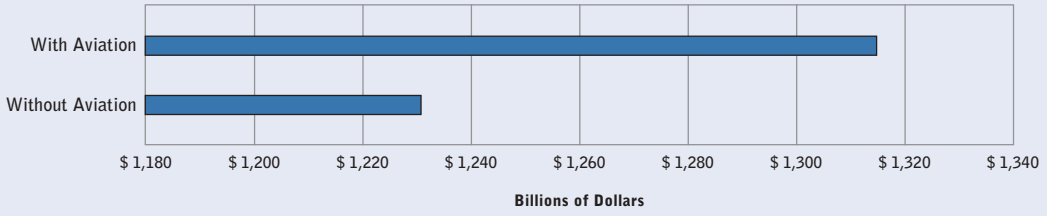
IMPACT OF AVIATION ON REAL PERSONAL INCOME IN CALIFORNIA — 2001

	Category	With Aviation	Without Aviation	Difference Amount	Difference Percentage
1	Real Personal Income (billions of dollars)	$ 1,314	$ 1,230	$ 84	6.4%
2	Average Per Capita Real Personal Income	$38,582	$36,455	$2,127	5.5%

IMPACT OF AVIATION ON REAL PERSONAL PER CAPITA INCOME — 2001

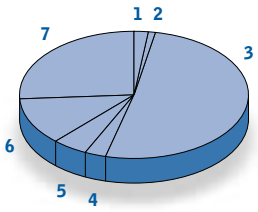


IMPACT OF AVIATION ON REAL PERSONAL INCOME IN CALIFORNIA — 2001



TAX IMPACT

Aviation generates tax revenue through a variety of mechanisms, including personal property taxes, taxable aviation gasoline excise tax revenues, taxable aircraft jet fuel excise tax revenues, possessory interest tax, and sales tax on general aviation aircraft. Total tax revenue generated as a result of aviation in Fiscal Year (FY) 2001–02 was slightly over $250.2 million.



TAX IMPACT OF AVIATION IN CALIFORNIA — 2002

	Type of Tax	Tax Revenue Generated (in millions of $)	Percent of Total
1	Excise Tax Revenue—Aviation Gasoline	$ 5.2	2%
2	Excise Tax Revenue—GA Jet Fuel	$ 2.4	1%
3	Sales & Use Tax—Jet Fuel for Airlines	$ 128.3	51%
4	Sales & Use Tax—Jet Fuel for General Aviation	$ 7.0	3%
5	Sales & Use Tax—Aircraft Sales	$ 12.7	5%
6	Possessory Interest Tax—Airlines	$ 29.0	12%
7	Personal Property Taxes	$ 65.7	26%
	Total Tax Revenue Generated	**$ 250.2**	**100%**

- **Personal property taxes**—The locally assessed value of aircraft in counties throughout California was slightly over $6.2 billion for 22,338 aircraft. Based upon an average tax rate of 1.07 percent, ERA estimates that property tax revenue for aircraft in California was $65.7 million.
- **Excise taxes**—Revenue from excise taxes on aviation gasoline totaled approximately $5.2 million during this time period. Excise taxes for general aviation jet fuel totaled $2.4 million.
- **Sales and use taxes**—State sales and use taxes totaled approximately $148.0 million during FY 2001–02. Of this, $128.3 million was generated by the sales of jet fuel used by airlines, $7.0 million was from jet fuel used by general aviation, and $12.7 million was from the sale of aircraft.
- **Possessory interest tax**—Private businesses on public properties are sometimes assessed property taxes. Airline possessory interest taxes totaled approximately $29 million during 2002.

Of the $250.2 million, $101 million goes to the State ($7.6 million helps fund the Aeronautics Account), and the remaining $149.2 million supports local governments and school districts.

AVIATION AND CALIFORNIA'S FUTURE

As California grows from its current population of just over 35 million to a state of 50 million in 20 to 25 years, aviation will play an increasingly important role in the future mobility of this population. While greater housing densities in the existing metropolitan areas will accommodate some of this population increase, much of the increase will spread to previously undeveloped portions of the state. The trunk-line travel demand from one metropolitan center to another may be served by the construction of a high-speed rail system. However, air transportation, using small and medium sized airports, will be effective in serving the mobility needs of this decentralizing population.

One of the great advantages of air transportation is its flexibility. Once an airstrip is in place, the level of service is able to vary directly with demand. As demand for air travel grows within these smaller communities, investments in airport improvements will be essential. These investments need to include not only the construction of capital facilities but also the acquisition and planning of land to prevent the encroachment of incompatible uses around these once rural airports.

Impact on California Life and Communities

Many of the quantifiable economic impacts of the aviation sector come through the major commercial service hub airports in California. However, aviation enhances many aspects of California life in smaller communities as well, and general aviation airports in those smaller communities play an important role in providing these services. Because of aviation, the agricultural products grown in the Central Valley reach overseas markets while still fresh. The wine growing regions benefit from tourists flown in by aircraft, the use of remote sensing from aircraft and satellites for quality control and pest control from crop dusters. The entertainment industry, so vital to the economy of Southern California, flies film stars and crew to remote locations to shoot movies and television shows. By providing time efficient linkages to centers of technology growth, airports and air service allow many smaller communities, like Chico, Hollister, Auburn and San Luis Obispo, to participate in California's economic transformation.

In addition to tangible benefits, aviation greatly enhances the quality of business, personal and family life for all Californians. Air transportation allows an average citizen to reside anywhere around the world and still keep in touch by reaching their destination faster than any other mode. People travel to, from, and within the state for various reasons including business, tourism, family vacations, reunions (family, class, club, etc.), weddings, other celebrations and events, funerals, work or just to keep in touch. All this can be accomplished quickly because of aviation.

AVIATION IMPACTS OUR DAILY LIVES IN WAYS THAT WE OFTEN TAKE FOR GRANTED, AS DEMONSTRATED BY THE FOLLOWING EXAMPLES:

- Although we grow many items locally in California, aviation allows us to have access to a variety of fresh fruit year-round. Some grapes are from Chile. Fresh bananas, mangos, and pineapples come from tropical climates. Live lobsters can't be frozen. Many food items are flown here.
- Just-in-time deliveries, which help reduce manufacturer and other business inventories in turn, result in savings for consumers.
- Component parts in the everyday items we use are produced elsewhere and flown to manufacturers for final production.
- Catalog orders (especially rush orders) coming from across the country are shipped by air.
- Items through Internet websites such as Ebay are regularly flown into airports then trucked to our homes.
- Contracts for business or personal items or services needing a quick turn-around are often transported by air.

CATALYST FOR ECONOMIC DEVELOPMENT

As California corporations continue to decentralize their operations to escape the high cost of major metropolitan areas, the state's system of 250 airports is becoming increasingly important. These airports allow smaller California communities to compete with lower cost locations in other states. Nationally, about 26 percent of general aviation aircraft are operated exclusively for business and another 60 percent are used at least partly for business. In addition, many California companies and executives are avoiding the "hassle factor" of commercial airports and airlines, especially in the aftermath of September 11th and opting instead to use corporate charter air services for business travel typically operating from smaller airports. This allows for increased security, privacy, convenience, and time saving.

High technology firms and wholesale distributors are particularly dependent on efficient product delivery. Agriculture, real estate, and environmental businesses predominantly use aircraft for aerial surveying. The following provides some examples of the importance of aviation and airports for businesses in California:

- **Chico Municipal Airport** was a major factor in the decision of FAFCO, the nation's oldest and largest solar manufacturer, to relocate from the Bay Area to Butte County. In addition, the industrial park near the airport provides over 2,000 jobs.
- After September 11th, Apex Aviation, based at **Charles M. Schulz–Sonoma County Airport,** reports that the number of business charters increased by 30 percent. Three of the company's seven pilots were hired in 2002, and 85 percent of total company revenues resulted from corporate charter services.
- A number of high-technology businesses have located in San Luis Obispo County in part due to the **San Luis Obispo Airport.** These firms in biotechnology, software development and aviation and aerospace manufacturing have created a high-tech cluster in this highly desirable Central Coast portion of California.
- As a result of the access provided to private aircraft by **Nevada County Airpark,** a number of Bay Area high technology companies have been able to open branch offices in Nevada County to take advantage of productive and cost-effective labor, as well as employee quality of life and affordable housing.
- Bridgeford Flying Services at **Napa County Airport** experienced a 30 percent increase in its charter business demand in 2002. Demand for the company's AstraJet, which transports clients to the East Coast in less than five hours, has tripled.
- The relocation of Howard Leight Enterprises, a medical supply manufacturer, to **Montgomery Field** was influenced by the existence of this airport in San Diego. The airport also services flights from the Niners Club Corporation, Honda dealerships and other corporations.
- **Porterville Municipal Airport** provides services to corporate jets for Wal-Mart, Foster Farms, and Mervyn's. Both Wal-Mart and Mervyn's have distribution centers in the area, in part due to the access provided by the airport.
- **Fresno Chandler Downtown Airport** has played a role in the revitalization of Downtown Fresno. The airport built 66 hangars and leased them to new tenants within six months. In addition, the airport is planning two new commercial buildings, which will be completed by the end of 2004.
- **Camarillo Airport** services a substantial amount of corporate travel from firms like Mercedes Benz, Harbor Freight Tools, and Salem Communications.

- Several million square feet of industrial and office space were recently built at **Chino Airport,** and many of the businesses in this space, including G&W Enterprises and Legacy Ranch Holdings, base their corporate aircraft there.
- A local lumber company that provides 100 jobs in the region has been able to continue operations as a result of the **Placerville Airport**.

CONVENIENT VENUES FOR CORPORATE AND BUSINESS ACTIVITIES

Airports that offer convenient schedules to and from multiple destinations are efficient meeting venues for high-level corporate executive and government officials to whom time is of great value. General aviation airports serve as offices to "briefcase businesses" for a range of users from small business owners to corporate executives. Some examples of how airports support "briefcase business" include the following:

- Because it serves the State Capitol, **Sacramento International Airport** represents an ideal meeting location for individuals from Southern California and other more distant areas of the state who need to have a face-to-face meeting with State officials. The time saving for all parties involved, due to the access provided by the air service as compared to an alternate mode of transport, is substantial.
- **Van Nuys Airport** in the San Fernando Valley is one of the many airports serving the increasingly busy "briefcase business" market of individuals able to fly in by private or business aircraft, conduct business on or near the airport, and depart within a matter of hours.
- **Burbank–Glendale–Pasadena** and **Metropolitan Oakland International Airports** are well located to serve these fly-in meetings as they provide first-rate meeting and business support facilities. These airports are short haul travel hubs that have convenient ground access to large metropolitan area populations.

INTERNATIONAL GATEWAYS

The key advantage of air travel is the tremendous time saving when one has to travel great distances. The increasing integration of the global economy would not be possible without air travel. The major international airports of the state link California with the other countries of the Pacific Rim, South America, Europe and the rest of the world. Without air service, a trip from San Francisco to Hong Kong takes nearly two weeks via ocean liner. A Boeing 747 makes that trip in approximately 13 hours.

Because of the air service from **Los Angeles** and **San Francisco International Airports,** San Francisco architects have designed many of the new office buildings in Shanghai, planners out of Sausalito are planning resorts in Thailand, and engineers out of Los Angeles are able to consult on the high speed rail project in Taiwan.

Air transport is critical for international trade in California. As the world's fifth largest economy, California exported almost $107 billion in goods worldwide to 219 different countries in 2001. The passage of North American Free Trade Agreement (NAFTA) and China's entrance into the World Trade Organization (WTO) have increased California's importance in the global market.

The state's largest trade partners include Mexico, Japan, Canada and Taiwan. California is the nation's top exporter to Asia. California is the leading export state in the country and accounts for almost 15 percent of total U.S. sales abroad. Top export products include computers, electronics components, non-electrical machinery, transportation equipment, chemicals, and agricultural products. Computer and electronic products account for nearly half of all California exports by value.

The following are examples of the role of airports in facilitating international trade for California:

- Bay Area airports—In 2000, close to $46.2 billion of exports went through the three major Bay Area airports—**San Francisco International, Metropolitan Oakland International,** and **Norman Y. Mineta–San Jose International**—representing 16.2 percent of total U.S. air exports and over six percent of all U.S. exports. This is largely due to the export of computer products from Silicon Valley. A large portion of this air trade is to Asia, with the top five export destinations being Japan, Taiwan, Korea, Singapore, and Hong Kong.
- **Calexico International Airport** is important to the maquiladora plants located throughout Mexico, and particularly along the U.S.–Mexico border. The airport services daily corporate flights between the two countries. There are over 25 aircraft operations arriving from Mexico daily.
- **Imperial County Airport** is less than 12 miles from the U.S.–Mexico border. There are numerous international business flights coming into the airport from Mexico, as well as the Pacific Rim.

AIR CARGO SERVICES

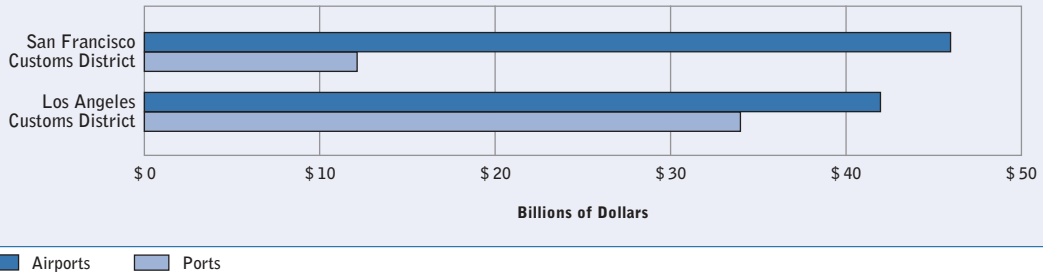
Movement of cargo through California's airports, particularly international activity, plays a significant role in the vitality of the state's economy, and the national economy as well. How air transportation of goods and services impacts everyday lives can be overlooked and taken for granted.

Most air cargo consists of high-value, time-sensitive documents and goods, such as electronics equipment, computer parts, and perishables that require just-in-time delivery. Speedy delivery of goods and services is essential to many manufacturing and service businesses involving items like fresh produce, equipment repair and auto parts, and business and banking documents. For transportation of medical supplies, vaccines and transplant organs, the speed in delivery by air is critical.

Air cargo serves the state and its residents in several forms. The world's governmental postal services depend on air transportation for timely delivery of mail and small packages. Dedicated air cargo carriers such as Federal Express (FedEx), Airborne Express, DHL, and United Parcel Service (UPS) provide air express service, for small packages (typically under 100 pounds), often with overnight delivery. Modern commerce involving catalog sales and online shopping is possible only with air express service and has grown to 60 percent of the U.S. air cargo market. Bulkier items, from elephants to machinery, are often carried in chartered or contract aircraft as airfreight. Other carriers such as Polar Air Cargo and BAX Global also carry larger cargo items. Airfreight is vital to the transport of large size, heavy weight or special purpose items across long distances in a short time. Equipment and supplies are shipped any place in the world in a matter of hours, which is vital for disaster relief.

The impact of the 2002 California seaport dock strike was lessened by the increased use of airfreight. Although the weight of air cargo is much less in proportion to all goods moved by ship, rail or truck, the value of air cargo is substantial. U.S. Customs reports the value of air cargo moved through California's airports in 2000 was $173 billion. The Los Angeles Customs District reports the value of goods flown through their airports was $41.8 billion while the value of goods shipped through ports was $34 billion. The San Francisco Customs District reports $46.2 billion by air verses $12 billion through ports. West Coast locations of California airports provide direct links to vast Asian markets.

VALUE OF GOODS FLOW THROUGH AIRPORTS AND PORTS — 2000



Worldwide, air cargo is expected to triple by 2010. With the fifth largest economy in the world, the influence of air cargo on California's economy is dramatic. California's air cargo facilities include:

- **Los Angeles International Airport** is the state's busiest international passenger and air cargo hub. With 88 passenger and cargo airlines serving the airport, over 2.9 million tons of air cargo landed and departed there in 2001. A wide range of cargo types move through the airport, from fresh flowers imported from South America to movie and music industry products exported to overseas customers.
- **Metropolitan Oakland International Airport** is a regional hub for FedEx. Over 1.6 million tons of cargo landed and departed there in 2001. This international facility supports a global economy of valuable perishable and time-sensitive cargo ranging from imported live Australian Lobsters to exported West Coast produce for Asian markets.
- **Ontario International Airport** is the western regional hub for United Parcel Service. Over 1.2 million tons of cargo landed and departed there in 2001. The airport handles a wide range of cargo from machinery to the latest Paris fashions.
- **Sacramento Mather Airport** is a regional hub for Airborne Express. UPS and Emery Worldwide operate there also. In 2001, over 419,000 tons of air cargo was flown from Mather, including service for the region's high-technology industry. The airport makes possible the just-in-time delivery of computer chips from India to local factories and the overnight shipment of completed computers to Indiana.
- **San Francisco International Airport** is the state's second largest international airport. Over one million tons of air cargo landed and departed there in 2001. The economy of the San Francisco Bay Area is influenced greatly by international import and export businesses that depend on air transportation to deliver locally manufactured computer and data processing equipment and fresh fruits and vegetables.
- **Southern California Logistics Airport** in San Bernardino County is becoming an intermodal cargo facility. Several air cargo carriers now use the facility to avoid the air traffic and road congestion at Los Angeles and Ontario International Airports. Private development of a 700-acre distribution complex is underway to store and maintain rail freight cars and locomotives. Plans include building warehousing and processing facilities for foreign-made automobiles. The complex will link air cargo with the Ports of Los Angeles and Long Beach by rail through a connection with the Alameda Corridor.

CALIFORNIA AGRICULTURE

California is the country's leading agriculture producer. More than half of the nation's fruits, nuts and vegetables are grown in California. In 2001, the state's gross cash income from agriculture amounted to $27.6 billion, and fruits, nuts, livestock, poultry and vegetables accounted for over three-fourths of this income. California has 88,000 farming operations, and the state's agriculture industry employs 1.1 million people. The top four counties in agriculture production are Tulare, Fresno, Monterey and Kern Counties.

California is not only the leading, but the only producer of certain specialty crops as well. For example, in 2001, California accounted for over 99 percent of the nation's production of the following agricultural products: almonds, artichokes, clingstone peaches, dates, figs, kiwifruit, nectarines, olives, persimmons, pistachios, plums, dried prunes, raisins, and walnuts.

Approximately 14 percent of the state's agricultural production is shipped to foreign countries. If California were a nation, it would be the sixth leading agricultural exporter in the world. Annually, $6.5 billion in food and agricultural commodities are shipped around the world, much by air due to the perishable nature of the products. Canada and Japan are the top two export destinations. The leading export products are almonds, cotton, wine, table grapes, milk/cream, oranges, processed tomatoes, rice, beef, and lettuce.

California's airports contribute greatly to the success of its agriculture industry, providing services for export shipment, corporate travel, crop dusting, crop storage facilities, and aerial photography. Some examples include:

- **Stockton Metropolitan Airport** has a long runway to facilitate the transport of highly perishable goods to Asian markets via jumbo jet. For example, cherries that sell for $25 per kilo in the basement of the high-end department stores in downtown Tokyo can be shipped overnight via air from facilities such as the Stockton Metropolitan Airport.
- Nunn Farms, one of the largest agricultural growers and processors of tomato products in California, maintains and fuels its aircraft in **Tracy Municipal Airport.** In addition, Morning Star Packing contracts with the Tracy Flight Center to conduct aerial monitoring of its crop development (primarily tomatoes) on several of its large farms between Tracy and Los Angeles.
- Diestal Farms, a major turkey grower, regularly uses the **Columbia Airport** for corporate travel.
- **Salinas Municipal Airport** is located in the Salinas Valley, the center of Monterey County's three billion-dollar agriculture industry. Dole Foods, one of the largest fruit and vegetable producers, uses the airport for corporate travel on a daily basis. The airport anticipates that most of its future growth will be from agriculture-related travel.
- Most of the major tenants at **Shafter–Minter Field** are agriculture-related businesses, including Acala Seeds, Bender Farms, Crop Care Applicators, Inland Crop Dusting, G.K. Lewis Irrigation Services, and the California Department of Agriculture.
- Foster Farms, a dairy and poultry producer, has built new facilities at **Modesto City–County Airport.**
- Paramount Citrus relocated its operations to **Delano Municipal Airport** largely because of the aviation services available at the airport.

THE WINE INDUSTRY

Wine is not only California's number one finished agricultural product in retail value, it also has special significance in California culture. California ranks fourth in the world in wine production and accounts for 98 percent of the wine shipments from the United States. It employs 145,000 people in the state and pays $4.3 billion in wages. California wines are famous throughout the world and continue to win awards at international wine competitions.

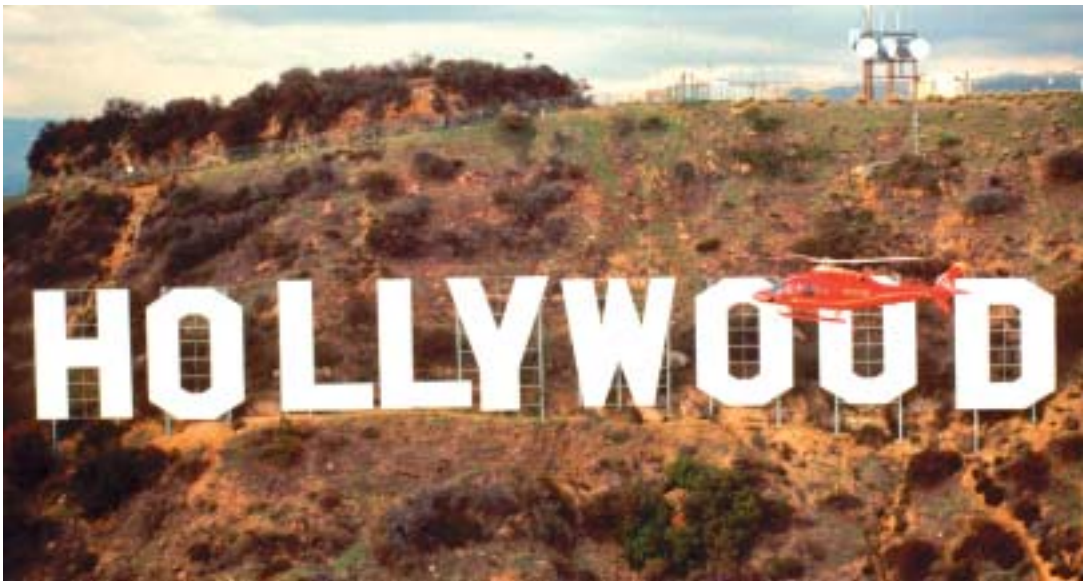
There are approximately 850 commercial wineries in California. The majority of these are in Napa, Sonoma and San Luis Obispo Counties. A concentration of wineries is also found in Mendocino, Santa Cruz, Santa Barbara, Monterey and Alameda Counties. The long-term outlook for the California wine industry is strong. There is increasing domestic demand for both moderately priced and luxury wines. Rising incomes and sophistication in many countries around the world are also driving growing export demand for California wines.

California's system of large and small airports plays an important role in the success of the wine industry. Key contributions include export shipment, pest control, local tourism and industry corporate travel. Some examples include:

- **Napa County Airport** is located in the Napa Valley, the best known wine-growing region in the United States. Local wineries, hotels, bed and breakfast lodges, and restaurants receive many tourists via the airport.
- Many tourists visit the wineries in the Livermore Valley because of the presence of the **Livermore Airport.**
- At the **Charles M. Schulz–Sonoma County Airport,** wine industry aircraft occupy the largest amount of hangar space. Located in the heart of Sonoma's wine country, this airport also receives a substantial number of winery visitors.
- **French Valley Airport** serves tourists visiting the Temecula wine country as this part of Riverside County becomes an increasingly popular attraction for wine enthusiasts.
- **Paso Robles Municipal Airport** is located in a region becoming a major wine growing area of California. Some wineries, such as the Treana Vineyards, have recently located in the Paso Robles area in part due to the nearby airport, which allows executives based in Napa to fly in for the day to inspect the vineyards. Airport officials estimate that one-third of the airport's activities are wine-industry related.
- **Porterville Municipal Airport** provides shuttle service for corporate travelers to and from Franzia Vineyards.

Aviation is also critical for pest management. For example, sulfur and copper sprays are extremely important for controlling powdery mildew, a problem that affects about 10 percent of wine grapes. Applying sulfur from aircraft allows for rapid response even in wet weather as well as the coverage of a large area in a short period of time.

Aviation has also been important for the industry's research and quality control. National Aeronautics and Space Administration (NASA) researchers have used remote-sensing technology images taken from airplanes and satellites to help vintners measure ripening rate, disease incidence, soil drainage, and fruit quality. Mondavi Winery of Oakdale has used remote-sensing technology extensively for this purpose. This technology was also used to initially site the wineries in Temecula.



THE ENTERTAINMENT INDUSTRY

The entertainment industry—movies, television production, recording studios, concerts—contributes greatly to the economy of Southern California and serves to define the culture of the state as well. The entertainment industry in California generates $28 billion in direct spending and directly employs 226,000 people. Though most of its economic impact is concentrated in Los Angeles County, other California counties have also benefited because some of the industry's activities are highly decentralized. Several California airports help their local economies by facilitating the needs of the entertainment industry, such as:

- Filming at the **Inyokern Airport,** which is located about two hours from Los Angeles, brings in nearly $4 million a year into the local economy. Film crews can spend up to six months in the region with a single production.
- Because movie and television personnel frequently use the **Santa Monica Airport** to travel to film sites, a number of production facilities have located near the airport. The City of Santa Monica receives approximately $1.2 billion in annual economic benefit from the entertainment industry, and the airport plays an important role in supporting this industry.
- **Lampson Field** serves tourists visiting Lake County, as well as celebrities performing at the nearby the Konocti Harbor Resort and Spa in Kelseyville.
- **Lake Tahoe and Tahoe–Truckee Airports** have been very important for film production in El Dorado, Placer, and Nevada Counties. The local region realized $1.6 million in economic impact from media production in 2000.

TOURISM IN CALIFORNIA

California received approximately 317 million domestic and international travelers during 2001. With 12 percent of the U.S. travel market, it is the most visited state in the country. Travel and tourism expenditures amount to $75 billion each year, providing employment for over one million residents. According to the California Department of Tourism, over 48 percent of domestic tourists visiting from outside California, approximately 14 percent of other North Americans, and all overseas visitors travel by air to visit California.

While much of the tourist travel is to the major metropolitan areas like Los Angeles, San Francisco, San Diego and Orange County, the state's system of airports has been critical to the success of California's tourism industry in less urbanized parts of the states. California is well known for its outdoor and recreational activities such as hiking, camping, fishing, skiing, mountaineering, and sightseeing. The venues for many of these recreational activities are located outside of California's major urban areas and are supported by the general aviation airports located in these smaller communities. The following highlights some of the smaller airports that support tourism and leisure activities in the state.

- **Mariposa–Yosemite Airport** plays an important role for tourists visiting Yosemite National Park. The park received about 3.4 million tourists in 2001, making it the most visited national park in the state.
- **Jack Northrup Field/Hawthorne** supports a charter plane service that transports Japanese visitors from the Los Angeles area to the Grand Canyon.
- **Hemet Ryan Airport** will facilitate new tourist visitation resulting from the completion of the Diamond Valley Reservoir in 2003. Created by dams at the mouths of two valleys that drain off the north end of Black Mountain, the reservoir will become the largest lake in Southern California and will feature a marina and recreation area.
- **Twentynine Palms Airport** serves adventure tourists visiting for parachuting, skydiving, soaring, and to visit national parks.
- **Nevada County Airpark** receives many tourists visiting the small gold mining towns of Grass Valley and Nevada City.
- **Ukiah Municipal Airport** serves as a gateway for tourists visiting local wineries or the Redwoods.

DISASTER PREPAREDNESS AND EMERGENCY RESPONSE

California's airports are critical for providing emergency response services to natural disasters including fires and earthquakes. They also play an important role in disaster preparedness, including the government response to weapons of mass destruction.

- There are 13 California Department of Forestry (CDF) bases throughout the state, located at airports such as **Redding Municipal, Chico Municipal,** and **Hemet-Ryan Airports.** The bases are located such that fire fighting aircraft can initiate aerial fire suppression activities at any location within about 20 minutes. These airports play an important role in fighting wildland fires throughout the state.
- **Chester–Rogers Field** serves as an air tanker base for the United States Forest Service (USFS), which participates in fire fighting efforts in Northern California and Northwestern Nevada. Currently, the USFS is rebuilding the base to enhance its fire suppression capability, adding one 20-person Helishot crew.
- **Hanford Municipal Airport** is home to the National Weather Service (NWS) San Joaquin Valley/ Hanford forecast station. The station provides weather information for a seven-county area and has state-of-the-art equipment, including Doppler weather radar.
- **Nevada County Airport** supports critical fire fighting and law enforcement functions.
- **Porterville Municipal Airport** is home to CDF, the Forest Service, and Bureau of Land Management tankers for fighting wildland fires.
- During the fire season, the California Department of Forestry and U.S. Forest Service operate one of the busiest air attack bases in the nation at the **Ramona Airport** in San Diego County.

- **Rio Vista Municipal Airport** is used as a base for fire and search and rescue services.
- Residents in the mountain communities of San Bernardino County benefit greatly from the fire tanker base located at **San Bernardino International Airport.** In response to a major fire in 1998, 26 aircraft operated out of this airport.
- **Watsonville Municipal Airport** was extremely important during the 1989 Loma Prieta earthquake, as it received food and other emergency supplies for the communities affected by the earthquake.
- The National Disaster Medical System has been in place for 15 years, and allows airports to transport patients out of an area damaged by a natural disaster. During a wartime or major terrorist act, the same system allows hospitals to receive injured patients. Every hospital is required to have a designated airport, and several California public use airports are a part of this system.
- California's airports also play an important role in supporting the federal government's planning efforts for a response to bioterrorism. There is a national pharmaceutical stockpile, and if necessary, these medical supplies can be brought into specifically designated airports in order to provide treatment.

MEDICAL SERVICES

Many lives have been saved as a result of emergency and critical medical services provided through aviation, particularly in more remote communities. The following examples highlight the importance of California's smaller airports in providing medical services throughout the state:

- **Imperial County Airport** regularly services medical flights into and out of the area.
- **Palo Alto Airport** is the closest airport to the Stanford Hospital and receives a large number of medical and life flights.
- **Fresno–Chandler Downtown Airport** played a major role in the development of a regional medical center in Downtown Fresno.
- **San Bernardino International Airport** receives flights carrying donor organs for area hospitals.

- The air ambulance service operating out of the **Susanville Municipal Airport** provides needed emergency services for an isolated, rural area of Northern California. In a 2002 helicopter crash, the air ambulance's quick response helped to save lives.
- The local community was able to retain a world-class heart surgeon due to the **Tahoe–Truckee Airport.**

LAW ENFORCEMENT AND PUBLIC SAFETY

Local, state, and federal law enforcement agencies rely upon aviation to enforce laws and maintain public safety in California. The important roles played by local airports in law enforcement and public safety are highlighted through the following examples:

- **Imperial County Airport** services California Highway Patrol and Border Patrol planes, as well as other law enforcement agencies monitoring drug traffic in the border region.
- **San Luis Obispo Airport** is a refueling base for the Coast Guard and provides support to the National Guard for drug enforcement aviation activities.
- **Buchanan Field** is the base for County Sheriff helicopters and life flight helicopters. Also, the airport provides a venue for law-enforcement courses in conjunction with the Sheriff's Office and the local junior college, which includes simulator equipment on defensive driving and high-speed chases.
- **Montgomery Field** is base for the U.S. Drug Enforcement Agency (DEA) and the San Diego Police Air Wing.
- **Brown Field** serves the U.S. Customs and the Border Patrol. In addition, the airport serves the transport of prisoners to and from Donavan State Prison and a county Detention Center located nearby. The U.S. Navy helicopter training and parachute team operates out of this airport.
- **Chino Airport** is located near two state prisons and serves the transportation needs of the California Department of Corrections.
- The Riverside County Sheriff and National Guard have helicopters based at the **Riverside Municipal Airport** to conduct drug raids in the area.
- The **Sacramento Executive Airport** as well as many other smaller airports are used as bases for radio and television news traffic reporting helicopters and planes.
- The **Ukiah Municipal Airport** is a base for marijuana identification and eradication efforts by local and federal law enforcement agencies, including the Bureau of Land Management, National Guard, and Drug Enforcement Agency.

EDUCATION AND TRAINING

Many of California's smaller airports serve aviation-related training and education functions that are at the forefront of innovation in the use of technology. The students and visitors that come in for these training programs spend dollars in local hotels, restaurants, shops and service establishments. There are also several airports throughout the state that have aviation-related museums. A few examples are:

- The International Flight Training Academy is located at **Meadows Field** just north of Bakersfield. This academy trains commercial pilots from all over the world.

Each year, the National Association of State Aviation Officials, along with the Federal Aviation Administration, sponsor a national themed aviation art contest. The purpose of this contest is to stimulate students' interest in aviation, consider aviation careers and increase public awareness of the benefits of aviation and aerospace.

- **Napa County Airport** is not only a hub for the wine industry but training for Japan Airlines pilots also takes place there.
- An international-caliber helicopter training school is located at **Buchanan Field.**
- The world's only civilian experimental flight test and training center is located at **Mojave Airport.** Foreign and domestic test pilots are trained to fly advanced aircraft at this desert airport.
- Experimental aircraft testing takes place at **Bakersfield Municipal** and **Visalia Municipal Airports.**
- **Southern California Logistics Airport** supports flight testing of different types of aircraft.
- **Nut Tree Airport** is home to an aircraft mechanics training facility.
- San Diego Aerospace Museum's Annex, Alley Airways Flying Museum, and Commemorative Air Force Museum (CAF) are all located at **Gillespie Field.** These museums educate San Diego residents and visitors to San Diego about aviation.
- Located at **San Carlos Airport,** the Hiller Aviation Museum is the largest indoor aviation museum complex in California, with some 75 replicas and restored aircraft in its collection. The centerpiece of the 53,000-square-foot complex is a 201-foot-wingspan Boeing Black Condor, a completely robotic CIA spy plane that holds the record for the highest piston-driven flight at 67,300 feet.

AIRPORTS AS IMPORTANT CIVIC PARTNERS

Many California airports provide services that contribute to their local communities in ways beyond just transportation. They provide space for meetings and services of local non-profit and civic organizations, organize fundraising events that benefit local charities, and cooperate with local schools and youth groups to provide aviation educational events for youth. A few examples of the many ways that airports participate in local civic life are:

- **Monterey Peninsula Airport** supports travel to and from educational institutions like the California State University at Monterey Bay (CSUMB), the Hopkins Marine Laboratory (operated by Stanford University) and the world-renowned Monterey Institute of International Studies. The airport also supports local sporting events like automobile racing at Laguna Seca and golf tournaments.
- **Brackett Field** provides facilities for the Los Angeles County Fair and other local consumer shows including a major annual recreational vehicle (RV) show. It also serves as a venue for public meetings of the local homeowners' associations and fire fighting organizations. Other events like the antique airplane and antique car shows are held at Brackett Field once a month.
- **Livermore Municipal Airport** hosts educational group events for community organizations like the Lions Club and Rotary Club.
- **Montgomery Field** is located in proximity to the San Diego Zoo. It acts as a base for the zoo's aircraft, which is used to transport animals from around the world.
- An aviation academy connected to the local school district uses the **Reid Hillview Airport's** facilities to reach out to underprivileged students.
- **Flabob Airport** sponsors monthly "Young Eagles" meetings and has a youth aviation education program.
- **Madera Municipal Airport** hosts air shows, Boy Scout activities, school visits, and supports flying club introductory flights.
- A number of community events are held at the **Petaluma Municipal Airport** including air shows, antique fairs, and an annual "penny-a-pound" flights to which the entire community is invited. The airport also participated in the Wings of History tour and exhibited two World War II bombers.
- At **Redlands Municipal Airport,** volunteer groups offer free flight experience for children, and the airport also provides educational opportunities for adults.
- **Salinas Municipal Airport** annually hosts the California International Air Show, which has succeeded in raising over $5 million for local charities.

MANAGING AIRPORTS AS A SYSTEM

When airports in a region are managed and operated as a system, there is opportunity to integrate the use of airport facilities to meet the range of air transportation needs. The system of five airports managed by Sacramento County is a good example.

Sacramento County's airport system serves the state capital and a region extending as far north as Redding, south to Modesto, east into the Sierra Nevada foothills and west into Yolo, Solano and Napa Counties. It provides a wide range of custom air services to several of the state's rapidly growing communities along the I-80, I-5, Highways 50 and 99 corridors. The region abuts the heavily used San Francisco Bay Area's network of airports and offers Bay Area travelers and shippers an attractive alternative to the congested Bay Area airports. The county airport system supports business from high technology manufacturing to small companies. It serves the agriculture and biotech industries, hospitals, universities, law enforcement, traffic reporting, medical evacuation, fire fighting, law enforcement, the California National Guard, U.S. Coast Guard, aircraft maintenance, flight training and recreation.

Managing the airports as an integrated system allows the county to make efficient and effective use of all the facilities for air transportation providers and users in the following ways:

- **Sacramento International Airport** is a Medium Hub airport providing scheduled air carrier service with over four million enplanements in 2001. It serves air cargo and general aviation business and corporate activities and is used by 12 major air carriers, one commuter airline and two airfreight operators. It is the location of Cessna Aircraft's West Coast jet maintenance facilities.
- **Sacramento Mather Field** is the region's main air cargo airport. It is a designated "reliever" for Sacramento International and is home to an Army National Guard helicopter unit. It serves as the stage for Intel Corporation's air taxi service to its Folsom campus from satellite facilities in Arizona, Oregon and the San Francisco Bay Area, and is an attractive staging airport for transpacific service with the region's longest runway (11,300 feet) that accommodates a fully loaded wide body aircraft. The airport also has excellent intermodal connectivity with easy freeway access and proximity to transcontinental rail hubs.
- **Sacramento Executive Airport** primarily services general aviation. It is a designated "reliever" for Sacramento International Airport, and also serves business and corporate activities, air taxi, law enforcement, flight training and a wide range of aircraft services.
- **Franklin Field** is a small, community airport primarily serving agriculture. It is also used for flight training and recreation, including a parachute club.
- **McClellan Airfield** is the airfield portion of the former McClellan Air Force Base. As part of the County's airport system, it is owned, operated, and maintained by the County as a public use general aviation airport. The remaining portion of the base is owned and is being redeveloped by McClellan Park LLC, a limited partnership. The airport has a unique, non-competing role among the five County-owned airports and is home to several tenants including a fixed based operator with 24-hour service to tenants and visitors to the business park, the Federal Aviation Administration (FAA), California Department of Forestry, a U.S. Coast Guard C-130 air rescue unit, and a small air charter business. There are also several aviation business tenants and an air museum located at the airport.

REDEVELOPMENT OF FORMER MILITARY AIRFIELDS

The Department of Defense (DOD) closed 29 military installations in California during the four rounds of Base Closure and Realignment (BRAC) from 1992–2001. The economic impact of these closures on California's economy totaled $9.6 billion reduction in annual revenues, and the loss of almost 100,000 high paying jobs throughout the state. In many cases the closed military installations included a military airfield that was converted to civilian aviation uses.

By looking at former military air fields that are now public use airports, it can be seen how these new facilities are not only increasing the capacity of the state's airport system but are providing opportunities to improve the state's intermodal transportation system. Also, they are serving as catalysts for business and employment opportunities that stimulate economic revitalization and growth for their communities and the state.

- **Castle Airport** (formerly Castle Air Force Base) was closed in 1995 and is being developed by Merced County as an aircraft maintenance complex, including an aircraft maintenance-training and air cargo center. The County's reuse plan includes a business park to complement maintenance and cargo operations and provide financial support for the airport. Merced County has renovated the base by demolishing buildings and upgrading communications infrastructure to make it attractive to high technology, commercial and industrial companies. An economic strategy and marketing plan for the base is scheduled for completion in 2003. Current tenants include a communications company, several educational institutions, and the Castle Challenger Learning Center Foundation.
- At **March Air Reserve Base** in Riverside County, BRAC realigned the base's function and reduced its size rather than close the base. Ownership of the base was transferred to the Air Force Reserve. A portion of the base was given to Riverside County for redevelopment. The Air Force retained control of the airfield and developed a Joint Use Partnership with the March Joint Powers Authority (MJPA) to allow civilian use of the airport. Under the terms of the partnership, MJPA is the Airport Authority charged with running the civilian air operation. The airfield has a 13,300-foot runway that can accommodate large commercial aircraft. MJPA redevelopment plans include development of March Inland Port, a commercial civilian air cargo facility and business park.
- **Marina Municipal Airport** in Monterey County (formerly the Fort Ord Army Training Facility/ Fritzsche Field) was opened to public use by the City of Marina in 1995. Reuse plans call for the development of a business park, hotel and golf course in addition to general aviation facilities. The County has built new T-hangars and 70 small general aviation aircraft are based there.
- **McClellan Airfield** (formerly McClellan Air Force Base) was closed under the BRAC process in 2001. Sacramento County added the airfield to its airport system and sold the remaining base to a limited partnership to develop an airport-centered industrial/high technology business park. The owners, McClellan Park LLC, capitalized on the base's aviation facilities and location to attract aviation-related business and companies. The airport is managed as a 24-hour/day operation with its own fixed base operator. In addition to the airfield, the Park offers a wide range of other business and community services. The military has retained a small presence.
- **Moffett Federal Airfield** in Santa Clara County (formerly Moffett Naval Air Station) was transferred to NASA by BRAC in 1994. It is home to NASA's Ames Research Center. One of Ames' current research projects is a modeling assessment of the nation's current and future air traffic control system needs. The California Air National Guard maintains an air rescue unit on site and operates the air traffic control tower for the airfield.

- **Sacramento Mather Airport** (formerly Mather Air Force Base) was converted to a public use airport by Sacramento County beginning in 1995. Its runway is the longest in the Sacramento County airport system and can accommodate a fully loaded departing Boeing 747 aircraft. With relatively easy access to the nearby highway system it is an attractive alternative to congested Bay Area airports and the Central Valley. Current tenants include seven air cargo airlines, an air taxi service, freight-forwarding companies, a flight school, a National Guard helicopter unit and the FAA's Northern California Terminal Radar Approach Control (TRACON).
- **San Bernardino International Airport** (formerly Norton Air Force Base) is owned by the San Bernardino County Airport Authority and under renovation to attract new tenants. The airport received a $5 million grant from the FAA to modernize hangars. Current tenants include the U.S. Forest Service, a commercial retail warehouse facility, and a new intermodal rail/truck center for Burlington Northern Santa Fe Railway (BNSF). SCAG's Regional Transportation Plan (RTP) identifies the airport as an important addition to the regional airport system and projects it will absorb a portion of the future demand for increased air service in the Los Angeles region.
- **Southern California Logistics Airport** (formerly George Air Force Base) in San Bernardino County is being developed under a joint powers authority as an aircraft maintenance and storage facility and a multimodal transportation hub. The Southern California Association of Governments' (SCAG) Regional Transportation Plan (RTP) anticipates this airport will absorb a portion of the projected demand for air cargo in the Los Angeles region over the next 20 years. Current tenants include a commercial airliner repair and storage company, aircraft engine test and manufacturing facility, and several international shipping companies. Most tenants are expanding their operations and building facilities. The airport will be extending its primary runway to 15,000 feet to accommodate fully-loaded Boeing 747's, thereby expanding the airport's attractiveness to new tenants and users.

The Role of Aviation in Government Services

Many economic benefits are reaped from the presence of government agencies in California. Various governmental agencies use aircraft and aviation for a number of activities including fighting wildland fires, enforcing laws, and facilitating international trade. While most federal agencies were responsive to the inquires of this study, several declined to provide specifics as to the amount of funds spent in California, the number of personnel employed and the number of aircraft based in the state. The following State and Federal agencies rely on aviation to carry out their responsibilities:

CALIFORNIA STATE AND FEDERAL AGENCIES WITH AVIATION PROGRAMS — 2001

Agency	California Annual Budget	California Staff	Aircraft in California
California State Agencies			
Dept. of Fish and Game, Air Services	$ 886,750	8	7 Fixed wing aircraft
Dept. of Forestry and Fire Protection, Aviation Management Program	$ 15,000,000	148	36 Fixed wing aircraft, 9 helicopters
Dept. of Justice, Mission Support Branch–Aviation Operations	$ 1,900,000	10	9 Fixed wing aircraft, 4 helicopters
Dept. of Transportation, Division of Aeronautics	$ 2,800,000	30	2 Fixed wing aircraft
California Highway Patrol, Office of Air Operations	$ 4,100,000	153	14 Fixed wing aircraft, 9 helicopters
Federal Agencies			
U.S. FAA[1]	$ 296,472,000	4,000	
NASA Ames Research Center[1]	$ 120,400,000	1,400	
NASA Dryden Flight Research Center[1]	$ 43,800,000	600	
NASA Jet Propulsion Laboratory	$ 300,000,000	5,200	
U.S. Customs Inspectors[1]	$ 59,866,800	1,200	
U.S. Customs Air and Marine Interdiction Division[1]	$ 7,500,000	170	17 Fixed wing aircraft and helicopters
USDA Forest Service, Regional Air Group	$ 16,000,000	19	8 Fixed wing aircraft
U.S. Drug Enforcement Administration	$ 1,100,000	14	11 aircraft
U.S. INS Border Patrol[1]	$ 2,900,000	42	5 Fixed wing aircraft, 17 helicopters
U.S. Marshals JPATS	not available[2]	NA[2]	not available[2]
U.S. Postal Service	not available[2]	NA[2]	not available[2]
U.S. Coast Guard	not available[2]	NA[2]	not available[2]
U.S. Transportation Security Administration	not available[2]	NA[2]	not available[2]
Total	**$ 872,725,550**	**12,994**	

[1] Salaries only.
[2] Information not available due to security issues, data collection process, or format of data.
Source: Various agencies and ERA.

FEDERAL GOVERNMENT

Federal agencies in California use aircraft and aviation for a number of activities including fighting fires, enforcing laws, and facilitating international trade. One major economic benefit is the return of federal tax dollars to California because of the federal aviation presence. However, the benefits to Californians are much broader.

Federal Aviation Administration

The Federal Aviation Administration (FAA) is the leading U.S. government agency responsible for the safety of civilian aviation. The FAA's mission is to provide a secure and efficient aerospace system that contributes to national security and U.S. aerospace safety. The agency's principal operational and regulatory responsibilities include air traffic control, certification of aircraft and aviation personnel, certification of airports, and environmental standards for civil aviation. FAA sets standards for civilian aircraft airworthiness, conducts aircraft inspections, issues licenses, provides airway facilities and services, and regulates air traffic. In addition, the FAA investigates aircraft accidents and promotes the development of a national system of airports called the National Plan of Integrated Airport Systems (NPIAS).

National Aeronautics and Space Administration (NASA)

The National Aeronautics and Space Administration (NASA) is a civilian federal agency that conducts research and develops operational programs in space exploration, satellites, and advanced aeronautics. NASA's mission is to understand and protect our planet, explore the universe and search for life, and inspire the next generation of explorers. California ranks first by state for total NASA dollars spent and normally receives about 20 percent of NASA's procurement funds. NASA affiliated facilities in California include Ames Research Center (Moffett Field), Dryden Flight Research Center (Edwards Air Force Base), and the Jet Propulsion Laboratory (Pasadena).

Transportation Security Administration (TSA)

The Transportation Security Administration (TSA), originally established under the Department of Transportation, is now the responsibility of the Department of Homeland Security (DHS). It is responsible for airport passenger screening at every U.S. airport with commercial service. TSA is improving aviation security by accelerating deployment of airport security equipment, facilitating passenger and baggage inspection, and hiring and deploying Federal Air Marshals.

U.S. Customs Service (USCS)

The United States Customs Services (USCS) is the primary enforcement agency responsible for monitoring U.S. border crossings. The USCS enforces import and export compliance with U.S. laws and regulations, collects revenue, and guards against smuggling.

Customs Inspectors perform a variety of functions at airport, seaport and border crossing Ports of Entry. They inspect or search ships, aircraft, baggage, persons, vehicles, and vessels for contraband to prevent illegal drugs and merchandise from being smuggled into or out of the U.S.

The USCS has an extensive land, marine, and air interdiction force called the Air and Marine Interdiction Division (AMID) to combat drug smuggling via aircraft. AMID's mission is to protect the U.S. borders and people from the smuggling of narcotics and other contraband with an integrated and coordinated air and marine interdiction force. AMID often supports other federal agencies. AMID efforts help in the seizure of thousands of pounds of drugs, millions of dollars of currency, and hundreds of vehicles, vessels, aircraft, and weapons.

The USCS uses an assortment of aircraft in AMID to conduct surveillance, primarily to detect and interdict suspected smugglers over water and all kinds of terrain. Other duties include supporting the rest of Customs for air or marine surveillance and special tasks associated with homeland security. California has a substantial part of the AMID program. An Air and Marine Coordination Center (AMICC) in Riverside, California provides command, control, communication and intelligence for the AMID interdiction assets.

U.S. Forest Service

The U.S. Forest Service (USFS) manages public lands in national forests and grasslands for multiple uses including sustained yield of renewable resources such as water, wildlife, and recreation. The USFS uses aircraft in numerous ways. Its aviation missions include operational personnel transport, research, forest rehabilitation, law enforcement support, aerial photography, and fire prevention and suppression. Forest Service Aviation Management (part of the Fire and Aviation Management program) operates the USFS aircraft fleet. Forest Service Aviation Management's primary mission is to support the ground fire fighters through aerial delivery of fire retardant and water, aerial reconnaissance, fire intelligence gathering and surveillance, firefighter and cargo transport, and delivery of smokejumpers.

The benefits of aerial fire fighting are numerous and varied. Aircraft can fly missions for reconnaissance, scouting, or fire mapping. For example, aircraft can respond to a fire call and relay information of a fire's location, size, and nature back to a ground crew. Today, aircraft in conjunction with the Internet can provide current, accurate assessments to firefighters regardless of their location so fire fighters can establish priorities, allocate resources, and develop strategies for handling the fire incident more quickly and effectively. Aircraft can apply a variety of retardants including chemical, water, and foam to slow the early spread of fire and allow more time for ground crews to reach the fire. The planes can also drench hot spots to enable fire fighters to get closer to the fire, apply retardant to the path or the head of a fire without endangering fire fighters, or drop solution as a backfire barrier. Aircraft also enhance the capability of the ground crew by enabling two to twenty smokejumpers with equipment and supplies to parachute into strategic areas of the fire.

Although aerial fire fighting is an important complement to ground crews, it also has unique features. With an aerial perspective, planes can notice and extinguish spot fires. They provide the fastest response to fires and if fires escape their initial boundaries, they are an effective support for large-scale containment. Planes can sometimes be more cost effective, flexible and faster than organizing a call-when-needed hand crew to staff fire lines. In remote terrain, aircraft are invaluable. Helicopters can carry hundreds of gallons of water to hard to reach locations such as steep hillsides or narrow valleys. The terrain might be unsuitable for heavy land-based equipment or might be inhospitable because of the elevation. One of the most important services helicopters provide is the capability to remove injured firefighters from the front lines and deliver them to medical facilities.

California has a Regional Air Group that is part of the USDA Forest Service Aviation Management program. In California, the USDA Regional Air Group helps administer national USDA contracts for fire suppression through their large fixed-wing, light aircraft, smokejumper, and helicopter programs. The air group helps to inspect equipment and pilots to make sure they meet contract specifications. To provide this contract oversight, the air group inspects aircraft for airworthiness, maintenance, and proper equipment and certifies pilots. The air group will also train and certify the support staff that help to manage the aircraft during field operations. In addition, the air group using a lead plane will also help coordinate aircraft fire drops or other missions to provide an element of safety during fire operations.

U.S. Drug Enforcement Administration

The United States Drug Enforcement Agency (DEA) is the leading agency for enforcing domestic federal drug laws and has the sole responsibility for coordinating and pursuing U.S. drug investigations abroad. It works in close cooperation with federal, state, local, and international law enforcement agencies to address threats from drugs, crime and violence.

The mission of the DEA is to enforce the controlled substances laws and regulations of the United States and to bring to the criminal justice system those organizations and members of organizations involved in the growing, manufacturing, or distribution of controlled substances in the U.S. The Office of Aviation Operations (OA) provides aviation support to domestic offices throughout the U.S. and several major programs like the Southwest Border Initiative and the National Marijuana Eradication Strategy. The air operations are largely electronic and photographic reconnaissance. The OA also has offices and aircraft in a number of countries in Central and South America for drug enforcement and logistical missions.

U.S. Border Patrol

The United States Border Patrol is the uniformed law enforcement arm of the Immigration and Naturalization Service (INS). The INS is the largest uniformed law enforcement organization in the nation. Its basic mission is to detect and prevent the unlawful entry of aliens into the U.S. and to apprehend those persons found in the U.S. in violation of immigration laws. The Border Patrol is responsible for securing 8,000 miles of international boundaries with particular focus on the area between Ports of Entry. The patrol uses a variety of vehicles including aircraft.

The Border Patrol's Air Unit is essential to fulfilling its mission. With both fixed-wing and rotary wing aircraft, thousands of miles of terrain are covered, much of it in isolated areas. This task would be nearly impossible with land-based vehicles alone. The aircraft are owned and operated by the Border Patrol with a central hub in El Paso, Texas and are housed at leased air hangars at public airports. In California, there are two Border Patrol air sectors located in San Diego and El Centro.

U.S. Coast Guard

In times of peace, the U.S. Coast Guard operates as part of the Department of Homeland Security and in wartime, serves under the Navy Department. The Coast Guard is the nation's front-line agency for enforcing laws at sea, protecting our coastline and ports, and saving lives. Air Stations in California are located in Humboldt Bay, Los Angeles, Sacramento, San Diego, and San Francisco.

U.S. Marshal Service

The U.S. Marshal Service (USMS) is an agency of the Department of Justice (DOJ). The mission of the USMS is to protect the Federal courts and ensure the effective operation of the judicial system. While the underlying mission of the USMS is to enforce the law and execute court orders, one of its primary responsibilities is: housing and transporting prisoners from the time they are brought into Federal custody until they are either acquitted or delivered to their designated Federal prison.

The USMS uses aircraft and aviation facilities to transport prisoners. The Justice Prisoner and Alien Transportation System (JPATS) is responsible for transporting via air all pretrial and sentenced federal prisoners and detainees including illegal aliens whether in the custody of the USMS, Bureau of Prisons (BOP), or the Immigration and Naturalization Service (INS). The program also provides prisoner transportation services for the Department of Defense (DOD), Department of State, as well as an increasing number of state and local law enforcement agencies on a reimbursable, space-available basis.

JPATS performs like a commercial airline system with booking, reservation, and operations. It is the only government operated, regularly scheduled passenger airline in the nation. On average, JPATS moves more than 250,000 prisoners and aliens a year through a coordinated network of aircraft, cars, vans, and buses.

In California, JPATS uses Travis Air Force Base, Southern California Logistics Airport, and occasionally San Diego International. Other airports are used on an as-needed basis. The aircraft used in California include Boeing 727s, MD-82s, DC-9 and smaller Sabreliner and Hawker jet aircraft.

U.S. Postal Service (USPS)

The United States Postal Service (USPS) is an independent establishment of the executive branch of the U.S. government that is responsible for providing postal services to "bind the Nation together through personal, educational, literary and business correspondence." The USPS is an integral part of the U.S. economy, delivering hundreds of millions of letters and packages and billions of dollars in financial transactions to 134 million addresses. Nationwide there are approximately 800,000 employees in the Postal Service who help to deliver almost half of the entire world's mail.

The USPS could not fulfill its mission without aircraft. The Postal Service spent $4.7 billion in 2000 for the contractual transportation of mail. Air transportation costs totaled $1.7 billion, representing about 36 percent of the total transportation costs. These costs include the use of commercial airlines as well as a dedicated network of aircraft and taxi service.

The Postal Service is one of the largest users of the commercial airline system and is therefore a heavy user of major California hub airports like Los Angeles, San Francisco, and Oakland. To move almost three billion pounds of domestic mail the Postal Service contracts with 56 commercial airlines and utilizes approximately 15,000 of the 56,000 daily commercial flights available. In addition to utilizing the major hub airports' commercial airline systems, the Postal Service has an intermodal Hub and Spoke Program (HASP) utilizing nine smaller hub airport facilities with 19 aircraft.

STATE GOVERNMENT

California State departments and agencies utilize aircraft and aviation facilities for a diverse group of responsibilities and needs from fire fighting to law enforcement to tracking wildlife.

California Department of Fish and Game

The California Department of Fish and Game (DFG) manages California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The DFG responsibilities range from habitat restoration to law enforcement to public education.

Air Services, the aviation unit of the DFG, is part of the Conservation Education and Law Enforcement Branch within the DFG. Air Services is based at Sacramento Executive Airport but the pilots and aircraft may be assigned to Hemet, Fresno, and Redding as well as Sacramento. The pilots and airplanes in the unit provide a number of services to the department including counting wildlife, tracking radio-collared wildlife, patrolling land and coastal areas, aerial photography, and aerial planting of fish in high mountain lakes. Air Services also provides air service for other agencies such as the Department of Water Resources, Department of Toxic Substances Control, and Fish and Game Commission on an as needed basis for tasks ranging from bio-radio telemetry (for tracking fish like sturgeon, striped bass, and salmon) to personnel transport.

California Department of Forestry and Fire Protection

The mission of the California Department of Forestry and Fire Protection (CDF) is to "protect the people of California from fires, respond to emergencies, and protect and enhance forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens." The department protects over 31 million acres of California's privately owned wildlands and provides a diverse range of emergency services to 35 of California's 58 counties through local government contracts.

Each year CDF fire fighters, fire engines and aircraft respond to an average of 6,700 wildland fires and 273,000 non-wildfire emergencies. The non-wildfire emergencies include: residential or commercial structure fires, automobile accidents, heart attacks, drownings, lost hikers, hazardous material spills, train wrecks, floods, and earthquakes. The CDF uses both ground and air resources to respond to fire and other emergencies. Without an aviation component, the CDF's ability to fulfill its mission would be severely diminished.

The CDF Aviation Management Program supports its ground assets with airtankers, helicopters and air attack aircraft. The program's air assets currently include Grumman S-2A 800 gallon airtankers, Grumman S-2T 1,200 gallon airtankers, UH-1H Super Huey helicopters and OV-10A for air attack coordination and control. There are CDF air bases located statewide so that aircraft can reach any fire within the state in 20 minutes or less.

In addition to fire retardant and water drops, helicopters can also transport fire fighters, equipment and injured personnel. During the California fire season the airtankers, helicopters, and air attack coordination aircraft are stationed at CDF bases located statewide. After each fire season, the aircraft and air attack planes are based in McClellan Airfield in Sacramento for the winter where maintenance is conducted. CDF helicopters remain at CDF helitack bases located statewide and are available for service year-round.

California Department of Justice

The Attorney General is responsible for ensuring that the laws of the state are uniformly and adequately enforced and carries out its responsibilities through the California Department of Justice. The Department's main offices are in Sacramento, Los Angeles, San Francisco, San Diego, Oakland and Fresno.

The Division of Law Enforcement, within the Department of Justice, is responsible for maintaining crime suppression programs and supporting other state and local law enforcement agencies through forensic sciences, narcotics investigation, intelligence, and training. Within the Division of Law Enforcement, the Mission Support Branch includes the Aviation Unit as part of its mission to enhance public safety.

The Mission Support Branch, Aviation Operations helps the Department of Justice fulfill its mission primarily through surveillance and transportation of dignitaries.

California Department of Transportation, Division of Aeronautics

The California Department of Transportation, Division of Aeronautics' (Caltrans Aeronautics) mission is to assist in developing and preserving "a safe and environmentally compatible air transportation system that meets the economic needs of the state." This division is part of the planning and maintenance infrastructure integral for the safe and efficient development and operation of air transportation in California. In its guiding vision, Caltrans Aeronautics seeks to help develop an air transportation system that will meet the majority of the needs of the aviation community and the general public in a safe, efficient, economically beneficial and environmentally compatible manner. The division's major responsibilities include:

- Inspecting (and issuing permits for) airports and hospital heliports for compliance with safety standards;
- Furnishing technical assistance to airports in design, maintenance, and administration;
- Providing State grants and loans to various entities (cities, counties, districts and airport land use commissions) for safety, maintenance, capital improvement projects and comprehensive land use plans at airports;
- Administering the State's noise regulation and land use planning laws that foster compatible land use and encourage environmental and noise mitigation measures;
- Supplying technical assistance to airport land use commissions to minimize the environmental impact of off-airport land use and development around airports;
- Providing for the integration of aviation into transportation planning on a regional, statewide, and national basis, including developing a California Aviation System Plan.

California Highway Patrol

The California Highway Patrol's (CHP) mission is to ensure safety, provide service to the public as they utilize the highway transportation system and to assist local government during emergencies when requested. The officers of the CHP patrol state highways, county roads, and streets within the CHP jurisdiction. The CHP law enforcement duties include enforcing provisions of the California Vehicle Code, drug interception, vehicle theft investigation and prevention, vehicle inspections, accident investigations, public awareness campaigns, and protective services for state officials, employees and facilities.

The CHP is a department in the state government within the Business, Transportation and Housing Agency. It is the largest traffic law enforcement organization in the nation. The CHP's field operations consist of Field Area offices, commercial vehicle inspection facilities and communications centers.

An Assistant Commissioner directs the Office of Air Operations, which manages the CHP aircraft program. The CHP uses the aircraft for speed enforcement, search and rescue operations, emergency medical evacuations and allied agency support.

LOCAL GOVERNMENT

Local government agencies are generally responsible for their own airport operations and planning and use airports for local law enforcement. Specific examples of how local government agencies utilize airports to carry out their missions are included as part of the preceding section, Impact on California Life and Communities.

California's Space Industry

California is a global leader in space research, technology, manufacturing, services and transportation. A number of factors helped to bring California to the leading edge of commercial space including its educational and research infrastructure, its deep supplier base and a long history of aviation industrial development. The golden state currently hosts more aerospace manufacturers than any other state, has three of the six international satellite manufacturers, has two of the five federal spaceports and is one of four states to have a commercial spaceport.

The space industry in the U.S. evolved from a solely government program to one where the government shares space transportation and services with the commercial sector. Instead of funding entire projects, the government now purchases committed transponders on commercial satellites for military use or takes advantage of dual use opportunities by providing some funding to build dual use rockets and satellites. While some satellite's constellations are U.S. government only (such as weather forecasting satellites and "black" spy satellites), many of the satellites are privately owned. Consumer and business demand for commercial satellite services is now outpacing government and scientific applications.

The commercial space industry now includes the commercial launch businesses as well as businesses enabled by commercial space transportation. The manufacture of commercial launch vehicles is a small part of the overall economic activity resulting from space transportation. The launch vehicles have promoted the development of satellite manufacturing and satellite communications services. These enabled services already constitute more than 90 percent of the total economic benefit associated with commercial space transportation, and are expected to grow much faster than the launch vehicle business. The industries associated with commercial space include:

1. Launch vehicle manufacture;
2. Satellite and ground equipment manufacturing;
3. Satellite services; and
4. Remote sensing.

A 1999 study by the Associate Administrator for Commercial Space Transportation, Federal Aviation Administration and the U.S. Department of Transportation estimated that the economic impact of commercial space transportation on the U.S. economy totaled over $61 billion and nearly 500,000 jobs. About 92 percent of the economic activity was in satellite and ground station manufacturing and services, six percent was related to launch vehicle manufacturing, and the remaining two percent attributed to distribution industries and remote sensing. The commercial space industry is an enormous one that has a cascading effect on a number of other industries and California benefits from its commercial space industry concentration.

In addition to the direct, indirect and induced economic benefits, the California economy also benefits from the "clustering" high technology research that is related to commercial space. For example, without the satellite industry, some of the high technology, research and development, entrepreneur investment, and new ideas that are an outgrowth of the industry would also not exist in California.

LAUNCH FACILITIES

One of the most critical and dramatic aspects of the commercial space industry is the launching of satellites and other payloads. Spaceports are the infrastructure backbone of the commercial space industry. They house launch pads and runways as well as provide the equipment and fuel needed to prepare launch vehicles and their payloads prior to launch. California has the highest concentration of launch facilities and enjoys unique and unparalleled access to space. Vandenberg Air Force Base and Edwards Air Force Base in California are two of the five federal spaceports and the California Spaceport, located at Vandenberg Air Force Base, is one of four commercial spaceports in the U.S.

Edwards Air Force Base

Edwards Air Force Base (EAFB) is located in the sparsely populated Western Mojave Desert in the Antelope Valley of California.

The Air Force Flight Test Center (AFFTC), the premier location for aerospace research, development, test, and evaluation (RDT&E) of and support for aerospace vehicles, is located at EAFB. This mission includes modeling and simulation, ground and flight testing, launch/flight evaluation, development testing of aerodynamic decelerators and the operation of the United States Air Force Test Pilot School. The AFFTC has the largest and most diverse fleet of general and specific test aircraft and is the Air Force's center of expertise for modifications of test aircraft.

EAFB is co-located with NASA's premier aeronautical flight research center, Dryden Flight Research Center, and the Air Force Research Laboratory's Propulsion Directorate, which oversees rocket engine test stands. The Air Force Research Laboratory (AFRL) is a world leader in space and missile rocket propulsion technology and has helped develop nearly every modern rocket propulsion system used by the U.S. The rocket technologies developed at AFRL are the basis for space shuttle solid boosters and main engines used by the U.S. commercial launch fleet.

Edwards AFB supports a region of the state that has not otherwise benefited from California's robust economy with 7,500 civilian jobs including hundreds of high technology research positions. Approximately fourteen aerospace contractors work at Edwards AFB, including Boeing, Lockheed Martin, and Northrop/Grumman.

One of the most important economic functions that Edwards AFB provides is its substantial RDT&E capability. The Air Force alone at Edwards AFB has nearly 600 scientists and engineers who provide experience and expertise that contributes enormously to the scientific foundation for aviation and space developments. The AFFTC at Edwards has a Technology Management Office that oversees cooperative agreements with educational facilities, private organizations and citizens to share resources.

Air Force Plant 42, a government-owned, contractor-operated facility, is located at Palmdale near Edwards AFB. It has eight separate production facilities on 5,800 acres and two 12,000-foot runways. Plant 42 supports the newest and most advanced commercial and military aerospace systems with the assistance of the high-speed flight test corridors at Edwards AFB. Many of the world-class aerospace firms operate at Plant 42 including Boeing, Northrop/Grumman, SR Technics/Swiss Air and British Aerospace/Marconi/Tracor. The facility is also home to Lockheed Martin advanced research and development (formerly "Skunkworks"). Boeing and Lockheed Martin both built and tested different versions of the Joint Strike Fighter, the world's most advanced fighter aircraft, at Plant 42. Approximately 8,500 employees work at Plant 42, representing about $500 million in payroll to the region.

Vandenberg Air Force Base

Vandenberg Air Force Base (VAFB) is a 155 square mile installation in Santa Barbara County on the Central Coast of California. Due to its unique geography it is the only location in the continental U.S. capable of launching polar orbit spacecraft without overflight of any landmass. It is the U.S.'s premier polar launch site and has five launch complexes supporting both government and commercial launches. VAFB provides infrastructure and program support for ballistic and suborbital military and science launches. Its infrastructure includes a 15,000-foot runway, control centers and facilities for launch, payload processing, tracking radar, optical tracking and telemetry. The base houses 53 government organizations and 49 contractor companies spread over 1,100 buildings.

VAFB partnered with Boeing to develop launch infrastructure for Evolved Expendable Launch Vehicles (EELV), a state-of-the-art family (small, medium and heavy-lift) of expendable launchers. The goal of the EELV program was to develop a national launch capability that would satisfy dual use payload (government and commercial) requirements and reduce the cost of space access by at least 25 percent. It is one of only two national sites for EELV launches.

The Air Force base is also home to the California Spaceport, a commercial launch site and services company. It was the first FAA/AST (Federal Aviation Administration/Associate Administrator for Commercial Space Transportation) licensed commercial launch site. The Spaceport has provided payload processing services for NASA's Lewis satellite and has contracts to provide payload processing for two Earth Observation System satellites.

The California Spaceport's Commercial Launch Facility (CLF) consists of a pad deck, support equipment building, launch equipment vault, launch duct and stand, communications equipment and launch control room. It is able to accommodate a wide variety of launch vehicles and has launched two Minotaur vehicles to date.

Commercial applications at VAFB started in 1987 and have become a major economic generator for the Central Coast of California, especially the Lompoc and Santa Maria areas. There are 22 private firms operating at VAFB including world-class aeronautics firms like The Boeing Company and Lockheed Martin. Over 6,500 civilian employees work at VAFB.

Sea Launch

Sea Launch is the world's only ocean-based launch services company providing a direct route to geo-synchronous transfer orbit for commercial satellite companies. It is an international company with U.S., Russian, Ukrainian, and Norwegian partners. This corporation has its Headquarters and Home Port facilities in Long Beach, California, where it has 150 full-time employees. In preparation for an actual launch, the number of employees swells to approximately four to five hundred.

After receipt of a customer satellite, Sea Launch fuels and encapsulates the satellite in a state-of-the-art Payload Processing Facility then transfers the integrated payload unit into the Assembly and Command Ship for integration with the launch vehicle. A horizontally integrated rocket is transferred to and stored in an environmentally controlled hangar on the Launch Platform, a semi-submersible ocean-going platform.

Sea Launch has heavy lift capability for commercial satellite customers. Its equatorial sea launch capability offers the most direct route to geostationary orbit providing maximum lift capacity for payloads. Its inaugural launch was in March 1999. Since then it has launched a number of payloads including a satellite for DIRECTV and twin communications satellites "Rock" and "Roll" for XM Satellite Radio.

SATELLITE MANUFACTURING AND SERVICES

Satellite-related manufacturing and services compose the majority of the commercial space industry economic activities. The satellites manufactured in California contribute to weather prediction, global communications, direct-to-home entertainment, environmental management, navigation, high-speed Internet, scientific exploration, and national security and have applications that benefit key industries such as entertainment, information technology and agriculture.

The commercial space industry in California has some of the largest and most recognized players in the business including The Boeing Company as well as many smaller, entrepreneurial firms such as DIRECTV. California is home to three of the major satellite producers including Boeing Satellite Systems located in El Segundo, Lockheed Martin Commercial Space Systems in Sunnyvale, and Space Systems Loral of Palo Alto. All of these firms have more than 40 years of experience in spacecraft and satellites with civil, military and commercial applications.

The Boeing Company

Boeing Space and Communications, headquartered in Seal Beach, is the largest space-related entity in the world and has 50 years of experience in space-related high technology achievements. The $10 billion enterprise has more than 38,000 employees, of which 36,600 are in California. Boeing Space and Communications reportedly has 25,600 employees working primarily in Los Angeles and Orange County. Another 5,300 are employed by Boeing's launch services which serves both commercial and government customers.

Boeing is a global market leader in commercial and military satellites, missile defense, space exploration, propulsion, and a leading provider of launch services. It is one of four partners in Sea Launch, the world's only ocean-based launch services company. This firm supports the U.S. government in a number of programs including the Air Force's Expendable Launch Vehicle program. It is also NASA's largest contractor and is involved with the program for Space Shuttle rocket engines and in the International Space Station, the largest and most complex international scientific project in history.

DIRECTV

DIRECTV based in El Segundo, is part of the Hughes Electronics Corporation, a subsidiary of General Motors Corporation. DIRECTV is a direct-to-home broadcasting company that provides digital multi-channel entertainment services. DIRECTV is currently the nation's leading digital satellite television provider with approximately eleven million subscribers. DIRECTV employs approximately 1,200 people in its El Segundo office.

Lockheed Martin

Lockheed Martin's Missiles and Space Operations designs, engineers and manufactures civil, commercial, and military space systems. Their products include spacecraft, launch vehicles, human space systems as well as the supporting ground systems. This unit of Lockheed Martin has 8,000 employees in California and 6,900 in the San Francisco Bay Area. Lockheed Martin's Missile and Space Operations works in conjunction with Lockheed Martin's Space Systems to market, design, and build telecommunications and remote sensing satellites. The final assembly, integration and testing takes place in Sunnyvale's state-of-the-art Commercial Satellite Center.

Approximately 1,500 Lockheed Martin employees provide launch support for space systems at Vandenberg AFB. These employees are responsible for pre-launch, handling, assembling, and fueling activities once launch vehicles arrive in California via aircraft from Colorado. Total Lockheed Martin employment in California is approximately 19,000.

Space Systems/Loral (SS/L)

Space Systems/Loral is a subsidiary of Loral Space and Communications headquartered in Palo Alto. As a full-service producer of commercial communications and weather satellites, SS/L designs, builds, and tests satellites. It also procures insurance and launch services and manages mission operations from its Mission Control Center in Palo Alto. SS/L employs approximately 3,100 people and posts annual sales of approximately $1 billion.

SPACE AS AN INTEGRAL PART OF EVERYDAY CALIFORNIA LIFE[1]

Commercial space transportation and related enabled industries produce a wide range of value-added benefits in addition to the immediately quantifiable positive economic impacts on the California economy. The following hypothetical chronology of daily activities illustrate some of the many and varied benefits that commercial space and enabled industries provide to the average Californian.

7:00 a.m. After waking up, you turn on your TV and watch the local news. You are one of the millions of Californians who watch the local news to receive the latest weather information. Nearly all the local TV stations in California use the weather forecasting data provided by U.S. government satellites.

8:00 a.m. While you drive to work, traffic reporter on the radio informs drivers of the congested highways and offers alternatives. Since urban planners use satellite imagery to plan construction of the office park and transportation corridors, your commute to the office is probably several minutes shorter than it would be without the use of satellite maps.

8:30 a.m. At work, you log on to your computer, and begin sending emails to clients across the country. Your firm could be one of a growing number of businesses in California who are connected to the Internet by satellite. A growing number of Internet Service Providers are using satellites as part of their Internet backbone.

10:00 a.m. You drive to a meeting across town and stop at a gas station. You use a credit card to pay for the gas at the pump. Satellite technology approves your credit card at the point of sale. Very Small Aperture Terminals (VSATs) are used in about half of all gas stations for instantaneous point of sale transactions.

12:00 p.m. At lunch you receive three pages on your beeper from clients in Texas, Florida and Massachusetts. You are one of the millions of Californians who rely on satellites for national pager coverage.

1:00 p.m. After lunch you return to the office and make some international phone calls that are routed through an international satellite network. Every time you make an international phone call, call an associate on an airplane, or contact a client in a remote location overseas, you are using satellite telephony services.

3:00 p.m. During the afternoon you receive faxes from international and domestic clients, track a package, and engage in a videoconference, all via satellite.

5:00 p.m. As you drive home you listen to the car radio. Satellites are now part of the traditional national radio broadcasting systems that transmit programs to local stations. You could be one of the early adopters of the new direct satellite radio service that offers up to 100 digitally encoded radio channels without static interruptions or loss of reception.

6:00 p.m. On your way home you stop to rent a movie, pick up your prescription at the local pharmacy, and go to the grocery store. Some of the retail chains you patronize use VSAT networks to transmit credit, debit and check authorization information. VSAT networks also help to keep retail costs down by providing point of sale inventory tracking.

8:00 p.m. After dinner, you relax and watch TV. Your direct-to-home (DTH) television system offers video content directly into your home using a dish antenna. Satellite equipment help to gather news used in local and national news shows, especially for live transmission of breaking news. Sporting and other events like elections rely on satellites for immediate transmission.

[1] Adapted from Appendix B: Space is an Integral Part of Daily Living in The Economic Impact of Commercial Space Transportation on the U.S. Economy published by the Associate Administrator for Commercial Space Transportation, the Federal Aviation Administration, and the U.S. Department of Transportation, February 2001. The chronology is adapted for California based on a national chronology provided in the Appendix.

Background Information

DIVISION OF AERONAUTICS

The State's aviation commitment began in 1947 with the California Aeronautics Commission, which in the early 1970s became the Division of Aeronautics within the Department of Transportation. The State Aeronautics Act, Public Utilities Code (PUC) section 21001 et seq., is the foundation for the Department's aeronautics policies. The Division issues permits for and regularly performs safety inspections, primarily of hospital heliports and public-use airports; makes recommendations regarding proposed school sites within two miles of an airport runway; and authorizes helicopter landing sites at/near schools. Aviation system planning provides for the integration of aviation into transportation system planning on a regional, statewide, and national basis. The Division of Aeronautics administers the State's noise regulations and land use planning laws that foster compatible land use around airports and encourage environmental mitigation measures to promote safety, lessen noise, air pollution, and other impacts resulting from aviation activity. The Division of Aeronautics also provides grants and loans for safety, maintenance and capital improvement projects at publicly-owned airports.

THE CONSULTANT TEAM

Economics Research Associates (ERA) was founded in 1958 and since then has developed into the largest land economics and real estate consulting firm in the United States. The firm has performed nearly 15,000 consulting assignments, divided evenly between government agencies and private interests. Over the past 30 years, ERA has evolved into an organization that provides high-level economic consulting services to all levels of government. Topic areas that ERA has consulted on include community revitalization and urban development planning, economic and fiscal impact studies, adaptive reuse of historic structures, transportation, joint public-private development, public and cultural facilities and financing and implementation plans. ERA has conducted economic impact studies for a wide variety of institutions and uses including high-speed rail in California and Taiwan, universities, airports, cultural facilities, and a number of local government public policies.

JD Franz and Associates is a full-service public opinion and marketing research firm. For over nineteen years, they have provided clients with a variety of quantitative and qualitative services including research design, implementation, data tabulation, and analysis. All of their services are conducted in-house. Their facilities include a centralized telephone center with fifteen fully monitored and CATI-equipped interviewing stations and an in-house computer network. ERA designed the airport manager survey and worked with JD Franz to implement it.

Finger Design Associates is a Bay Area full-service graphic design firm that has been providing creative services to a wide variety of businesses for over 20 years. The firm's extensive design expertise includes annual reports, brochures, corporate identity, newsletters, signage, advertising, posters and Web site design for both the public and private sectors. Each project is managed from the initial concept to the delivery of the finished product.


Caltrans
Caltrans

APPENDIX B

California's System of Public Use Airports

CALIFORNIA'S SYSTEM OF PUBLIC USE AIRPORTS

Air Carrier Airports

General Aviation

AIRPORTS WITH SCHEDULED AIR CARRIER PASSENGER SERVICE

Airport	Associated City	County
Commercial Service Airports		
Merced Municipal Airport, MacReady Field	Merced	Merced
Primary Commercial Service Airports		
LARGE HUBS		
Los Angeles International	Los Angeles	Los Angeles
San Diego International	San Diego	San Diego
San Francisco International	San Francisco	San Mateo
MEDIUM HUBS		
Burbank–Glendale–Pasadena	Burbank	Los Angeles
John Wayne Airport, Orange Co.	Santa Ana	Orange
Ontario International	Ontario	San Bernardino
Metropolitan Oakland International	Oakland	Alameda

Sacramento International	Sacramento	Sacramento
Norman Y. Mineta–San Jose International	San Jose	Santa Clara

SMALL HUBS

Fresno Yosemite International	Fresno	Fresno
Long Beach Municipal Airport (Daugherty)	Long Beach	Los Angeles
Palm Springs International	Palm Springs	Riverside
Santa Barbara International	Santa Barbara	Santa Barbara

NONHUBS

Arcata	Arcata/Eureka	Humboldt
Chico Municipal	Chico	Butte
Imperial County	Imperial	Imperial
Inyokern	Inyokern	Kern
Jack McNamara Field	Crescent City	Del Norte
McClellan–Palomar	Carlsbad	San Diego
Meadows Field	Bakersfield	Kern
Modesto City–County	Modesto	Stanislaus
Monterey Peninsula	Monterey	Monterey
Oxnard	Oxnard	Ventura
Redding Municipal	Redding	Shasta
San Luis Obispo	San Luis Obispo	San Luis Obispo
Santa Maria Public	Santa Maria	Santa Barbara
Stockton Metropolitan	Stockton	San Joaquin
Visalia Municipal	Visalia	Tulare

GENERAL AVIATION AIRPORTS

Airport	Associated City	County	NPIAS[1] Classification
Metropolitan General Aviation Airports			
Brackett Field	La Verne	Los Angeles	Reliever
Buchanan Field	Concord	Contra Costa	Reliever
Camarillo	Camarillo	Ventura	Reliever
Charles M. Schulz–Sonoma County	Santa Rosa	Sonoma	Reliever
Compton/Woodley	Compton	Los Angeles	Reliever
El Monte	El Monte	Los Angeles	Reliever
Hayward Executive	Hayward	Alameda	Reliever
Jack Northrop Field/Hawthorne	Hawthorne	Los Angeles	Reliever
Livermore Municipal	Livermore	Alameda	Reliever
McClellan Airfield	Sacramento	Sacramento	Non-NPIAS
Montgomery Field	San Diego	San Diego	Reliever
Palo Alto	Palo Alto	Santa Clara	Reliever
Reid Hillview	San Jose	Santa Clara	Reliever
Sacramento Executive	Sacramento	Sacramento	Reliever
Sacramento Mather	Sacramento	Sacramento	Reliever
San Carlos	San Carlos	San Mateo	Reliever

[1] National Plan of Integrated Airport Systems

Santa Monica Municipal	Santa Monica	Los Angeles	Reliever
Van Nuys	Van Nuys	Los Angeles	Reliever
Whiteman	Los Angeles	Los Angeles	Reliever
Zamperini Field	Torrance	Los Angeles	Reliever

Regional General Aviation Airports

Apple Valley	Apple Valley	San Bernardino	General Aviation
Auburn Municipal	Auburn	Placer	General Aviation
Bakersfield Municipal	Bakersfield	Kern	General Aviation
Barstow–Daggett	Daggett	San Bernardino	General Aviation
Benton	Redding	Shasta	General Aviation
Bermuda Dunes	Palm Springs	Riverside	General Aviation
Big Bear City	Big Bear City	San Bernardino	General Aviation
Bishop	Bishop	Inyo	General Aviation
Brown Field	San Diego	San Diego	Reliever
Cable	Upland	San Bernardino	Reliever
Chester–Rodgers	Chester	Plumas	General Aviation
Chino	Chino	San Bernardino	Reliever
Columbia	Columbia	Tuolumne	General Aviation
Corona Municipal	Corona	Riverside	General Aviation
Delano Municipal	Delano	Kern	General Aviation
Desert Resorts Regional	Palm Springs	Riverside	General Aviation
Flabob	Rubidoux	Riverside	Non-NPIAS
French Valley	Murieta/Temecula	Riverside	General Aviation
Fresno Chandler Downtown	Fresno	Fresno	Reliever
Fullerton Municipal	Fullerton	Orange	Reliever
Gen. Wm. J. Fox	Lancaster	Los Angeles	General Aviation
Gillespie Field	El Cajon	San Diego	Reliever
Gnoss Field	Novato	Marin	Reliever
Half Moon Bay	Half Moon Bay	San Mateo	Reliever
Hanford Municipal	Hanford	Kings	General Aviation
Hemet–Ryan	Hemet	Riverside	General Aviation
Hollister Municipal	Hollister	San Benito	General Aviation
Lake Tahoe	South Lake Tahoe	El Dorado	General Aviation
Lampson Field	Lakeport	Lake	General Aviation
Lincoln Regional	Lincoln	Placer	Reliever
Madera Municipal	Madera	Madera	General Aviation
Mammoth Yosemite	Mammoth Lakes	Mono	General Aviation
Mariposa–Yosemite	Mariposa	Mariposa	General Aviation
Mefford Field	Tulare	Tulare	General Aviation
Mojave	Majove	Kern	General Aviation
Murray Field	Eureka	Humboldt	General Aviation
Napa County	Napa	Napa	Reliever
Needles	Needles	San Bernardino	General Aviation
Nevada County Airpark	Grass Valley	Nevada	General Aviation
Nut Tree	Vacaville	Solano	General Aviation
Oceanside Municipal	Oceanside	San Diego	General Aviation
Oroville Municipal	Oroville	Butte	General Aviation
Paso Robles Municipal	Paso Robles	San Luis Obispo	General Aviation

Petaluma Municipal	Petaluma	Sonoma	Reliever
Placerville	Placerville	El Dorado	General Aviation
Porterville Municipal	Porterville	Tulare	General Aviation
Ramona	Ramona	San Diego	Reliever
Redlands Municipal	Redlands	San Bernardino	General Aviation
Rialto Municipal/Art Scholl Memorial	Rialto	San Bernardino	Reliever
Rio Vista Municipal	Rio Vista	Solano	General Aviation
Riverside Municipal	Riverside	Riverside	Reliever
Rohnerville	Fortuna	Humboldt	General Aviation
Salinas Municipal	Salinas	Monterey	General Aviation
San Bernardino International	San Bernardino	San Bernardino	Reliever
Shafter–Minter Field	Shafter	Kern	General Aviation
Southern California Logistics	Victorville	San Bernardino	General Aviation
South County	San Martin	Santa Clara	Reliever
Susanville Municipal	Susanville	Lassen	General Aviation
Tehachapi Municipal	Tehachapi	Kern	General Aviation
Tracy Municipal	Tracy	San Joaquin	General Aviation
Truckee–Tahoe	Truckee	Nevada	General Aviation
Twentynine Palms	Twentynine Palms	San Bernardino	General Aviation
Ukiah Municipal	Ukiah	Mendocino	General Aviation
Watsonville Municipal	Watsonville	Santa Cruz	General Aviation
Westover Field Amador County	Jackson	Amador	General Aviation
Yuba County	Marysville	Yuba	General Aviation

Community General Aviation Airports

Alturas Municipal	Alturas	Modoc	General Aviation
Andy McBeth	Klamath Glen	Del Norte	Non-NPIAS
Banning Municipal	Banning	Riverside	General Aviation
Beckwourth Nervino	Beckwourth	Plumas	General Aviation
Blythe	Blythe	Riverside	General Aviation
Boonville	Boonville	Mendocino	General Aviation
Borrego Valley	Borrego Springs	San Diego	General Aviation
Brawley Municipal	Brawley	Imperial	General Aviation
Brownsville Aero Pines	Brownsville	Yuba	General Aviation
Bryant Field	Bridgeport	Mono	General Aviation
Byron	Byron	Contra Costa	Reliever
Calaveras County/Maury Rasmussen	San Andreas	Calaveras	General Aviation
Calexico International	Calexico	Imperial	General Aviation
California City Municipal	California City	Kern	General Aviation
Cameron Air Park	Cameron Park	El Dorado	General Aviation
Castle	Atwater	Merced	General Aviation
Catalina	Avalon	Los Angeles	General Aviation
Cedarville	Cedarvillle	Modoc	General Aviation
Chowchilla	Chowchilla	Madera	General Aviation
Cliff Hatfield Municipal	Calipatria	Imperial	Non-NPIAS
Cloverdale Municipal	Cloverdale	Sonoma	General Aviation
Coalinga Municipal	Coalinga	Fresno	General Aviation
Colusa County	Colusa	Colusa	General Aviation
Corcoran	Corcoran	Kings	General Aviation

Corning Municipal	Corning	Tehama	General Aviation
Dunsmuir Muni–Mott	Dunsmuir	Siskiyou	General Aviation
Eckert Field	Strathmore	Tulare	Non-NPIAS
Elk Grove	Elk Grove	Sacramento	Non-NPIAS
Eureka Municipal	Eureka	Humboldt	Non-NPIAS
Exeter (Thunderhawk Field)	Exeter	Tulare	Non-NPIAS
Fall River Mills	Fall River Mills	Shasta	General Aviation
Fallbrook Community Airpark	Fallbrook	San Diego	General Aviation
Firebaugh	Firebaugh	Fresno	General Aviation
Franklin Field	Franklin	Sacramento	General Aviation
Frazier Lake Airpark	Hollister	San Benito	Non-NPIAS
Furnace Creek	Death Valley	Inyo	General Aviation
Garberville	Garberville	Humboldt	General Aviation
Georgetown	Georgetown	El Dorado	General Aviation
Gustine	Gustine	Merced	General Aviation
Haigh Field	Orland	Glenn	General Aviation
Happy Camp	Happy Camp	Siskiyou	General Aviation
Hayfork	Hayfork	Trinity	General Aviation
Healdsburg Municipal	Healdsburg	Sonoma	General Aviation
Hesperia	Hesperia	San Bernardino	General Aviation
Hi Desert	Joshua Tree	San Bernardino	Non-NPIAS
Hyampom	Hyampom	Trinity	Non-NPIAS
Independence	Independence	Inyo	General Aviation
Kern Valley	Kernville	Kern	General Aviation
Kneeland	Eureka	Humboldt	General Aviation
Little River	Little River	Mendocino	General Aviation
Lodi	Lodi	San Joaquin	General Aviation
Lompoc	Lompoc	Santa Barbara	General Aviation
Lone Pine	Lone Pine	Inyo	General Aviation
Lonnie Poole Field–Weaverville	Weaverville	Trinity	General Aviation
Los Banos Municipal	Los Banos	Merced	General Aviation
Lost Hills Kern County	Lost Hills	Kern	General Aviation
Mendota	Mendota	Fresno	General Aviation
Mesa Del Rey	King City	Monterey	General Aviation
Montague–Yreka, Rohrer Field	Montague	Siskiyou	Non-NPIAS
Mountain Valley	Tehachapi	Kern	Non-NPIAS
Oakdale Municipal	Oakdale	Stanislaus	General Aviation
Ocean Ridge	Gualala	Mendocino	Non-NPIAS
Paradise Skypark	Paradise	Butte	General Aviation
Parrett Field	Angwin	Napa	General Aviation
Perris Valley	Perris	Riverside	Non-NPIAS
Pine Mountain Lake	Groveland	Tuolumne	General Aviation
Quincy Gansner Field	Quincy	Plumas	General Aviation
Ranchaero	Chico	Butte	Non-NPIAS
Rancho Murieta	Rancho Murieta	Sacramento	General Aviation
Red Bluff Municipal	Red Bluff	Tehama	General Aviation
Reedley Municipal	Reedley	Fresno	General Aviation
Rio Linda	Rio Linda	Sacramento	General Aviation
Rosamond Skypark	Rosamond	Kern	Non-NPIAS

Round Valley	Covelo	Mendocino	General Aviation
Ruth	Ruth	Trinity	General Aviation
Santa Paula	Santa Paula	Ventura	General Aviation
Santa Ynez	Santa Ynez	Santa Barbara	General Aviation
Scott Valley	Fort Jones	Siskiyou	General Aviation
Selma	Selma	Fresno	Non-NPIAS
Sequoia Field	Visalia	Tulare	General Aviation
Shelter Cove	Shelter Cove	Humboldt	General Aviation
Sierra Skypark	Fresno	Fresno	Non-NPIAS
Siskiyou County	Montague	Siskiyou	General Aviation
Sonoma Skypark	Sonoma	Sonoma	Non-NPIAS
Sonoma Valley	Schellville/Sonoma	Sonoma	Non-NPIAS
Southard Field	Bieber	Lassen	Non-NPIAS
Sutter County	Yuba City	Sutter	General Aviation
Taft	Taft	Kern	General Aviation
Trinity Center/James E. Swett Field	Trinity Center	Trinity	General Aviation
Trona	Trona	Inyo	General Aviation
Tulelake	Tulelake	Modoc	General Aviation
Turlock Municipal	Turlock	Merced	General Aviation
University	Davis	Yolo	General Aviation
Ward Field	Gasquet	Del Norte	Non-NPIAS
Wasco	Wasco	Kern	General Aviation
Watts–Woodland	Woodland	Yolo	General Aviation
Weed	Weed	Siskiyou	General Aviation
Willits Municipal	Willits	Mendocino	General Aviation
Willows–Glenn County	Willows	Glenn	General Aviation
Woodlake	Woodlake	Tulare	General Aviation
Yolo County–Davis/Woodland/Winters	Davis/Woodland/Winters	Yolo	General Aviation
Yucca Valley	Yucca Valley	San Bernardino	Non-NPIAS

Limited Use General Aviation Airports

Adin	Adin	Modoc	Non-NPIAS
Agua Caliente Springs	Agua Caliente Springs	San Diego	Non-NPIAS
Agua Dulce Airpark	Agua Dulce	Los Angeles	General Aviation
Alpine County	Markleeville	Alpine	Non-NPIAS
Baker	Baker	San Bernardino	Non-NPIAS
Blue Canyon	Emigrant Gap	Placer	Non-NPIAS
Butte Valley	Dorris	Siskiyou	General Aviation
California Pines	Alturas	Modoc	Non-NPIAS
Chemehuevi Valley	Chemehuevi Valley	San Bernardino	General Aviation
Chiriaco Summit	Chiriaco Summit	Riverside	Non-NPIAS
Desert Center	Desert Center	Riverside	Non-NPIAS
Dinsmore	Dinsmore	Humboldt	General Aviation
Elk Hills–Buttonwillow	Buttonwillow	Kern	Non-NPIAS
Fort Bidwell	Fort Bidwell	Modoc	Non-NPIAS
Gravelly Valley	Upper Lake	Lake	Non-NPIAS
Harris Ranch	Coalinga	Fresno	Non-NPIAS
Herlong	Herlong	Lassen	Non-NPIAS

Hoopa	Hoopa	Humboldt	General Aviation
Jacumba	Jacumba	San Diego	Non-NPIAS
Kingdon Airpark	Lodi	San Joaquin	Non-NPIAS
Lee Vining	Lee Vining	Mono	General Aviation
Lodi Airpark	Lodi	San Joaquin	Non-NPIAS
Marina Municipal	Marina	Monterey	General Aviation
New Cuyama	New Cuyama	Santa Barbara	Non-NPIAS
Oceano County	Oceano	San Luis Obispo	General Aviation
Ocotillo	Ocotillo Wells	San Diego	Non-NPIAS
Poso–Kern County	Famoso	Kern	Non-NPIAS
Ravendale	Ravendale	Lassen	Non-NPIAS
Salton Sea	Salton City	Imperial	Non-NPIAS
Shoshone	Shoshone	Inyo	Non-NPIAS
Sierraville Dearwater	Sierraville	Sierra	Non-NPIAS
Spaulding	Susanville	Lassen	Non-NPIAS
Stovepipe Wells	Death Valley	Inyo	Non-NPIAS

Joint Use Airports[2]

March ARB	Riverside	Riverside	Reliever
Palmdale Plant 42	Palmdale	Los Angeles	General Aviation

[2] Public Use airports are those airports with unrestricted access. March ARB and Palmdale Plant 42 require prior authorization from the Air Force before civil aviation can enter airspace. Therefore, by definition the two Joint Use airports do not meet the criteria for a Public Use airport. They are included in this report due to the agreement between the Military and the Joint Powers Authorities for limited access by commercial carrier aircraft and some business jets. Although cargo service has been terminated since 1998 at Palmdale Plant 42, it has the potential for becoming an Inland Empire Reliever—General Aviation airport.

Glossary of Terms

ACTIVITY—Used in aviation to refer to any kind of movement, e.g., cargo flights, passenger flights, or passenger enplanements.

AGGLOMERATION ECONOMICS—The study of the clustering of economic activities or industries in certain geographic locations resulting in increased efficiencies.

AIR CARGO—Commercial freight, including express packages and mail, transported by passenger or all cargo airlines.

AIR CARRIER—An airline providing scheduled air service for the commercial transport of passengers or cargo.

AIR TAXI—An air carrier hired to transport passengers or cargo. Generally operate small aircraft "for hire" for specific trips.

AIRCRAFT OPERATION—The airborne movement of an aircraft, with each takeoff or landing counted as one operation. There are two types of operations: local and itinerant.

AIRPORT—An area of land or water used or intended to be used for the landing and takeoff of aircraft and includes its buildings and facilities, if any.

ALL-CARGO CARRIER—An air carrier providing scheduled airfreight, express, and mail transportation over specified routes, as well as the conduct of non-scheduled operations that may include passengers.

AVGAS—Aviation gasoline used in piston-engine aircraft.

BASED AIRCRAFT—General aviation, air carrier and other aircraft that use an airport as a "residence" or home base, usually by some form of agreement between the aircraft owner and airport management.

CHARTER—A non-scheduled flight offered by an airline.

CONNECTING PASSENGERS—Air passengers using an airport for the purpose of transferring from one flight to another.

DOMESTIC FLIGHT—A flight within the United States.

DOMESTIC PASSENGER—A passenger transported on an entirely domestic flight.

ENDOGENOUS—An endogenous variable is the result of the inner-workings or the relationships of the model; it is an output of the model. Its variability depends on other parts of the model or the operation of the system and on exogenous variable(s).

ENPLANEMENT—A passenger boarding of a flight.

EQUATORIAL—Being in the plane of the equator.

EXCISE TAX—A tax imposed on the manufacture and distribution of certain non-essential consumer goods.

EXOGENOUS—A variable whose value is wholly causally independent from other variables in the system.

FEDERAL AVIATION ADMINISTRATION (FAA)—A federal agency charged with regulating air commerce to promote its safety and development, encouraging and developing civil aviation, air traffic control, and air navigation, and promoting the development of the national system of airports.

FIXED BASE OPERATOR (FBO)—An aircraft service operation, normally consisting of fuel sales, aircraft rentals, charter aircraft, aircraft sales and maintenance with a fixed base of operation at an airport.

FRACTIONAL OWNERSHIP PROGRAMS—A program where a company or individual buys or leases a partial interest in a aircraft. The owner can use a aircraft for a certain number of days or weeks per year.

GENERAL AVIATION (GA)—Any aviation activity other than that performed by air carriers and the military. The types of aircraft used in general aviation activities cover a wide spectrum from corporate multi-engine jet aircraft piloted by professional crews to amateur-built single-engine piston aircraft, aerobatic planes, balloons, and blimps.

GENERAL AVIATION AIRCRAFT—All civil aircraft except those owned and classified as air carrier and military.

GEOSTATIONARY—Being or having an equatorial orbit requiring an angular velocity the same as that of the earth so that the position of a satellite in such an orbit is fixed with respect to the earth.

GEOSYNCHRONOUS—See definition for geostationary.

GROSS STATE PRODUCT—The market value of the goods and services produced by the labor and property located in a state.

HELIPORT—Any area of land or water, including areas elevated on a structure, which is used for, or intended for use for, the landing and takeoff of helicopters. A Heliport is a type of airport.

HUB, AIRPORT—FAA designation for a commercial service airport based on its share of total United States air carrier passenger enplanements, categorized as a large, medium, small, or nonhub airport. A hub airport is used by an individual airline as a major transfer point for its passengers, traveling to and from other airports.

INTERNATIONAL FLIGHT—A flight with an origin in one country and a destination in another. United States carriers are required to have FAA approval for international flights.

ITINERANT OPERATIONS—Aircraft operations other than local operations.

JUST-IN-TIME (JIT)—JIT is a management philosophy that strives to eliminate sources of manufacturing waste by producing the right part in the right place at the right time. JIT strives to improve profits and return on investment by reducing inventory levels, improving product quality, reducing production and delivery lead times, and reducing other costs (such as those associated with machine setup and equipment breakdown). The general idea is to establish flow processes by linking work centers so that there is an even, balanced flow of materials throughout the entire production process, similar to that found in an assembly line.

LIFE FLIGHT—Emergency air transport for medically necessary circumstances such as critically ill or injured patients that need immediate specialized lifesaving medical care.

LOCAL OPERATIONS—Actions performed by aircraft that (a) operate in the local traffic pattern or within sight of the airport; (b) are known to be departing for or arriving from flights in local practice areas located within a 20-mile radius of the airport.

MAQUILADORA—Assembly plants, often referred to as in-bond plants, where raw materials or component parts are temporarily imported for assembly in Mexico and the assembled product is exported.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS (NPIAS)—A plan prepared for Congress by FAA designating and classifying airports that provide an extensive network of air transportation to all parts of the country; and estimating federal-aid funding needed for infrastructure development.

OPERATIONS—The landing or the takeoff of aircraft. Either a landing or takeoff is counted as one operation.

POSSESSORY INTEREST TAX—Tax on a private individual or company that has possession or exclusive use of government-owned tax-exempt property such as the possession of an airplane hangar.

PUBLIC USE AIRPORT—Publicly or privately owned airport that offers the use of its facilities to the public without prior notice or special invitation or clearance, and that has been issued a California Airport Permit by the California Department of Transportation, Division of Aeronautics.

REGISTERED AIRCRAFT—Aircraft registered by FAA as required for all active United States aircraft.

REGIONAL JET—Passenger-carrying jet powered aircraft with a seating capacity of 30 to 100 passengers.

RELIEVER AIRPORT—A metropolitan area general aviation airport with facilities and services suitable for attracting and diverting general aviation activity away from major air carrier airports. The immediate benefit is reduced congestion and additional capacity at the larger air carrier facility.

REMI—REMI stands for Regional Economic Models, Inc., a provider of methodologies for socioeconomic modeling.

REMI MODEL—A socioeconomic forecasting and policy analysis model. The model predicts for each year in the future, the number and distribution of employment in a defined region for different industrial or occupational categories. The model also predicts other variables such as personal income, population, wage rates, output and valued added.

SOCIOECONOMIC—Data pertaining to the population and economic characteristics of a region.

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ACKNOWLEDGEMENTS

The Consultant Team

Economics Research Associates (San Francisco)

William W. Lee, *Senior Vice President*

Linda Cheu, *Senior Associate*

Sujata Srivastava, *Associate*

Erwin Cho, *Associate*

J.D. Franz Research (Sacramento)

Jennifer Franz, *President*

Lupe J. Strickland *Project Manager*

Finger Design (Oakland)

Arlene Finger, *President*

Business, Transportation and Housing Agency

California Department of Transportation – Division of Aeronautics Staff

Debbie Nozuka, *Associate Transportation Planner Assistant Study Project Manager*

Jackie Fowler, *Secretary*

Gary Cathey, *Chief, Office of Airports*

Betsy Eskridge, *Senior Aviation Consultant Specialist*

Bob Moore, *Chief, Office of Technical Services*

Colette Armao, *Associate Transportation Planner*

Ron Bolyard, *Transportation Planner*

David Cohen, *Transportation Planner*

Sandy Hesnard, *Associate Environmental Planner*

Teresa Ishikawa, *Associate Transportation Planner*

Gwyn Reese, *Associate Transportation Planner*

Glen Rickelton, *Transportation Planner*

Kevin Ryan, *Transportation Planner*

Leslie Snow, *Associate Transportation Planner*

Mark Aldridge, *Associate Aviation Consultant*

Dan Gargas, *Associate Aviation Consultant*

Kurt Haukohl, *Associate Aviation Consultant*

Gary Knudsen, *Associate Aviation Consultant*

Keith Turner, *Associate Aviation Consultant*

Bob Buendia, *Transportation Engineer*

Don Hansen, *Transportation Engineer*

Ivan Karnezis, *Transportation Engineer*

Contacts for Airport Business Surveys

Floyd Best, *Airport Manager* McClellan-Palomar Airport

Bill Cobb, *Airport Manager* Corona Municipal Airport

Howard Cook, *Airport Manager* Modesto City-County Airport

Wilmer Cope, *Airport Manager* Hanford Municipal Airport

Rod Dinger, *Airport Manager* Redding Municipal Airport

Richard Fernbaugh, *Airport Manager* Lompoc Airport

Tom Haglund, *Former Assistant City Manager* City of Hanford

Leander Hauri, *Airport Manager* Livermore Municipal Airport

Dan Horton, *Airport Manager* Murray Field

Lawrence Jackson Hollister Municipal Airport

Dan Kovacich, *Airport Manager* Fall River Mills Airport

Jerry Martin, *Airport Manager* Auburn Municipal Airport

Todd McNamee, *Deputy Director of Airports* Camarillo Airport

Todd Muck Association of Monterey Bay Area Governments

Jan Reynolds, *City Manager* City of Hanford

Allen Ritter, *Airport Manager* Hollister Municipal Airport

Scott Smith, *Director of Airports* Camarillo Airport

Jack Stewart, *City Manager* California City

John Stout, *Airport Manager* Charles M. Schultz–Sonoma County Airport

Tom Weil, *Airport Manager* California City Municipal Airport

Stuart Witt, *Airport Manager* Mojave Airport

Other Contacts

Ken Babineaux, *Chief Pilot* U.S. Drug Enforcement Agency, Air Ops Center

Richard Balaban U.S. Customs

Ann Beach Boeing Space and Communications

Steve Berberet California Space Authority

Elly Brekke, *Executive Manager* U.S. Federal Aviation Administration

Karen Boyle U.S. Air and Marine Interdiction Division

Bob Coats, *Public Affairs* Lockheed Martin Commercial Space Systems

Bob Coward, *Air Unit Manager* USDA Forest Service, Regional Air Group

Karen Donaldson U.S. Air and Marine Interdiction Division

Randy Gallegos U.S. Immigration and Naturalization Service, Border Patrol

Major Tom Gilroy Edwards Air Force Base, Public Affairs

Florastine P. Graham, *FOI/PA Officer* U.S. Marshals

Nancy Harper U.S. Air and Marine Interdiction Division

Dave Hayes State of California Board of Equalization

Larry Heitz, *Senior Warden* Department of Fish and Game, Air Services

James Henry U.S. Immigration and Naturalization Service, Border Patrol

Don Hines U.S. Marshal's Office

Jack Hokanson Vandenberg Air Force Base

Peter S. Hudes, *Vice President* The Air Chart Company

Dennis Hulbert, *Regional Aviation Manager* USDA Forest Service, Regional Air Group

Richard Just, *Chief* Department of Forestry and Fire Protection, Aviation

Lloyd Kindred State of California Department of Forestry and Fire Protection

Paula Korn Sea Launch

Paul Lane State of California Board of Equalization

Gary Lickert U.S. Immigration and Naturalization Service, Border Patrol

Albert Lister U.S. Postal Service

Sandy Monge *Program Analyst* U.S. Federal Aviation Administration

Mark Nalley California Highway Patrol, Office of Air Operations

Kenneth Pekarek *Asst. Director for JPATS* U.S. Marshals

Arthur A.E. Pitts Sr. *Director, Inspection and Evaluation Division* U.S. Customs

Larry P. Salazar Boeing Space and Communications

Eric Seiberlich, *Special Agent* Department of Justice, Mission Support Branch

Steve Tatum Lockheed Martin Commercial Space Systems

Judy Vaughn *Director of Small Business* Edwards Air Force Base

Ron Washington U.S. Postal Service

Mike Wong State of California Highway Patrol

Barbara K. Zakrison, *Director, Personnel Systems Staff* U.S. Customs

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DEPARTMENT OF TRANSPORTATION

P.O. Box 942874
Sacramento, CA 94274-0001
www.dot.ca.gov/aeronautics