AVIATION PLAN

California Aviation System Plan

Adopted by the California Transportation Commission

August 18, 2021

The preparation of this document was supported in part with financial assistance through the Airport Improvement Program (AIP) from the Federal Aviation Administration (FAA; AIP Grant Number 3-06-0000-010-2018) as provided under Title 49 USC § 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

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California Aviation System Plan 2020

California Department of Transportation
Division of Aeronautics
1120 N Street
Sacramento, CA 95814

In partnership with the Federal Aviation Administration

Editors' Notes: The project for updating the California Aviation System Plan (CASP) of 2020 began in October 2019 with the first of three major phases: data collection, preliminary draft, and final draft. The data collection phase included subject matter reports for use as CASP chapters, and it was conducted through April 2020 amid events from the COVID-19 coronavirus pandemic. Other than acknowledging the pandemic in CASP, its effects on aviation became well documented in world and national news. The impacts could not be explored further within the scope of work approved by the Federal Aviation Administration for CASP 2020 when formulated in 2018.

Photographic content furnished by Mead & Hunt, Inc., unless otherwise cited.

CASP 2020 follows provisions in California Public Utilities Code (PUC) sections 21701-21707, specifying CASP updates every five years. The 2020 study is an update of the CASP Policy Element of 2016. The project has been under the auspices of:

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Acronyms and Abbreviations

A

AAA - Airport Airspace Analysis
AAAE - American Association of Airport Executives
AAT - Alturas Municipal Airport
AB - Assembly Bill
ABAG - Association of Bay Area Governments
AC - Advisory Circular
ACAA - Allegheny County Airport Authority
ACI-NA - Airports Council International – North America
ACIP - Airport Capital Improvement Program
ACRP - Airport Cooperative Research Program
ACV - California Redwood Coast – Humboldt County Airport
ADIP - Airports Data and Information Program
ADS-B - Automatic Dependent Surveillance – Broadcast
AFB - Air Force Base
AGIS - Airports Geographic Information Systems
AIA - Airport Influence Area
AICUZ - Air Installations Compatible Use Zones
AIN - Aviation Industry News
AIP - Airport Improvement Program
AJO - Corona Municipal Airport
ALP - Airport Layout Plan
ALUC - Airport Land Use Commission
ALUCP - Airport Land Use Compatibility Plan
AMD - Aerospace Manufacturing and Design
ANSA - Aviation and Safety Noise Abatement Act of 1979
AOPA - Aircraft Owner and Pilots Association
APC - Napa County Airport
APMS - Airport Pavement Management System
APV - Apple Valley Airport
ARB - March Air Reserve Base
ARFF - Aircraft Rescue and Firefighting
ASV - Annual Service Volumes
ATCT - Air Traffic Control Tower

AUN - Auburn Municipal Airport
AV - Automated vehicles
AVX - Catalina Airport

B

BCA - Benefit-Cost Analysis
BFL - Meadows Field Airport
BIH - Bishop Airport
BLH - Blythe Airport
BLU - Blue Canyon Airport
BNG -Banning Municipal Airport
BUR - Bob Hope Airport
BWC - Brawley Municipal Airport

C

CAAP - California Aid to Airports Program
Cal Fire – California Department of Forestry and Fire Protection
CAGR - Compound Annual Growth Rate
CALTRANS - State of California Department of Transportation
CAPSCA - Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation
CASP - California Aviation System Plan
CATMT - Collaborative Air Traffic Management Technologies
CATS - Certification Activity Tracking System
CAV -Connected and Autonomous Vehicle
CCB - Cable Airport
CCR - Buchanan Field Airport
CDFW - California Department of Fish and Wildlife
CEC - Jack McNamara Field Airport
CEQA - California Environmental Quality Act
CFMP - California Freight Mobility Plan
CFR - Code of Federal Regulations
CHSR - California High Speed Rail
CIC - Chico Municipal Airport
CIP - Capital Improvement Plan

CJF – Conventional Jet Fuel
CLR - Cliff Hatfield Memorial Airport
CLUE - Airport Compatible Land Use Evaluation
CMA - Camarillo Airport
CNEL - Community Noise Equivalent Level
CNO - Chino Airport
CNRA - California Natural Resources Agency
COVID-19 - 2020 Coronavirus Pandemic
CPM - Compton-Woodley Airport
CPU - Calaveras Co. - Maury Rasmussen Airport
CRQ - McClellan-Palomar Airport
CRS - Congressional Research Service
CTC - California Transportation Commission
CTP - California Transportation Plan
CVH - Hollister Municipal Airport
CXL - Calexico International Airport

D

DAG - Barstow-Daggett Airport
DBA - A-weighted Decibels
DLO - Delano Municipal Airport
DNL - Day-Night Level
DOA - California Department of Transportation, Division of Aeronautics
DOD - United States Department of Defense
DVO - Gnoss Field Airport
DWA - Yolo County-Davis Woodland Winters Airport

E

EAS - Essential Air Service
EC - Education Code
ECT - Eno Center for Transportation
EDU - University Airport
EED - Needles Airport
EKA – Eureka Murray Field Airport
EMT - San Gabriel Valley (El Monte) Airport

EO - Executive Order
EPA - U.S. Environmental Protection Agency
ERAM - En Route Automation Modernization
e-VTOL - Vertical Takeoff and Landing

F

FAA - Federal Aviation Administration
FACT3 - FACT3: Airport Capacity Needs in the National Airspace System
FAR - Federal Aviation Regulation
FAT - Fresno-Yosemite International Airport
FBO – Fixed Base Operator (On-airport businesses not usually affiliated with the airport sponsor.)
FCH - Fresno Chandler Executive Airport
FHWA - Federal Highway Administration
FOT - Rohnerville Airport
FRA - Federal Railroad Administration
FTA - Federal Transit Administration
FUL - Fullerton Municipal Airport
FY - Fiscal Year

G

GA - General Aviation
GASNA - General Aviation System Needs Assessment
GDP - Gross Domestic Product
GHG - Greenhouse Gas
GIS - Geographic Information Systems
GOO - Nevada County Airport
GSE - Ground Service Equipment

H

HAF - Half Moon Bay Airport
HES - Healdsburg Municipal Airport
HHR - Jack Northrop Field-Hawthorne Municipal Airport

HJO - Hanford Municipal Airport
HMT - Hemet-Ryan Airport
HR 302 - FAA Reauthorization Act of 2018
HWD - Hayward Executive Airport

I

ICAO - International Civil Aeronautics Organization
ILG - Institute for Local Government
INFRA - Infrastructure for Rebuilding America
IPL - Imperial County Airport
ITC -Intermodal Transit Center
ITSP - *California Interregional Transportation Strategic Plan*
IYK - Inyokern Airport
IZA - Santa Ynez Airport

J

JAQ - Westover Field Amador County Airport
JLUS - Joint Land Use Study

K

KIC - Mesa Del Rey Airport

L

LAX - Los Angeles International
LCCA - Life Cycle Cost Analysis
LGB - Long Beach Airport - Daugherty Field
LHM - Lincoln Regional Airport - Karl Harder Field
LID - Low-Impact Development
LLR - Little River Airport
LPC - Lompoc Airport
LSN - Los Banos Municipal Airport
LVK - Livermore Municipal Airport

M

MAE - Madera Municipal Airport
MAP-21 - Moving Ahead for Progress in the 21st Century
MCC - McClellan Airfield
MCE - Merced Regional Airport - Macready Field
MEP - Multi-engine Piston
MER - Castle Airport
MHHW - Mean Higher High-Water Datum
MHR - Sacramento Mather Airport
MHV - Mojave Air and Space Port
MIT - Shafter Airport - Minter Field
MMH - Mammoth Yosemite Airport
MOD - Modesto City - County Airport - Harry Sham Field
MOS - Modifications of Standards
MPI - Mariposa - Yosemite Airport
MPO -Metropolitan Planning Organization
MRY - Monterey Regional Airport
MTC – Metropolitan Transportation Commission (Bay Area)
MTI - Mineta Transportation Institute
MYF - Montgomery-Gibbs Executive Airport
MYV - Yuba County Airport

N

NAAQS - National Ambient Air Quality Standards
NAIOP - NAIOP Commercial Real Estate Development Association
NAS - National Airspace System
NASA - National Aeronautics and Space Administration
NCBRP - Northern Columbia Basin Railroad Project
NCSL - National Conference of State Legislatures
NEPA - National Environmental Policy Act of 1969
NPAIS - National Plan of Integrated Airport Systems
NVS - National Airspace System Voice System

O

OAK - Metropolitan Oakland International Airport
OAR - Marina Municipal Airport
OE/AAA - Obstruction Evaluation Office of Obstacle Evaluation/Airport Airspace Analysis
OFA - Object Free Areas
OKB - Bob Maxwell Memorial Airfield Airport
ONT - Ontario International Airport
OPR - Governor's Office of Planning and Research
OVE - Oroville Municipal Airport
OXR - Oxnard Airport

P

PAFI - Piston Aviation Fuel Initiative
PAO - Palo Alto Airport
PCI - Pavement Condition Index
PFC - Passenger Facility Charges
PIT - Pittsburgh International Airport
PMP - Advisory Circular 150/5380-7B, Airport Pavement Management Program
POC - Brackett Field Airport
POML - Port of Moses Lake
PPIC - Public Policy Institute of California
PRB - Paso Robles Municipal Airport
PRC - Public Resources Code
PSP - Palm Springs International Airport
PTV - Porterville Municipal Airport
PUC - California Public Utilities Code
PVF - Placerville Airport

R

RAL - Riverside Municipal Airport
RAND - RAND Corporation

RBL - Red Bluff Municipal Airport
RDC - Runway Design Codes
RDD - Redding Municipal Airport
REI - Redlands Municipal Airport
RFP - Request for Proposal
RHV - Reid Hillview Airport
RIR - Flabob Airport
RIU - Rancho Murieta Airport
RIV - March ARB
RNM - Ramona Airport
ROFA - Runway Object Free Area
RPZ - Runway Protection Zone
RSA - Runway Safety Area
RTIP - Regional Transportation Improvement Plan
RTP - Regional Transportation Plans
RTPA - Regional Transportation Planning Agency
RVH - Reid Hillview Airport

S

SAA - California State Aeronautics Act
SAC - Sacramento Executive Airport
SAF - Sustainable Aviation Fuel (or, SAJF for Sustainable Alternative Jet Fuel)
SAGA - Sustainable Aviation Guidance Alliance
SAN - San Diego International Airport
SANDAG - San Diego Association of Government
SARS - Severe Acute Respiratory Syndrome
SAS - Salton Sea Airport
SB - Senate Bill
SBA - Santa Barbara Municipal Airport
SBD - San Bernardino International Airport
SBP - San Luis Obispo County Regional Airport
SCAC - South Carolina Aeronautics Commission
SCAG - Southern California Area Government
SCK - Stockton Metropolitan Airport
SCLA - Southern California Logistics Airport
SCS - Sustainable Communities Strategies

SDB - San Bernardino International Airport
SDIA -San Diego International Airport
SDM - Brown Field Airport
SEE - Gillespie Field Airport
SEP - Single-engine Piston
SFO - San Francisco International Airport
SHOPP - State Highway Operation and Protection Program
SHS - State Highway System
SIY - Siskiyou County Airport
SJC - Norman Y Mineta San Jose International Airport
SLR - Sea Level Rise
SMF - Sacramento International Airport
SMO - Santa Monica Municipal Airport
SMX - Santa Maria Public Airport/Captain G Allan Hancock Field
SNA - John Wayne-Orange County Airport
SNS - Salinas Municipal Airport
SQL - San Carlos Airport
SR - State Routes
STS - Charles M Schulz - Sonoma County Airport
SVE -Susanville Municipal Airport
SWIM - System Wide Information Management
SZP - Santa Paula Airport

T

TAF - Terminal Area Forecast
TAMR - Terminal Automation Modernization and Replacement
TCY - Tracy Municipal Airport
TIF - Tax increment financing
TIFIA - Transportation Infrastructure Finance and Innovation Act
TIGER - Transportation Investment Generating Economic Recovery
TIP - Transportation Improvement Program
TLR - Mefford Field Airport
TNC - Transportation Network Companies
TNP - Twentynine Palms Airport
TOA - Zamperini Field Airport
TRK - Truckee-Tahoe Airport

TRM - Jacqueline Cochran Regional Airport
TSP - Tehachapi Municipal Airport
TVL - Lake Tahoe Airport

U

UAM - Urban Air Mobility
UAS - Unmanned Aircraft Systems
UDD - Bermuda Dunes Airport
UKI - Ukiah Municipal Airport
US - United States
USC - United States Code
USDA - United States Department of Agriculture
USDOT - United States Department of Transportation
USSF - U.S. Space Force

V

VALE - Voluntary Airport Low Emissions
VCB - Nut Tree Airport
VCV - Southern California Logistics Airport
VIS - Visalia Municipal Airport
VMT - Vehicle Miles Traveled
VNY - Van Nuys Airport

W

WHP - Whiteman Airport
WJF - General William J Fox Airport
WLW - Willows - Glenn County Airport
WVI - Watsonville Municipal Airport

Z

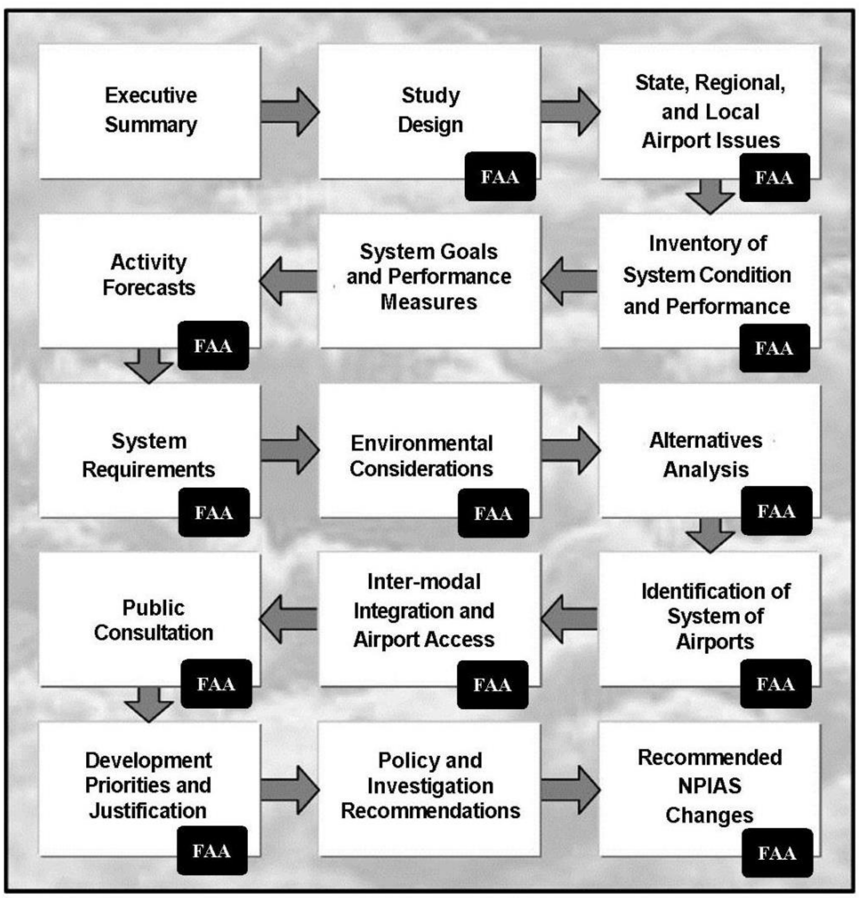
ZEV - Zero-Emission Vehicles

Other terms or acronyms are explained within the text of the Executive Summary.

Executive Summary

OVERVIEW

The California Aviation System Plan study of 2020 (CASP 2020) embarks on a new direction for State Aviation System Plans (SASPs). Traditionally, states review their airports collectively to describe their facilities and capabilities as a system that serves aviation needs for a range of system users: travelers, corporate flight operations, cargo, training and as a source for employment and other economic contributions. A "traditional" SASP uses elements described by the Federal Aviation Administration (FAA) in its guidance document, Advisory Circular 150/5070-7 (AC 150/5070-7), Change 1, "The Airport System Plan Process." An AC conveys technical information for subject areas within FAA jurisdiction. Focused on airports, the AC's 15 elements below are applied only to airports in the National Plan of Integrated Airport Systems (NPIAS):



Source: FAA AC 150/5070-7

In contrast, CASP 2020 comprehensively views California public-use airports to evaluate aviation and contribute to the California Transportation Plan of 2050 (CTP 2050). CTP 2050 is the state's long-range transportation plan that establishes an aspirational vision that articulates strategic goals, policies, and recommendations to improve multimodal mobility and accessibility while reducing greenhouse gas (GHG) emissions.[1]

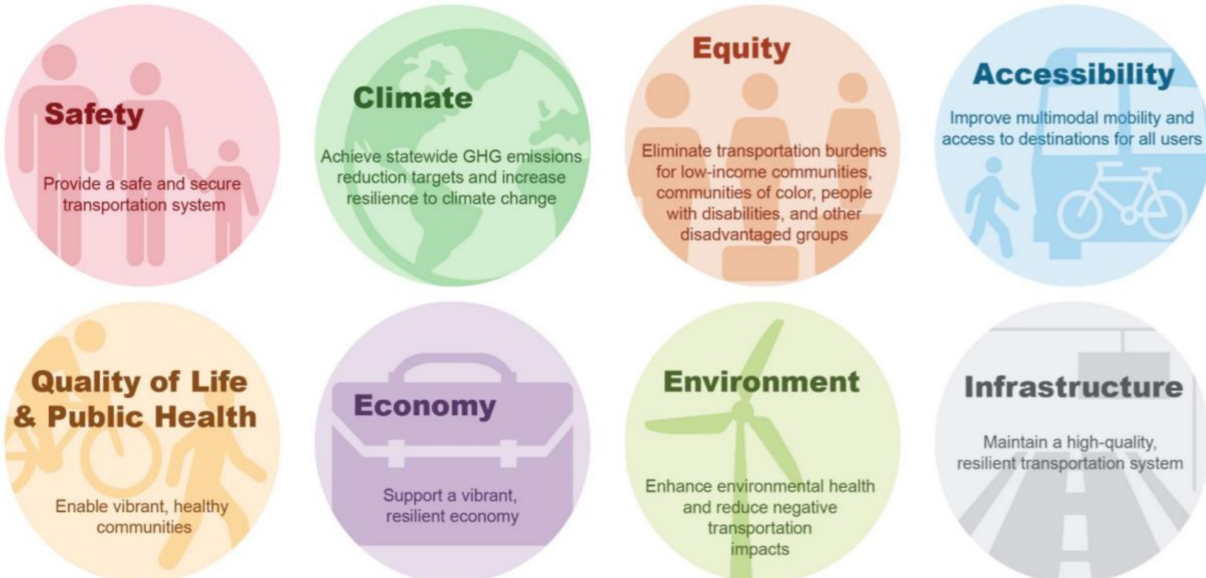
Source: Caltrans Division of Aeronautics

From each CASP subject, "integrated support" becomes the vision to realize aviation's full measure of contributions in California that CASP 2020 discerns from key factors:

- Coordinated planning between airports and municipalities for effective land use, safety, and sustainability
- Regulatory updates to balance land use and housing issues with airport viability
- State funding commitments and coordination with federal sources for system integrity

[1] https://dot.ca.gov/programs/transportation-planning/state-planning/california-transportation-plan

In each CASP 2020 subject, CASP 2020 establishes alignment with the goals of CTP 2050:



Source: California Transportation Plan 2050

Earlier iterations of the CASP have been presented as single elements. The last element, completed in 2016, is a "Policy Element." It reviewed airports and airport needs very broadly for the classifications used in the role airports serve. However, it also laid a foundation for CASP 2020 with subject areas not limited to airports or policy, but to those areas consistent with the CTP 2050 vision of transportation as integrated benefits, not as a single function. In the same way, CASP 2020 articulates aviation's vision for the benefits it adds to the State.

POLICY AND REGULATORY FRAMEWORK

CASP 2020 is introduced by explaining its two-fold requirement to satisfy provisions in sections of the State's Public Utilities Code (PUC), that comprise the State Aeronautics Act (SAA), and FAA guidance from AC 150/5070-7. PUC statutes 21701and 21702 reviews CASP 2020 specifications for NPIAS airports:

- Introduction and background
- Air transportation issues
- Alternative regional, State, and comparative plans
- Ten-year capital improvement plans (CIP) for each airport (covered in a separate review detailed in chapters 2 and 3)

AC150/5070-7 has regulatory effect when a SASP is supported by FAA funds and not solely advisory.

NPIAS is a characterization by FAA for public-owned airports in each state that meet FAA criteria for supporting the National Airspace System (NAS), qualifying them for federal financial support.

Source: FAA

The NAS is the totality of regulators, customers, physical and technological elements, and physical space that facilitate aviation activities in the United States.

The California Department of Transportation (Caltrans), Division of Aeronautics (Division), applied for an FAA grant to support the CASP 2020 project consistent with PUC section 21707. The Division recognized CASP 2020 needed a new direction to keep pace within the evolution of the CTP 2050, requiring an exhaustive update to all CASP 2020 elements.[2] Caltrans, FAA and the California Transportation Commission (CTC) agreed to view CASP 2020 in a new light. Thus, grant approval included FAA's approval to conduct the CASP 2020 study beyond the "traditional" SASP format. And CTC interests include relevant PUC information given a new reality: Transportation is changing, and Caltrans is looking ahead to the way it envisions the State's multimodal transportation system and its component facilities.

Accordingly, CASP 2020 takes its place as one of six modal plans in CTP 2050. It organizes aviation's capabilities and specifies airport roles and needs beyond this introduction in the following key areas:

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[2] PUC 21707:
Any funds necessary to carry out Sections 21701, 21702, and 21704 shall be obtained from federal grants, except for updates of the capital improvement plan and policy elements of the California Aviation System Plan, which may be funded from nonfederal sources.

- Economics and Funding
- Infrastructure and Safety
- Trends and Forecasts
- Mobility and Access
- Land Use and Sustainability

ECONOMICS AND FUNDING

Airports support aeronautical operations in air commerce (cargo and passengers) provide jobs in flight support (fueling, maintenance and training), aviation services and supplies (parts, pilot supplies and equipment), as well as airport operations and management. Airports also generate tax revenues that are resources for many community needs, such as funding for first responders and K-12 public schools. These components typically add up to aviation's significant economic impact, consistent with the CTP 2050 goal of "a vibrant, resilient economy." See **Figure 1** below:

Photo: Salinas Airport
Courtesy of Monterey Bay Herald

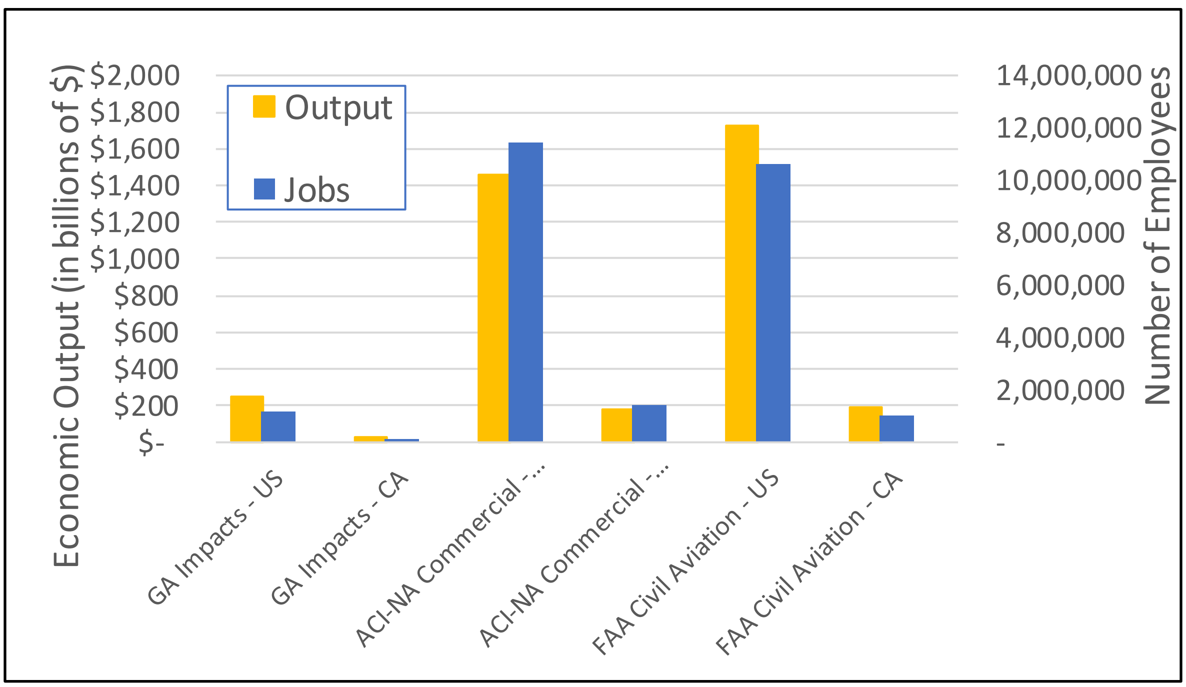

Figure E-1: Findings of Aviation Economic Impact Studies for the U.S. and California
Source: Mead & Hunt, 2020

In response to community impacts, airport sponsors have created memorandums of understanding (MOUs) or other documents to mitigate the impacts from airport operations. For example, in 2004, Los Angeles World Airports (LAWA) established a Community Benefits Agreement (CBA) for Los Angeles International Airport (LAX) with the LAX Coalition for Economic, Environmental and Educational Justice (Coalition).[3] The CBA has been updated regularly to show progress in mitigating noise and emissions, reviewing projects from the LAX Master Plan and facilitating connections between job applicants and airport-based employers (not necessarily LAWA). The LAX/CBA contributes to positive airport-neighbor relations by assisting focused recruitment for airport employment among its components. As guidance, airport sponsors could tailor a CBA to local needs.

Airports require financial support for maintenance and repairs of pavement and facilities, operations, marketing, and other activities. Support is also required for local airport needs and tasks related to the broader goals found in CTP 2050.

Airports routinely provide support for local communities, especially during times of emergencies. Airports are often a staging area for both response activities and as a delivery location for goods and services. Additionally, airports are often a venue for local events and activities such as air shows, youth involvement, cultural events and as the home base for local groups such as the Civil Air Patrol. However, direct airport sponsors can not necessarily shoulder the support costs on their own. They use a combination of funding sources with availability tied to airport categories. Most financial support of capital needs is from the FAA's Airport Improvement Program (AIP), funded by congressional appropriations, distributed as grants or entitlements. AIP is applied only to public-use airports in the NPIAS. The NPIAS concept is a means by which FAA looks at the states' airports collectively as systems. They are integrated by standardized designs and operations, allowing FAA to discern and prioritize needs nationwide. The NPIAS is updated every five years with estimates from FAA regional offices and forecasts from state system plans: "While all 5-year capital estimates are AIP-eligible, some may be funded by other sources, including Passenger Facility Charges (PFCs), airport revenue from tenants and services, or financing such as bonds."[4] PFCs are surcharges on airline tickets added and collected by airport sponsors.

[3] https://www.lawa.org/-/media/lawa-web/lawa-our-lax/cbastatusreport2019.ashx

[4] FAA NPIAS 2019-2023: Report of the Secretary of Transportation to the United States Congress Pursuant to Title 49 U.S. Code, Section 47103.

Accordingly, a major primary airport with commercial airline service using bond financing can also use PFCs, but a medium-sized General Aviation (GA) airport outside a metropolitan area cannot. These airports will likely be collecting landing fees, hangar rentals or applying for FAA AIP grants. A smaller, rural airport may add to these sources, in addition to their eligibility for FAA entitlements. The entitlements for non-primary airports are $150,000 annually.[5] FAA defines primary airports as commercial service (CS) airports with more than 10,000 annual enplanements; non-primary airports are CS airports with at least 2,500 and no more than 10,000 enplanements (or, passenger boardings). CS airports serve scheduled airlines; GA airports serve all other aircraft operations except airlines and the military. (There are 21 military airports that allow civilian aircraft access.)[6]

The Division provides grants and loans to fund airport projects for safety, maintenance, and capital improvements as well as for the preparation of Airport Land Use Compatibility Plans (ALUCPs) through the California Aid to Airports Program (CAAP). State excise tax on GA fuel is the division's primary source of revenue to fund and maintain its grant programs. Aviation gasoline and GA jet fuel are taxed per Revenue and Taxation Code sections 7360 and 7392, respectively. Prior to the fiscal year that began in 2009, revenues averaged approximately $7,500,000 annually. Since the Great Recession from 2008-2009, these figures fell to $5,686,000 at the end of State fiscal year 2019. The amount rose to $6,104,000 in fiscal year 2020. These funding declines have adversely impacted two of the three CAAP grant programs (detailed below) by eliminating funding for one and greatly reducing funding for another.

State Annual Credit

A total of 149 of California's GA airports are eligible to receive a $10,000 annual credit. These funds can be used for airfield maintenance and construction projects as well as airfield and land use compatibility planning. It is possible to accumulate these funds for up to five years.

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5 Non-primary entitlement is available to use in the fiscal year it becomes available and the following three fiscal years. Sponsors may choose to delay using their entitlements until the final year in order to fund a larger project. Unused funds expire after four years unless the sponsor obligates the funds under a grant or transfers the funds to another NPIAS airport.

6 https://www.faa.gov/airports/planning_capacity/joint_use_airports/

Airports can request the $10,000 each year or request a greater amount from a future year once funds have accumulated.[7] Reliever airports are not eligible. FAA defines Reliever airports as airports designated by the FAA to relieve congestion at CS airports and to provide improved GA access to the overall community. These may be publicly or privately owned. Approximately 88 percent of NPIAS airports are GA.

Airport Improvement Program Matching Grant

An AIP Matching Grant is a State grant designed to assist an airport sponsor in meeting the local match for an AIP grant from the FAA. At times, the Division has implemented caps on per project AIP Match grants (some below a 5% match) to ensure the maximum number of airports are able to benefit from this program. Local airport sponsors make up the difference.

Acquisition and Development Grant

The Acquisition and Development (A&D) program is designed specifically to provide State grants to eligible, publicly owned, public-use airports for planning, construction, and land acquisition. Funding for A&D grants is provided through any funds remaining after Annual Credits and AIP Matching Grants are programmed. A&D grants typically range between $20,000 and $500,000 for a given project. Since Fiscal Year 2017-2018, A&D grants have not been programmed, as there were no remaining funds from Annual Credits and AIP Matching Grants.

State Loan Program

The Division also administers a revolving loan program, which has not been fully utilized and has additional capacity. Three types of loans are available: Revenue Generating Loans, Airport Development Loans, and Matching Funds Loans. These are typically low-interest loans, repayable over a period not to exceed 17 years, and dedicated for GA use.

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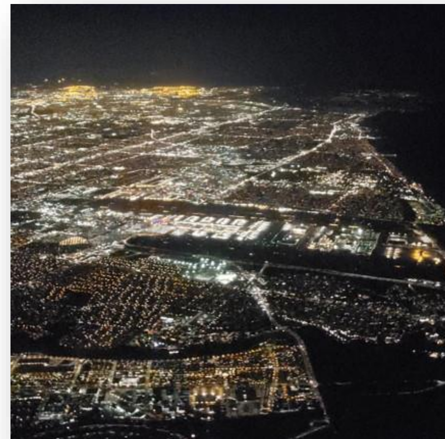
[7] State of California Department of Transportation (Caltrans), Division of Aeronautics (Division) 2019b. California Department of Transportation "State Dollars for Your Airport." Sacramento, CA. https://dot.ca.gov/-/media/dot-media/programs/aeronautics/documents/1016-state-dollars-for-your airport-october-2019-a11y.pdf

INFRASTRUCTURE AND SAFETY

The United States has more than 5,000 airports nationwide, of which 3,304 are included in the NPIAS. An airport must be included in the NPIAS to be eligible to receive a federal AIP. The FAA works with state aviation agencies and local planning organizations to identify public-use airports that should be included in the NPIAS. CASP 2020 departs from this practice with its emphasis on aviation, versus typical SASPs (and FAA's system plan guidance) focusing on airports.



Division of Aeronautics file photo

CASP 2020 takes a new approach to say that aviation is successful when airports are supported appropriately. The result is aviation's part in CTP 2050 for "a high-quality resilient transportation system." Resiliency becomes a crucial matter for California when considering the potential for the State to be more seriously impacted by climate change. Of special note, Caltrans and the Department of Forestry and Fire Protection (Cal Fire) should collaborate on decisions about airports utilized for wildfire response. Considering the wildfires of 2020, strategic locations reviewed with Cal Fire's federal firefighting partners and airport sponsors would be a worthy investment of time. The collaboration would assist FAA planning efforts for the best use of grant support without diminishing airport support in other areas of the State.

FORECASTS, TRENDS AND NEEDS

CASP 2020 does not undertake forecasts for airport flight activity levels, enplanements, or based aircraft that are often seen in SASPs. Instead, FAA's Aerospace Forecast (Forecast) is utilized to review aviation issues from airport and operational perspectives for the 20-year period from 2019 to 2039.[8] The Forecast pre-dates the COVID-19 event and the key matters are listed below for an overview of industry well-being and expectations.

Source: FAA

[8] FAA Aerospace Forecast, Fiscal Years 2019 to 2039. https://www.faa.gov/data_research/aviation/aerospace_forecasts/

Commercial Aviation

The FAA foresees the air carrier trends from recent years continuing:

- Selective capacity expansion
- Steady growth in the number of seats per aircraft
- Increased competitive pressure to ultra-low-cost carrier expansion; and
- Increased price discrimination

General Aviation

GA covers everything other than commercial service and military aviation. It has several components to consider in assessing future needs or directions. According to the Forecast, GA has declined slightly in recent years but currently appears to be holding steady.

Pilots and Mechanics

The Forecast also monitors national aviation activity based on the number of active pilots. The total number of pilots is projected to increase from a total of 469,455, pilots in 2019 to a total of 478,015 in 2039, with a modest growth rate of 0.3% from 2019 through 2039.

There are concerns in the aviation industry regarding a current and future shortage of aviation maintenance personnel. Economists estimate the deficit will emerge sooner in Asia, but recent (labor) forecasts indicate that there could be a shortage of more than 40,000 certified aviation mechanics in the U.S. between 2018 and 2036.[9]

E-commerce and Air cargo

E-commerce growth and demand for same-day and next-day delivery service is resulting in modest increases in air cargo at urban airports. Amazon has opened nine "Prime Now" hubs clustered around Los Angeles, San Francisco, San Diego, Sacramento, and San Jose. Caltrans' latest California Air Cargo Groundside Needs data (updated from the 2013 study) indicates the cargo tonnage at airports is expected to grow at most airports by 2040.

[9] Aerospace Manufacturing and Design; April 3, 2018. https://www.aerospacemanufacturinganddesign.com/article/addressing--the-aviation--mechanic shortage/

Key Emerging Technologies and Trends

The horizon has a clear view ahead of State and national efforts aligned with CTP 2050 goals of environment, climate, and safety. A key focus is the reduction of Greenhouse Gas (GHG) emissions, which places emphasis on jet fuel. Jet fuel is petroleum-based and used in aircraft powered by gas-turbine engines. The most common refinements for civil aviation are called Jet-A and Jet A-1, from standardized international specifications.

The Commercial Aviation Alternative Fuels Initiative (www.caafi.org) is a collaboration among FAA, airlines and fuel producers to further develop jet fuel alternatives. FAA has its own research and development programs, and it remains in regulatory control of aviation fuels. To date, FAA has approved five "bio-feed" alternatives to Jet-A. Their use varies, but airline and corporate operators are presently conducting operations with Safe Alternative Jet Fuel (SAJF). In addition, GHG emissions have been in decline according to the U.S. Environmental Protection Agency in the excerpted chart seen below:

U.S. Transportation GHG Emissions (Tg CO_2 Equivalent)

								Change from 1990 to 2018	
Source	1990	2005	2014	2015	2016	2017	2018	Absolute	Percent
Aircraft	**189.2**	**193.6**	**151.3**	**160.5**	**169.0**	**174.8**	**175.5**	**-13.7**	**-7.2**
Commercial Aviation	110.9	134.0	116.3	120.1	121.5	129.2	130.8	19.9	17.9
Military Aircraft	35.3	19.5	14.1	13.6	12.4	12.3	11.9	-23.4	-66.2
General Aviation	42.9	40.1	20.9	26.8	35.1	33.3	32.8	-10.2	-23.7

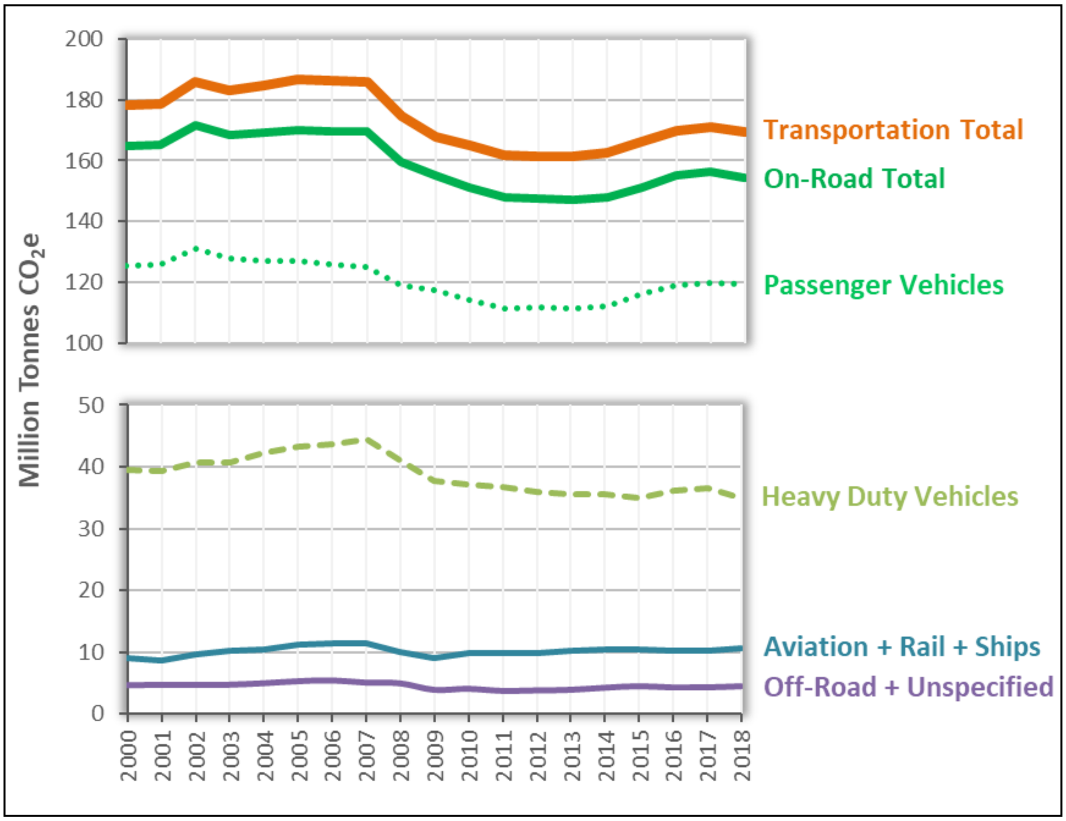
Source: "Fast Facts" / U.S. Transportation Sector GHG Emissions (EPA), 1990-2018.

Improvements in engine technology continue to facilitate a reduction in GHG emissions.[10] The 2020 edition of the GHG inventory from the California Air Resources Board (CARB) shows notable findings related to State goals for emission reduction:

[10] International Air Transport Association (IATA) study, "Aircraft Technology Roadmap to 2050." https://www.iata.org/contentassets/8d19e716636a47c184e7221c77563c93/technology20roadmap20to20205020no20foreword.pdf

- California statewide GHG emissions dropped below the 2020 GHG limit in 2016, remaining below the 2020 GHG limit since then
- Transportation emissions decreased in 2018 compared to the previous year, which is the first year over year decrease since 2013

GHG emission reductions from Transportation in California are seen below:



CARB Overview of GHG Emissions from the Transportation Sector (2000-2018).
https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

Since 2010, the FAA has worked with industry stakeholders to develop a new, lead-free version of "avgas" (higher octane fuel used only for piston aircraft engines) in the Piston Aviation Fuel Initiative (PAFI). The continued use of leaded fuel in GA is a safety matter.

Lead protects against uncontrolled combustion, or detonation (engine knock), in piston engines and to guard against engine failure under conditions for aircraft engines that are not the same for automobile engines.

- The Next Generation Air Transportation System (NextGen) air traffic control system is the FAA-led modernization effort to make flying safer, more efficient, and more predictable. Rather than a single technology, NextGen includes the implementation of several technologies to transform the NAS from a ground-based system of air traffic control to a satellite-based system of traffic management.
- Transportation Network Companies (TNCs) have become a popular choice for airport users. TNC use appears to have direct impacts on California airports by changing the way people travel to and from the airport. Less use of airport parking or rental cars leads to decreased revenues. Although no recent studies quantify the revenue impact, data from Southern California airports indicate that ride-hailing fees charged by airports have sufficiently off-set decreased revenue from fewer trips by taxis.
- Unmanned Aircraft Systems (UAS), commonly referred to as drones, and Urban Air Mobility (UAM), from the introduction of electric aircraft, depict the movement of people and small goods from point-to-point in congested urban areas as "airborne taxis." UAM is becoming known as "Advanced Air Mobility" (AAM) because it may not be confined to urban areas. The two segments provide opportunities to expand employment and manufacturing opportunities. New aircraft types will require design and testing, and ground support will be required for operations and maintenance. However, electric aircraft could affect California's power generation infrastructure. Examining new supplies of electricity is beyond the scope of CASP. FAA regulatory use of airspace is evolving to safely integrate new aircraft types with existing aircraft.
- Caltrans policy is evolving for any proposed use of rights-of-way for landing sites. The use of electric aircraft may also have the potential of being interrupted by power shutoffs related to extreme heat and wildfires.
- Compatible non-aeronautical development can offer potential for California airports to supplement revenue from airport operations. It remains subject to FAA scrutiny for airports that accept federal grants.
- FAA Order 5190-6B is the "Airport Compliance Manual" that defines the obligations for airport sponsors associated with the use of federal grants, including land use compatibility. An FAA Order is an instructional document for FAA employees to implement policy and statutes.
- The Airport Compliance Manual doesn't rule out non-aeronautical development: "Many communities have relied upon their airports as an economic engine. Proximity of industrial parks and recreational areas has proven not only to be compatible, but to be mutually beneficial as well." However, the Airport

Compliance Manual is specific in stressing compatibility: "Incompatible land use at or near airports may result in the creation of hazards to air navigation and reductions in airport utility resulting from obstructions to flight paths or noise-related incompatible land use." When assessing future needs, airport planning and municipal planning require collaboration for optimal support of community needs. The Division regularly confers with local officials on land use cases that arise in the vicinity of airports to help resolve potentially incompatible land use.

Capacity

Aviation system capacity refers to the ability of the aviation system to meet the anticipated demands for air travel. Airport capacity refers to the ability of an airport to meet the anticipated or forecast demand for enplanement and operations. Airports with insufficient capacity can experience congestion and flight delays that affect the rest of the aviation system. In the latest FAA analysis, San Francisco International (SFO) airport was identified as the one California airport having capacity-related constraints—due especially to geography. However, FAA acknowledged SFO's participation in regional planning efforts to address capacity needs.

Caltrans completed the "California Interregional Transportation Strategic Plan" (ITSP) in 2015, which identifies specific corridors that support the interregional movement of freight, tourism, and business travel. Airports are acknowledged in the ITSP for their part in critical "first and last-mile connectors" for the non-flight segments of freight delivery. Airport contributions for interregional corridor maintenance are complex due to FAA criteria as applied outside of airport property. Regional initiatives may be the answer to address funding limitations for achieving some level of comprehensive support for airport connections with strategic corridors.

MOBILITY AND ACCESS

Within the CTP 2050 goal of improving accessibility through a multimodal emphasis, the contribution of aviation hinges on key factors (in section 5.6):

- Transportation to airports may cross jurisdictional boundaries, thereby diffusing planning efforts among multiple agencies
- Funding for airport access projects may be challenged by limitations in regulations and criteria

Division of Aeronautics file photo

- Cargo or passenger access cannot improve without additional connections to “key corridors” or port facilities
- Promoting access to California’s non-commercial service airports can be challenged by limited or non-existent local transit routes or connections
- The addition of active transportation elements for travelers and employees at airports would be beneficial. These elements include bicycle, pedestrian, shared ride and multimodal transportation.

Planning and Funding as Key Issues

Efforts for ensuring airport access and mobility are often challenging because airport planning activities may not be aligned with local and municipal planning. Additionally, as airports assess needs and formulate plans to address those needs, they come to heavily rely on financial assistance from FAA through AIP grants. Additional funding can be used from applicable airport revenues (e.g., tenant rents, parking, etc.), but the funds are applied via airport planning, not municipal planning. When a project extends beyond the airport entrance, FAA imposes limits on AIP within defined parameters of short distances for access roads or nearby transit stops.

Microtransit, Transportation Network Companies and Active Transportation

Microtransit concerns the use of on-demand public transit services that can offer fixed or flexible routes for passengers and on-demand scheduling. Microtransit providers typically use mid-size passenger vans. Microtransit has the potential to provide affordable transportation options for airport access by employees and air travelers during non-service hours, or where local transit service only reaches the airport vicinity instead of a direct airport stop.

While TNCs are both prevalent and popular, they may create negative effects on mobility and access for airports. The use of TNCs to drop off passengers can lead to increased congestion in the terminal area and nearby roads, and many airports have identified specific waiting areas for TNC vehicles away from terminals. In addition, the increased use of TNCs may have contributed to a decrease in the number of passengers using public transit or shuttle services. Long-time shuttle services, such as SuperShuttle, have gone out of business nationwide (Hamm et al. 2019).

And the availability of hotel shuttles has decreased. These challenges are not confined to airport passengers but also affect those who work at airports. Several key factors affect airport access for employees: [11]

- The availability of transit service at the employee residence
- The accessibility of the employee worksite to transit service, as not all employees work in publicly accessible areas of the airport
- The availability of transit service during non-traditional work hours
- The availability and cost of parking
- Access to an automobile
- Access to, and availability of, Active Transportation options, including sidewalks and bicycle lanes

Active Transportation in CASP 2020 aligns with the CTP 2050 for Quality of Life. Inclusive planning is needed for facilitating walking or bicycling access. Active Transportation modes span CASP 2020 in Mobility and Access, Trends and Land Use by:

- Applicability to commercial service and GA airports
- Facilitating designated movement areas and inter-modal connections
- Availability for airport passengers and employees alike

General Aviation Access

California's 241 public-use airports that do not provide scheduled passenger service in metropolitan areas, nor are near major business centers, serve a wide array of public interests and services, including:

- Business/corporate, recreational, and cargo
- Flight training and emergency response
- Agriculture, firefighting, or medical and emergency support

Each service or function is worthy of convenient access. Yet, this segment of aviation is often only accessible by personal vehicle. GA airports located in urban areas may have car rental vendors or may be served by regional bus service, but airports in suburban and rural areas may not, due to specific challenges:

[11] Airport Cooperative Research Program. 2008. "Ground Access to Major Airports by Public Transportation." http://www.trb.org/Publications/Blurbs/157099.aspx

- Insufficient demand to support transit service
- Users of GA airports may draw from a large catchment area (the geographic area from which an airport can reasonably expect to draw passengers) that involves multiple communities whose transit services might not cross jurisdictional boundaries

Regional transportation planning becomes critical to support the roles of GA airports because:

- GA airports meet community needs as well as those of the flying public through a broad mix of fixed-wing and helicopter operations
- Corporate jet activity and air taxi/charter operations mutually impact both the business community and the airport's bottom line
- Aircraft sales, parts, and maintenance/repair all contribute to an airport's role in the local economy

Freight and Corridors

In California, the number of Cargo and Freight Agents is expected to grow much faster than average growth rate for all occupations. Jobs for Cargo and Freight Agents are expected to increase by 19.8 percent, or 2,600 jobs, between 2016 and 2026. The share of these jobs in aviation is estimated to be 7.3%.[12] The economic impacts of air cargo include direct, indirect, induced, and catalytic effects. However, most jobs, and the benefits derived from them, are located at a few airports—typically, those near highway corridors critical for California's transportation as described in Caltrans' ITSP:

[12] California Employment Development Department: https://www.labormarketinfo.edd.ca.gov/OccGuides/detail.aspx?Soccode=435011&Geography=0604000001

Freight Volumes at Airports within 2 miles of Strategic Interregional Corridors		
Corridor	**Number of Airports**	**Freight / Mail (lbs.)**
North-South Corridors		
San Diego/Mexico - Inland Empire	8	330,763,978
South Coast - Central Coast	10	7,364,302,042
Central Coast - San Jose/ San Francisco Bay Area	14	125,012,438
San Jose/San Francisco Bay Area - North Coast	17	2,822,764,232
San Jose/San Francisco Bay Area - Central Valley – Los Angeles (LA)	26	8,751,915,156
Sacramento – Oregon	10	256,981,821
High Desert - Eastern Sierras - Northern Nevada	11	1,154,077
East-West Corridors		
Southern CA - Southern Nevada/Arizona	15	7,258,654,116
Central Coast - Central Valley East/West Connectors	17	6,721,304
San Jose/San Francisco Bay Area - Sacramento - Northern Nevada	12	3,349,648,689
North Coast - Northern Nevada	12	412,609,085

One hundred and fifteen (115) of the State's 241 public-use airports are within 2 miles of a strategic interregional corridor. Yet, as noted below, airport use for cargo interests are concentrated at 35 airports, creating the potential for economic development at under-utilized airports.

Airports with Air Cargo Operations Adjacent to Strategic Interregional Corridors

Airport	Corridors	Class	Air Cargo (lbs.)
Los Angeles (LAX)	• South Coast-Central Coast • San Jose / San Francisco Bay Area – Central Valley – LA • Southern California – Southern Nevada/Arizona	Commercial Service Primary	5,336,561,890
Ontario (ONT)	• South Coast-Central Coast • Southern California – Southern Nevada/Arizona	Commercial Service Primary	1,502,227,780
San Francisco (SFO)	• San Jose San Francisco Bay Area – Sacramento-Northern Nevada • San Jose / San Francisco Bay Area – Central Valley – LA • San Jose / San Francisco Bay Area – North Coast	Commercial Service Primary	1,468,184,839
Oakland (OAK)	• San Jose San Francisco Bay Area – Sacramento-Northern Nevada • San Jose / San Francisco Bay Area – Central Valley – LA • San Jose / San Francisco Bay Area – North Coast	Commercial Service Primary	1,352,063,005
San Diego (SAN)	• San Diego/Mexico Border – Inland Empire Connections • South Coast-Central Coast • Southern California – Southern Nevada/Arizona	Commercial Service Primary	330,763,978
Sacramento (SMF)	• San Jose San Francisco Bay Area – Sacramento-Northern Nevada • North Coast-Northern Nevada • Sacramento Valley – Oregon • San Jose / San Francisco Bay Area – Central Valley – LA	Commercial Service Primary	255,000,436
Mather (MHR)	• San Jose San Francisco Bay Area – Sacramento-Northern Nevada • North Coast-Northern Nevada	Reliever	154,269,245

Airport	Corridors	Class	Air Cargo (lbs.)
San Jose (SJC)	• San Jose San Francisco Bay Area – Sacramento-Northern Nevada • San Jose / San Francisco Bay Area – Central Valley – LA • Central Coast- San Jose/San Francisco Bay Area	Commercial Service Primary	120,093,388
Burbank (BUR)	• South Coast-Central Coast • San Jose / San Francisco Bay Area – Central Valley – LA	Commercial Service Primary	105,423,498
Stockton (SCK)	• San Jose / San Francisco Bay Area – Central Valley – LA	Commercial Service Primary	89,399,267
Long Beach (LGB)	• South Coast-Central Coast • Southern California – Southern Nevada/Arizona Corridor	Commercial Service Primary	46,839,298
John Wayne (SNA)	• South Coast-Central Coast	Commercial Service Primary	39,159,450
Fresno (FAT)	• San Jose / San Francisco Bay Area – Central Valley – LA	Commercial Service Primary	20,468,771
Santa Barbara (SBA)	• South Coast-Central Coast	Commercial Service Primary	3,326,148
Visalia (VIS)	• Central Coast – San Joaquin Valley East/West Connections Corridor • San Jose / San Francisco Bay Area – Central Valley – LA	General Aviation	2,583,879
Santa Maria (SMX)	• Central Coast- San Jose/San Francisco Bay Area Corridor	Commercial Service Primary	2,354,713
Bakersfield (BFL)	• Central Coast – San Joaquin Valley East/West Connections • San Jose / San Francisco Bay Area – Central Valley – LA	Commercial Service Primary	2,136,194

Airport	Corridors	Class	Air Cargo (lbs.)
San Luis Obispo (SBP)	• Central Coast- San Jose/San Francisco Bay Area Corridor	Commercial Service Primary	1,967,506
San Bernardino (SBD)	• Southern California – Southern Nevada/Arizona Corridor	Reliever	1,859,081
Redding (RDD)	• North Coast-Northern Nevada • Sacramento Valley – Oregon	Commercial Service Primary	1,726,688
Arcata (ACV)	• North Coast-Northern Nevada • San Jose / San Francisco Bay Area – North Coast	Commercial Service Primary	1,612,722
Inyokern (IYK)	• High Desert-Eastern Sierra-	General Aviation	666,529
Ukiah (UKI)	• San Jose / San Francisco Bay Area – North Coast	General Aviation	618,264
Monterey (MRY)	• Central Coast- San Jose/San Francisco Bay Area Corridor	Commercial Service Primary	569,378
Palm Springs (PSP)	• Southern California – Southern Nevada/Arizona	Commercial Service Primary	402,089
Bishop (BIH)	• Northern Nevada Corridor	General Aviation	381,752
Murray Field (EKA)	• San Jose / San Francisco Bay Area – North Coast	General Aviation	284,070
Chico (CIC)	• Sacramento Valley – Oregon	General Aviation	254,701
Victorville (VCV)	• High Desert-Eastern Sierra-	Reliever	105,793
McClellan (MCC)	• San Jose San Francisco Bay Area – Sacramento-Northern Nevada	General Aviation	37,786

Airport	Corridors	Class	Air Cargo (lbs.)
Paso Robles (PRB)	• Central Coast- San Jose/San Francisco Bay Area Corridor • Central Coast – San Joaquin Valley East/West Connections	General Aviation	13,728
Salinas (SNS)	• Central Coast- San Jose/San Francisco Bay Area Corridor • Central Coast – San Joaquin Valley East/West Connections	General Aviation	13,727
Tehachapi (TSP)	• Central Coast – San Joaquin Valley East/West Connections	General Aviation	6,272
San Luis Obispo (SBP)	• Central Coast – San Joaquin Valley East/West Connections	Commercial Service Primary	1,967.51
Sonoma County (STS)	• San Jose / San Francisco Bay Area – North Coast	Commercial Service Primary	1,337
Total airports: 35		Total freight (lbs.): 10,841,379,170	

Assessing Expansion of Freight Options

Air cargo operators may consider expansion outside their established hubs when the cost of delays outweighs the efficiencies and cost savings of concentration and colocation. Thus, air cargo companies that operate outside of the networks of all cargo carriers, such as courier services, medical deliveries, and intra-regional logistics companies, may realize benefits by developing their facilities at less congested airports. Airport operators can assess the adequacy of their facilities for air cargo development using the guidelines in the 2015 "Air Cargo Facility Planning and Development Final Report," which also provides a planning and development framework for airports to develop or improve air cargo infrastructure.[13]

Climate Change Resiliency

Caltrans has developed district-specific Vulnerability Assessments to better understand the risk to the State Highway System and other Caltrans assets. The assessments seek to:

- Understand the types of weather-related and longer climate change events that will occur with greater frequency or intensity in the future
- Assess and identify system assets that are vulnerable to various climate influences and natural hazards
- Develop a method to prioritize candidate projects that respond to climate change concerns as resources become available

Climate/extreme weather conditions evaluated for each Caltrans district include temperature increase, precipitation volatility, sea level rise (SLR), storm surge, wildlife, and combined events (i.e., wildlife and flooding, SLR and storm surge). These assessments can also be applied to aviation facilities.

The Assessments are summarized in **Appendix E.**

[13] National Academies of Sciences, Engineering, and Medicine: "Air Cargo Facility Planning and Development", 2015.

LAND USE AND SUSTAINABILITY

Photo: Courtesy of Butte County, CA

This section of CASP 2020 draws from legislation related to land use, other measures designed to benefit long-term economic and environmental goals for the State, and—from the goals of CTP 2050—discrepancies that merit attention for safety and community well-being. CTP 2050 “aims to advance social equity by actively directing support, resources, and protections to disadvantaged communities” (Caltrans 2021). For example, a housing proposal close to an airport may not cover “protections to disadvantaged communities” if decisions are made on the proposal that do not acknowledge potential noise and safety implications. Close attention to land use matters also comes to bear on the CTP 2050 goal for Quality of Life and Public Health.

Urban Development Induced by Airport Development

When the City of Sacramento regained control from the U.S. Army of Sutterville Aerodrome, after the end of World War II, it was re-named Sacramento Municipal Airport. It served the community from a location southwest of downtown, away from residential neighborhoods, with room to grow as post-war air commerce continued to expand after 1947. Eventually, on-going needs required an airport dedicated to airline service, and Sacramento International Airport was constructed in 1967. The municipal airport then focused on GA operations and was re-named Sacramento Executive Airport (SAC). During these years, and beyond, residential, and commercial zones continually expanded such that they now encircle SAC (below):

Sacramento Municipal Airport, 1947

Sacramento Executive Airport, 2016

Nationwide Environmental Title Research, LLC. (NETR). 2020. NETROnline: Historic Aerials. Available at https://www.historicaerials.com/.

The Replicating Pattern of Urban Development

The scenes above occur nationwide as the Airport Cooperative Research Program (ACRP) found in 2010. The document states "Airport relocation is no longer an easy or viable remedy for most communities seeking to address the effects of airport encroachment. Sites for new airports have become increasingly rare, and if a new site is found, communities tend to expand toward the airport and the whole cycle begins again."[14]

However, the issue involves more than development zones changing or expanding over time. General Plans may follow guidance to be updated every 10 years, but ALUCPs do not. They can be updated at the discretion of an Airport Land Use Commission (ALUC), just not more than once a year. Consequently, ALUCPs can possibly become outdated. The Division has found that the average age of current ALUCPs in the State is approximately 17 years. The situation is exacerbated as changes occur from local elections and professional airport staff insufficiencies. In addition, municipal and airport planning are not always congruent.

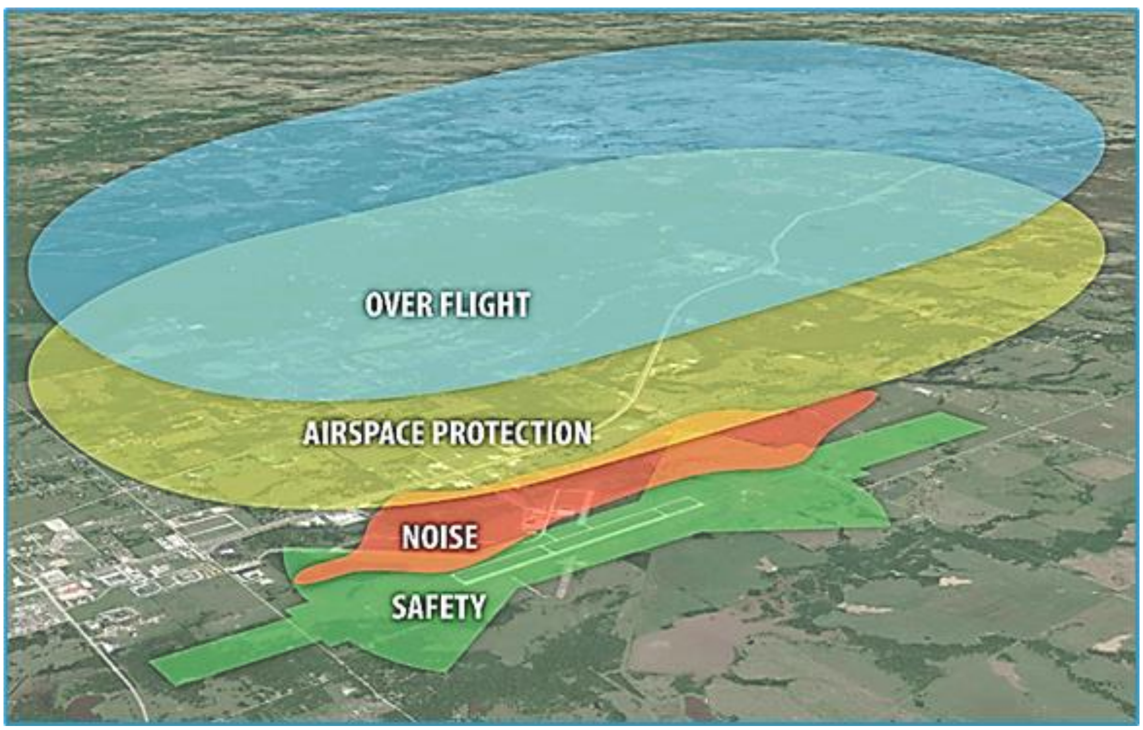
[14] ACRP Report 27, "Enhancing Airport Land Use Compatibility, Volume 1: Land Use Fundamentals and Implementation Resources."

Compatibility Factors

Airport land use compatibility planning seeks to "minimize the public's exposure to excessive noise and safety hazards" while providing for the "orderly expansion of airports" (PUC section 21670 (a)(2)). The California Airport Land Use Planning Handbook (Handbook) identifies the types of compatibility concerns that ALUCs should consider. Thus, each ALUCP can be customized to reflect individual airport conditions. The Handbook discusses four types of "compatibility factors" for land use near an airport:

- Noise
- Overflight
- Safety
- Airspace Protection

Taken together, the areas comprise multiple levels of an airport-specific Airport Influence Area (AIA), illustrated below:



Source: Mead & Hunt, Inc., 2019

Each level works to minimize the public's exposure to excessive noise and safety hazards, but there are limits to local regulation. For example, zoning can be used as a safety buffer between the airport and residential or commercial development. Airport overlay districts are applied like zoning for airspace protection. These measures address vertical structures and land use close to runway ends.

An example is Runway Protection Zones that are tied to airport development plans. However, it should be noted that airspace is federal jurisdiction controlled by FAA via Congressional mandate. Therefore, FAA can only examine development proposals for any impacts to airspace. To address the other compatibility factors, FAA regulations and grant support can be used for noise studies and mitigation. Overflight concerns are typically addressed with avigation easements[15] for property owners, or real estate disclosures for prospective property owners, as the means to acknowledge aeronautical activity overhead.

CONCLUSION

Aviation as a modal component within the CTP 2050 provides vital support for the integrated movement of goods and people in California. To continue to contribute to the economy and the social wellbeing of California, aviation activities and facilities need strong and consistent planning, policy, and funding support. The vision of CASP 2020 is for aviation in California to be supported successfully through elements that will maintain its value to the State. These include integration of State and federal funding mechanisms, harmonizing regional or local land use plans that are fully coordinated between airport and local/regional planners for consistent guidance of development, and retaining airport utilization through the combined use of 14 CFR Part 77 and Airport Design Standards.[16]

[15] From FAA's Airport Sponsor Guide, Section 560/Airport Property Interests (abridged): "An avigation easement is a conveyance of a specified property interest for a particular area that restricts the use by the owner of the surface. Such easement rights may consist of the right-of-flight of aircraft; the right to cause noise, dust, etc., and the right to remove all objects protruding into the airspace together with the right to prohibit future obstructions in the airspace."

[16] 14 CFR Part 77 applies to required evaluation and mitigation of obstructions near airports. Design Standards from AC 150/5300-13 allow adjustments to runways and approach and departure airspace in order to clear obstructions.

Chapter 1:

Introduction and Regulatory and Policy Framework

In February 2021, the State of California Department of Transportation (Caltrans) published the California Transportation Plan 2050 (CTP 2050), which offers an aspirational vision, articulates strategic goals, and presents policies and recommendations to improve mobility and accessibility while reducing greenhouse gas emissions. To further these efforts, the Division contributes CASP 2020, which considers California's airports, heliports, and aviation infrastructure as a single system. CASP 2020 is being done with grant support from the FAA. It marks a new direction to integrate the aviation system into the State's vast, multi-modal transportation system. Accordingly, CASP 2020 will serve as one of six modal plans included in CTP 2050. It will support Caltrans' ongoing mission, as expressed in its mission statement:

"Provide a safe and reliable transportation network that serves all people and respects the environment."

CASP 2020 identifies the new technologies, trends, and global influences that are affecting California aviation and its role within the overall transportation network. With FAA approval, it departs from previous versions that periodically reviewed individual elements by instead presenting a comprehensive update within a new vision of how aviation will help the State face challenges from sea level rise, greenhouse gas emissions, and ongoing demographic change.

California's Aviation System Plan has previously presented individual elements associated with facility inventories, improvements, and funding to review needs and capabilities pursuant to the California Public Utilities Code (PUC) section 21701. The CASP must also address the Federal Aviation Administration's (FAA) Advisory Circular (AC) 150/5070-7 (Change 1) to help guide its (grant) support of airport improvements. CASP 2020 incorporates both requirements within a vision for aviation's service to the State by discussing:

- The regulatory and policy frameworks associated with aviation system planning
- How the "new" CASP complies with those regulatory and policy frameworks, and
- The relationship between CTP 2050 and past elements of the system plan

1.1 BACKGROUND

California's transportation is currently on the verge of transformation. These changes affect surface traffic patterns and must be considered during land use designs. The envisioned use of on-demand air travel services in our cities and the use of unmanned aircraft systems (UAS) to conduct business will affect how we plan our aviation system, airspace, and nearby land use. Technological changes in surface transportation, such as the use of driver-assistance features for vehicles on our streets and highways and the construction of the State's high-speed rail, are perhaps the most conspicuous signs of these changes. The use of shared vehicles and shared ride services are changing the way many passengers travel to and from California airports. Transportation is changing, and Caltrans is looking ahead to the way it envisions the State's multimodal transportation system and its component facilities.

To address recent and forthcoming changes in California's multi-modal transportation network, Caltrans has re-envisioned its long-range planning. Beginning with the development of the California Transportation Plan 2040 (CTP 2040) in 2015, Caltrans undertook a more integrated, systematic, and strategic approach to transportation planning. This new approach expanded consideration beyond individual modes of transportation and transportation facilities and focused on how they work together to comprise a statewide, integrated transportation network that moves people and goods throughout the State of California. This integrated approach allowed Caltrans to consider overall gaps among and between transportation modes, identify changes to optimize the transportation of goods and services, and, in doing so, reduce the greenhouse gas (GHG) production in accordance with state mandates. The processes initiated with the publication of CTP 2040 was further refined in the forthcoming publication of the next statewide transportation plan, California Transportation Plan 2050 (CTP 2050), which was published in early 2021 and presents a 30-year planning horizon. The Caltrans Division of Aeronautics (Division) is revising the California Aviation System Plan (CASP) to create a new vision for California aviation that will be integrated with CTP 2050. CASP 2020 will be a visioning document and will serve as the foundation for a future implementation program for the vision.

- **Statewide Transportation Planning Goals:** As one of six modal transportation plans that comprise Caltrans' CTP 2050, the CASP considers the role of aviation in meeting the current and future needs for moving goods and people. The CASP considers how the State's aviation facilities function as a system and how that system supports the State's overall multimodal transportation network.

- **Statewide Aviation System Planning Goals:** To support the CTP 2050, the CASP identifies how the State's aviation facilities and infrastructure are classified by the FAA and Caltrans; the roles and operational differences between Commercial Service, General Aviation (GA), National Plan of Integrated Airport Systems (NPIAS) and Non-NPIAS airports, heliports, military airports and their activities; and the role of airports during emergencies. The data provided in the CASP will support subsequent planning and funding decisions for facilities and capital improvements.
- **Statewide Aviation System Planning Goals:** To support CTP 2050, CASP 2020 will identify how the State's aviation facilities and infrastructure are classified by the FAA and Caltrans; the roles and operational differences between CS and GA airports, NPIAS and non-NPIAS airports, plus heliports, military airports and their activities; and the role of airports during emergencies. The data provided in the CASP will support subsequent planning and funding decisions for facilities and capital improvements.

Objective:
The CASP presents a vision to integrate FAA and Caltrans' priorities for aviation in a manner that aligns with the CTP 2050.

Because CASP 2020 is funded by the FAA and is used to support airport funding requests, it must adhere to regulations and planning guidance in FAA AC 150/5070-7, CASP 2020 also has requirements to follow from PUC 21701 et seq. The following discussion presents an overview of the federal and State regulations that must be considered for CASP 2020.

1.2 AGENCY ROLES AND REGULATORY FRAMEWORK

1.2.1 Federal Aviation Administration

Division staff must address applicable federal and State statutes, regulations, and guidance during preparation of CASP 2020. In doing so, the Division is guided first by federal statutes and directives, then State statutes, then Caltrans directives. This uncompromising order stands in place for specific reason: the FAA is congressionally mandated to manage U.S. aviation and airspace. The FAA applies Title14 CFR and its "Parts," and publishes guidance and regulatory documents known as Orders and ACs that are used for all aeronautical issues and activities. The standards set forth in certain FAA regulations have been incorporated into State regulations, which are enforced by the Division.

Also, the FAA manages AIP, which provides grants for capital improvement projects at NPIAS airports. The NPIAS report of 2021-2025 identifies 3,304 public use airports that are significant to national air transportation and, therefore, are eligible to receive federal grants under the AIP (FAA 2020). California's aviation system relies on AIP funding to help maintain and improve airports in compliance with FAA regulations. Airport sponsors who receive federal grant dollars for capital improvements must adhere to FAA regulations and standards or risk the loss of federal funds (FAA/AIP Grant Assurances).

Attachment 1-A, at the end of this chapter, identifies the FAA's roles and responsibilities as they are associated with system planning and other topics that will be addressed in CASP 2020.

Federal System Planning Regulations and Guidance

Pursuant to Federal Law 49 United States Code (USC) 47102(8), state, metropolitan, and regional airport system plans must be developed to provide information and guidance on the extent, kind, location, and timing of public airport improvements needed to provide a viable, balanced, and integrated system of public-use airports. FAA uses system plans to assist with AIP programming.

AC 150/5070-7 provides guidance for use in accomplishing effective airport system planning and stresses the importance of state aviation system plans to the national air transportation system. The current version of the AC (Change 1) includes references to a two-part FAA study, "General Aviation Airports: A National Asset." The study classifies more than 3,000 general aviation airports, heliports, and seaplane bases into functional categories.

Roles and Responsibilities

FAA –Manages the national civil aviation system through the regulation of aircraft, aeronautical activities, and facilities.

State of California Department of Transportation (Caltrans) – Responsible for preparing the California Transportation Plan (CTP), which identifies the state's long-range transportation needs.

Caltrans Division of Aeronautics (Division) – Supports the statewide aviation system through State regulations, funding programs and subject matter expertise for promoting safety, airport land use compatibility, economic value of aviation, and a fully -integrated multimodal transportation system.

They reflect each facility's existing activity level and economic value to the local community, region, and nation. AIP-funded state aviation system plans must acknowledge the Asset classifications. (FAA 2012)

AC 150/5070-7 identifies the applicable elements for a system plan that can be used as needed for state or regional interests. **Attachment 1-B,** at the end of this chapter, identifies the system plan elements found in AC 150/5070-7 and how CASP 2020 will use the elements as required with federal grant assistance.

1.2.2 California Transportation Commission

The California Transportation Commission (Commission) was established in 1978 following a growing concern to provide a single, unified, statewide transportation policy. The Commission replaced and assumed the responsibility of four independent bodies: the California Highway Commission, the State Transportation Board, the State Aeronautics Board, and the California Toll Bridge Authority. The eleven-member Commission coordinates with the Secretary of the California State Transportation Agency (CalSTA) and the Legislature in formulating and evaluating State policies and plans for California's transportation programs. The Commission also oversees the development of certain guidelines associated with transportation planning. As such, the CTC must review and comment on CASP 2020. Following the Division's consideration of the CTC's comments and any necessary revisions, CTC is responsible for determining whether to adopt or disapprove CASP 2020.

1.2.3 California Department of Transportation Division of Aeronautics

The California State Department of Aeronautics was established in 1947. Following the formation of Caltrans in 1973, the Department of Aeronautics (now the Division) became one of six modal agencies within Caltrans. The Division contributes to Caltrans' overall mission of "providing a safe, sustainable, integrated and efficient transportation system" by contributing expertise focused on the State's aviation system.

The Division's priorities are established by the PUC Section 21001 (et. seq.) which includes the SAA, and the California Code of Regulations (CCR, Title 21, for Public Works, including Caltrans and the Division). Caltrans guidance and the Division's internal policies have appeared previously in the CASP Policy Element.

As directed by the SAA, the Division is responsible for providing "uniformity of the laws and regulations relating to aeronautics consistent with federal aeronautics laws and regulations." The Division also is a steward and advocate of aviation in California. In accordance with (PUC) Section 21002 of the SAA, Division efforts focus on activities that "protect the public interest in aeronautics and aeronautical progress." In addition to the powers granted to the Division by State statute, the Division is subject to departmental programs and directives, including multimodal transportation programs. In cooperation with, and in support of, the FAA, the Division serves as an advisor to Caltrans, ALUCs, and airport sponsors for ways to better include safe aviation into the fabric of California communities and multimodal transportation planning (Division, Policy Element 2016).

1.2.4 California Aviation System Plan

The Division is responsible for preparing and updating the California Aviation System Plan (CASP). The CASP must be revised every five years (PUC Section 21704) and serves as input to Caltrans' statewide transportation plan and statewide Capital Improvement Plan. The CASP is subject to review, public comment and CTC approval, inclusive of the topics identified in PUC Section 21702. Historically, the Division has addressed these topics through key elements and supplements:

Policy Element

The Policy Element has been the basis for implementing the State Aeronautics Act and identifying the Division's role in furthering Caltrans' mission, vision, and values for a multimodal, interregional transportation system. Last updated in 2016, the Policy Element has served as the CASP with policy goals, implementation measures, and performance measures associated with seven subject areas that affect, or are affected by, aviation.

General Aviation System Needs Assessment

To help the FAA understand the types of projects that might best serve the entire State aviation system, the Division prepared a comprehensive General Aviation System Needs Assessment (GASNA) supplement, which was last updated in 2013. A review in 2016 yielded a guidebook of airport resources utilized by the State Operations Center during emergencies.

The GASNA identified core project needs for general aviation airports that would fulfill safety and infrastructure needs as well as capacity upgrades. This information was made available to the FAA so that it could identify the State's priority when evaluating grant requests from California's GA airports. The projects identified in the GASNA also helped the State allocate its limited grant funds toward system-wide improvements.

Inventory Element

The purpose of the Inventory Element has been to provide an overview of the broader assets within the aviation system by examining the characteristics of each facility. The primary objective of the Inventory Element has been to capture an appropriate level of data that will ultimately be used to help the Division make informed decisions related to planning and developing the system of airports and aviation in California. The Inventory Element was last updated in 2015. It addressed public-use airports and hospital heliports, automated weather observation systems used for aviation, and the role, purpose, and authority of ALUCs in California.

Capital Improvement Plan

The Capital Improvement Program (CIP) is a ten-year, fiscally unconstrained list of capital and planning projects submitted to Caltrans. These projects are predominantly based on airport master plans or other comparable long-range planning documents prepared by airport sponsors. The CIP is compiled biennially (every two years) in accordance with the PUC Section 21704 and is presented to the CTC for review, comment, and approval. Not all projects listed in the CIP are programmed or funded.

The current CIP element was completed in 2021 for the timeframe through 2030. The approved CIP also serves as the planning document that allows Caltrans to program grants for the CAAP. (Appendix A)

The CAAP provides financial assistance to local airport sponsors. The CAAP includes two grant programs, and a third component defined by annual credits:

- AIP Matching Grants to assist local airports with their required share of FAA AIP grants
- A&D for planning, construction, and land acquisition
- Annual Credits are State funds that accrue to each eligible airport for use at the sponsor's discretion for projects tied principally to airport operations (e.g., fueling, wash racks).

1.2.5 Aviation Planning Regulations and Guidance

The overarching State guidance for CASP preparation and content is provided in PUC Section 21702. The CASP must establish "goals and objectives for aviation improvement."

Attachment 1-B identifies elements of an aviation system plan in accordance with the PUC and explains how the new CASP will fulfill those requirements, and how they correspond to FAA guidance in AC 150/5070-7.

1.3 THE CALIFORNIA TRANSPORTATION PLAN

The CTP is a long-range, fiscally unconstrained planning document that articulates Statewide transportation priorities and sets a roadmap for future transportation investments. It serves as the guiding document for Statewide and regional transportation policy and is also informed by local modal plans, Regional Transportation Plans and Sustainable Communities Strategies (RTP, SCSs), and other relevant plans, studies, and analyses. The CTP serves as a unifying policy framework informing future modal and regional plan development and investment decision-making. The CTP must be updated every five years in accordance with federal and State law.

1.3.1 California Transportation Plan 2040: A New Approach to Transportation Planning

CTP 2040, completed in 2015, represented a new generation of transportation planning that responded to seminal climate change legislation enacted at the State level since 2002. Although the overarching goal of the legislation was to reduce GHG emissions and address global climate change, it also established new priorities that, if implemented, would affect statewide transportation goals, planning, and investment.

Table 1-1 summarizes pertinent legislation:

Table 1-1: Legislation Promoting a New Approach to Statewide Transportation Planning

Legislation	Summary
Assembly Bill 32 (AB 32) (2006), California's landmark Global Warming Solution Act of 2006	Requires reducing the State GHG emissions to 1990 levels by 2020.
Senate Bill 375 (SB 375) (2008) Sustainable Communities and Climate Protection Act	Requires MPOs to include SCS in their RTPs for the purposes of reducing GHG emissions and aligning planning for transportation and housing.
Senate Bill 391 (SB 391) (2018) California Homes and Jobs Act	Requires Caltrans to update the CTP every five years while showing how the State will achieve the statewide GHG reduction goals of AB 32. Directs Caltrans to consider the use of alternative fuels, new technology, tailpipe emissions reductions, and expansion of public transit commuter rail, intercity rail, bicycling, and walking. Requires the CTP to identify statewide integrated multimodal transportation system needs to achieve these results. The California Interregional Blueprint was developed in response and served as the foundation for CTP 2040.
Executive Order (EO) B-16- 12 (2012)	Calls for continued reduction of GHG emissions in the transportation sector to 80 percent below 1990 levels by 2050.
SB 743 (2013)	Requires the Office of Planning and Research to revise its environmental assessment guidelines to emphasize reduction of GHG emissions, development of multimodal transportation networks, and diversity of land uses.
EO B-30-15 (2015)	Establishes a statewide GHG reduction target of 40 percent below 1990 levels by 2030—the most aggressive benchmark enacted by any government in North America. The Order also requires life-cycle accounting for state infrastructure projects.
EO B-32-15 (2015)	Requires California State agencies such as CalSTA, California Environmental Protection Agency (CalEPA), California Natural Resources Agency (CNRA), and other relevant departments to develop an integrated action plan by July 2015 that will establish clear targets to improve freight efficiency, transition to zero-emission technologies, and increase competitiveness of California's freight system.

1.3.2 California Transportation Plan 2050 and California's Long-range Vision for Transportation

In accordance with federal and State laws mandating a 5-year update cycle, Caltrans recently undertook a new CTP that was published in early 2021 and addresses a planning horizon extending through 2050. CTP 2050 provides a long-range, multi-modal transportation plan and will serve as a unifying policy framework to inform future transportation planning and investment decisions. The plan also responds to the California Transportation Commission's recently adopted CTP Guidelines (2017), which provides a policy framework that includes four primary plan elements, as seen in **Table 1-2**.

Table 1-2: California Transportation Plan 2050: Required Plan Elements

Required Element	Purpose/Description
Plan Development	Summarizes the overall approach to the CTP 2050 development, including research and inputs to the process, plan requirements, and public and stakeholder outreach approach and findings.
Strategies	Identifies all potential strategies from a range of sources that can address CTP goals and objectives.
Technical Analysis	Summarizes the approach to data collection, scenario development, modeling and analysis, and economic analysis.
Financial Element	Describes sources of funding and financing currently available to support the implementation of the recommendations.
Implementation	Articulates a road map for implementing the plan (expected in 2021).

Source: CTP 2050 (Caltrans 2021)

Setting the stage for CTP 2050, CTP 2040 responded to legislation and sought to shift California's transportation system planning paradigm from transportation as a defined entity to one that identified transportation as a comprehensive means for improving the quality of life, economic opportunity, and the environment for all Californians. CTP 2050 addresses new federal reporting requirements, new statewide priorities (such as affordable housing and climate change), and new legislation. It also incorporates data from new State and regional plans and six modal plans, including the CASP.
Table 1-3 below summarizes the major issues that are addressed in CTP 2050.

Table 1-3: Summary of Major Issues to be Addressed in CTP 2050 (Caltrans 2021)

Demographics	**Population increase:** the state population will grow by 20 percent by 2050 to reach 49 million residents. **An aging population:** Adults over 65 will comprise more than 25 percent of the population. **Changing travel preferences:** Car ownership and travel patterns will change.
Land Use	**Housing shortage:** Home buyers are moving to exurban areas in search of affordable housing, which will affect traffic patterns and densities. **Location of new growth:** Growth will occur in major urban areas, but low- and middle-income residents will continue to seek housing in less dense, more affordable places, increasing the need to travel further to access jobs and services. Moreover, rural and suburban areas are likely to face growing development pressures to provide nearer jobs and services.
Climate Change	**Transportation and GHG:** Transportation remains the greatest source of GHG emissions (approximately 40 percent in 2016), and it is linked to climate change. Sea levels are expected to rise 20 inches by 2050, resulting in flooding and infrastructure damage **Carbon Reduction Targets:** Transportation must continue to address emissions reduction legislation. **Adaptation and Resilience:** Transportation planning efforts must address the preservation and adaptation of the State's transportation systems and infrastructure to climate change.
Social Equity	**Income Inequality**: One in 7 Californians lives in poverty, and commute time has been cited as the single, strongest determinant of escaping poverty. **Racial Disparities**: In California, persons of color are twice as likely to ride public transit, experience longer commutes, and have fewer job opportunities than white, non-Hispanic persons. Pedestrian fatality rates are twice as high in black communities than white, non-Hispanic communities. **Environmental Justice:** Low-income and minority households experience greater exposure to air pollution and congestion.
Quality of Life	**Improved Quality of Life:** Transportation planning can improve the quality of life for California Residents though: • Active transportation options in our communities, and • Providing greater access to employment and other services

1.3.3 Relationship between the CASP 2020 and CTP 2050

As one of six modal plans addressed by CTP 2050, the CASP 2020 will:

- Contribute to the results of aviation system research, policies, strategies, and findings for incorporation into CTP 2050
- Implement the previously developed CTP goals and objectives into the CASP (see **Table 1-4** below)

Table 1-4: Summary of CASP 2020 Vision

Chapter	Content Summary
Executive Summary	The Executive Summary will serve two purposes: • It will be an overview of the CASP • It will summarize the CASP and its findings
Chapter 1: Introduction	This introduction describes the regulatory and policy affairs related to CASP 2020: • Federal and State Regulations associated with aviation system planning and how Caltrans will fulfill those objectives • The role of the aviation system in California's overall transportation network
Chapter 2: Economics and Funding	Chapter 2 will identify the economic value of California's aviation system and the positive economic impacts that airports have for their host communities. The chapter will also address the differences between federal and state grant programs and opportunities to better align these programs. The discussion will be structured to complement the funding discussion identified in Chapter 3. Chapter 3 will address federal and State priorities and how they can be better integrated to maintain airport infrastructure and enhance aviation safety, especially through the alignment of federal and State funding mechanisms. Specific items to be discussed include: • Federal and State CIP projects • Life-cycle costs • Priority projects based on federal and State standards
Chapter 3: Infrastructure and Safety	Chapter 3 will address federal and State priorities and how they can be better integrated to maintain airport infrastructure and enhance aviation safety, especially through the alignment of federal and State funding mechanisms: • Federal and State Capital Improvement Plan projects • Life-cycle costs • Priority projects based on federal and State standards

Chapter	Content Summary
Chapter 4: Forecasts, Trends, and Needs	Chapter 4 will summarize and discuss current aviation forecasts for California. It will address evolving trends associated with commercial and general aviation. Recommendations will be provided to improve California's aviation system based on: • Demand and capacity forecasts • Changes in GA and commercial aviation • Economic trends • Emerging Technologies • The effective and collaborative use of GIS technology • Education and outreach
Chapter 5: Mobility and Access	Chapter 5 will identify gaps between airports and surface transportation systems and how those gaps can be closed to create a more seamless system for people and freight. The discussion will specifically address: • The use of new transportation technologies (automated and shared vehicles, TNCs) and their effect on airport facilities and planning • How underutilized GA airports can expand business opportunities • Specific airports that meet Caltrans and FAA objectives pertaining to interregional and freight corridors, and how the lessons learned from these facilities can be applied elsewhere to improve the transportation system • Priority emergency airports and how they can facilitate local and regional access to support emergency response
Chapter 6: Land Use and Sustainability	Chapter 6 will focus on land use planning on and near airports and the land use compatibility planning principles and guidance set forth in the Handbook for areas within approximately 2 miles of an airport. It will also consider the integration of sustainable practices on and near airports. The chapter will discuss: • GHG reduction strategies • Smart Growth principles • Land use compatibility factors (noise, safety, airspace, and overflight)
Appendices	Appendices will include background papers, maps, and supporting documentation including, but not limited to, facility inventories and forecast data.

CASP Objective:
CASP 2020 is to be a vision document that integrates FAA and Caltrans' priorities for aviation in a manner that aligns with CTP 2050.

CASP 2020 will identify a new vision for California's aviation system. It identifies the relationships between aviation and other transportation modes, and seeks solutions to make California's aviation facilities resilient to the effects of global climate change.

CASP 2020 identifies new ways to serve California's growing population. And CASP 2020 identifies broad objectives and policy goals that consider and coincide with the issues, goals, and objectives identified in CTP 2050 planning documents. Parallel to the 2017 CTP guidelines prepared by the Commission, which require the development of a CTP Implementation Element, the Division will also prepare a future CASP Implementation document to further the goals of the statewide aviation system and the ideas presented in CASP 2020.

Attachment 1-A: Comparison of Caltrans and FAA Roles Regarding Airports and Airport System Planning

Role	FAA	Caltrans Aeronautics
System Planning	Provides guidance for state and regional system plans in AC 150/5070-7 Guidance becomes mandatory when FAA provides funding.	Required to prepare a California Aviation System Plan that "shall include, but not be limited to, every California airport designated in the NPIAS and any other existing or proposed public use airports, as designated by the division." [PUC Sec. 21701]
Airport Design Standards	Establishes standards for the geometric layout and engineering design of runways, taxiways, aprons, and other facilities at civil airports from AC 150/5300-13 Design standards are advisory but become mandatory when the FAA provides funding for the facilities.	Uses California Code of Regulations, Title 21, Sections 3525-3560 (Airports and Heliports), which incorporate many FAA standards and specify State-specific requirements.
Technical Support	Various FAA units assist airport operators regarding facility design and operations, particularly where safety is a concern. Supports ACRP, an industry-driven, applied research program that develops practical solutions to problems faced by airport operators.	May make available its engineering and other technical services, with or without charge, to any political subdivision or person desiring them in connection with the planning, acquisition, construction, improvement, maintenance, or operation of airports or air navigation facilities. [PUC Sec. 21601]
Financial Assistance	Through AIP, provides grants to public agencies — and, in some cases, to private owners and entities — for the planning and development of public-use airports that are included in the NPIAS. Requires that airport sponsors provide certain assurances as conditions for receipt of grant funds.	Subject to the terms and within the limits of special appropriations made by the Legislature, may render financial assistance by grant or loan, or both, to political subdivisions jointly in the planning, acquisition, construction, improvement, maintenance, or operation of an airport owned or controlled, or to be owned or controlled, by a political subdivision or subdivisions. [PUC Sec. 21602(a)]
Airport Permits	Does not require permits for construction or operation of airports but does require compliance with grant assurances when FAA funding is involved in airport development. The Airport Compliance Program ensures airport sponsors comply with the Federal obligations they assume when they accept Federal grant funds or the transfer of Federal property for airport purposes.	Issues permits required for operation of public-use and special- use airports and heliports. [PUC Sec. 21662]
Obstruction Analyses & Permits	Requires submittal of notice of proposed construction or alteration of objects that may affect the national airspace, air navigation facilities, or airport capacity. [FAA Form 7460-1] Conducts airspace study to determine whether proposed objects would be a hazard to air navigation. [14 CFR Part 77.31] Has no authority to prevent construction or alteration of objects except via grant assurances agreed to by airport sponsors. Can modify or cancel airport instrument approach procedures if necessitated by new objects that effect the procedures' airspace.	Follows 14 CFR Part 77 guidelines via PUC Section 21659 for obstruction analysis. May issue permits for any structure that extends more than 500 feet above ground level per PUC Section 21656 or refuse permits to ensure safety per PUC 21657.

Role	FAA	Caltrans Aeronautics
Aircraft Noise Exposure	Provides funding for airport noise compatibility planning. Noise exposure maps and noise compatibility programs are required to be done by airport sponsors for noise abatement land acquisition to be eligible for FAA funding. [14 CFR Part 150] Prescribes notice requirements and procedures for airport operators to implement noise and access restrictions on Stage 3 aircraft. [14 CFR Part 161]	Recognizes the authority of the federal government to regulate the operation of aircraft and to control the use of the airways. Adopts "noise standards governing operation of aircraft and aircraft engines for airports operating under a valid permit issued by the department to an extent not prohibited by federal law. The standards shall be based upon the level of noise acceptable to a reasonable person residing in the vicinity of the airport." [PUC Sec. 21669]
Land Use Controls	Has no direct control over land uses, but Grant Assurance No. 21 requires that, as a condition for receipt of an FAA grant, airport sponsors "will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft." Similarly, Grant Assurance No. 20 says that airport sponsors "will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards."	Prepares and publishes the Handbook establishing statewide guidelines for airport land use compatibility planning based on the SAA. ALUCs—required to be created in most counties in the state—must be guided by information in the Handbook when preparing compatibility plans for individual airports. [PUC Sec. 21674.7]
School Site Reviews	No explicit role.	Evaluates certain proposed K–12 school and community college sites. Evaluations are required for proposed sites within 2 nautical miles of an airport. In general, the evaluations aim to determine whether a proposed site provides an adequate level of safety and non-disruptive noise and, in so doing, enables the guiding principles of safety for the building occupants and comprehensive community planning. [Education Code Secs. 17215 and 81033] Similar review required for proposed state building sites. [PUC Sec. 21655)

Attachment 1-B: Comparison of Federal and State Aviation System Planning Requirements

Federal Guidance for Aviation System Planning			
Section	**Contents**	**How CASP 2020 Fulfills the Requirement**	**Variations from Federal Guidance**
Executive Summary	Highlights the main elements and recommendations of the planning study.	A detailed Executive Summary will be provided in CASP 2020	None.
Study Design	A comprehensive outline of what data will be collected, the methodologies to be used in the analysis, and the output that is required.	CASP 2020 is designed around requirements from FAA and the PUC, introduced in Chapter 1. Each subsequent chapter will contain a description of analytical methods.	None.
State, Regional and Local Issues	A list of major aviation issues, problems, questions, and opportunities is vital in developing the plan. May include issues of a national nature or concerns specific to a state, metropolitan region, local community, or multi-state area. Items should be ranked in order of importance and include strategies to address each issue.	CASP 2020 identifies issues, questions, and opportunity at the State and regional level, such as: • The overall goals and objectives of the CTP 2050, and how the CASP is a component of the CTP 2050. • Needs or gaps in CASP 2020 that prevent it from contributing to the overall goals of CTP 2050 and, conversely, needs or gaps in other modal systems that prevent the aviation system from optimal performance. • A list of prioritized strategies to identify how CASP 2020 can better contribute to achieving CTP 2050 goals and objectives. Strategies may range in use from airports to legislation.	None.
Inventory of System Condition and Performance	Airport system adequacy can be determined from the condition and performance of certain important characteristics of its individual airports. Planners should initially conduct an inventory to identify existing conditions that may affect the service level or role of the airports, such as: • Airport physical characteristics and activity levels • Environmental and land use considerations and applicable laws • Statewide or regional socioeconomic data • Navigational aids, landing aids, and approach minima • Historical data on weather conditions (system-wide or regional basis) • Surface transportation characteristics, including existing and planned highway and transit systems • Terminal, airspace, and airfield capacity	The primary objective of CASP 2020 is to evaluate the ability of California's aviation system to contribute to CTP 2050: • CASP will review the roles of individual airports within the aviation system in Chapter 3, Infrastructure and Safety; • Statewide and regional socioeconomic data will be addressed in Chapter 2, Economics and Funding and Chapter 5, Mobility and Access. Statewide and regional environmental laws and land use considerations will be discussed in Chapter 6, Land Use and Sustainability, as well as descriptions of recent legislation associated with California's development of CTP 2040 and CTP 2050. • Surface Transportation characteristics will be addressed in Chapter 5, Mobility and Access. • Terminal, airspace, and airfield capacity will be addressed in Chapter 4, Forecasts, Trends and Needs, to identify how capacity issues affect the State's multi-modal transportation system, and aviation's performance for emissions reductions.	Individual airport terminal, airspace, and airfield capacity will not be evaluated in detail in CASP. System wide challenges will be discussed. Specific airport needs and cost estimates will be addressed within implementation to be developed upon completion of CASP 2020 and within on-going CIP updates.
System Goals and Performance Measures	Broad system goals and performance measures resulting in products that can be effectively used by the region, state, and the FAA in determining annual airport development needs should be established. Performance measures should be developed to determine the level of service of the system of airports, based on the performance of individual airports.	CASP 2020 establishes systemwide goals to support the overall goals and objectives of CTP 2050.	Specific goals and performance measures will be considered for implementation upon the completion of CASP 2020.

Federal Guidance for Aviation System Planning			
Section	**Contents**	**How CASP 2020 Fulfills the Requirement**	**Variations from Federal Guidance**
Activity Forecasts	Airport system plans provide forecasts to define an airport's role within the system, prioritize airport development, and determine Runway Design Codes (RDC).	Chapter 4, Forecasts, Trends, and Needs will consider the results of current forecasting studies by the FAA and the Division to identify trends in aviation and system needs. The studies will be reviewed to identify: • Changes in GA and CS activity for a minimum 20-year planning horizon • Changes in GA activity and potential impacts • CS and GA activity in 20+ years • Current and future aviation trends including emerging technologies • Economic development relationships and their relationship to emerging trends and technologies.	CASP 2020 does not include forecasts; the results and trends identified in the analysis of available data will be used to identify which airports warrant additional forecasts and provide recommendations for airport development. Specific airport development projects and cost estimates will be considered for implementation upon the completion of CASP 2020.
System Requirements	Capacity Analysis—Airfield and Airspace: Airfield capacity analysis may be conducted for individual airports as part of the system planning study, but this is primarily an FAA function because the FAA ensures the safe and efficient movement of aircraft. An analysis of possible new airport development should consider the potential of underutilized airports in the region that could provide additional regional capacity, obviating the need for new investments. Consideration should be given to the reasons why the airports are currently underutilized and what might cause a shift in the distribution of future aviation activity to those locations.	The primary goal of CASP 2020 is to consider the role of California's aviation system as a component of CTP 2050. The data developed for Chapter 5 (Mobility and Access), in relation to transportation and freight corridors will identify specific opportunities to incorporate underutilized airports into the overall transportation system more effectively. The discussions presented in Chapter 4 (Forecasts, Trends, and Needs) will contribute to a discussion of factors that might shift or redistribute future aviation activity to different airports in aviation system.	CASP 2020 does not provide new analysis for individual airports, but it will recommend regions in which airport capacity may be optimized via trends or necessary diversions from other airports approaching airfield capacity. The recommendations for individual airports will be considered in subsequent implementation and CIP updates.
Environmental Considerations	Consider environmental issues in the evaluation process and development of airport system planning recommendations. The plan should consider obvious and known environmental features.	Environmental Issues will be addressed in Chapter 6 (Land Use, Environment, and Sustainability). The chapter will focus on: • Airport land use compatibility, a subject for which Caltrans is a leader in providing guidance to airport operators and local jurisdictions; • Sustainability, in terms of the sustainability goals associated with CTP 2050 and FAA's EONs model and sustainable practices that can be undertaken by airport operators, and • Reduce GHG emissions, specifically changes in airport operations and emerging technologies that can contribute to California's statewide efforts in greenhouse gas reduction, all of which is germane to Chapter 4 (Forecasts, Trends, and Needs)	Environmental considerations will be considered for specific airports associated with system planning recommendations. Environmental recommendations for land use, socioeconomic impacts, equity, and GHG reduction will remain central to CASP.

Federal Guidance for Aviation System Planning			
Section	**Contents**	**How CASP 2020 Fulfills the Requirement**	**Variations from Federal Guidance**
		CASP 2020 does not consider the environmental issues associated with every airport in the system plan. Known environmental resources will be considered for specific airports identified for increased activity or potential improvements to facilitate CTP goals.	Environmental improvements will be discussed in the subsequent implementation document.
Alternatives Analysis	Develop alternatives to examine a broad set of functional alternatives for the airports in the system, rather than detailed design considerations for each individual airport. Alternatives may focus on: • Financing (constrained vs. unconstrained), • The airport system (expanded vs. reduced), • Airport roles (private vs. public), and • Environmental impacts (mitigation vs. no build). Analysis should attempt to balance the need for airfield capacity and airspace to minimize environmental impacts. Analysis should include a "no action" alternative and include criteria to compare alternatives, such as capital costs, aviation safety, airspace utilization, ability to address need, environmental impacts, delay and other operational costs, consistency with local area comprehensive and transportation plans, and land use availability and compatibility.	Alternatives for CASP may be limited by the priority to align with CTP 2050. One of the primary objectives of CTP 2050 is to identify how the many components of California's multimodal transportation system can work together to balance transportation needs while reducing GHG emissions. An evaluation of environmental impacts — especially those associated with air quality, land use, and social equity — is central to CASP 2050 and will be discussed in Chapter 4, (Forecasts, Trends, and Needs) and Chapter 6 (Land Use and Sustainability).	A list of proposed projects and their financing will be addressed for implementation upon the completion of CASP 2020.
Identification of System of Airports	Identify the final system of airports following the determination of system requirements, the investigation of alternatives, and the application of evaluation criteria. The existing role of each airport also should be identified.	CASP 2020 includes a detailed description of California's current aviation system, including each airport's FAA and Caltrans classification, and airport roles (e.g., commercial service, general aviation, heliports, military, and emergency response). It also includes a description of aviation's role and the importance of California's multimodal transportation system. Recommendations will be provided to identify the role of specific airports or groups of airports to optimize California's aviation system.	CASP will provide FAA with reasoning for the State's airport priorities.
Intermodal Integration and Airport Access	Evaluate aviation needs within the context of multi-modal planning. Develop plans in coordination with other transportation planning efforts. Consider the area's social, economic, and environmental conditions, and overall transportation system performance issues. Airport access and land use impacts should be treated explicitly in appropriate state and metropolitan plans. Surface transportation	CASP 2020 was prepared as part of CTP 2050, which considers all modes of transportation. CASP addresses the alignment of aviation with the overall CTP 2050. Chapter 5, (Mobility and Access): • Identify intermodal ground access gaps to airports from surface transportation (rail, and transit systems) and make recommendations for closing those gaps	None.

Federal Guidance for Aviation System Planning			
Section	**Contents**	**How CASP 2020 Fulfills the Requirement**	**Variations from Federal Guidance**
	plans should consider the issues of highway access to airports, congestion, parking supply and fees, public transit access, taxicabs and other private surface transportation providers, and rail or truck access for air cargo. The aviation planning agency should consult with highway and transit planners, MPOs, and airport sponsors.	• Examine access to commercial and GA airports by commercial passengers, freight haulers of all sizes, and airport employees • Identify key airports that better meet Caltrans and FAA objections related to strategic transportation and freight corridors and emergency response	
Development Priorities and Justification	Justified development needs will be translated into costs and schedules based on priorities and likely financial sources. The priorities are essential to the development of the NPIAS and facilitation of FAA grant funds disbursed through the FAA's Airport Capital Improvement Program (ACIP). A Cost-Effective Plan of Action should be prepared for 5-,10-, and 20-year planning horizons.	CASP 2020 identifies both short-term and long-term system priorities for up to a 30-year planning horizon (2020 to 2050). Specific implementation will follow CASP 2020 visioning.	CASP seeks to reconcile differences in FAA and State assistance programs, providing FAA with the State's reasoning for airport priorities.
Policy and Investigation Recommendations	The airport system plan report may contain recommendations on state, regional, or local policy changes to address the needs of aviation, including new funding mechanisms, land use and zoning guidance, or regulatory changes. The airport system plan should also recommend additional studies, when appropriate, to collect inventory data on runway safety areas, pavement condition, or approach procedures, or to investigate specific problems such as poor air service or inefficient inter-modal connections.	CASP 2020 is intended only to illuminate and elucidate aviation's service to the intermodal goals of CTP 2050.	N/A
Recommended National Plan of Integrated Air Service (NPIAS) changes	After completing a system plan, a state aviation agency can recommend airports to add or remove from the NPIAS.	CASP 2020 is intended only to illuminate and elucidate aviation's service to the intermodal goals of CTP 2050.	N/A
California Public Utilities Code Requirements for Aviation System Plans			
Background and introduction element	Summary of aviation activity in California that establishes goals and objectives for aviation improvement.	CASP 2020 shall include a summary of current activity and identify goals and objectives for improvements to the aviation system and to the State's long-term multi-modal transportation plan as described by CTP 2050.	None.
Air Transportation Issues Element	Addresses issues such as aviation safety, airport noise, airport ground access, transportation systems management, airport financing, airport land use compatibility planning, and institutional relationships.	CASP 2020 reviews air transportation issues in the following chapters: • Economics and Funding (2): facility support and alternate sources • Infrastructure and Safety (3): benefits of airport support • Forecasts, Trends, and Needs (4): institutional relationships, industry activity, transportation management, and environmental performance • Mobility and Access (5): congestion factors, interregional corridors and their relationship to airports, new technologies or systems poised to change mobility and affect access	None.

Federal Guidance for Aviation System Planning			
Section	**Contents**	**How CASP 2020 Fulfills the Requirement**	**Variations from Federal Guidance**
		• Land Use and Sustainability (6): airport noise and land use compatibility planning	
Regional Plan Alternative Element	Consists of the aviation elements of the RTPs prepared by each transportation planning agency. This element shall: • Consider regional air transportation matters relating to growth, capacity needs, county activity, airport activity, and systemwide activity in order to adequately evaluate the overall impacts of regional activity in relation to the statewide air transportation system. • Propose general aviation and air carrier public use airports for consideration by the CTC for funding eligibility under this chapter.	The aviation elements of individual RTPs will be summarized in Chapter 5 (Mobility and Access). The discussion will address: • Statewide guidance pertaining to the identification and inclusion of local aviation and aviation facilities in the regional system plans prepared by local metropolitan and transportation planning agencies, and • Opportunities for the integration of aviation interests and intermodal connectivity and collaboration with ALUCs and their implication on the State's ALUC guidance document.	None.
State Plan Alternative Element	Includes consideration of statewide air transportation matters relating to growth, including, but not limited to, county activity, airport activity, and systemwide activity in order to adequately evaluate the state aviation system and to designate an adequate number of general aviation and air- carrier public use airports for state funding in order to provide a level of air service and safety acceptable to the public.	Airports functioning as a system will be addressed in CASP visioning by discussing aviation as a component of its overall multi-modal transportation plan.	None.
Comparative Element	Compares and contrasts the regional plan alternative with the state plan alternative, including, but not limited to, airport noise, air quality, toxic waste cleanup, energy, economics, and passengers served.	State and regional comparisons will be enjoined by discussions within Chapter 6 (Land Use and Sustainability).	Not applicable; AC 150/5070 has no similar element.
Capital Improvement Plan	A 10-year CIP for each airport based on each airport's adopted master plan (if the airport has a master plan) approved by the applicable transportation planning agency and submitted to the division for inclusion in the California Aviation System Plan.	CASP 2020 reviews airport needs and retains its 5-year update cycle to monitor needs. However, projects and costs estimates will remain within the Division's biennial CIP.	CIP reports are collected biennially (even years) by the Division from all State-permitted, public-use airport sponsors, offset by the CIP delivery schedule for the CTC (odd years). FAA requires an annual update from each NPIAS airport sponsor only.

Federal Guidance for Aviation System Planning			
Section	**Contents**	**How CASP 2020 Fulfills the Requirement**	**Variations from Federal Guidance**
Other Elements	Any other element deemed appropriate by the division and the transportation planning agencies.	CASP 2020 departs from past "elements" with a comprehensive vision document complemented by a future implementation plan.	Not applicable.
Summary and Conclusion Element	Presents findings and recommended courses of action.	CASP 2020 includes actions for use in a future Implementation plan, to replace previous Elements for Implementation and Inventory and ensure project funding from the Aeronautics Account in the State Transportation Fund shall be consistent with CASP 2020.	None.
Sources: California Public Utilities Code. Federal Department of Transportation, Federal Aviation Administration. 2015. AC 150/5070-7, Section 5. Washington, DC. Available at: https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5070-7-change1.pdf			

Chapter 2:

Economics and Funding

Aviation is a key component of California's transportation system that provides access to the NAS and the world. Airports enable California's residents, workers, tourists, travelers, and goods to move quickly and safely over vast distances, journeying across the State, throughout the nation, and across international borders. Airports are also critical to California's economic performance because they support economic output, draw business and tourism, promote local economic development, and retain jobs that might otherwise be relocated elsewhere. The connectivity that California's 241 public-use airports offer make California's $3.1 trillion (T) economy possible, ranking it fifth behind the national economies of the world (Forbes 2019).[17]

Chapter 2 explains why California's airports are so important to their communities, their state, and the nation. Numerous studies have examined the economic benefits of airports and aviation. The following discussion provides an overview of a number of those studies and puts in perspective how valuable airports are in terms of how they contribute to a vibrant economy. The investment needs of California's airports for the five-year period from 2019 to 2023, and the traditional sources of funding and financing for airport capital projects, are also summarized. But, because traditional funding sources are likely insufficient to meet the current and future investment needs of California's airports, examples of alternatives are presented.

2.1 VALUE OF AIRPORTS TO COMMUNITIES

2.1.1 Value of Aviation in California and Nationwide

Aviation contributes substantially to California's economy and is an important component of our nation's economy. The recent contribution of California's aviation assets has been documented in the following reports:

[17] Forbes. December 2019. "Best States for Business." Retrieved from https://www.forbes.com/places/ca/

- "Contributions of General Aviation to the U.S. Economy in 2018" by PricewaterhouseCoopers, quantified the economic benefits from general aviation (GA) in 2014
- "The Economic Impact of U.S. Commercial Airports in 2017" by the ACI-NA assessed the economic impacts of those airports with commercial airline service in 2017
- The "Economic Impact of Civil Aviation on the U.S. Economy," from FAA, looked at civil aviation's economic impacts using 2014 as a base year

Since the studies used different base years for analysis, the fiscal results were adjusted to reflect 2019 dollars using Bureau of Labor Statistics Consumer Price Index inflation data. This allows a comparison between the results of each study. **Figure 2-1** presents the economic output (in inflation-adjusted 2019 dollars) and employment. Output measures the economic activity in terms of an organization's annual gross sales or annual expenses in cases where sales are not applicable.

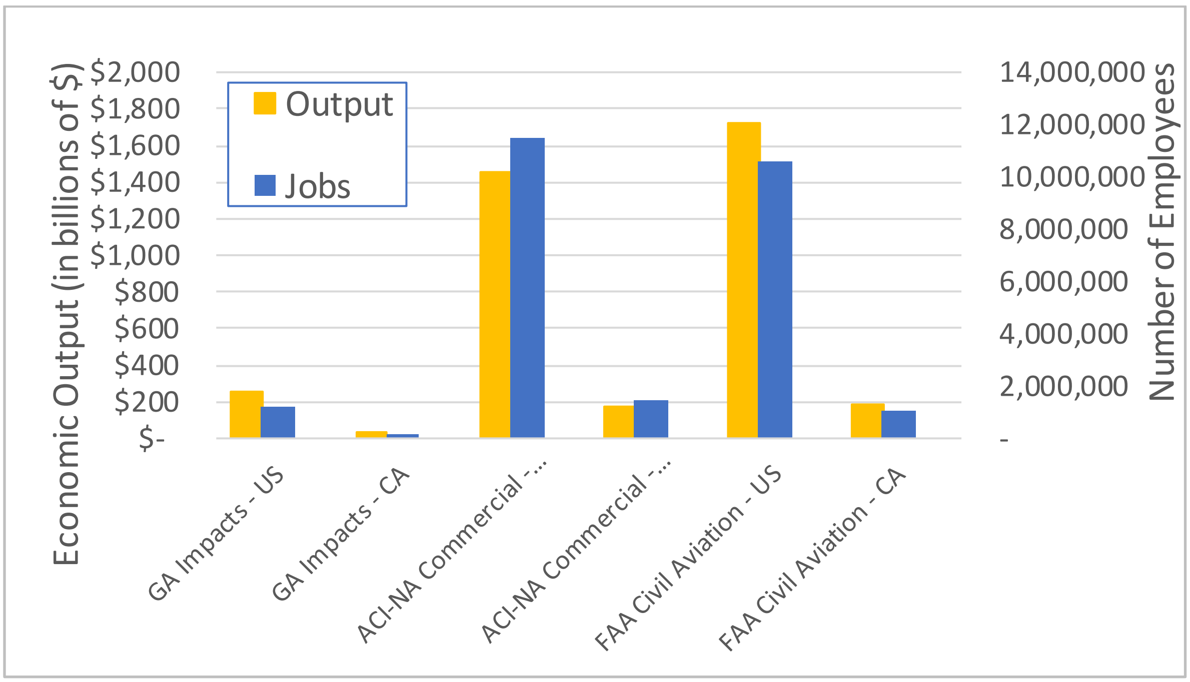


Figure 2-1: Findings of Aviation Economic Impact Studies for the U.S. and California
Source: Mead & Hunt, 2020

GA activity consists of all aviation activity except military or scheduled airline or air cargo service. Examples include individuals flying private aircraft, flight training, charter flights, corporate flight operations, aerial applications, and on-demand cargo flights, to name a few.

PricewaterhouseCoopers prepared the study for several aviation interest groups, including the Aircraft Owners and Pilots Association (AOPA), the National Business Aviation Association (NBAA), and the Helicopter Association International (HAI), all of which are vested in promoting GA interests. The study examined the impacts of the GA industry, its associated supply chain, and impacts stemming from spending by visitors that use GA. The study found that, in 2019 adjusted dollars, GA contributed $251billion(B) in output to the U.S. economy and supported nearly 1.2 million jobs. California's share of these GA impacts was substantial; the economic output was estimated at $33B, or more than 13 percent of the total. The study found that California's GA industry was responsible for more than 148,000 jobs, or approximately 13 percent of GA jobs nationwide (PricewaterhouseCoopers LLP 2020).

While GA generates significant economic activity, commercial airlines dominate the aviation industry in terms of jobs and output. ACI-NA, which represents commercial airports, routinely conducts periodic economic impact studies of the approximately 500 commercial airports in the U.S. The last study looked at the impacts of these airports in 2017. The inflation adjusted figures indicate that commercial airports accounted for nearly $1.5T in output and 11.5 million jobs nationwide. California's 22 commercial airports (at the time) were responsible for $177B of that economic output, or more than 12 percent of the U.S. total. Approximately 1.5 million jobs resulted from activity at these airports, which comprised nearly 13 percent of U.S. commercial service airport-related jobs[18] (ACI-NA 2018).

The FAA's "Economic Impact of Civil Aviation on the U.S. Economy" evaluated the economic impact of all civil aviation (commercial and GA) activity in the U.S. When adjusted for inflation, it found that the impact from U.S. airports amounted to more than $1.7 trillion (T) in output and 10.6 million jobs. Airports in California generated $189B (11 percent of the total) and supported more than 1 million jobs, which is nearly 10 percent of all aviation-related jobs in the U.S. (FAA 2017). It should be noted that this FAA study determined that employment from all U.S. airports was less than ACI-NA's estimate for just U.S. commercial service airports. This is because the FAA study used 2014 as a base year, so the ACI study, using a base year of 2017, accounts for three years of growth in the aviation industry.

[18] The ACI-NA report was prepared using the NPIAS 2018 data.

The FAA study provides a breakdown in jobs resulting from aviation activity. **Figure 2-2** shows the percentage that each segment of aviation employs in California. Nearly two out of three aviation-related jobs are tied to spending by visitors using commercial airlines. The other aviation segments in California responsible for the employment of aviation workers are the airlines (12%) and aircraft manufacturing (11%) (FAA 2017).

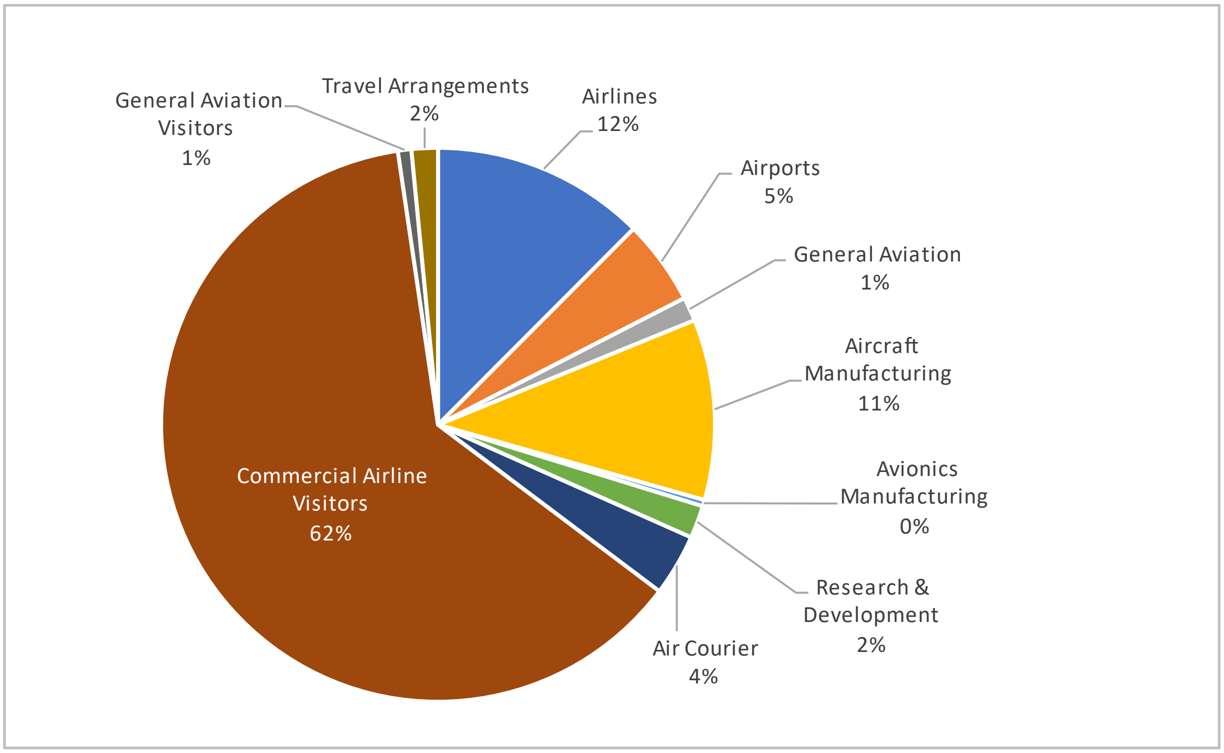


Figure 2-2: California Aviation Employee Distribution

Source: FAA, 2017

Based on data obtained from all three studies, airports and aviation have a significant economic impact in the U.S. and support many jobs. Aviation in California contributes a greater share to the overall economy than aviation does in other states, which is not surprising based on its geographic extent, population, and number of airports. Depending upon the study cited, California's airports account for 10 to 13 percent of the total U.S. airport economic impact. The results of the ACI-NA study found that the impact of California airports is second only to Florida, both in terms of employment and output[19] (ACI-NA 2018).

[19] The economic impacts of commercial service airports in California and Florida are predominately driven by the large hub airports. Florida has four large hubs, while California only

A 2012 study examined some of the reasons behind California's strong aviation economy. It found that California's advantages included:

- A comparatively higher concentration of aviation companies
- A strong global position through aerospace companies with international markets that are recognized leaders in the field
- A highly skilled workforce

The report also found that average pay for a California aerospace worker was 24 percent higher than the average salary in seven comparison states – Alabama, Florida, Georgia, Kansas, South Carolina, Texas, and Washington (A.T. Kearney 2014).

2.1.2 Benefits of Aviation to Communities

The preceding discussion focused on the economic benefits of aviation to California and the nation. To adequately illustrate the benefits that airports bring their communities, a couple of anecdotes serve to demonstrate the importance of airports at the local and regional level.

The "2012-2035 Regional Transportation Plan/Sustainable Communities Strategy" published by the Southern California Association of Governments (SCAG) examines the transportation needs of the 18 million people spread across a six-county area: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. This area includes six commercial service airports – Los Angeles International (LAX), Bob Hope Airport (BUR), John Wayne (Orange County (SNA), Long Beach (LGB), Ontario International (ONT), Imperial County Airport (IPL) and Palm Springs International (PSP) – plus numerous GA airports. The report succinctly summarizes the economic importance of the region's airports:

> "Southern California airports play a crucial role in international trade, particularly with Pacific Rim countries, and to the regional economy. Unless the regional airport ground access system is substantially improved, many potential air passengers will choose not to fly at all, and growing ground access congestion could hamper the ability of air cargo trucks to access airports and make timely deliveries. This will translate to substantial economic loss to the region and a threat to our regional economy and well-being" (SCAG, 2012*)*.

has three, and this is the primary difference. Texas, with only two large hubs, ranks third behind California.

The report makes numerous recommendations to enhance the existing economic contributions of its airports (SCAG, 2012). For example, supporting secondary airports in the region (where additional activity is desired) through incentives and marketing. Also, projects that enhance capacity and regional accessibility, and identifying incentives that airports can use to encourage airlines to provide new air service.

The "Caltrans Airport Forecasting Study" included data from case studies at several California airports. Its examination of Fresno-Yosemite International Airport found evidence that the airport was a contributing factor in the decision to locate the GAP Pacific Distribution Center in Fresno (Cambridge Systematics, 2014). The distribution center employs more than 300 full-time workers. Seasonal work and subsequent expansions of the facility have boosted that number.[20]

At the local level, a recent economic impact assessment conducted by Contra Costa County demonstrated two General Aviation airports as integral economic components for the area.

Buchanan Field (CCR) is a busy urban airport located in the City of Concord, and Byron Airport (C83) is in a remote area of eastern Contra Costa County characterized by agriculture. In 2016, these GA airports provided more than 800 jobs, generated more than $105 million in annual economic output, and generated more $18 million in federal, State, and local tax revenue. Moreover, the airports are operating through a separate enterprise fund, and the revenue generated exceeds the cost of expenses.

The value offered by Contra Costa County airports to their communities extends well beyond the jobs, economic output, and taxes generated by the airports and their associated businesses. CCR serves as a base for two air ambulance providers that fly critically injured patients and transport organs and medical supplies. Firefighting and community education businesses provide essential training, including those interested in the aviation industry; both airports offer flight training. Recreation businesses, such as skydiving and air travel businesses, provide residents with opportunities for travel and leisure, and aircraft storage and maintenance facilities allow residents to conveniently store their personal aircraft. (Contra Costa County, 2016)

[20] From the Fresno Bee, March 2018.

California's airports are economic engines for regional, State, and national economies. They promote economic activity locally, provide jobs, and can help attract businesses that rely on air transportation to facilitate the movement of people and goods.

In response to community impacts, airport sponsors have created MOUs or other documents to mitigate the impacts from airport operations. Seen more so in urban areas than rural, the agreements cover both environmental and economic issues. For example, in 2004, Los Angeles World Airports (LAWA) established a Community Benefits Agreement (CBA) for Los Angeles International Airport (LAX) with the LAX Coalition for Economic, Environmental and Educational Justice (Coalition).[21] Set to expire with the end of 2020, the CBA has been updated regularly to show progress in mitigating noise and emissions, reviewing projects from the LAX Master Plan and filling jobs at airport-based employers (not necessarily LAWA):

> "The First Source Hiring Program (FSHP) provides residents from the communities immediately surrounding the airport and those most impacted by airport operations—South Los Angeles, El Segundo, Hawthorne, Inglewood, and Lennox—access to airport jobs. FSHP focuses much of its outreach in these areas. FSHP works closely with local Community Organizations such as Work Source Centers, One-Stop Centers, and faith-based organizations to promote airport jobs for LAX employers. FSHP provides training to these organizations on how to apply for jobs at LAX and what is needed to obtain a job with LAX employers. FSHP also promotes jobs through its website platform at www.jobsatlax.org."[22]

The LAX/CBA contributes to positive airport-neighbor relations by assisting focused recruitment for airport employment among its components. As guidance, airport sponsors could tailor a CBA to local needs.

2.2 INVESTMENT NEEDS OF CALIFORNIA AIRPORTS

With the value of California's airports firmly established, it is obvious that adequately maintaining and improving California's aviation assets is critical to the well-being of California's economy and its citizens' quality of life. The method of doing so involves first establishing the financial needs of California's airports.

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[21] https://www.lawa.org/-/media/lawa-web/lawa-our-lax/cbastatusreport2019.ashx

[22] Ibid

This analysis only examines the capital side of the airport income statement based on the assumption that the day-to-day operating expenses are covered by the airport's sponsor. Furthermore, State and federal financial aid is generally targeted to capital projects at airports, not the everyday costs involved with running an airport for operations and maintenance.

2.2.1 Aeronautics Capital Improvement Plan

The Division publishes a biennial Capital Improvement Plan (CIP) that identifies capital projects for a 10-year period (Division 2021). Projects are identified by individual airports and the anticipated year of execution. The most recent version, "Aeronautics Capital Improvement Plan 2021 – 2030," presents a list of fiscally unconstrained capital and planning projects. These projects are based predominantly on airport master plans or other comparable long-range planning documents prepared by airport sponsors. The CIP is compiled in accordance with the Public Utilities Code Section 21704.
It is presented to the CTC for review, comment, and approval. Not all projects listed in the CIP are programmed or funded. Likewise, California airports do not report all their projects to the Division. For example, commercial service airports have other funding sources to draw from besides State or AIP funds. They can use PFCs, revenues generated on site through leases, user resources fees, and parking fees. As a result, the Division's estimate of airport needs is not indicative of all anticipated airport projects.

The approved CIP also serves as the planning document that allows the Division to program grants for CAAP. The CAAP provides financial assistance to local airport sponsors in order to establish, maintain, and improve the statewide system of airports.

The CAAP includes two grant programs:

- The AIP matching grants program that assists local airports with their required share of FAA AIP grants
- The A&D program for planning, construction, and land acquisition projects, and

Since the Aeronautics CIP lists projects by year, it is possible to isolate the projects in the 2021 to 2030 timeframe to better coincide with other estimates. The CIP for 2021 appears in **Appendix A**.

2.3 TRADITIONAL FUNDING / FINANCING SOURCES FOR CALIFORNIA AIRPORTS

As shown in the preceding discussion, the infrastructure needs of California's Aviation System are significant, regardless of the reporting source. Airport sponsors in California have historically relied on capital development funding provided by federal, state, and local sources, each of which are discussed in the following sections.

2.3.1 Federal Sources

The most common source of federal aid for public airport facilities is the AIP, administered by the FAA. The Airport and Airway Improvement Act of 1982 authorizes funding for the AIP from the Airport and Airway Trust Fund (the Trust Fund) for airport development, airport planning, and noise compatibility planning and programs. The Trust Fund is funded through several user taxes on airfares, air freight, and aviation fuel and allocates these tax revenues on a local matching share basis. AIP funds are distributed to different categories of public-use airports owned by public entities that are included in the NPIAS, with some exceptions made for public use airports under private ownership identified in the NPIAS.

Grants under the AIP are distributed to airports in two ways: entitlement grants and discretionary grants. Entitlement grants are apportioned to airports by formula. Primary airports, defined as those airports with scheduled commercial passenger service and 10,000 or more annual enplanements, receive at least a $1M entitlement annually if Congress appropriates $3.2B or more to the AIP. GA airports, which are classified as nonprimary airports, receive a nonprimary entitlement of $150,000 annually. The FAA awards discretionary grants on a competitive basis for individual projects based on capacity enhancement and their importance to the national air transportation system. AIP grants may be used to fund eligible airfield improvements, terminal projects (for non-hub airports), airport roadways, land acquisition, noise mitigation, and safety and security systems and equipment.

The FAA's share of funding for AIP projects varies by airport type. The federal share of AIP matching funds for entitlement and discretionary grants is as follows, with airport sponsors responsible for raising the remaining share from other sources:

- 75 percent for large- and medium-hub airports (80 percent for noise compatibility projects)
- 90 percent for other airports

- Not to exceed 90 percent for airport projects in states participating in the state block grant program
- 70 percent for projects at airports receiving exemptions under U.S.C. §47134, the pilot program for private ownership of airports
- Airports reclassified as medium hubs due to increased passenger volumes may retain eligibility for up to a 90 percent federal share for a two-year transition period
- Certain economically distressed communities receiving subsidized air service may be eligible for up to a 95 percent federal share of project costs (CRS 2019a)

In October 2018, Congress passed the FAA Reauthorization Act of 2018 (HR 302). Under this current reauthorization, the AIP was extended for five Federal Fiscal Years to 2023 and is funded at $3.35B for all five years, which continues AIP funding at the same level since 2012 (NCSL 2018).

Over the past five years (FY2015 to FY2019), the FAA has awarded more than $16.6B in AIP grants to NPIAS airports. California airports received approximately $1.3B. These amounts fail to cover even half of the projected NPIAS capital needs over the next five years for the U.S. or California (FAA Grants 2019).

2.3.2 State Sources

The Division of Aeronautics provides grants and loans to fund airport projects for safety, maintenance, and capital improvements as well as for the preparation of ALUCPs through the CAAP. State excise tax on GA fuel is the Division's primary source of revenue to fund and maintain its grant programs. Aviation gasoline is taxed at 18 cents per gallon and GA jet fuel at 2 cents per gallon per Revenue and Taxation Code sections 7360 and 7392, respectively. Prior to fiscal year that began in 2009, revenues averaged approximately $7,500,000 annually. Since the Great Recession from 2008-09, these figures fell to $5,686,000, by State fiscal year 2018-19. While creating challenges to fund robust grant programs that benefit public-use airports statewide, the figure rose in fiscal year 2020 to $6,104,000. (SCO 2019)

Caltrans Division of Aeronautics Grants

The Division operates several grant programs similar in concept to the FAA's AIP.

State Annual Credit

A total of 149 GA airports are eligible to receive a $10,000 annual entitlement. These funds can be used for airfield maintenance and construction projects as well as airfield and land use compatibility planning. It is possible to accumulate these funds for up to five years. Airports can request the $10,000 each year or request a greater amount from a future year once funds have accumulated (Caltrans 2019a). Reliever airports are not eligible for this grant, but the number of GA designated airports may fluctuate as airports change designation with the FAA.

AIP Matching Grant

An AIP Matching Grant is a state grant designed to assist an airport sponsor in meeting the local match for an AIP grant from the FAA. The Division provides a match up to five percent of the sponsor's AIP grant. Only General Aviation airports (including the Reliever classification) are eligible for the AIP Matching Grant (Caltrans 2019a). Starting in Fiscal Year 2017-2018, the Division implemented caps on per project AIP Match grants (at below 5%) to ensure the maximum number of airports can benefit from this program. The significance is that for grant requests greater than the established cap, airport sponsors who will not receive the full 5% match from the State will have to pay the difference in order to ensure FAA grant compliance.

Acquisition and Development Grant

The Acquisition and Development (A&D) program is designed specifically to provide state grants to eligible, publicly owned, public-use airports for planning, construction, and land acquisition. Funding for A&D grants is provided through any funds remaining after Annual Credits and AIP Matching Grants are programmed. The grants are subject to allocation by the CTC. A&D grants typically range between $20,000 and $500,000 annually for a given airport. The match rate is 90 percent state and 10 percent local. Eligible project categories include enhancing safety, capacity, security and preparing ALUCPs (Caltrans 2019b).

Since Fiscal Year 2017-2018, A&D grants have not been programmed as there were no remaining funds from Annual Credits and AIP Matching Grants due to the decline noted earlier in tax revenues associated with fuel sales.

State Loan Program

The Division of Aeronautics also administers a revolving loan program, which has not been fully utilized and has additional capacity. Three types of loans are available: Revenue Generating Loans, Airport Development Loans, and Matching Funds Loans. These are typically low-interest loans, repayable over a period not to exceed 17 years. Loans from this program are discretionary and are available for airport development and land acquisition, to provide funds to match AIP grants, or develop revenue-producing facilities (e.g., aircraft storage hangars, terminals, fueling facilities, utilities, etc.) at any publicly owned, public-use airport so long as the funds are used for GA purposes. The interest rate for these loans is based on the most recent issue of State of California bonds sold prior to approval of the loan (Caltrans 2019b).

2.3.3 Local Sources

The three primary local sources available for airport capital development funding include PFCs, tax-exempt bonds, and internally generated capital resulting from retained airport revenues.

Passenger Facility Charges

PFCs allow a commercial service airport to collect a fee from each enplaned passenger to aid in the implementation of its capital improvement program (CIP). The collection and use of PFC revenues is authorized under the Aviation Safety and Capacity Expansion Act of 1990 and Part 158 of the Federal Aviation Regulations, the PFC Program (14 CFR, Part 158). PFCs are collected for enplaning passengers at an airport and are used to finance all or portions of specific capital improvements that are identified by the airport sponsor and approved by the FAA prior to the initiation of PFC collection. To be eligible for PFC funding, a project must:

- Preserve or enhance safety, security, or capacity of the national air transportation system
- Reduce or mitigate airport noise from an airport; or
- Provide opportunities for enhanced competition between or among air carriers.

This funding mechanism helps an airport raise local funds for improvement projects that can be used in conjunction with other federal and state resources. Currently, federal regulations allow an airport to collect a PFC fee up to $4.50 per enplaned passenger, a ceiling that has been in place since 2000 (CRS 2019a).

Tax-Exempt Bonds

Primary airports have long used bonds to finance large-scale capital projects with long-term debt. In 2017 and 2018, airports in the United States raised approximately $14.7B and $17.4B in bond issues, respectively (CRS 2019a). Bonds are often used to construct and renovate parking garages, terminal buildings, maintenance facilities, and other airport services. Tax-exempt Private Activity Bonds (PABs) are the most widely used type of bond issued to finance airport capital projects, accounting for 60 percent of bonds issued over the last decade (ACI-NA 2020). PABs are issued by a municipality or public authority and allow the use of landing fees, charges on airport users, and property taxes on privately controlled on-airport buildings to service debt without obligating tax revenue. Examples of these bonds include general obligation bonds, which are secured through the general tax authority, and general airport revenue bonds, which are secured primarily from the revenues of the airport. The primary advantage of PABs is that, due to their tax-exempt status, airports can raise funds comparatively cheaply since investors receive a federal income tax exclusion on interest paid on the bonds. This makes PABs the most cost-efficient form of airport infrastructure financing available today (ACI-NA 2020).

Internally Generated Capital Resulting from Retained Airport Revenues

Airport sponsors and operators depend on various sources of aeronautical and non-aeronautical revenue to fund capital projects. For example, most commercial service and GA airports charge user fees associated with aircraft parking and storage, aviation-related ground and building rent, landing fees, and fuel flowage fees. Commercial service airports can capture additional revenue from concessions, lease-paying businesses within the terminal that support airline passengers, and higher landing fees due to use by heavier aircraft. After covering their operating expenses, any left-over revenue is often used to pay for capital projects.

Funding History

The preceding sections have summarized the traditional sources of capital funding available to California's airports. To answer the question of how much money they provide, one needs to examine past airport financial records and forecast what these sources are likely to provide in the future. The FAA Authorization Act of 1994 requires commercial service airports to file financial reports annually with the FAA. Filed in the Certification Activity Tracking System (CATS), the reports provide information on each airport's revenues, expenses, and capital expenditures.

Using data from this system, historic data relating to sources of capital funding for California's airports was compiled. CATS provided the amount of PFCs collected each year, bond proceeds collected each year, and how much airports contributed to capital projects from their retained revenues.

CATS data missing from GA airports should be insignificant for the following reasons:

- GA airports derive no revenues from PFC
- GA airports rarely issue bonds, and what is issued is dwarfed by the amount issued by CS airports, and
- Capital contributions from GA airport revenues typically do not exceed what is required for matching grants, and that amount is included in the AIP data

CATS data for 2014 to 2019 is shown in **Figure 2-3**, along with FAA AIP data:

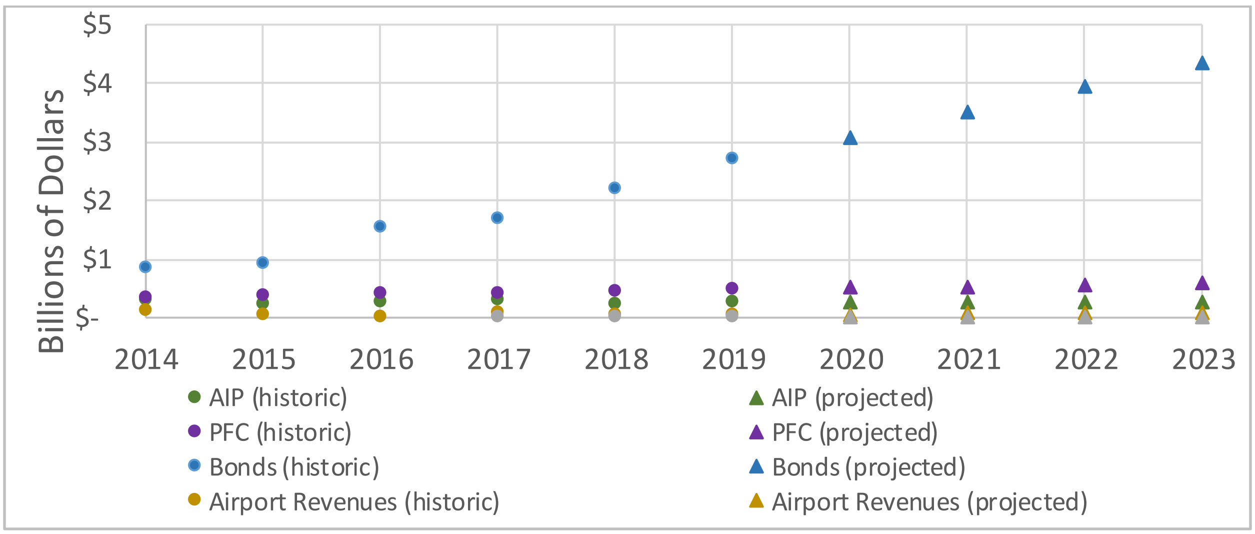


Figure 2-3: California Airport Capital Sources by Year, 2014-2019, and Projected Sources
Source: FAA, 2020; Mead & Hunt, 2020.

Using regression analysis on the data from 2014 to 2019, each capital funding source was projected out to 2023, as shown in **Figure 2-3**. Regression analysis effectively determines the trend of historical data and carries that trend forward to future years.

From this point, it appears that adding the different capital funding sources would yield the expected funding available for 2019 through 2023. However, these funding sources are not independent of each other. For example, PFC funds are used not only to pay for projects on a pay-as-you-go basis, but also to pay for the debt service on PFC backed bonds.

The same is true of airport retained revenues, which are also frequently used as matching funds for AIP grants. So, the combined total funding of AIP, PFCs, bonds, airport revenues, and Caltrans funding, is not simply the sum of the parts, but something less than the total, depending upon how these funds are allocated and intermixed. This level of detail is not available in CATS; a range is required, as shown in **Table 2-3**.

The table assumes for the low estimate that all PFC, airport revenues, and Caltrans funding are included in the other sources of capital and are not included in the total. The high estimate assumes the opposite – that no PFCs are used to back bonds and airport revenues and Caltrans funds are not used for AIP matching funds—so their entirety is included in the total.

Table 2-1: Estimated Capital Funding Available to California Airports, 2019 to 2023

Capital Funding Source	**Low Estimate** (in billions of $)	**High Estimate** (in billions of $)
AIP	$1.39	$1.39
PFCs	$0.00	$2.70
Bonds	$17.61	$17.61
Airport Revenues	$0.00	$0.39
California Funding	$0.00	$0.03
2019-2023 Total	**$19.01**	**$22.12**
Source: FAA, California Department of Transportation Division of Aeronautics, and Mead & Hunt.		

From **Table 2-1**, California airports can expect between $19B and $22B in capital funding available from 2019 to 2023.

There are proposals aimed at enhancing conventional forms of capital funding to close this gap. For example, an increase in the $4.50 PFC cap could allow airports to generate additional revenue for capital projects. However, this only aids commercial service airports. Furthermore, many commercial service airports already have their PFC revenue streams locked up in committed projects for several years. Because of reasons like this, other sources of capital funding are needed to close California's airport funding gap. Section 4 examines a number of these alternative funding options.

2.3.4 Federal Sources

Several alternative federal programs are available to airport sponsors and operators to fund airport infrastructure projects. These include the United States Department of Transportation's (USDOT) discretionary grant and credit assistance programs and the United States Department of Agriculture (USDA) Rural Development's direct loan and grant program.

United States Department of Transportation Discretionary Grant Programs

The USDOT operates two similar and highly competitive discretionary grant programs to fund projects that make the nation's transportation systems safer and more efficient as well as improve economic productivity and quality of life: The Infrastructure for Rebuilding America Grant Program and the Better Utilizing Investments to Leverage Development Grant Program.

Infrastructure for Rebuilding America Grant Program

The Infrastructure for Rebuilding America (INFRA) program, formerly known as the Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies (FASTLANE) grant program established in 2015, aims to rebuild the nation's aging infrastructure. The program uses selection criteria that promote projects with national and regional economic vitality goals while leveraging non-federal funding to increase the total investment by state, local, and private partners. Grants are awarded to both large and small projects under the program, with minimum grants for these projects being $25M and $5M, respectively. Ten percent of available funds each fiscal year of INFRA funding are reserved for small projects. The program also recognizes the importance of rural projects, which receive at least 25 percent of INFRA grant funding. In 2019, $856M in total grants was awarded to 20 transportation improvement projects during the latest round of the program (ECT 2019). The USDOT is making approximately $889M available for the latest round of the INFRA program, which was announced in March 2021 (USDOT 2021).

Eligible applicants for INFRA grants are as follows:

- A state or group of states
- A metropolitan planning organization that serves an urbanized area (as defined by the Bureau of the Census) with a population of more than 200,000 individuals
- A unit of local government or group of local governments

- A political subdivision of a state or local government
- A special purpose district or public authority with a transportation function, including a port authority
- A federal land management agency that applies jointly with a state or group of states
- A tribal government or a consortium of tribal governments; or
- A multi-state or multi-jurisdictional group of public entities (USDOT 2020a).

The INFRA program requires project sponsors to submit a grant application, a key component of which is the preparation of a benefit-cost analysis (BCA) for the proposed project. A BCA is a method by which the future benefits of a proposed project are identified and quantified for comparison to its anticipated costs. The USDOT evaluates an applicant's BCA to ensure that projects that maximize benefits and minimize costs are awarded funding under the program.

Benefits typically evaluated in a BCA include travel time savings, operating cost savings, safety improvements, and emissions reduction. Costs include capital expenditures and operations and maintenance expenditures. An important consideration for project sponsors interested in competing for funding in the INFRA program is that a grant application and BCA typically costs $40,000 to $50,000 to prepare, which some applicants may not be able to afford.

Types of projects eligible for funding under the INFRA program include:

- A highway freight project carried out on the National Highway Freight Network
- A highway or bridge project carried out on the National Highway System
- A railway-highway grade crossing or grade separation project; and
- A freight project that is 1) an intermodal or rail project, or 2) within the boundaries of a public or private freight rail, water (including ports), or intermodal facility; is a surface transportation infrastructure project necessary to facilitate direct intermodal interchange, transfer, or access into or out of the facility; and will significantly improve freight movement on the National Highway Freight Network (USDOT 2020a).

Based on these criteria, an intermodal project located at an airport is eligible for INFRA grant funding, but most other airport capital projects, including new runways, taxiways, and terminals, are not.

An example below of an intermodal project that received funding under the FASTLANE grant program prior to its change to the INFRA grant program is the Northern Columbia Basin Railroad project at Port of Moses Lake in Washington State. The Port of Moses Lake is located between Seattle and Spokane and was established to promote economic development in central Washington.

The Port operates an industrial park, a foreign trade zone, and the Grant County International Airport, which combined comprise more than 5,700 acres of infrastructure that supports a wide range of aviation and commercial business. In 2017, the Port was awarded a $9.9M FASTLANE grant to complete construction of the Northern Columbia Basin Railroad project, which will restore rail service to the Port that ended in 2009 and provide new intermodal linkages between air cargo and rail (Port of Moses Lake 2016).

A $9.9 million FASTLANE grant was awarded to restore the rail service to the Port of Moses in Washington State and provide new intermodal linkages between air cargo and rail.

Source: Wsdot.wa.gov

Better Utilizing Investments to Leverage Development (BUILD) Grant Program

Previously known as the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants Program, which was created in the American Recovery and Reinvestment Act of 2009, the BUILD program allows project sponsors at the state and local levels to obtain funding for multi-modal, multi-jurisdictional projects that have limited sources of federal funds through traditional USDOT programs.

The goal of the BUILD program is to upgrade transportation infrastructure across the United States to make it safer and more efficient. BUILD grants are for planning and capital investments in surface transportation infrastructure and are awarded on a competitive basis for projects that will have a significant local or regional impact. Projects eligible for BUILD funding include*:

- Road or bridge projects eligible under Title 23, USC
- Public transportation projects eligible under Chapter 53 of Title 49, USC
- Passenger and freight rail transportation projects
- Port infrastructure investments (including inland ports and land ports of entry)

- Intermodal projects
- Projects investing in surface transportation facilities that are located on tribal land and for which title or maintenance responsibility is vested in the federal government (USDOT 2020b)

  *Subject to updates in 2021.

The maximum grant award in the latest round of BUILD funding announced in January 2020 will be $25M, with no more than $100M to be awarded to a single state. The BUILD program also recognizes the importance of improving transportation infrastructure in rural communities, with 50 percent of BUILD funding reserved for projects in those areas (USDOT 2020c). Since 2009, the TIGER and BUILD programs have provided a combined $7.9B to 609 projects (USDOT 2020d).

Like the INFRA program, airport capital projects such as runways, taxiways, airport traffic control towers, terminals, and aircraft gates are ineligible for BUILD grants. Examples of eligible airport projects are intermodal projects located at airport facilities, transit connections to airports, joint use facilities on airport property that serve additional uses (e.g., transit connections, intermodal freight transfer facilities, and rail extensions), as well as publicly-accessible roads into, out of, and through airport properties (USDOT 2020c). A grant application, including a BCA, must be submitted as part of the BUILD program's competitive process, which can be cost-prohibitive for some project sponsors.

In 2019, the Allegheny County Airport Authority in Pennsylvania received an $18.7 million BUILD grant for the Cargo Building 4 Intermodal Freight Transfer Facilities Development Project located at Pittsburgh International Airport. This project involves construction of a 75,000-square-foot cargo processing facility and an adjacent surface parking lot to expand air cargo operations at the airport (USDOT 2019).

In 2019, the Allegheny County Airport Authority received an $18.7 million BUILD grant to expand air cargo operations at the Pittsburgh International Airport.

Source: Allegheny County Airport Authority

Transportation Infrastructure Finance and Innovation Act (TIFIA) Credit Program

The USDOT's TIFIA Credit Program provides credit assistance for qualified projects of regional and national significance. The primary goal of the TIFIA program is to enable the construction of large-scale surface transportation projects by providing financing to complement state, local, and private investment. The USDOT created the program to respond to state and local governments seeking financing for large-scale transportation projects at reasonable rates, which is difficult to secure for projects financed with uncertain revenue streams such as tolls and other types of user charges.
State and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities are eligible to apply for credit assistance.

The following types of projects are eligible for the TIFIA program:

- Highways and bridges
- Intelligent transportation systems
- Intermodal connectors
- Transit facilities and vehicles
- Intercity buses and facilities
- Freight transfer facilities
- Pedestrian bicycle infrastructure networks
- Transit-oriented development
- Rural infrastructure projects
- Passenger rail vehicles and facilities; and
- Surface transportation elements of port projects (USDOT 2017)

Many airport capital improvement projects such as runways and terminal buildings are ineligible for the program. However, some airports have found ways to use this program.

Three types of financial assistance for projects are offered through the TIFIA program:

- **Secured (direct) loan** – This option offers flexible repayment terms and provides combined construction and permanent financing of capital costs. Repayment can begin five years after substantial completion of the project, with a maximum repayment term of 35 years.

- **Loan guarantee** – The loan guarantee option provides full-faith-and-credit guarantees by the federal government and guarantees a borrower's repayments to a non-federal lender. Repayment must begin no later than five years after the project's substantial completion.
- **Standby line of credit** – Applicants can use a standby line of credit to serve as a secondary source of funding to supplement project revenues, if needed, during the first 10 years of project operations. The line of credit is available up to 10 years after substantial completion of the project (USDOT 2018).

In 2018, The City of Chicago received a $272 million TIFIA loan to support the construction of a multimodal facility that serves as central access point at O'Hare International Airport.

Source: Chicago Department of Aviation https://www.flychicago.com/ohare/tofrom/publictransit/Pages/default.aspx

Major requirements of the program are:

- **Minimum anticipated project costs** – $10M for transit-oriented development, local, and rural projects; $15M for Intelligent Transportation System projects; and $50M for all other surface transportation projects
- **TIFIA credit assistance limit** – Loans and loan guarantees can be provided up to a maximum of 49 percent of project costs; lines of credit can be for an amount up to a maximum of 33 percent of project costs
- **Investment grade rating** – Senior debt and TIFIA loans must receive investment grade ratings from at least two nationally recognized credit rating agencies (only one rating required if less than $75M), and
- **Dedicated repayment source** – The project must have a dedicated revenue source pledged to secure both the TIFIA and senior debt financing (USDOT 2017)

TIFIA financing is an attractive option for project sponsors for several reasons. One is that TIFIA interest rates are often lower than what most borrowers can obtain in the private markets. The interest rates are also fixed, unlike private commercial loans that have variable rates. The long repayment period for direct loans is also difficult to find in the private capital market. Lastly, TIFIA financing enables project sponsors to construct large-scale projects years earlier since they do not need to rely on pay-as-you go funding from tolls and other types of user generated revenue.

TIFIA financing also has several limitations. Among these are the difficulties of attracting private investment to risky projects, the difficulties of developing revenue mechanisms to service loans, the likelihood of requiring grant funding to make up a portion of the capital, and limits to the number of projects that can use credit assistance (CRS 2019b). Between 1998 and 2018, the TIFIA program provided $32B to 74 projects with a total cost of approximately $117B. The average total project cost during this period was $1.5B, with TIFIA providing an average of $430M in assistance (CRS 2019b).

An example of an airport project that has benefited from the TIFIA program is a combined parking and public transportation facility that opened at Chicago O'Hare International Airport in 2018. Partially financed with a $272 million TIFIA loan, the Multi Modal Facility serves as central access point for all rental cars, public parking, busing, commuter rail, and other regional transit serving O'Hare (City of Chicago 2018).

United States Department of Agriculture Rural Development – Community Facilities Direct Loan and Grant Program

The United States Department of Agriculture (USDA) Rural Development's Community Facilities Direct Loan and Grant Program provides affordable funding to public bodies, community-based nonprofit corporations, and federally recognized tribes to develop essential community facilities in rural areas. Jurisdictions eligible for this program are rural areas including cities, villages, townships, and towns including federally recognized tribal lands with no more than 20,000 residents according to the latest U.S. Census data. The program defines an essential community facility as "a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area and does not include private, commercial, or business undertakings" (USDA 2020a).

Examples of essential community facilities include:

- Public facilities such as town halls, courthouses, airports, or street improvements
- Educational services such as museums, libraries, or private schools
- Healthcare facilities such as hospitals, medical clinics, dental clinics, nursing homes, or assisted living facilities, and
- Community support services such as childcare centers, community centers, fairgrounds, or transitional housing

Several types of airport capital projects can be financed through funding under the program, including terminals, hangars, runways, parking areas, roadways, curbside improvements, and administrative facilities (USDA 2019).

The program offers funding through low interest direct loans, grants, and a loan guarantee program. Funding priorities are determined through a point system based on population and median household income. Under this system, priority is given to small communities with a population of 5,500 or fewer and low-income communities having a median household income below 80 percent of the state nonmetropolitan median household income. The terms of direct loans, grants, and loan guarantees under the program are discussed below.

Direct Loans

Funding provided through a direct loan involves interest rates set by USDA Rural Development and a repayment period limited to the useful life of the facility or any statutory limitation on the applicant's borrowing authority, with a maximum term of 40 years. The interest rate is fixed for the entire term of the loan and is determined by the median household income of the service area. There are no prep-payment penalties. The average direct loan size is $4M, but the Community Facilities Program has funded projects greater than $100M (USDA 2019).

Grants

Funds must first be available before grants can be awarded. If funds are available, applicants must be eligible for grant assistance, which is provided on a graduated scale, with smaller communities with the lowest median household income being eligible for projects with a higher proportion of grant funds. At the upper end of this scale, grant assistance is limited to a maximum of 75 percent of eligible project costs when the proposed project is located in a rural community having a population of 5,000 or fewer, and the median household income of the proposed service area is below the higher of the poverty line or 60 percent of the state nonmetropolitan median household income. At the low end, grant assistance is limited to a maximum of 15 percent of eligible project costs when the proposed project is located in a rural community having a population of 20,000 or fewer and the median household income of the proposed service area is below the poverty line or 90 percent of the state non-metropolitan median household income, whichever is higher (USDA 2020a).

Loan Guarantee

Essentially the same as the direct loan program, the loan guarantee program helps eligible borrowers build essential community facilities in rural areas by providing loan guarantees to private lenders. The loan guarantees are for loans made to borrowers who, without the guarantee, would be unable to secure commercial credit on reasonable terms. This program can guarantee up to 90 percent of loss of both principal and interest on loans and bonds made by a commercial lender to a public body, nonprofit, or federally recognized tribe. Unlike the direct loan program, the interest rate can be fixed or variable and is negotiated between the lender and borrower (USDA 2020b).

Additional requirements of direct loans, grants, and loan guarantees under the Community Facilities Program include the following:

- Applicants must have legal authority to borrow money, obtain security, repay loans, and construct, operate, and maintain the proposed facilities
- Applicants must be unable to finance the project from their own resources or through commercial credit at reasonable rates and terms
- Facilities must serve the rural area where they are or will be located
- Projects must demonstrate substantial community support
- Environmental review must be completed and acceptable (USDA 2020a)

The Lamoni Municipal Airport in Decatur County, Iowa is an example of an airport that has successfully used a USDA Community Facilities loan to help fund capital improvements. To build a runway extension and six-bay hangar, the airport used funding from the FAA, Iowa Department of Transportation, and a $750,000 Community Facilities Loan that served as the community's local match (USDA 2019).

The Lamoni Municipal Airport in Decatur County, Iowa, used a $750,000 USDA Community Facilities loan as the local match to supplement FAA funding to build a runway extension and six-bay T-hangar.

Source: City of Lamoni https://www.leadonlamoni.com/emergency-medical-services/airport/#

2.3.5 Local Sources

At the local level, a variety of alternative strategies are available to airport sponsors and operators to generate revenues that can be used to fund capital projects. Some of these include focusing on customer interests to achieve increased sales of in-terminal concessions, advertising, parking, and added customer services; achieving greater efficiencies and cost savings through shared use of equipment and facilities among airport tenants or through cross-utilization of airport staff; and managing existing passenger concessions and services to achieve new revenue (ACRP 2015).

Two additional approaches that may provide the opportunity for significant revenue development are the following:

- Revenue participation in non-aeronautical real estate development through public-private partnerships
- Tax increment financing

Non-Aeronautical Real Estate Development through Public-Private Partnerships

Airports fortunate enough to own large tracts of developable real estate may take advantage of their unique position as transportation centers and maximize revenues through non-aeronautical real estate development. Examples of non-aeronautical development an airport sponsor may consider include:

- Transportation and logistics facilities such as consolidated cargo facilities, receiving and distribution centers, and warehouses
- Foreign trade zones
- Commercial development such as office complexes, retail stores and malls, hotels and conference centers, medical clinics, and entertainment venues
- Industrial parks; and
- Recreation areas such as golf courses, parks and trails, and sports centers (ACRP 2015)

A P3 between the City of Victorville and Stirling Development helped transform the former George Air Force Base into a logistics and aerospace hub with major tenants including FedEx, General Electric, and Pratt & Whitney. https://www.victorvilleca.gov/government/city-departments/airport/leasing-opportunities

Photo courtesy of Southern California Logistics Airport

It is important to note that FAA approval of these uses is often necessary since they are usually deemed non-aeronautical and may require land release approval from the FAA to facilitate their development.

An approach some airport sponsors are using today to build such facilities is to partner with other public and private companies in order to maximize revenues and minimize risk. There are several types of partnering arrangements an airport sponsor can use, one of which is a public-private partnership or P3. In the context of airports, a P3 is a contractual relationship between an airport sponsor and a private developer to develop a site on airport property. In this relationship, the airport sponsor and private developer share in both the costs of and revenues generated by the development. An airport sponsor may employ this strategy if it does not have the resources, time, or expertise to complete the development project alone (ACRP 2017).

Selection of a P3 structure for a development project offers a variety of benefits, not all of which are available for every P3 arrangement. These benefits include the following:

- Project delivery can often occur in less time and at a lower cost
- Competition can be promoted not only on cost but also on alternative designs and technical considerations during the procurement process
- Certain risks can be transferred to the private developer, which protects the airport sponsor
- Accountability is increased by providing a single point of responsibility for all elements of project delivery
- Financing alternatives can be more flexible in cases where an airport sponsor has cash flow or borrowing capacity limits
- Contract terms can be more easily customized to address specific project concerns
- Financial risk for the airport sponsor can be reduced
- Long-term maintenance of the facility can be included in a P3 structure; and
- Design/construction and operations/maintenance responsibilities can be packaged to optimize the delivery of both (Kaplan Kirsch & Rockwell 2017)

Despite these benefits, P3s are not without drawbacks. Airport sponsors should consider the complexity of implementing this strategy, which may require the assistance of an investment banker to provide services such as valuing assets, making recommendations to enhance marketability, and identifying the market of potential partners.

An extensive request for proposal (RFP) process that identifies the best partner and negotiates the contract will also be required. Airline approval may be necessary depending on the airport's airline operating agreement, and FAA and bondholder approval may be required if assets acquired with federal funds or assets covered by outstanding bonds, respectively, are involved (ACRP 2015). In addition to these implementation factors, there are potential political issues associated with P3s. The public has historically been skeptical of P3s because of the belief that taxpayer dollars fund public facilities such as airports and introducing private investment into the public facility can raise concerns. Public support may be required prior to establishing a P3 (ACRP 2015).

An example of a success story using a P3 approach is the Southern California Logistics Airport (VCV) in Victorville, California. A public-private partnership formed between the City of Victorville and Stirling Development in 2000. It has redeveloped the former George Air Force Base into a logistics and aerospace hub. Commercial development on the 2,500-acre airport includes major tenants such as FedEx, General Electric, Leading Edge Aviation Services, Newell Rubbermaid, Plastipak Packaging, Pratt & Whitney, and Victorville Aerospace Resources and Technologies. This development on SCLA is the anchor for additional multimodal industrial development adjacent to the airport (NAIOP 2015).

Tax Increment Financing

Tax increment financing (TIF) has become a popular method of financing economic development in the United States from megaprojects such as Chicago's Lincoln Yards and Amazon's HQ2 project to smaller-scale projects involving neighborhood improvements and affordable housing (CityLab 2019). In the transportation industry, TIF has been used to finance many transit projects. An example is the Transbay Transit Center building in San Francisco where TIF is helping to finance an estimated 33 percent of the $42M cost of the facility. TIF has not been widely used for airport projects; however, it may provide opportunities for creative financing for projects, such as industrial parks, that include an airport component (ACRP 2015).

To finance a project through a TIF, a district encompassing the geographic boundaries of the project's impact area is established. A lead agency, such as a city or other established taxing authority, administers the TIF district. Bonds are issued within this district to pay for the project, with the assumption that the infrastructure improvements will increase property values within the district.

As property values rise, the additional property taxes collected above the baseline property tax revenues (i.e., tax revenues without the project) are used to pay the debt service on the bonds. The difference between the baseline tax revenues and the additional property taxes serves as the incremental revenue stream that finances the project. Factors determining the amount of revenue generated by TIF are the size of the TIF district, the type of infrastructure project, and market conditions (ACRP 2015).

TIF has several advantages as a strategy for financing infrastructure improvements:

- TIF allows a municipality to maintain control without counting against its debt limit because there is a dedicated revenue stream
- The public generally does not view TIF as a tax increase
- Those who pay for the infrastructure improvement through property taxes also enjoy the benefits of the investment (ACRP 2015)

Disadvantages of TIFs generally include:

- The agency benefiting from the project may be responsible for the bond payments if TIF revenues are not able to cover debt service
- Projects may have unforeseen costs, which can inhibit the TIF district's success (ACRP 2015)

An example of an airport where TIF has been used successfully is Pittsburgh International Airport (PIT) in Pittsburgh, Pennsylvania. PIT sits on 8,800 acres of land in Allegheny County in southwestern Pennsylvania. Allegheny County long identified the development of portions of the airport's property as a key element of its economic development plan, which occurred on a limited basis in the airport's earlier days when the Allegheny County Department of Aviation served as the airport sponsor. In 1999, Allegheny County formed the Allegheny County Airport Authority (ACAA) to not only oversee all areas of airport operations, but also prepare an aggressive development plan for airport property.

The ACAA's first step was to determine how much airport land was available for development. After identifying the airport's aeronautical needs for the next 50 years, approximately 3,800 acres of land was left for non-aeronautical use, which the FAA approved on the airport's Airport Layout Plan (ALP). The ACAA later determined that only 1,900 acres of land were available for non-aeronautical development due to topography. Much of the land was previously used for coal mining (ACRP 2015).

Once the amount of land available for development was identified, the ACAA, Allegheny County Department of Economic Development, planning consultants, and local townships looked at the most suitable land uses and determined these to be warehouse distribution, office, light industrial, tech/flex, and hospitality.

The initial proposed development was a new warehouse industrial park, now known as Clinton Commerce Park, projected to consist of 1.5 million square feet of large bulk warehouse buildings. There were significant hurdles to overcome before development of the industrial park could begin. First, the site required substantial transportation and utility infrastructure improvements. There was also a lack of funding to pay for these improvements, which were anticipated to cost $7.5M, approximately 40 percent of the project's total cost of $18.5M (ACRP 2015). To help pay for the infrastructure improvements, the ACAA coordinated with the school district, county, local townships, and County Redevelopment Authority.

A TIF district was created that included 150 acres of the proposed industrial park. The taxing bodies, consisting of the school district, local townships, and county, agreed to contribute 75 percent of the real estate revenues generated by the development that exceeded the baseline property tax revenues toward the infrastructure improvements (ACRP 2015). The creation of the TIF district spurred significantly more private investment into the Clinton Commerce Park than the $60M originally anticipated, because it filled a gap in funding for transportation and utility infrastructure to the site. Today, Clinton Commerce Park is generating significant revenue for the ACAA (ACRP 2015).

2.4 ALIGNMENT WITH CTP GOALS AND OBJECTIVES

CTP 2050 seeks to identify a statewide transportation system that optimizes the movement of people and freight to the benefit of California's economy, environment, and communities. Each modal unit must assess its infrastructure to identify where improvements are needed most, identify and access available funding, and direct investment dollars toward those transportation facilities that will best meet the State's demographic, environmental, economic, and quality of life challenges. As a component of that system, aviation contributes to the quality of life for all Californians by providing a safe and secure airport system that supports sustainable economic growth for our communities, the State, and the nation.

2.4.1 CTP Policy Goals and Agency Funding

CTP 2050 promotes eight overall policy goals that can be achieved only through adequate funding, careful allocation of those funds, and sound fiscal management:

- **Equity:** Eliminate transportation burdens for low-income communities, communities of color, people with disabilities, and other disadvantaged groups
- **Quality of Life & Public Health:** Enable vibrant, healthy communities
- **Safety:** Provide a safe, secure transportation system with zero fatalities
- **Accessibility:** Improve multimodal mobility and access to destinations for all users
- **Infrastructure:** Maintain a high-quality, resilient transportation system
- **Environment**: Enhance environmental health and reduce negative transportation impacts
- **Economy:** Support a vibrant, resilient economy.
- **Climate:** Achieve the targets for GHG emissions set statewide and increase resilience to climate change

While the Division and FAA support each of these goals through differences and complements in their funding programs, as summarized below in **Table 2-2,** Division programs give preference to GA airports that do not have the same options as CS airports, but they are not limited to NPIAS airports.

Table 2-2: Federal and State Aviation Funding in Support of CTP 2050 Goals

CTP 2050 Goal	Federal Funding Support	State Funding Support
Transportation Equity	The FAA supports transportation equity at NPIAS airports through grants for the development of transit connections within airport boundaries.	Caltrans' offices provide standalone grants or matching grants to support a variety of modes that provide Californians with a more efficient transportation system and transportation access.
Quality of Life	The FAA supports quality of life goals for Californians by: • Providing federal grants to support the preservation and development of NPIAS airports, • Requiring compliance with environmental laws, orders, and regulations as a condition of federal funding, and • Supporting the development of aviation and air cargo facilities to support a vibrant economy	The CAAP provides financial assistance to local airport sponsors to establish, maintain, and improve the statewide system of airports. In doing so, it contributes to California aviation and a vibrant State economy (see **Section 1**).
Safety	The FAA provides grants to support safety projects at NPIAS airports such as • Obstruction mitigation, • Purchase of safety equipment (e.g., ARFF facilities and equipment), • RSA improvements, • Security fencing and access control (between movement areas and terminals), and • Projects that enable compliance with design criteria and standards	The CAAP provides financial assistance to local airport sponsors to establish, maintain, and improve the statewide system of airports. State grants are applied to capital projects for safety, capacity, and security. Limited funds are designated to ALUCPs for safety interests. The AIP State Match program contributes up to 5 percent of the federal grant amount to assist local sponsors meet their 10 percent match amount.

CTP 2050 Goal	Federal Funding Support	State Funding Support
Accessibility/Mobility	The FAA provides grants to NPIAS airports to support the development of surface group access buildings that are within the property line, such as: • Roads and highways • Transit connections	Various modal agencies within Caltrans support the development of single and multi-modal improvements for passengers and air cargo.
Infrastructure	The FAA provides grants to NPIAS airports to promote aviation system preservation through: • Capacity improvements, such as the construction of new runways, taxiways, and their extension, • Terminal improvements to accommodate increased passenger use and changes in the aircraft fleet, and • Reconstruction and replacement of facilities when normal maintenance is no longer an option	The CAAP provides financial assistance to local airport sponsors to establish, maintain, and improve the statewide system of airports.
Environment/Climate	FAA requires airport sponsors who receive federal funding or propose ALP changes to comply with the National Environmental Policy Act of 1969 (NEPA). Measures for reduced GHG emissions are not specified in the NPIAS report. However, FAA acts as the U.S. lead agency for participating In GHG reduction initiatives from the International Civil Aeronautics Organization (ICAO). FAA support is available to airports as	Airport sponsors who receive grants from the Division must demonstrate compliance with the California Environmental Quality Act and associated laws, orders, and their implementing regulation. Limited funding from the CAAP are allocated for the preparation of ALUCPs, which seek to minimize the public's exposure to aviation-related noise and safety hazards within 2 miles of public use airports.

CTP 2050 Goal	Federal Funding Support	State Funding Support
	incentive to switch ground support equipment to electric units.	
Economy	The California economy is the world's fifth largest, and aviation contributes significantly to both the State and national economies (see **Section 1**). Support to California's airports helps to support the state's economy.	The CAAP provides financial assistance to local airport sponsors to establish, maintain, and improve the statewide system of airports. In doing so, it contributes to California aviation and a vibrant State economy (see **Section 1**)
Source: FAA, 2018		

2.4.2 Opportunities to promote CTP 2050 Goals

Funding is central to a safe and efficient transportation system, and the goals identified by CTP 2050 can only be achieved if funding is available to construct, support, and maintain that infrastructure.

Only a portion of the improvements identified in the Division's CIP are constrained, and the availability of State and federal dollars may be impacted due to the Covid-19 outbreak. The Division and FAA will need to work together more closely to identify access and optimize available funds.

The Division is uniquely positioned to help airport operators, communities, and decision makers improve their facilities by acting as a liaison and providing leadership and outreach. The collaboration will contribute to the State's multimodal transportation system to the benefit of all citizens. Specific measures could be implemented that use existing resources. Each recommendation is followed by a statement to describe how it could contribute to or support CTP 2050 goals.

Create a Specific Role for Designated Airport Funding Specialists

The Division should identify designated staff to explore opportunities with other transportation agencies and related funding sources. While dedicated staff execute traditional funding programs and contribute to CIP development, their efforts could be expanded or supplemented to:

- explore how projects completed by other states and agencies accessed new or different funding sources (as described in Section 4)
- reach out to other transportation agencies to explore new ways to coordinate projects so that they may qualify for other funding sources
- provide outreach to GA airport operators and their communities to alert them of alternative funding sources
- collaborate with FAA to coordinate the Division's CIP with FAA's AIP programming

Relationship to CTP 2050 goals: Exploring opportunities with other transportation agencies and related funding opportunities will support CTP 2050 Accessibility, Infrastructure, and Economy goals.

Incorporate Aviation Planning and Funding into Land Use Compatibility Planning Efforts

As defined by statute, ALUCs do not participate in airport planning or operations; rather, they seek to reconcile airport and community planning efforts to avoid conflicts associated with exposure to aviation noise and safety hazards. The preparation of ALUCPs provides unique opportunities to discuss long-range visions for the airport. These efforts could be bolstered during ALUCP preparation to consider the links between community and airport development goals and the funding opportunities that could be available to support both, such as the use of underutilized airports to support aviation-compatible community development projects, energy development projects, or business park development.

Relationship to CTP 2050 goals: The Division's current land use compatibility program provides opportunities to consider current and future aviation and community development goals and opportunities to find synergies between those goals and funding opportunities. These opportunities promote all eight CTP 2050 goals.

Provide Training Opportunities for GA and Non-NPIAS Airport Operators

Airport development is expensive. GA airport operators and their communities are often challenged to provide funding to support airport improvements or provide matching dollars. Research is time consuming, and GA airport operators may face resource limitations, lack expertise to seek out different funding sources, or prepare complex grant applications. Dedicated staff members could assist GA and non-NPIAS airports to identify applicable funding sources for appropriate aviation facility and community development projects. Staff can also serve as a liaison to facilitate project identification and inclusion in the CIP or NPIAS, to help explain review criteria comprised of several components ranging from development needs to proximity with nearby airports. (FAA Order 5090.5)

Relationship to CTP 2050 goals: Providing training opportunities can help local aviation professionals hone their skills while supporting the improvements to the State's transportation infrastructure. Such efforts support CTP goals associated with equity, system safety, and preservation and promote a vibrant economy.

Develop and Aviation Development and Funding Toolkit

The Division and outreach professionals can provide leadership through the development of an Aviation Development and Funding Toolkit.

It could feature:

- Applicable funding sources and match requirements
- Alternative funding partnerships and opportunities (see **Section 4**)
- Tools for communicating the benefits of airports and development needs to their communities

Relationship to CTP 2050 goals: Education and outreach can facilitate airport and aviation system improvements and provide staff development opportunities to airport operators and planners. Such benefits coincide with efforts to enhance safety, system preservation, the local economy, and improve the quality of life for community residents.

Table 2-3 summarizes new and alternative opportunities to support California's aviation system and CTP 2050 goals.

Table 2-3: CTP 2050 Policy Guidance

Goals and Objectives	Challenges Related to Aviation
• **Equity:** Eliminate transportation burdens for low-income communities, communities of color, people with disabilities, and other disadvantaged groups • **Quality of Life & Public Health:** Enable vibrant, healthy communities • **Safety:** Provide a safe, secure transportation system with zero fatalities • **Accessibility:** Improve multimodal mobility and access to destinations for all users • **Infrastructure:** Maintain a high-quality, resilient transportation system • **Environment**: Enhance environmental health and reduce negative transportation impacts • **Economy:** Support a vibrant, resilient economy. • **Climate:** Achieve the targets for GHG emissions set statewide and increase resilience to climate change	• Disparity between available funding and assessed need • Federal funding eligibility and allocations based on NPIAS and airport classification • Knowledge and information sharing **Opportunities** • Consider airports and aviation within a broader context of promoting interaction and identifying funding opportunities across modal agencies • Provide leadership and education to airports and their communities to identify aviation-related opportunities and funding.

Opportunity and Policy Recommendations for the Division to Promote Aviation and CTP 2050 Goals
Policy Recommendation The Division serves as a liaison among airports, their communities, other modal agencies, and decision makers to promote improvements to the aviation system, California's multimodal transportation system, and the communities it serves. **Recommended Policy Goal and Measures** Promote leadership to help airports, airport operators, and their communities improve the aviation system through the development of strategic improvements and funding. • Provide dedicated staff to Identify and share knowledge with airport operators statewide about alternative funding sources and assist with funding requests. • In coordination with its existing land use compatibility efforts, encourage and incorporate discussions of aviation goals, opportunities, and funding in ALUCP documents. • Provide dedicated training opportunities for GA and non-NPIAS airport operators and their communities to seek out funding programs that will support aviation planning, community development goals, and transportation equity. • Provide an Aviation Toolkit for airport operators and communities to reach out to elected officials, decision makers, and stakeholders that communicates the needs of airports and their benefits to the local economy.

Chapter 3:

Infrastructure and Safety

3.1 AIRPORT FUNDING PROGRAMS

Both the FAA and the Division must consider the condition of airport infrastructure and the ongoing development and maintenance of aviation infrastructure that are necessary to keep aviation safe. This chapter summarizes Federal and State programs and priorities associated with the States aviation infrastructure and safety goals as they are defined by various laws, regulations, policies, and guidance. This discussion identifies the challenges associated with balancing federal and State priorities so that both programs can better support and complement one another to the benefit of the State's overall transportation system as set forth in the CTP 2050. One of the primary goals of the discussion is to identify how federal and State programs can be better aligned to optimize available funding programs and matching grants.

The research and conclusions for this chapter were based upon the following considerations:

- Federal and State aviation systems, airport categories, and capital improvement plans
- How Caltrans identifies safety and security projects based on federal and State laws, regulations, and guidance
- The types of projects that are likely to be needed to further the goals of CTP 2050
- How funding sources can be aligned to achieve these infrastructure goals

The data presented here will serve as the basis of the CTP 2050 Vision Element. Where abbreviated, full citations are found in "References" (Chapter 7).

3.2 NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS

The FAA's mission is within the goals of the U.S. Department of Transportation (USDOT) "to provide a safe, efficient, convenient, and competitive transportation system in four strategic goals of safety, infrastructure, innovation, and accountability. The FAA has also adopted these goals with a focus on the aviation mode." (FAA 2020). To ensure a safe and efficient airport system, the FAA prepares NPIAS. In accordance with Title 49 USC, Section 47103, the NPIAS:

> "…shall include the kind and estimated cost of eligible airport development the Secretary of Transportation considers necessary to provide a safe, efficient, and integrated system of public-use airports adequate to anticipate and meet the needs of civil aeronautics, to meet the national defense requirements of the Secretary of Defense, and to meet identified needs of the United States Postal Service."

The NPIAS report for 2021-2025 was released October 6, 2020 (FAA 2020). Approximately $43.6 billion (B) in AIP-eligible and justified airport projects are estimated between 2021 and 2025, an increase of $8.5B (24%) from the NPIAS issued two years ago. Estimates do not account for aviation impacts from COVID-19.

The NPIAS is FAA's means of determining airport project support nationwide, providing an overview of FAA's priorities for infrastructure versus distinctions made in California. It confirms the importance of airports to the national transportation system and economy.

In the chart below, the U.S. has more than 5,000 public-use airports, with 3,304 in the NPIAS:

Type of Facility	Total U.S. Facilities	Private-Use Facilities	Public-Use Facilities	Existing NPIAS Facilities
Airport	13,065	8,263	4,802	3,258
Heliport	5,901	5,842	59	9
Seaplane Base	510	300	210	37
Ultralight	112	109	3	
Gliderport	35	30	5	
Balloonport	13	12	1	
Total	**19,636**	**14,556**	**5,080**	**3,304**

Chart 3-1: NPIAS Facilities (2021-2025)
Source: FAA 2020

California airports from the 2021-2025 FAA NPIAS report are listed in **Attachment 3-A** and depicted on **Figure 3-2** as presented at the end of this chapter.

For the NPIAS, an airport must meet criteria reviewed in **Table 3-1.**

Table 3-1: FAA Considerations for NPIAS Airports	
Airport Attribute	**Description**
Safe and Efficient	Airports should be safe and efficient, located where people will use them, and developed and maintained to appropriate standards.
Affordable	Airports should be affordable to both users and the Government, relying primarily on producing self-sustaining revenue and placing minimal burden on the general revenues of the local, State, and Federal Governments,
Flexible and Expandable	Airports should be flexible and expandable and able to meet increased demand and accommodate new aircraft types.
Permanent	Airports should be permanent with assurance that they will remain open for aeronautical use over the long term.
Compatible with their Communities	Airports should be compatible with surrounding communities, maintaining a balance between the needs of aviation, the environment, and the requirements of residents.
Support Systematic Change	Airports should be developed in concert with improvements to the air traffic control system and technological advancement.
Support National Needs	The airport system should support a variety of critical national objectives, such as defense, emergency readiness, law enforcement, and postal delivery.
Extensive and Accessible	The airport system should provide as many people as possible with convenient access to air transportation.
Source: FAA 2020	

Because an airport must be included in the NPIAS to be eligible to receive a federal grant under the AIP, the FAA works with state aviation agencies and local planning organizations to identify public-use airports that should be included in the NPIAS. Historically, the capital development needs at NPIAS airports have exceeded available AIP resources. Thus, airport development needs at NPIAS airports may be funded by other federal sources, such as PFCs, airport revenues (e.g., parking fees, tenant leases), financing, or state funding.

3.2.1 Federal Airport Categories and Classifications

Enplanement: a passenger boarding an aircraft at a given airport.

The FAA classifies each NPIAS airport according to a role from such factors as the size of the airport, the types of users and operations, its facilities and services, and geographic location. The FAA considers airports in two broad categories:

- Primary (CS) Airports and
- Non-primary Airports

Primary Commercial Service Airports

Public-use airports with air carrier service and 10,000 or more commercial passenger enplanements each year are classified as CS airports. In the U.S. FAA identifies 396 NPIAS airports as primary. CS airports have four categories: large hubs (L, 30), medium hubs (M, 31), small hubs (S, 69), and non-hubs (N, 266). California has 23 primary airports, seen in **Table 3-2** with their hub categories. (FAA 2020)

Table 3-2: CA Primary Airports

City	Airport	ID	Hub
Arcata/Eureka	California Redwood Coast-Humboldt Co.	ACV	N
Bakersfield	Meadows Field	BFL	N
Burbank	Bob Hope	BUR	M
Concord	Buchanan Field	CCR	N
Fresno	Fresno Yosemite International	FAT	S
Long Beach	Long Beach -Daugherty Field	LGB	S
Los Angeles	Los Angeles International	LAX	L
Mammoth Lakes	Mammoth Yosemite	MMH	N
Monterey	Monterey Regional	MRY	N
Oakland	Metropolitan Oakland International	OAK	M
Ontario	Ontario International	ONT	M
Palm Springs	Palm Springs International	PSP	S
Redding	Redding Municipal	RDD	N
Sacramento	Sacramento International	SMF	M
San Diego	San Diego International	SAN	L
San Francisco	San Francisco International	SFO	L
San Jose	Norman Y. Mineta San Jose International	SJC	M
San Luis Obispo	San Luis County Regional	SBP	N
Santa Ana	John Wayne Airport-Orange County	SNA	M
Santa Barbara	Santa Barbara Municipal	SBA	N

City	Airport	ID	Hub
Santa Maria	Santa Maria Public	SMX	N
Santa Rosa	Charles M. Schulz-Sonoma County	STS	N
Stockton	Stockton Metropolitan	SCK	N

Non-Primary Airports

Non-primary airports are used primarily by general aviation aircraft and include the following classifications:

- **Non-primary CS airports** – airports that support a small number of airline passenger enplanements (2,500 to 9,999 annual enplanements), as well as reliever and GA operations.
- **Reliever airports** – airports designated by the FAA to provide congestion relief for CS airports and to provide more GA access to the overall community (FAA 2018).
- **GA airports** – airports that support the activity of all aircraft operations other than commercial aircraft or military aircraft operations. Commercial aircraft and even military aircraft often operate at GA airports; however, those aircraft are not the primary users of the facilities.

In the chart below, the FAA summarizes primary and non-primary airports in the latest NPIAS report for their enplanements, operations and development:

Number of Airports	Airport Category	Percentage of Airports	Percentage of Runways	Percentage of 2018 Total Enplanements	Percentage of All Based Aircraft[1]	Percentage of Total Operations	Percentage of NPIAS Cost[2]
30	Large Hub	1	3	71.39	0.7	13.3	29.4
31	Medium Hub	1	2	16.65	1.7	5.1	10.7
69	Small Hub	2	3	8.46	4.4	6.8	11.7
266	Nonhub	8	10	3.43	11	12	14.2
396	Primary Subtotal	12	18	99.93	17.8	37.1	66
92	National	3	4		9.7	8.9	4.6
482	Regional	14	16		20.4	23.3	9.6
1,213	Local	37	34		18.7	22.2	12.7
893	Basic	27	22		3.6	6.4	6.6
228	Unclassified	7	6		1	2.1	0
2,908	Nonprimary Subtotal	88	82	0.07	53.4	62.9	33.5
3,304	Total NPIAS Airports	100	100	100	71.2	100	99.4

[1]Based on active general aviation fleet of 211,749 aircraft in 2018. The remaining aircraft are based at other, non-NPIAS airports.
[2] These costs are rounded and do not include the cost for new airports (0.6 percent).

Chart 3-2: NPIAS Summary of Primary and Non-Primary Airports (2021-2025)
Source: FAA 2020

In May 2012, the FAA published the “General Aviation Airports: A National Asset” report (known as the ASSET Study), followed by the release of the ASSET 2 report in March 2014. In these reports, the FAA produced a categorization system for all airports in the NPIAS that are not classified as primary. They serve primarily GA operations.
The most recent version of the NPIAS carried forth these additional classifications for GA airports and refined their definitions, seen in **Table 3-3:** (FAA 2020)

Table 3-3: ASSET Classifications for GA Airports

Classification	Description
National Airports	Located in metropolitan areas near major business centers and support flying throughout the Nation and the world. National airports are attractive alternatives to the busy primary airports and have very high levels of activity with many jets and multi-engine propeller aircraft.
Regional Airports	Regional airports are also in metropolitan areas and serve relatively large populations. These airports support regional economies with interstate and some long-distance flying and have high levels of activity, including some jets and multiengine propeller aircraft.
Local Airports	Local airports are a critical component of our general aviation system, providing communities with access to local and regional markets. Typically, local airports are located near larger population centers but not necessarily in metropolitan areas.
Basic Airports	Typically located in in rural areas. Basic airports link communities with the national airport system and support private general aviation flying and make other unique contributions such as emergency response access, firefighting, and mail delivery.
Unclassified Airports	These airports tend to have limited activity and include 182 public-owned and 46 private-owned airports.

3.2.2 State of California Aviation System

Executing California’s Aviation System Plan must consider current and anticipated future needs, so that the State’s airports can adequately support aviation. These needs are based in part on individual airport requirements, also, and especially, on environmental issues and multi-modal needs. Included are historical data and the condition of the State’s current aviation infrastructure and assets. Historically, Caltrans has prepared an Aviation Inventory Element at 5-year intervals.

It describes public-use airports and heliports that comprise the State's aviation system and their condition. Last updated in 2013, the Inventory Element has served many functions. First, it summarizes the characteristics of each facility and describes how each facility contributes to the State's aviation system. It has also been used to help the Division make informed decisions related to planning, developing, and maintaining the system. Finally, it has helped to identify and prioritize capital improvements that may be included in the Division's CIP, which is revised every two years.

Data presented in the Inventory Element have been based on existing aviation databases; in-person interviews with airport operators; master plans, ALPs, and planning documents (regional system plans, master plans). Also utilized are data collected during the Division's permit safety compliance inspections at public-use airports and hospital heliports.

Now, the Inventory Element is useful background. Revisions and updates based on the Inventory Element will be supported with the CIP and provided as part of the subsequent implementation effort associated with the CASP 2020.

State Airport Classifications

As of October 2020, the California has 241 airports, 190 of which are in the NPIAS.

The Airport Classifications used by the Division vary from those used by the FAA in the NPIAS. To better distinguish airports for State planning purposes, the Division worked with its regional partners to create functional airport classifications that distinguish various airport types based on the community they serve (Caltrans, 2016 Policy Element). California's airport classifications consider unique factors including:

- Access the airport provides
- Population size or geographic location of region the airport serves
- Types of flying activities
- Types and quantities of aircraft accommodated, and
- Services provided

As discussed previously, the NPIAS includes four categories of airports: Primary, Non-primary, Reliever, or GA. The Division's classifications provide greater specificity to the types of GA airports in the State than the overall category provided by the FAA. While the FAA classifications for airports and the CASP definitions are similar, there are nuances to each classification system that are used to identify the diversity among California's airports.

Table 3-4 provides a comparison between FAA and California airport classifications:

Table 3-4: NPIAS and Caltrans' Airport Functional Classifications

NPIAS Classifications	CASP Functional Classifications
GA and Reliever Airports **Basic, Local Airports**	**Limited Use** Subcategory is added if the Limited Use Airport supports a special service. • Agriculture • Firefighting • Recreational Access • Medical Emergency
	Community Subcategory is added if the Community Airport supports a special service. • Agriculture • Firefighting • Recreational Access
	Regional Much like Community, accommodating GA aircraft with international ranges; located in population centers.
	Metropolitan Subcategory of Regional; added if the Metropolitan Airport supports a special service. • Business/Corporate • Recreational Access • Cargo
Commercial-Primary and Nonprimary Airports	**Nonprimary-Regional** **Nonprimary-Metropolitan** **Primary-(Hub-Size)-Regional** **Primary-(Hub-Size)-Metropolitan** Subcategory is added if one of the above category airports support a special service. 1. Regularly scheduled passenger service 2. Business/Corporate 3. Recreational Access 4. Cargo
Source: Caltrans, CASP 2016 Policy Element	

See below for the definitions of the terms presented in the table 3-4. The different airport categories reflect different roles and operational requirements based on infrastructure and safety.

- **Commercial/Primary** - use the same classification as FAA commercial service airports. Commercial airports that serve more than 2,500 annual enplaned passengers but fewer than 10,000 passengers are considered "non-primary commercial airports." Airports serving more than 10,000 enplaned passengers annually are defined as "primary commercial airports." Caltrans further classifies primary and non-primary commercial airports based on their size and location (Regional or Metropolitan) (Caltrans, CASP 2016 Policy Element).
- **Metropolitan Airports** - serve the same activities as Regional airports; located in urbanized areas; provide for the same flying activities as Regional airports with an emphasis on business, charter, and corporate flying; accommodate all business jet services for pilots and aircraft, including jet fuel; have a published instrument approach and a control tower; and provide flight planning facilities. They may be further identified by subcategory based on the type of special services they provide, such as business/corporate, recreational access, or cargo.
- **Regional Airports** - provide the same access as Community airports but may provide international access. They are usually located in an area with a larger population base than Community airports and serve multiple cities or counties and a higher concentration of business and corporate aircraft activity. They may accommodate most business, multi-engine, and jet aircraft, provide most services for pilots and aircraft (including aviation fuel), and have a published instrument approach. They may be further identified by subcategory based on the type of special services they provide, such as business/corporate, recreational access, or cargo. They may have a control tower.
- **Community Airports** - provide access to other regions and states, are located near small communities or in remote locations, and serve/generally support recreational flying, training, and local emergencies. They accommodate predominately single-engine aircraft and provide basic services for pilots and aircraft. They may further be identified by subcategory if they support a special or geographically specific service, such as agriculture, firefighting, or providing recreational access.
- **Limited Use Airports** - provide limited access, are usually located in non-urban areas, and may be used for a single purpose, such as firefighting. Limited use airports have few or no based aircraft and provide no services. They are further identified by subcategory if they support a special or geographically specific service, such as agriculture, firefighting, providing recreational access, or medical emergency.

Table 3-5 reviews California's 241 public-use by State classifications. The State classifications are listed with the 2021-2025 NPIAS airports in Attachment 3A. Current State classifications are subject to review and update based on resources available to the Division when allocated.

Table 3-5: Caltrans Airports by State Classification

State Category	Number of Airports
Commercial	27
Metropolitan	19
Regional	69
Community	92
Limited use	33
Joint Use (military and civilian)	1
Total Airports	**241**

The previous CASP Inventory Element included one joint-use airport: March Air Reserve Base (ARB). March ARB is operated by the March Inland Port Airport Authority as a Joint Use GA/military airfield. The airport supports limited, non-military air carrier, and air freight operations.

As shown in **Table 3-5**, the State identifies 27 commercial-service airports compared to the 23 commercial service airports identified in the NPIAS: Crescent City Airport/McNamara Field, Merced Regional Airport, Imperial County Airport, McClellan-Palomar/Carlsbad Airport, and Buchanan Field Division (Caltrans, CIP 2019) are identified by the Division as commercial service airports, either because they are included in the Essential Air Service (EAS) program or had an interval of commercial service with more than 10,000 annual enplanements. For EAS, the FAA currently subsidizes commuter airlines to serve those communities that would not otherwise receive any scheduled air service, and they are AIP-eligible.

Airport, Classification and Funding Eligibility

Airport classifications are important because they are used to determine funding eligibility. Airports that are not included in the NPIAS are not eligible to receive AIP funds, but they may be eligible for State grants. Depending on the need at certain California airports, including those in the NPIAS, State funds can assist an airport sponsor with its required local share of a federal AIP grant. To be discussed in in detail in Section 3, State funds are applied through three programs that are focused on non-primary GA airports. Primary airports have more funding options from AIP.

They utilize bonds, entitlements in proportion to enplanements and PFCs. Non-primary airports also receive entitlements, but they are a "fixed amount" of $150,000 annually for up to four years until the entitlements are withdrawn if not used. (FAA 2019d).

3.2.3 Heliports

California has hundreds of private and special use heliports associated with the State aviation system. However, they are discussed in the SAA in very limited terms: emergency services and operations proposed near schools that require Division approval. Typically, heliports are defined in two categories that are covered by private ownership:

- Special Use and
- Personal Use

"Public-use heliports" are rare and not necessarily specified in an airport permit when located on airport property. Instead, it is more common to see heliports co-located on airports that are in use for tenant activities such as flight training or manufacturing, which means the heliport remains private-use, even if the airport is public-use. Even more common: helicopters operating to/from public-use airports that do not have specified heliports; operations are conducted with permit approval at an airport location designated for helicopters to help facilitate separation from fixed-wing aircraft.

Attachment 3-B at the end of this chapter presents the 2020 inventory of California heliports.

3.3 INFRASTRUCTURE AND SAFETY

USDOT's Strategic Plan for FY 2018-2022 sets the direction to provide safe, efficient, convenient, and sustainable transportation choices, as reflected in USDOT's four strategic goals:

1. **Safety:** Reduce transportation-related fatalities and serious injuries across the transportation system
2. **Infrastructure:** Invest in infrastructure to ensure mobility and accessibility and to stimulate economic growth, productivity, and competitiveness for American workers and businesses
3. **Innovation:** Lead in the development and deployment of innovative practices and technologies that improve the safety and performance of the Nation's transportation system

4. **Accountability:** Serve the Nation with reduced regulatory burden and greater efficiency, effectiveness, and accountability. (FAA 2018a)

The following discussion focuses on how the FAA works to further these goals; the links among safety, infrastructure, and accountability, and how the Division strives to address these issues. Subsequent chapters of the CASP 2020 will discuss the Division's efforts to address innovation, trends, and technological change.

3.3.1 FAA Infrastructure and Safety

Title 49 in federal regulations (49 CFR, Section 40101 [a] [1]) asserts the policy of "assigning and maintaining safety as the highest priority in air commerce." To promote safety systemwide, the FAA develops regulations, design standards, and guidance, and it directs federal AIP funds to support projects that help promote safety through compliance with its regulations, standards, and guidance. For purposes of this document, three areas are exemplified to demonstrate how the FAA manifests its efforts to support safety and infrastructure maintenance:

- Airport Design Guidance
- Pavement Management
- Airspace Protection

Airport Design Guidance

The availability and condition of infrastructure can affect the severity of an accident if not designed or corrected properly. To enhance safety, the FAA prepares design standards to meet long-term aviation demand in a manner that is consistent with national policy. AC 150/5300-13 identifies the design elements needed to maintain safety and efficiency according to national policy. As set forth in the AC, airport operators should make every effort to bring their airports up to the standards identified in the AC.

AC 150/5300-13 identifies design standards that will accommodate the operations that are likely to occur at an airport based on the aircraft, or group of aircraft characteristics of the most critical aircraft, identified during airport planning. Some of the specific items identified in the AC include runway length and width; separation distances between runways, taxiways, and taxilanes; lighting; and dimensions for a variety of safety areas such as runway safety areas (RSA), object free areas (OFAs), runway protection zones (RPZs), and many others.

To promote compliance with its design standards, the FAA allocates AIP funds to airports within the NPIAS to support capital improvement projects that can enhance airport safety and are intended to reduce the incidence of accidents, fatalities, and runway incursions. With the help of the AIP funds, operators of NPIAS airports can implement safety enhancement projects such as those that reconfigure runways and taxiways to optimize both safety and efficiency, construct perimeter roads to separate aircraft and surface vehicles, or enable compliance with FAA design standards.

Runway Safety Area Improvements

During the past 15 years, the FAA improvements at NPIAS airports have focused upon bringing RSAs into compliance with FAA standards. RSAs are immediately adjacent and parallel to the runway and extend beyond the end of each runway. These areas should remain free of structures, objects, and occupants that are not necessary for aviation. Items such as lights or navigational aids that need to be located within the RSA are allowed.

RSAs are critical to aircraft safety because takeoffs and landings are the phases of flight most susceptible to accidents, and pilots depend on these open areas to minimize injuries or damage in the event of an overrun or when an aircraft accidentally veers off the runway edge, or if confronted with a forced "off-airport" landing from engine failure. RSAs range from 120 feet to 500 feet wide and extend from 240 feet to 1,000 feet beyond the runway end, depending upon the classification of the runway, based on the size and speed of aircraft that use the runway.

The focus on RSAs highlights how the FAA may target a specific design standard or safety concern that has implications nationwide. This focus goes beyond the day-to-day attention paid to the more global discussion of creating and maintaining a safe aviation system through a wide array of regulation, standards, and guidance.

Pavement Management

Airfield pavement requires ongoing maintenance, and well-maintained runways can enhance safety and minimize damage to aircraft. Several methods are available to assess the condition of an airport pavement from high level assessments to more detailed evaluation of specific pavement sections. They work together to provide the FAA, states, and individual airports with a quantifiable condition of their pavements.

The higher-level assessment is associated with the FAA's ongoing airport inspections to update its Airport Master Records (FAA Form 5010) for public-use airports. The results from these inspections are reported through the FAA's Airport Safety Data Program. Runway pavement conditions are classified as excellent, good, fair, poor, or failed. The FAA's longstanding goal is to ensure that at least 93% of paved runways at NPIAS airports are maintained in in excellent, good, or fair condition. (FAA 2020)

A more specific assessment is focused on developing a Pavement Condition Index (PCI) rating for airport pavements. The PCI rating considers several variables for individual segments of airport pavements, such as runways, taxiways, and aprons. The variables are combined to result in a PCI number of individual pavement segments that provide an airport with a numerical assessment of the pavement condition. The PCI ranges from 100 to zero, where 100 represents new pavement and zero represents pavement failure. A PCI rating above 70 is considered to represent pavement in good condition and can usually be maintained through crack sealing. Pavements conditions rated with a PCI of less than 70 may be targeted for various maintenance measures that could range from targeted joint repair to full pavement reconstruction.

AC 150/5380-7B, "Airport Pavement Management Program (PMP)," identifies a specific program for airport operators to use in efforts to make cost-effective decisions about pavement maintenance and rehabilitation (M & R) that includes a defined set of procedures for collecting, analyzing, maintaining, and reporting pavement data (FAA, 2014). The systematic approach to pavement assessment considers the overall life cycle of aircraft pavements and helps to identify optimal and cost-effective strategies for maintaining pavements in a safe and serviceable condition. The cumulative effect of systematic, successive preservation treatments is to minimize or eliminate costly repairs and postpone costly rehabilitation and reconstruction. Use of the AC is mandatory for all projects funded by federal funds (i.e., AIP grants or the PFC Program).

Pavement management is the largest development category accounting for about 39 percent or $17B of NPIAS funding needs and includes sealing, rehabilitation, and reconstruction of airfield pavement. It increased by 29% and reflects an increase in pavement rehabilitation costs by every type of NPIAS airport. The primary airports account for 62% of this development with large hub airports accounting for 23%. The nonprimary airports account for 38% of this development. (FAA 2020)

When airport pavements require rehabilitation or reconstruction, the FAA requires airport operators to consider life-cycle costs during AIP procurement when it is specified in a bidding document (FAA Order 5100.38C; FAA 2019b). Life-cycle costs encompass the entire period during which facilities are present or envisioned, including planning, construction, commission, operating, management, maintenance, repair, improvements, decommissioning, and demolition. A Life Cycle Cost Analysis (LCCA) or Benefits-Cost Analysis (BCA) can provide critical information to the overall decision-making process, but it cannot be the only criteria considered. The lowest LCCA option may not necessarily be the best option when considered in conjunction with other factors such as risk or environmental concerns.

Airspace Protection

FAA applies 14 CFR Part 77 and AC 150/5300-13 for safety. In 14 CFR 1.1, navigable airspace is defined as "the airspace at or above the minimum altitudes of flight that are needed to ensure safety in the takeoff and landing of aircraft, and where potential hazards require identification and mitigation." 14 CFR Part 77 specifies the requirement to notify FAA of development activities near an airport. FAA evaluates the development and any vertical objects to determine how they would affect airspace:

- Any object of natural growth, terrain, or permanent or temporary construction or alteration,
- The alteration of any permanent or temporary existing structure by a change in its height, including appurtenances or lateral dimensions, including equipment or material used therein. (14 CFR Part 77.13)

The FAA establishes "imaginary surfaces" (sections of airspace) in relation to civil airports and runways based on the runway length and the use of visual or instrument runway approaches. 14 CFR Part 77 is incorporated within the SAA via PUC Section 21659 to address obstructions at State airports. 14 CFR Part 77.19 airspace sections include:

- **Horizontal surface** A horizontal plane 150 feet above the established airport elevation
- **Conical surface** A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet.
- **Primary surface** A surface longitudinally centered on a runway. The width of the primary surface is:

- 250 feet for utility runways having only visual approaches
- 500 feet for utility runways having non-precision instrument approaches
- For other than utility runways, the width is:
  - 500 feet for visual runways having only visual approaches
  - 500 feet for non-precision instrument runways having visibility minimums greater than three-fourths statute mile
  - 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with visibility minimums as low as three-fourths of a statute mile, and for precision instrument runways.

- **Approach surface** A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.
- **Transitional surface** These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces.

AC 150/5300-13 has similar "surfaces" related to various angular paths used for approaches and departures extending outward from runways up to two nautical miles:

- **OFZ**: The clearing standard precludes aircraft and other object penetrations, except for frangible guidance equipment required in the OFZ because of its function (such as visual lighting aids).
- **ROFZ:** A defined volume of airspace centered above the runway centerline, above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. It extends 200 feet beyond each end of the runway with widths based on aircraft approach speeds.
- **Inner-approach OFZ**: The inner-approach OFZ is a defined volume of airspace centered on the approach area. It applies only to runways with an airport lighting system associated with instrument landing equipment. This OFZ begins 200 feet from the runway threshold, at the same elevation as the runway threshold, and extends 200 feet beyond the last light unit in the lighting system.
- **Inner-transitional OFZ:** The inner-transitional OFZ is a defined volume of airspace along the sides of the ROFZ and inner-approach OFZ. It applies only to runways with lower than 3/4 statute mile approach visibility minimums associated with instrument landing approaches. (FAA 2014a)

Unlike 14 CFR Part 77 surfaces, the surfaces for airport design are applied to runways and taxiways based on aircraft performance and dimensions, not solely on obstructions. That requires obstructions to be evaluated in relation to runway lengths and taxiway widths (whether new or existing) such that designs can be implemented or adjusted to maintain safety for the aircraft of intended use. Seen in Chapter 6 (Land Use and Sustainability), the adjustments are applied by how the airspace is used, whereas 14 CFR Part 77 requires that an obstruction be mitigated by removal, lower height or lighting without any adjustment to the airspace.

As a complement to FAA airspace protection, airspace conflicts can be addressed through local land use and zoning controls, avigation easements, and land acquisition. Conflicts are also identified through the FAA Airspace Review Process used with14 CFR Part 77, which is initiated through the submission of the FAA Form 7460-1 through the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) web portal.

FAA has no jurisdiction to control obstructions, only to assess impacts of proposed projects or land use changes on navigable airspace. However, if land acquisition is identified by a local airport operator to be suitable for obstacle control, FAA can assist with funding the acquisition for eligible airports. Otherwise, FAA will impose limitations on approach and departure maneuvering in order to keep aircraft clear of an obstacle. FAA points out that design standards allow adjustments in approach and departure airspace for additional safety measures beyond the baseline set by Part 77. In some cases, the FAA approach/departure design standards may identify lower threshold siting surfaces than identified by 14 CFR Part 77 surfaces, thereby providing additional airspace protection. These surfaces are evaluated by FAA when developers submit proposals to the Office of Obstacle Evaluation/Airport Airspace Analysis (OE/AAA).

This process is occasionally referred to as "the 7460 process," to align with the associated FAA form. The process returns a determination from the FAA on whether the proposed development would or would not present a hazard to air navigation. Mitigation measures will be specified in the determination when applicable. The airspace can be protected at the local level by requiring a determination of "no hazard" from the FAA prior to issuing a development permit. Ultimately, however, airspace can be better protected locally with legal height restrictions and/or zoning (as seen in PUC 21688).

3.3.2 Division's Approach to Safety and Infrastructure

The Division's policies generally align with the USDOT and the FAA; the Division considers the promotion of a safe aviation environment for pilots, passengers, and persons on the ground as its most important obligation. The Division performs the following policy-driven activities to foster and promote safety in accordance with State law as set forth in the PUC, as well so to comply with, or further FAA policies, regulations, and guidance.

Master Record Review Updates and Compliance Inspections

The Division conducts FAA Airport Master Record inspection updates and State Permit Compliance Inspections for public-use airports, heliports, and hospital heliports as set forth in federal guidelines, State law and regulations, and Division policy. This extends the benefit of safety inspections where FAA does not have the staff to cover all facilities nationwide and to adhere to State interests in safety.

FAA complement: FAA inspects airports that participate in the certification program defined in 14 CFR Part 139, which has additional safety and safety criteria intended primarily for airports with scheduled airline service (although there are "Part 139-certified" GA airports). State inspections include Part 139 airports, but only in review of State permit compliance.

Application and Permit Review

The Division reviews permit applications and issues site approvals and permits for airports, heliports, and related amendments in accordance with PUC §21662. Through this review process, the Division can identify and prohibit activities with the potential to introduce hazards to aviation safety, airspace, or security.

FAA complement: FAA has no specific function to issue facility permits, except as "safety approvals" for launch sites used for space flight. Approvals for facilities are executed through airspace studies in the same manner as obstruction analyses, but they are focused instead on determining and resolving conflicts in airspace use with other airport or heliport locations. The Division's activities support compliance with FAA regulations and design standards because the Division will issue a permit only if a facility meets State design standards derived from FAA but specified in CCR Title 21.

California Airport Pavement Management System

Caltrans, in partnership with the FAA and airport sponsors, is responsible for ensuring that aircraft pavements at public-use airports are maintained in good condition and in accordance with FAA standards and guidance. FAA conducts airport surveys to measure pavement conditions at five-year intervals and maintains the data in an Airport Pavement Management System (APMS). The data in the system is used to develop projections on the useful life of the pavement and help prioritize projects and optimize available funds.

FAA Complement: APMS complements and supports FAA infrastructure standards and guidance by supporting a systematic review of airport pavements, enabling airports to comply with AIP funding eligibility requirements, and furthering the FAA's goal of ensuring that at least 93 percent of paved runways at NPIAS airports are maintained in in excellent, good, or fair condition.

Compatible Land Use Planning

The Division collaborates with ALUCs (created by local jurisdictions under the SAA that identifies ALUC powers and duties) and publishes guidance for ALUCs to use in the development of ALUCPs in accordance with PUC Section 21674. Such efforts protect public health, safety, and welfare by preventing encroachment on airport operation areas by promoting the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to safety hazards within areas around public-use airports. To further promote land use compatibility near airports, the Division also conducts site evaluations for proposed schools (K-12), community colleges, and State buildings within two nautical miles of an airport runway, and reviews and evaluates applications to authorize helicopter landing sites near schools in accordance with California State Education Code §17215 and §81033, and PUC §21655.

FAA complement: Although the FAA provides guidance for land use compatibility near airports, only local jurisdictions can enact land use policies and zoning through their police powers. The Division's ALUCP guidance furthers the FAA's compatible land use goals and helps to address issues associated with 14 CFR Part 77 by guiding ALUCs to identify the areas beneath imaginary surfaces for each public use airport and areas that are subject to height restrictions and obstruction analysis. AC 150/5300-13 complements 14 CFR Part 77 by adjusting airspace for obstruction clearance, and by identifying areas such as RSAs and RPZs that should remain free of structures.

Used together, 14 CFR Part 77 and AC 150/5300-13 assist planning efforts to make the most of airport use and safety. The complementary nature of 14 CFR Part 77 and airport design standards is particularly relevant at the Mineta San Jose International Airport (SJC). The runway landing thresholds at SJC are displaced by up to 2,500 feet for obstacle clearance. Obstacle identification was accomplished by both 14 CFR Part 77 and design standard criteria. However, it is conceivable that displaced thresholds would not be required if land use at the obstacle(s) site included airport approach (and departure) needs as a factor in planning the land use.

3.4 FUNDING FOR SAFETY AND INFRASTRUCTURE IMPROVEMENTS

3.4.1 Federal Funding for NPIAS Airports

As described earlier, the California Aviation System includes 241 airports, 190 of which are included in the NPIAS and are eligible for federal funds to support capital improvements. The FAA prepares the NPIAS for 5-year intervals based on data from locally prepared airport master plans, airport system capital improvement plans (state and regional plans), and airport inspections. These airport planning documents consider all significant aviation requirements and are tied to the current use and condition of each airport and the forecast increase in activity.

FAA compiles the data from these plans to identify capital improvement projects that are considered eligible for AIP funding and likely to be justified by aviation forecasts during a five-year period. The costs associated with AIP-eligible development projects exceeds the availability funding each year, and AIP funding cannot be guaranteed.

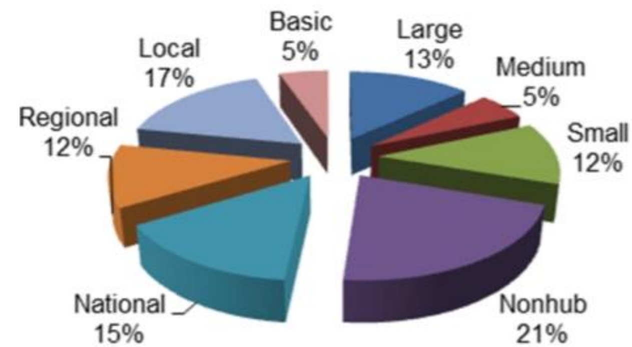
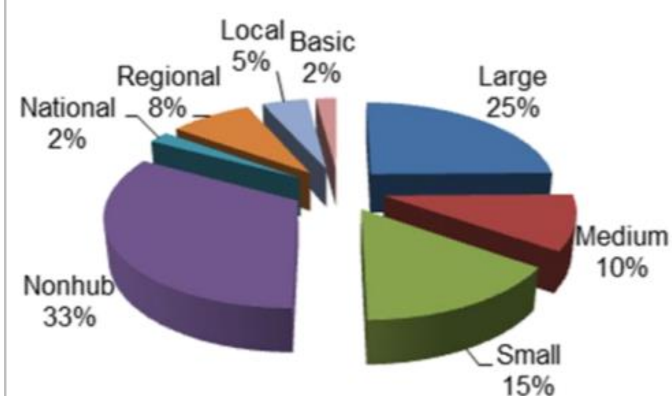
Typically, state system plans identify airports in the NPIAS that have national impact. The state plans also identify the airports considered important to state air transportation objectives. However, aviation system plan recommendations on capital development at individual airports are usually secondary to airport master plan information. For assessing overall aviation needs, CASP 2020 will not include suggested airports for the NPIAS. CASP 2020 instead will seek to provide the State's reasoning for determining priorities for airports and improvement projects. Determinations made from reviewing airports and their projects is a point of stark importance following the State's wildfire needs of 2020. It is necessary for Caltrans and the Department of Forestry and Fire Protection (Cal Fire) to collaborate on decisions about airports utilized for wildfire response.

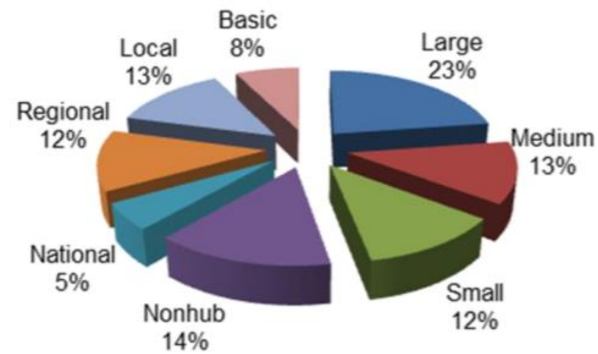
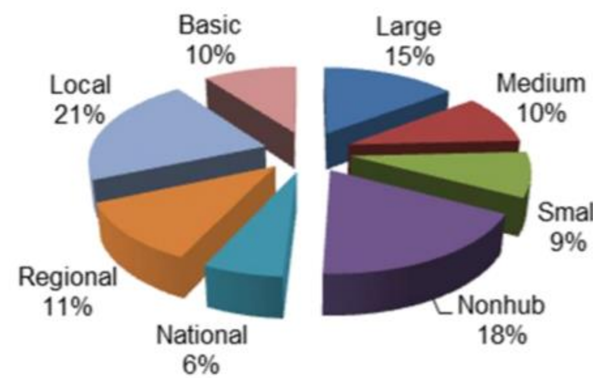
Strategic locations reviewed with Cal Fire's federal firefighting partners and local airport sponsors can assist FAA planning for the best use of grant support without diminishing airport support in other areas of the State.

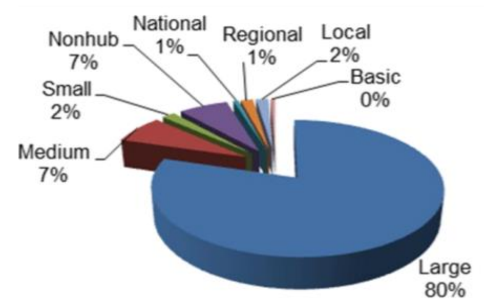
While NPIAS is not a primary focus of CASP 2020, no discussion of aviation infrastructure and safety can exclude the NPIAS report. The report is FAA's means to prioritize AIP funds for safety, security, and airfield projects. Grants to NPIAS airports provide up to 90 percent of the estimated project cost (depending on airport classification). Meanwhile, the PFC Program is part of AIP that applies only to airports with passenger airline service to assist with funding specific improvement projects (FAA/PFC). PFC rates are added to each ticket and they have been capped of $4.50 since 2000. Airlines have argued consistently against raising the cap to avoid an increase in ticket prices, as airports continue to argue for it amid project costs that have steadily increased. (AAAE and RAND)

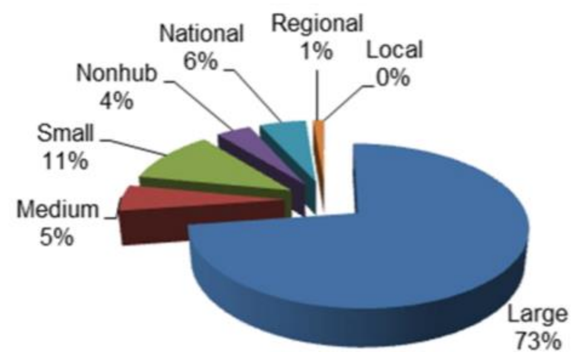
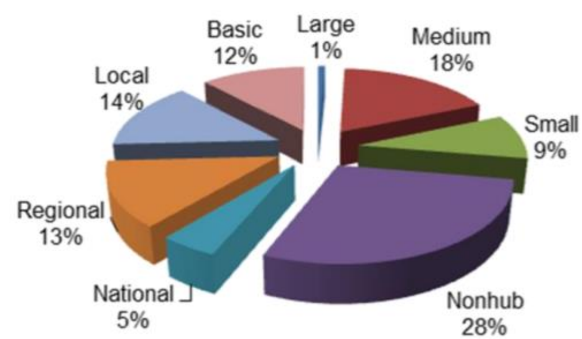
Table 3-6 summarizes FAA's execution of AIP funding through eleven project purposes identified by airport type, the types of projects included in each category/purpose, and the percentage of the overall AIP allocated for that purpose as allocated to primary and non-primary airports. (Source: FAA 2020)

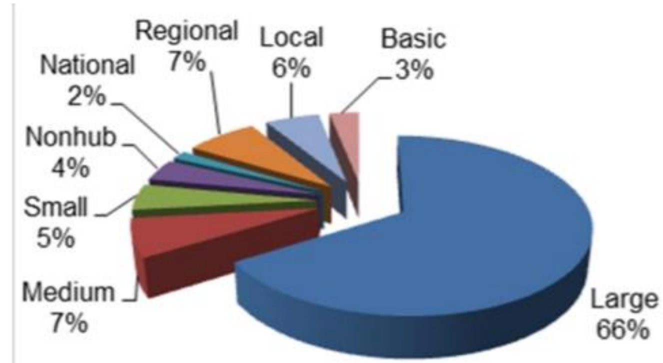
Table 3-6: Summary of NPIAS Costs by Purpose and Airport Classification

Project Purpose	Development Projects	Portion of NPIAS/Airport Classification
Safety The FAA uses AIP funds to enhance airfield safety and support the Agency's goal of reducing accidents, fatalities, and runway incursions. Safety and security projects include development that is required by Federal regulation, airport certification procedures, or design standards and are intended primarily for the protection of human life.	**Safety projects** Obstruction lighting and removal Acquisition of ARFF equipment required by 14 CFR Part 139 Construction or expansion of ARFF buildings RSA improvements	
Security Security projects are intended primarily to protect human life via access control. Primary airports have identified access control systems and other security improvement projects totaling $112.5 million (83%). Nonprimary airports have identified approximately $23 million (17%) in perimeter fencing.	**Security projects:** Fencing and Access control Security enhancements required by 49 CFR, Part 1542 Combined projected costs: $1.6 billion (B)	See below 

Project Purpose	Development Projects	Portion of NPIAS/Airport Classification
Reconstruction/Rehabilitation Development to reseal, rehabilitate, or reconstruct airport facilities, runway, taxiway, and apron pavement and lighting systems that have deteriorated due to weather or use is categorized as rehabilitation.	Projects include the replacement or rehabilitation of airport facilities that are deteriorated or have reached the end of their useful lives, such as: Runway, taxiway, and apron pavement Projected development costs: $17B	
Standards Standards projects include development that is needed to bring an existing airport into compliance with the design criteria recommended by the FAA. They also include development that is needed to comply with FAA technical and operational specifications.	Pavement and lighting improvements or acquiring equipment Buildings for equipment or aircraft hangars Projected development costs: $11.8B	

Project Purpose	Development Projects	Portion of NPIAS/Airport Classification
Environment The FAA works with other federal and state environmental resource agencies to achieve concurrent reviews and coordinate permit approvals to the greatest extent possible.	NEPA obligates federal agencies to review environmental impacts CEQA applies in California Determinations include: Environmental Impact Reviews Environmental Assessments Categorical Exclusions Projected development costs: $797M	

Project Purpose	Development Projects	Portion of NPIAS/Airport Classification
Noise The FAA estimates that the number of people in the U.S. living near airports with noise levels above the Day-Night Level (DNL) 65dB decreased from approximately 498,000 in CY 2005 to 430,000 in CY 2018. Specific data for California is not included in the 2021-25 NPIAS report. But nationwide improvement follows on-going engine technological improvements. (California uses the Community Noise Equivalent Level (CNEL); See page 255.	Noise mitigation projects for residences or public buildings Airport noise monitoring systems Compensation to property owners for overflights Projected development costs: $614M	
Access Access development refers to surface ground access facilities that are within the airport property line	Roads and highways Transit connections Projected development costs: $457M	

Project Purpose	Development Projects	Portion of NPIAS/Airport Classification
Airport Capacity Airport development refers to projects that are constructed primarily to reduce delay/accommodate more passengers, cargo, operations, or based aircraft.	New runway, taxiway, and extensions Apron construction and extensions Projected development costs: $4.1B	
New Airports New airports and helipads proposed for communities that generate a substantial demand for air transportation and either do not have an airport or have an airport that cannot be improved to meet minimum standards of safety and efficiency. In addition, new commercial service and general aviation airports are recommended for communities where existing airports are congested and cannot be expanded to meet the forecast demand for air transportation.	The 2021-2025 NPIAS anticipates three general aviation airports, two nonprimary commercial service airports, and one primary airport Projected development costs: $302M	Costs in this category increased 7% from the last NPIAS. This category also includes AIP-eligible costs for new airports opening by 2025 or under construction with an opening date after 2025.

Project Purpose	Development Projects	Portion of NPIAS/Airport Classification
Other Miscellaneous necessary projects that may not fit into a specific category.	Fuel farms, utilities, parking lots Projected costs: $253M	This category of development accounts for about 0.6% of the total development in the NPIAS. Nonprimary airports account for 92% of this development.
Special Programs A new entry for 2021-2025 covering Projects in FAA priorities for the safety, security, and capacity.	Runway grooves/friction treatment; contract towers Projected costs: $36M	This category accounts for 0.1% with contract towers comprising 95 percent of the total.

As shown in **Table 3-6,** nearly two-thirds of all AIP funds are directed to primary, commercial-service airports, where most passenger activity occurs (at 523 airports; (FAA/Passengers). AIP funds assist GA airports (in the NPIAS) because they are among the remaining (public-use) airports that serve all other operations outside of airline service.[23] Of the 191 California airports in the NPIAS, 22 are commercial service airports that can receive PFC funds,[24] in addition to AIP, and other (local) sources (such as parking fees). California's GA airports in the NPAIS typically use AIP funds, State grants or loans, and local funds to support infrastructure maintenance and development projects.

3.4.2 State Funding for Airport Improvements

Section 3.4 makes it clear that airport classifications and activity levels determine funding assistance for airport improvements, while funding sources have limitations. Even the degree of need can be considered inconsistent from the State perspective. California airports (NPIAS or not) have additional demands on their capital assets from disasters and emergencies that do not occur elsewhere (or, at least to the same degree). And, by all accounts, airports in California may be affected by climate change sooner than those in many other parts of the U.S. State funding programs assist typical capital needs, and they are not limited by NPIAS-specific criteria. However, they must adjust for needs that are defined by atypical circumstances.

Aeronautics Capital Improvement Plan: 2021-2030

In accordance with the PUC, the Division prepares a CIP, which presents a list of fiscally unrestrained projects for a 10-year period (Division 2021). The plan is submitted to the CTC for review and approval. The Division revises the plan biennially. The CIP addresses both NPIAS and non-NPIAS airports included in the State's aviation system. Although non-NPIAS airports are ineligible for FAA AIP funds, they may be eligible for State support, excluding public-use airports that are privately-owned.

Appendix A reviews the Division's CIP.

[23] FAA recorded 5,080 public-use U.S. airports by February 2020. Continuous evaluation of the NPIAS varies the number of airports for any given year that are included in the NPIAS. Currently, NPIAS has 3,304 (public-use) airports.
[24] As of 12/31/19, FAA approved airports in Carlsbad (via enplanements) and Imperial County (via scheduled service) for PFCs.

California Aid to Airports Program

The CIP enables Caltrans to program grants for the CAAP. The CAAP provides financial assistance to local airport sponsors to establish, maintain, and improve the statewide system of public-use, publicly owned airports. The CAAP includes three grant programs:

- **Annual Credits:** The Division can provide a $10,000/year annual entitlement to (public-use, publicly owned,) GA airports as reimbursement for eligible expenses.
- **A&D:** The A&D program provides grants to GA airport operators for capital improvements or (public-use, publicly owned) airport planning efforts. A&D grants will support 90 percent of the estimated project cost. The airport sponsor must provide the remaining 10 percent of the project cost.

  A&D grants can be used to prepare or update ALUCPs. Historically, the CTC has allocated 25 percent of the A&D Grant program for the preparation of ALUCPs, serving to minimize the public's exposure to aviation related safety hazards within two miles of public use airports and supporting the Division's Safety policy. However, in recent years, the A&D program has not been funded.
- **AIP State Match Program:** Local sponsors must provide a 10 percent match for federal AIP grants. The State may contribute up to 5 percent of the federal grant amount to assist local airport sponsors meet the local match requirement. (Caltrans CIP Update, 2021)

The Division uses a Priority Ranking Matrix within the CIP to identify eligible projects. Projects submitted for funding are prioritized in the following order: safety, capacity, and security. As part of previous CASP updates, the Division prepared the GASNA, which identified airport projects that are necessary to achieve minimum FAA standards. GASNA served as input to both federal and State funding decisions for safety.

The California Airport Loan Program can also provide discretionary State loans to support construction and land acquisition projects for GA airports.

3.5 ALIGNMENT WITH CTP GOALS AND OBJECTIVES

The CASP is one modal component of the CTP 2050, which seeks to address both people and freight and their integral relationship to the State's economy, environment, and communities. CASP must identify programs and directives to better support aviation in California while addressing the fundamental changes associated with:

- Demographic changes
- Land use
- Climate change; GHG Reduction and SLR
- New and Emerging Technologies
- Social Equity
- Quality of life
- Safety and Security, and
- California's Economy (Caltrans 2021)

3.5.1 CTP Infrastructure and Safety Goals and Objectives

CTP 2050 policy guidance is simple: "California's safe, resilient, and universally accessible transportation system supports vibrant communities, advances racial and economic justice, and improves public and environmental health." (Caltrans 2021). To support this policy, CTP policy guidance identifies three key safety issues to support a safe and secure transportation system:

- Eliminate fatalities and serious injuries
- Enhance transportation system user security
- Improve emergency preparedness, response, and recovery (Caltrans 2021)

FAA and the Division support CTP's safety goal in the broadest sense, as both agencies place safety as first among their priorities. However, neither the federal or State levels have a funding or planning structure from which it can address the key safety issues associated with improved emergency preparedness, response, and recovery. Improvements focused on operational benefits (e.g. new user demands, new aircraft/fleet mixes, pavement rehabilitation, etc.) are only part of the story. As noted from Caltrans Vulnerability Assessments (Appendix E), climatic changes direct attention primarily to supporting the State Highway System, but support provided from aviation requires sufficient access to aviation. In response, specific opportunities associated with CTP 2050 include:

- Preparing for more frequent and severe extreme weather events and natural disasters
- Enhancing emergency response, evacuation capabilities and ongoing disaster relief

3.5.2 CASP Planning Challenges

Each of the CTP's eight issue areas affect, or is affected by, the State's aviation infrastructure. However, available federal funding and programs for aviation infrastructure will pose challenges to the Division because they do not address many of the broad issues affecting California's aviation system. In fact, the NPIAS clearly states that "improvements to assist airports to withstand severe weather events," which are central to California's CTP goals, are not eligible for NPIAS funding (FAA 2018, emphasis added). There are additional challenges from CTP goals focused often on surface transportation modes that do not readily transfer to aviation needs.

The topic of weather-related events and their impact on aviation resources is a fine example of the topics that have been specifically identified by the State of California for consideration in its overall transportation planning efforts and illustrates how California leads the nation in its consideration of climate change reductions and mitigation efforts. However, the State's early embrace of these efforts can pose challenges to Caltrans, the CTP, and its associated modal plans, as there are limited funding sources available to address greenhouse gas reduction or resiliency to climate change through traditional funding sources. As noted previously, climate change is one of the primary issues that must be addressed in the CTP, and all California airports should be addressing the causes and effects of climate change as part of their short- and long-range planning. It should be considered necessary now to implement current projects to include resiliency measures to mitigate the effects of severe and extreme weather events.

Many of California's coastal airports are vulnerable to sea level change, including several primary-commercial service airports (e.g., San Francisco International, Oakland International, San Diego International). These airports are vital to numerous users that include local, State, national, and international markets. Creating solid arguments that demonstrate how extreme weather impacts are tied to safety and infrastructure preservation will be critical to maintaining these resources. For example, consider a recent project at SFO that erected an SLR barrier to defend the airfield from events that could effectively shut down the airport. For that to happen, a ripple effect would occur through northern California and beyond. Strategic intermodal resources can help mitigate the secondary impact when an aviation site is crippled, but timely recovery is hampered by insufficient, "preemptive" attention to aviation preservation.

If that point is reached, then a third wave of impacts occurs in the State economy when aviation use is lessened for disaster relief, evacuations, and other emergency responses.

On a related matter, the FAA has made substantial effort and investment to provide RSA improvements at airports nationwide. Much of this investment at coastal airports could be jeopardized from SLR. Similarly, the condition and integrity of the runway pavements may be compromised from inundation, resulting in a reduced PCI. Since pavement condition contributes to safety, the degradation of airport pavements must also be viewed as a safety-related concern and thus addressed in a proactive manner, where feasible, and in advance of SLR predictions and extreme weather events identified in association with global climate change. To reiterate, addressing these issues later or in a reactive manner can compromise safety at individual airports and broadly affect the NAS.

The USDOT has identified vulnerabilities related to climate change, such as the probability of unexpected infrastructure failure and disruptions to transportation overall (US DOT 2013). But, as noted, FAA policy has not incorporated these considerations into the current NPIAS (USDOT 2018). This causes challenges for the Division and Caltrans since there is minimal policy alignment between these federal policies and those State policies identified in in the CTP related to climate change and emergency response.

3.5.3 Collaboration with Other State Agencies to Address Climate Change

Several State agencies and non-government organizations have undertaken research associated with topics related to climate change impacts, such as the California Natural Resources Agency, California Ocean Protection Council, and Sea the Future. Numerous issues that affect California's aviation system are directly related to this topic, including rises in sea-level, fire impacts, and air quality. Some efforts to undertake infrastructure improvements at California's primary CS airports are underway to address some of these issues. However, California's GA airport operators may not have the funds necessary to fully explore climate change. State and non-government agencies must be consulted to identify the vulnerability of California's GA airports to these same issues so that necessary infrastructure improvements may be identified.

3.5.4 Policy Goals

Caltrans has established policy goals to foster and promote safety in aeronautics, and it has implemented those goals through a variety of policies and programs including its permitting process, land use compatibility planning efforts, airport compliance inspections, and pavement management system. They have been drawn from the 2016 CASP Policy Element. Moving forward, however, the Division will need to consider safety, and improving infrastructure, through a new lens for the challenges that spring from sources outside of the aviation system. See **Figure 3.1** below. New and bold policy goals will be needed to overcome State and FAA funding limitations and set forth coordination among the Division and non-transportation agencies, State and regional planning agencies, and emergency service agencies. New policies should strive to:

- Seek and acknowledge potential conflicts in CTP and CASP goals to determine the best means for compromise or resolution. Collaboration with FAA to evaluate pavement alternatives that have reduced GHG emissions for highway use for could only succeed for aviation if pavement strength is maintained for aircraft.
- Consider the predictable effects of global climate change as important safety issues that warrant infrastructure improvement at the local level and system wide planning considerations.
- Encourage collaboration among airports to identify resiliency solutions. California's CS airports have initiated efforts to address SLR effects and these lessons could be shared among California's GA airports.
- Link proposed resiliency/sustainability solutions to project plans requiring environmental reviews such that "solutions" become projects that can be considered for grant funding instead of being rejected as mitigation for severe weather.
- Promote further collaboration among State agencies not traditionally consulted during transportation or municipal planning and programming decisions, such as natural resources agencies, the Governor's Offices of Emergency Services, Planning and Research and Business and Economic Development, and the California Department of Forestry and Fire Protection (CalFire).

Include statewide and regional agencies for flood control. This would lead to practices that can expose a community or region to the value of local airports for safety and the role that sustainability plays for both environmental and economic benefit.

CTP 2050 SAFETY POLICY GUIDANCE

Provide a safe, secure transportation system with zero fatalities

- **Eliminate** fatalities and serious injuries across all modes
- **Enhance** transportation system user security
- **Improve** emergency preparedness, response, and recovery

CTP 2050 PRIMER

Goals and Objectives

- **Reducing system injuries and fatalities.** California's Strategic Highway Safety Plan calls for zero deaths on the system by 2030 and aligns with MAP 21.
- **Bicyclist and pedestrian safety.** Improving safety among cyclists and pedestrians is critical to providing alternatives to auto travel.
- **Emergency response.** More frequent and severe weather events and natural disasters have created a greater need for emergency response and evacuation systems.
- **Data security.** Emerging transportation technologies and data security can pose concerns to system users.

Opportunities and Challenges

- **Manage Risk.** Safeguard against risks posed by new and emerging technologies, including Connected Automated Vehicles (CAV), Artificial Intelligence (AI), and the Internet of Things (IoT).
- **Reduce conflict.** Address/resolve conflicts between CAV and active transportation modes.
- **Prepare for Extreme Events.** Prepare for more frequent and severe extreme weather events and natural disasters.
- **Enhance Emergency Response.** Increase emergency response and evacuation capabilities.

CASP 2020 Policy Recommendations

Identify new policies that link to CTP issues, objectives and goals:

- **Consider** the predictable effects of global climate change as important safety issues that warrant infrastructure improvement at the local level and system wide planning considerations.
- **Encourage** collaboration among airports to identify resiliency solutions. California's commercial-service airports have initiated efforts to address the effects of sea level rise, and these lessons could be shared among California's GA airports that may also be vulnerable to sea level rise.
- **Promote** further collaboration among state agencies that were not traditionally consulted during transportation planning and programming decisions, such as natural resource agencies, the Governor's Office of Emergency Services, CalFire, statewide and regional flood control agencies, etc.

Figure 3-1: CTP 2050 Safety Policy Guidance

Source: Mead & Hunt, Inc.

Attachment 3-A: California NPIAS airports 2021-2025

Note: State Functional Classes are subject to review and updates as resources allocated to the Division of Aeronautics may allow.

City	Airport	FAA ID	Owner-ship	Hub	FAA/ASSET Role	FAA Category	FAA Category in 5 Years	CA Functional Class	2021-2025 FAA Dev Estimate
Alturas	Alturas Municipal	AAT	PU		Basic	GA	GA	COMMUNITY	$4,681,241
Apple Valley	Apple Valley	APV	PU		Local	GA	GA	REGIONAL-Business/Corporate	$3,608,333
Auburn	Auburn Municipal	AUN	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$1,935,521
Bakersfield	Bakersfield Municipal	L45	PU		Local	GA	GA	REGIONAL	$4,583,692
Banning	Banning Municipal	BNG	PU		Local	GA	GA	COMMUNITY	$1,305,556
Daggett	Barstow-Daggett	DAG	PU		Basic	GA	GA	REGIONAL	$5,550,000
Redding	Benton Field	O85	PU		Local	GA	GA	REGIONAL	$2,263,572
Big Bear City	Big Bear City	L35	PU		Local	GA	GA	REGIONAL	$3,966,667
Bishop	Bishop	BIH	PU		Local	GA	GA	REGIONAL-Business/Corporate	$17,988,889
Blythe	Blythe	BLH	PU		Basic	GA	GA	COMMUNITY	$10,730,667
Burbank	Bob Hope	BUR	PU	M		P	P	PRIMARY-MEDIUM HUB-METROPOLITAN-Business/Corporate	$176,353,749
Oceanside	Bob Maxwell Memorial Airfield	OKB	PU		Local	GA	GA	REGIONAL	$7,659,444
Boonville	Boonville	D83	PU		Basic	GA	GA	COMMUNITY	$1,149,079
Borrego Springs	Borrego Valley	L08	PU		Basic	GA	GA	COMMUNITY	$2,510,000
La Verne	Brackett Field	POC	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$166,667
Brawley	Brawley Municipal	BWC	PU		Local	GA	GA	COMMUNITY	$10,431,575
San Diego	Brown Field Municipal	SDM	PU		Regional	R	R	REGIONAL-Business/Corporate	$11,103,333
Bridgeport	Bryant Field	O57	PU		Unclassified	GA	GA	COMMUNITY-Recreation	$0
Concord	Buchanan Field	CCR	PU	N		P	P	PRIMARY-NON HUB-METROPOLITAN-Business/Corporate	$9,696,667
Dorris	Butte Valley	A32	PU		Unclassified	GA	GA	LIMITED USE-Agriculture	$0
Byron	Byron	C83	PU		Local	R	R	COMMUNITY-Recreation	$1,787,500
Upland	Cable	CCB	PR		Regional	R	R	REGIONAL	$9,098,276
San Andreas	Calaveras County-Maury Rasmussen Field	CPU	PU		Local	GA	GA	COMMUNITY	$3,479,805
Calexico	Calexico International	CXL	PU		Basic	GA	GA	COMMUNITY	$11,361,155
California City	California City Municipal	L71	PU		Unclassified	GA	GA	COMMUNITY-Recreation	$0
Arcata/Eureka	California Redwood Coast-Humboldt County	ACV	PU	N		P	P	PRIMARY-NON HUB-REGIONAL-Business/Corporate	$6,350,698

City	Airport	FAA ID	Owner-ship	Hub	FAA/ASSET Role	FAA Category	FAA Category in 5 Years	CA Functional Class	2021-2025 FAA Dev Estimate
Camarillo	Camarillo	CMA	PU		National	R	R	METROPOLITAN-Business/Corporate	$65,786,667
Cameron Park	Cameron Park	O61	PU		Local	GA	GA	COMMUNITY	$0
Atwater	Castle	MER	PU		Local	GA	GA	REGIONAL	$1,113,889
Cedarville	Cedarville	O59	PU		Unclassified	GA	GA	COMMUNITY	$0
Santa Rosa	Charles M Schulz-Sonoma County	STS	PU	N		P	P	PRIMARY-NON-HUB-REGIONAL-Business/Corporate	$24,883,217
Chemehuevi Valley	Chemehuevi Valley	49X	NA		Basic	GA	GA	LIMITED USE	$874,755
Chico	Chico Municipal	CIC	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$29,412,660
Chino	Chino	CNO	PU		Regional	R	R	REGIONAL-Business/Corporate	$28,393,941
Chowchilla	Chowchilla	2O6	PU		Local	GA	GA	COMMUNITY	$5,469,464
Cloverdale	Cloverdale Municipal	O60	PU		Local	GA	GA	COMMUNITY	$1,565,556
Columbia	Columbia	O22	PU		Local	GA	GA	REGIONAL-Recreation	$866,667
Colusa	Colusa County	O08	PU		Local	GA	GA	COMMUNITY	$963,125
Compton	Compton/Woodley	CPM	PU		Local	R	R	METROPOLITAN-Business/Corporate	$10,711,111
Corning	Corning Municipal	0O4	PU		Basic	GA	GA	COMMUNITY	$604,013
Corona	Corona Municipal	AJO	PU		Local	GA	GA	REGIONAL-Recreation	$0
Delano	Delano Municipal	DLO	PU		Basic	GA	GA	REGIONAL	$7,620,666
Dinsmore	Dinsmore	D63	PU		Unclassified	GA	GA	LIMITED USE-Firefighting	$0
Dunsmuir	Dunsmuir Municipal-Mott	1O6	PU		Basic	GA	GA	COMMUNITY	$7,179,568
Willits	Ells Field-Willits Municipal	O28	PU		Basic	GA	GA	COMMUNITY-Recreation	$1,114,612
Fall River Mills	Fall River Mills	O89	PU		Basic	GA	GA	COMMUNITY	$347,500
Fallbrook	Fallbrook Community Airpark	L18	PU		Local	GA	GA	COMMUNITY	$6,833,333
Firebaugh	Firebaugh	F34	PU		Basic	GA	GA	COMMUNITY-Agriculture	$686,333
Franklin	Franklin Field	F72	PU		Basic	GA	GA	COMMUNITY-Agriculture	$2,061,112
Murrieta/Temecula	French Valley	F70	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$1,244,444
Fresno	Fresno Chandler Executive	FCH	PU		Regional	R	R	REGIONAL-Business/Corporate	$2,209,333
Fresno	Fresno Yosemite International	FAT	PU	S		P	P	PRIMARY-SMALL HUB-METROPOLITAN-Business/Corporate	$31,777,838
Fullerton	Fullerton Municipal	FUL	PU		Regional	R	R	REGIONAL-Business/Corporate	$3,636,111
Quincy	Gansner Field	2O1	PU		Local	GA	GA	COMMUNITY	$2,175,466
Garberville	Garberville	O16	PU		Basic	GA	GA	COMMUNITY	$395,571

City	Airport	FAA ID	Owner-ship	Hub	FAA/ASSET Role	FAA Category	FAA Category in 5 Years	CA Functional Class	2021-2025 FAA Dev Estimate
Lancaster	General Wm J Fox Airfield	WJF	PU		Local	GA	GA	REGIONAL-Business/Corporate	$1,166,667
Georgetown	Georgetown	E36	PU		Basic	GA	GA	COMMUNITY	$2,000,667
San Diego/El Cajon	Gillespie Field	SEE	PU		National	R	R	REGIONAL-Business/Corporate	$38,482,609
Novato	Gnoss Field	DVO	PU		Regional	R	R	REGIONAL-Business/Corporate	$16,825,481
Gustine	Gustine	3O1	PU		Basic	GA	GA	COMMUNITY-Agriculture	$1,064,445
Orland	Haigh Field	O37	PU		Local	GA	GA	COMMUNITY	$750,000
Half Moon Bay	Half Moon Bay	HAF	PU		Basic	R	R	REGIONAL	$3,403,667
Hanford	Hanford Municipal	HJO	PU		Local	GA	GA	REGIONAL	$6,075,356
Happy Camp	Happy Camp	36S	PU		Unclassified	GA	GA	COMMUNITY	$0
Hayfork	Hayfork	F62	PU		Unclassified	GA	GA	COMMUNITY	$0
Hayward	Hayward Executive	HWD	PU		National	R	R	METROPOLITAN-Business/Corporate	$8,822,333
Healdsburg	Healdsburg Municipal	HES	PU		Local	GA	GA	COMMUNITY	$979,722
Hemet	Hemet-Ryan	HMT	PU		Local	GA	GA	REGIONAL-Business/Corporate	$2,942,222
Hollister	Hollister Municipal	CVH	PU		Local	GA	GA	REGIONAL	$2,707,194
Hoopa	Hoopa	O21	PU		Basic	GA	GA	LIMITED USE	$0
Imperial	Imperial County	IPL	PU		Regional	CS	CS	COMMERCIAL SERVICE NON-PRIMARY	$5,161,999
Independence	Independence	2O7	PU		Unclassified	GA	GA	COMMUNITY	$0
Inyokern	Inyokern	IYK	PU		Basic	GA	GA	General Aviation-Regional-Business/Corporate	$25,017,749
Crescent City	Jack McNamara Field	CEC	PU		Regional	CS	CS	Commercial Service - Non-Primary	$12,751,272
Hawthorne	Jack Northrop Field/Hawthorne Municipal	HHR	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$9,404,778
Palm Springs	Jacqueline Cochran Regional	TRM	PU		National	GA	GA	REGIONAL-Business/Corporate	$6,419,667
Santa Ana	John Wayne Airport-Orange County	SNA	PU	M		P	P	PRIMARY-MEDIUIM HUB-METROPOLITAN-Business/Corporate	$88,981,251
Kernville	Kern Valley	L05	PU		Basic	GA	GA	COMMUNITY-Recreation	$7,089,312
Eureka	Kneeland	O19	PU		Unclassified	GA	GA	COMMUNITY-Firefighting	$0
South Lake Tahoe	Lake Tahoe	TVL	PU		Local	GA	GA	REGIONAL-Business/Corporate	$1,211,111
Lakeport	Lampson Field	1O2	PU		Local	GA	GA	REGIONAL	$1,902,778
Lee Vining	Lee Vining	O24	PU		Unclassified	GA	GA	LIMITED USE-Recreation	$0
Lincoln	Lincoln Regional/Karl Harder Field	LHM	PU		Local	R	R	REGIONAL-Business/Corporate	$9,392,714
Littleriver	Little River	LLR	PU		Basic	GA	GA	COMMUNITY	$8,896,023

City	Airport	FAA ID	Owner-ship	Hub	FAA/ASSET Role	FAA Category	FAA Category in 5 Years	CA Functional Class	2021-2025 FAA Dev Estimate
Livermore	Livermore Municipal	LVK	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$3,222,778
Lompoc	Lompoc	LPC	PU		Local	GA	GA	COMMUNITY	$3,813,405
Lone Pine	Lone Pine/Death Valley	O26	PU		Basic	GA	GA	COMMUNITY	$5,331,877
Long Beach	Long Beach /Daugherty Field/	LGB	PU	S		P	P	PRIMARY-SMALL HUB-METROPOLITAN-Business/Corporate	$192,582,110
Weaverville	Lonnie Pool Field/Weaverville	O54	PU		Unclassified	GA	GA	COMMUNITY-Recreation	$0
Los Angeles	Los Angeles International	LAX	PU	L		P	P	PRIMARY-LARGE HUB-METROPOLITAN-Business/Corporate	$486,801,991
Los Banos	Los Banos Municipal	LSN	PU		Local	GA	GA	COMMUNITY-Agriculture	$938,889
Madera	Madera Municipal	MAE	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$7,981,667
Mammoth Lakes	Mammoth Yosemite	MMH	PU	N		P	P	PRIMARY-NON HUB-REGIONAL-Business/Corporate	$22,929,669
Riverside	March ARB	RIV	MA		National	R	R	JOINT-USE	$10,460,555
Marina	Marina Municipal	OAR	PU		Local	GA	GA	COMMUNITY	$1,561,667
Mariposa	Mariposa-Yosemite	MPI	PU		Local	GA	GA	REGIONAL	$5,844,516
Sacramento	McClellan Airfield	MCC	PR		Unclassified	GA	GA	METROPOLITAN-Business/Corporate	$0
Carlsbad	McClellan-Palomar	CRQ	PU		National	CS	P	COMMERCIAL SERVICE NON-PRIMARY	$36,175,105
Bakersfield	Meadows Field	BFL	PU	N		P	P	PRIMARY-NON HUB-REGIONAL-Business/Corporate	$52,662,793
Tulare	Mefford Field	TLR	PU		Local	GA	GA	REGIONAL	$1,420,456
Merced	Merced Regional/Macready Field	MCE	PU		Regional	CS	CS	COMMERCIAL SERVICE NON-PRIMARY	$947,368
King City	Mesa Del Rey	KIC	PU		Basic	GA	GA	COMMUNITY	$1,507,834
Oakland	Metropolitan Oakland International	OAK	PU	M		P	P	PRIMARY-MEDIUM HUB-METROPOLITAN-Business/Corporate	$64,450,011
Modesto	Modesto City County-Harry Sham Field	MOD	PU		Regional	GA	GA	Regional-Business/Corporate	$1,638,889
Mojave	Mojave Air and Space Port	MHV	PU		Local	GA	GA	REGIONAL-Business/Corporate	$35,697,588
Monterey	Monterey Regional	MRY	PU	N		P	P	PRIMARY-NON HUB-REGIONAL-Business/Corporate	$55,100,662

City	Airport	FAA ID	Owner-ship	Hub	FAA/ASSET Role	FAA Category	FAA Category in 5 Years	CA Functional Class	2021-2025 FAA Dev Estimate
San Diego	Montgomery-Gibbs Executive	MYF	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$29,688,889
Eureka	Murray Field	EKA	PU		Local	GA	GA	REGIONAL	$2,235,784
Napa	Napa County	APC	PU		National	R	R	REGIONAL-Business/Corporate	$13,995,389
Needles	Needles	EED	PU		Unclassified	GA	GA	REGIONAL	$0
Beckwourth	Nervino	O02	PU		Basic	GA	GA	COMMUNITY	$829,291
Grass Valley	Nevada County	GOO	PU		Local	GA	GA	REGIONAL-Recreation	$3,653,555
Coalinga	New Coalinga Municipal	C80	PU		Basic	GA	GA	COMMUNITY	$1,507,672
San Jose	Norman Y Mineta San Jose International	SJC	PU	M		P	P	PRIMARY-MEDUIM HUB-METROPOLITAN-Business/Corporate	$77,388,934
Vacaville	Nut Tree	VCB	PU		Local	GA	GA	REGIONAL-Business/Corporate	$2,399,689
Oakdale	Oakdale	O27	PU		Local	GA	GA	COMMUNITY	$4,311,560
Oceano	Oceano County	L52	PU		Basic	GA	GA	LIMITED USE-Recreation	$3,056,418
Ontario	Ontario International	ONT	PU	M		P	P	PRIMARY-MEDIUM HUB-METROPOLITAN-Business/Corporate	$143,552,391
Oroville	Oroville Municipal	OVE	PU		Local	GA	GA	REGIONAL	$2,733,811
Oxnard	Oxnard	OXR	PU		Regional	GA	GA	METROPOLITAN-Business/Corporate	$28,533,334
Palm Springs	Palm Springs International	PSP	PU	S		P	P	PRIMARY-SMALL HUB-METROPOLITAN-Business/Corporate	$26,159,079
Palmdale	Palmdale USAF Plant 42	PMD	MA		Unclassified	GA	GA	Military	$0
Palo Alto	Palo Alto	PAO	PU		Local	R	R	METROPOLITAN-Business/Corporate	$5,117,333
Paso Robles	Paso Robles Municipal	PRB	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$3,088,889
Petaluma	Petaluma Municipal	O69	PU		Regional	R	R	REGIONAL-Business/Corporate	$1,527,800
Groveland	Pine Mountain Lake	E45	PU		Basic	GA	GA	COMMUNITY-Recreation	$0
Placerville	Placerville	PVF	PU		Local	GA	GA	REGIONAL-Business/Corporate-Firefighting	$1,176,667
Porterville	Porterville Municipal	PTV	PU		Local	GA	GA	REGIONAL	$1,078,222
Ramona	Ramona	RNM	PU		Regional	R	R	REGIONAL	$5,230,000
Rancho Murieta	Rancho Murieta	RIU	PR		Unclassified	GA	GA	COMMUNITY	$0
Red Bluff	Red Bluff Municipal	RBL	PU		Regional	GA	GA	COMMUNITY	$1,342,777
Redding	Redding Municipal	RDD	PU	N		P	P	PRIMARY-NON HUB-REGIONAL-Business/Corporate	$8,395,047

City	Airport	FAA ID	Owner-ship	Hub	FAA/ASSET Role	FAA Category	FAA Category in 5 Years	CA Functional Class	2021-2025 FAA Dev Estimate
Redlands	Redlands Municipal	REI	PU		Local	GA	GA	REGIONAL-Business/Corporate	$2,300,000
Reedley	Reedley Municipal	O32	PU		Local	GA	GA	COMMUNITY	$2,105,188
San Jose	Reid-Hillview of Santa Clara County	RHV	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$733,334
Rio Vista	Rio Vista Municipal	O88	PU		Local	GA	GA	REGIONAL	$2,656,390
Riverside	Riverside Municipal	RAL	PU		Regional	R	R	REGIONAL-Business/Corporate	$5,554,445
Chester	Rogers Field	O05	PU		Basic	GA	GA	REGIONAL	$1,095,444
Fortuna	Rohnerville	FOT	PU		Basic	GA	GA	REGIONAL	$1,592,045
Covelo	Round Valley	O09	PU		Unclassified	GA	GA	COMMUNITY	$0
Ruth	Ruth	T42	PU		Unclassified	GA	GA	COMMUNITY-Recreation	$0
Sacramento	Sacramento Executive	SAC	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$11,833,334
Sacramento	Sacramento International	SMF	PU	M		P	P	PRIMARY-MEDIUM HUB-METROPOLITAN-Business/Corporate	$36,631,056
Sacramento	Sacramento Mather	MHR	PU		National	R	R	METROPOLITAN-Cargo	$54,386,280
Salinas	Salinas Municipal	SNS	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$5,669,862
San Bernardino	San Bernardino International	SBD	PU		National	R	R	REGIONAL-Business/Corporate	$5,741,414
San Carlos	San Carlos	SQL	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$2,316,775
San Diego	San Diego International	SAN	PU	L		P	P	PRIMARY-LARGE HUB-METROPOLITAN-Business/Corporate	$1,713,224,538
San Francisco	San Francisco International	SFO	PU	L		P	P	PRIMARY-LARGE HUB-METROPOLITAN-Business/Corporate	$340,515,125
El Monte	San Gabriel Valley	EMT	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$15,472,222
San Luis Obispo	San Luis County Regional	SBP	PU	N		P	P	PRIMARY-NON HUB-REGIONAL-Business/Corporate	$33,867,932
San Martin	San Martin	E16	PU		Local	R	R	REGIONAL	$2,165,555
Santa Barbara	Santa Barbara Municipal	SBA	PU	N		P	P	PRIMARY-NON-HUB-METROPOLITAN-Business/Corporate	$29,916,653
Santa Maria	Santa Maria Public	SMX	PU	N		P	P	PRIMARY-NON HUB-REGIONAL-Business/Corporate	$23,181,458
Santa Monica	Santa Monica Municipal	SMO	PU		Local	R	R	METROPOLITAN-Business/Corporate	$0
Santa Ynez	Santa Ynez	IZA	PU		Local	GA	GA	COMMUNITY	$5,881,111
Fort Jones	Scott Valley	A30	PU		Local	GA	GA	COMMUNITY	$1,315,556

City	Airport	FAA ID	Owner-ship	Hub	FAA/ASSET Role	FAA Category	FAA Category in 5 Years	CA Functional Class	2021-2025 FAA Dev Estimate
Visalia	Sequoia Field	D86	PU		Unclassified	GA	GA	COMMUNITY-Agriculture	$0
Shafter	Shafter-Minter Field	MIT	PU		Local	GA	GA	REGIONAL-Business/Corporate	$9,541,667
Shelter Cove	Shelter Cove	0Q5	PU		Unclassified	GA	GA	COMMUNITY	$0
Montague	Siskiyou County	SIY	PU		Basic	GA	GA	COMMUNITY	$1,150,000
Victorville	Southern California Logistics	VCV	PU		Regional	R	R	REGIONAL	$28,350,851
Stockton	Stockton Metropolitan	SCK	PU	N		P	P	PRIMARY-NON HUB-METROPOLITAN-Business/Corporate	$42,671,686
Susanville	Susanville Municipal	SVE	PU		Local	GA	GA	REGIONAL	$2,325,723
Yuba City	Sutter County	O52	PU		Local	GA	GA	COMMUNITY	$933,333
Taft	Taft-Kern County	L17	PU		Basic	GA	GA	COMMUNITY	$0
Tehachapi	Tehachapi Municipal	TSP	PU		Local	GA	GA	REGIONAL-Business/Corporate	$13,441,000
Tracy	Tracy Municipal	TCY	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$1,579,333
Trinity Center	Trinity Center	O86	PU		Basic	GA	GA	COMMUNITY-Recreation	$1,451,868
Trona	Trona	L72	PU		Basic	GA	GA	COMMUNITY	$0
Truckee	Truckee-Tahoe	TRK	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$9,969,250
Tulelake	Tulelake Municipal	O81	PU		Basic	GA	GA	COMMUNITY-Agriculture	$3,425,683
Turlock	Turlock Municipal	O15	PU		Local	GA	GA	COMMUNITY	$1,786,111
Twentynine Palms	Twentynine Palms	TNP	PU		Basic	GA	GA	REGIONAL	$1,358,333
Ukiah	Ukiah Municipal	UKI	PU		Local	GA	GA	REGIONAL-Business/Corporate	$875,789
Davis	University	EDU	PU		Local	GA	GA	COMMUNITY	$3,496,781
Van Nuys	Van Nuys	VNY	PU		National	R	R	METROPOLITAN-Business/Corporate	$40,997,770
Visalia	Visalia Municipal	VIS	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$4,678,385
Wasco	Wasco-Kern County	L19	PU		Unclassified	GA	GA	COMMUNITY	$0
Watsonville	Watsonville Municipal	WVI	PU		Regional	GA	GA	REGIONAL-Business/Corporate	$6,638,646
Weed	Weed	O46	PU		Basic	GA	GA	COMMUNITY	$350,000
Jackson	Westover Field Amador County	JAQ	PU		Local	GA	GA	REGIONAL-Business/Corporate	$2,464,445
Los Angeles	Whiteman	WHP	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$6,746,778
Mendota	William Robert Johnston Municipal	M90	PU		Unclassified	GA	GA	COMMUNITY	$0
Willows	Willows-Glenn County	WLW	PU		Local	GA	GA	COMMUNITY	$793,777
Woodlake	Woodlake	O42	PU		Basic	GA	GA	COMMUNITY	$666,667

City	Airport	FAA ID	Owner-ship	Hub	FAA/ASSET Role	FAA Category	FAA Category in 5 Years	CA Functional Class	2021-2025 FAA Dev Estimate
Davis/Woodland /Winters	Yolo County	DWA	PU		Local	GA	GA	COMMUNITY-Agriculture	$2,407,785
Marysville	Yuba County	MYV	PU		Local	GA	GA	REGIONAL-Business/Corporate	$2,288,888
Torrance	Zamperini Field	TOA	PU		Regional	R	R	METROPOLITAN-Business/Corporate	$0

Figure 3-2: Caltrans Division of Aeronautics California Public Use Airports and Federal Airfields

Source: Caltrans Division of Aeronautics

Attachment 3-B: 2020 Inventory of California Heliports

Name	County	Use	Ownership
333 SOUTH HOPE STREET	Los Angeles	Special	Private
5670 WILSHIRE HELIPORT	Los Angeles	Personal	Private
700 NORTH BRAND HELIPORT	Los Angeles	Special	Private
707 WILSHIRE HELIPORT	Los Angeles	Personal	Private
A.G. SPANOS COMPANIES	San Joaquin	Special	Private
ABC - TV	Los Angeles	Personal	Private
ABC-7 TV	Los Angeles	Special	Private
ADELANTO FIRE DEPT	San Bernardino	Special	Public
ADVENTIST HEALTH AND RIDEOUT HELIPORT	Yuba	Special	Private
ADVENTIST HEALTH BAKERSFIELD HOSPITAL	Kern	Special	Private
ADVENTIST HEALTH HOWARD MEMORIAL	Mendocino	Special	Private
ADVENTIST HEALTH MED CTR TEHACHAPI	Kern	Special	Private
ADVENTIST HEALTH SONORA HELIPORT	Tuolumne	Special	Private
ADVENTIST HEALTH UKIAH VALLEY HELIPORT	Mendocino	Special	Private
ADVENTIST MEDICAL CENTER HANFORD	Kings	Special	Private
AEROMETALS HELIPORT	Sacramento	Special	Private
AIRESEARCH MANUFACTURING	Los Angeles	Personal	Private
AIRPORT IMPERIAL BUILDING	Los Angeles	Personal	Private
AIRPORT TOWER ""B""	Los Angeles	Personal	Private
ALMADEN WINERY	San Benito	Personal	Private
ALTA VISTA	Santa Cruz	Personal	Private
AMERICAN DISPLAY INCORPORATED	Orange	Personal	Private
ANACAPA VIEW	Los Angeles	Personal	Private
ANAHEIM CANYON TOWER HP	Orange	Special	Private
ANAHEIM POLICE DEPARTMENT HP	Orange	Special	Public
ANGEL CITY HELIPORT	Los Angeles	Special	Private
ANTELOPE VALLEY HOSP MED CTR	Los Angeles	Special	Public
ARROWHEAD RMC HP #1	San Bernardino	Special	Public
ARROWHEAD RMC HP #2	San Bernardino	Special	Public
AT&T CENTER HELIPORT	Los Angeles	Personal	Private
BAKER HELIPORT	San Bernardino	Personal	Private
BAKERSFIELD MEMORIAL HOSPITAL	Kern	Special	Private
BALDWIN BASE	Orange	Personal	Private
BANK OF AMERICA DATA CENTER	Los Angeles	Special	Private
BANNER LASSEN MEDICAL CENTER	Lassen	Special	Private
BARSTOW COMMUNITY HOSPITAL	San Bernardino	Special	Public
BARSTOW COMMUNITY HOSPITAL HELIPORT	San Bernardino	Special	Private
BARTON MEMORIAL HOSPITAL	El Dorado	Special	Private
BASELINE HELITACK BASE	Tuolumne	Special	Public
BEAR VALLEY HELITACK BASE	San Benito	Special	Private
BENICIA REFINERY	Solano	Personal	Private
BILTMORE HOTEL	Los Angeles	Personal	Private
BLACKWATER HELIPORT	Riverside	Special	Private
BLM RAVENDALE	Lassen	Exempt	Public
BOEING ANAHEIM BUILDING 203	Orange	Special	Private
BOEING CANOGA PARK	Los Angeles	Special	Private
BOEING DE SOTO	Los Angeles	Special	Private
BOEING HUNTINGTON BEACH	Orange	Personal	Private
BOEING SANTA SUSANA	Ventura	Special	Private
BOEING SEAL BEACH (GROUND LEVEL)	Orange	Special	Private
BOEING SEAL BEACH (ROOFTOP)	Orange	Personal	Private
BOSWELL PROCESSING	Kings	Personal	Private
BOWMAN LAKE	Nevada	Personal	Private
BROADCOM	Orange	Special	Private
BURNEY SHERIFF'S STATION HELIPORT	Shasta	Special	Public
BURROUGHS	Kern	Special	Private
BUTTE COUNTY SHERIFF HELIPORT	Butte	Special	Public
C. T. F. HELIPORT	Monterey	Special	Public
CALIFORNIA SPEEDWAY COMPETITOR	San Bernardino	Special	Private
CALIFORNIA SPEEDWAY MEDICAL	San Bernardino	Special	Private
CALTRANS DISTRICT 7	Los Angeles	Special	Public
CAMP 5	El Dorado	Exempt	Private
CAMP PARKS	Alameda	Military	Navy
CASTAIC DAM	Los Angeles	Exempt	Public
CASTLE HP	Riverside	Personal	Private
CBS TELEVISION CITY	Los Angeles	Personal	Private
CDF ALMA FIRE STATION	Santa Clara	Personal	Public
CDF AUBURN	Placer	Special	Public
CDF BIEBER STATION	Lassen	Exempt	Public
CDF BOGGS MOUNTAIN	Lake	Personal	Public
CDF EEL RIVER	Humboldt	Exempt	Public
CDF KNEELAND HELIPORT	Humboldt	Special	Public
CDF SANGER	Fresno	Special	Public
CDF SUSANVILLE	Lassen	Special	Private

Name	County	Use	Ownership
CDF VINA FIRE STATION	Tehama	Special	Public
CENTERPORT HELIPORT	Orange	Special	Private
CHAMBER OF COMMERCE BUILDING HELIPORT	Los Angeles	Special	Private
CHAPIN MEDICAL	Riverside	Special	Private
CHARLES D. LOGASA	San Francisco	Special	Public
CHEVRON EL SEGUNDO	Los Angeles	Personal	Private
CHILDRENS HOSPITAL OAKLAND	Alameda	Special	Private
CHILDRENS HOSPITAL OF L.A. HP 1	Los Angeles	Special	Private
CHILDRENS HOSPITAL OF L.A. HP 2	Los Angeles	Special	Private
CHILDREN'S HOSPITAL OF ORANGE COUNTY NORTH	Orange	Special	Private
CHILDREN'S HOSPITAL OF ORANGE COUNTY SOUTH	Orange	Special	Private
CHP HEADQUARTERS	Sacramento	Special	Public
CHP MORONGO BASIN HELIPORT	San Bernardino	Special	Public
CIMA CENTER HELIPORT	Sacramento	Personal	Private
CITY HALL - RIVERSIDE	Riverside	Special	Public
CITY NATIONAL BANK BUILDING	Los Angeles	Personal	Private
CITY NATIONAL PLAZA	Los Angeles	Personal	Private
CITY OF SANTA FE SPRINGS	Los Angeles	Special	Public
CITY SERVICE YARD	Los Angeles	Personal	Public
CIVIC CENTER	Orange	Special	Public
CIVIC FINANCIAL CENTER	Los Angeles	Special	Public
CLOVIS COMMUNITY HOSPITAL	Fresno	Special	Private
COGENT HELIPORT	Los Angeles	Special	Private
COMMERCE OFFICE PARK HELIPORT	Los Angeles	Special	Private
COMMODORE CENTER	Marin	Personal	Private
COMMUNICATIONS	Orange	Personal	Public
COMMUNITY MEMORIAL HOSPITAL	Ventura	Special	Private
COMMUNITY REG MED CTR PAD A	Fresno	Special	Private
COMMUNITY REG MED CTR PAD B	Fresno	Special	Private
COMMUNITY REG MED CTR PAD C	Fresno	Special	Private
COMMUNITY REGIONAL MEDICAL TRAUMA CENTER	Fresno	Special	Private
COSMODYNE	Los Angeles	Personal	Private
COSTA MESA POLICE DEPARTMENT	Orange	Special	Public
CRC-HUNTINGTON BEACH	Orange	Personal	Private
CROMWELL FIELD	Los Angeles	Personal	Private
DANIEL FREEMAN	Los Angeles	Special	Private
DEL MAR	Orange	Personal	Private
DENIO	Kern	Special	Private
DESERT REGIONAL MEDICAL CENTER	Riverside	Special	Private
DESERT VALLEY HOSPITAL	San Bernardino	Special	Private
DIGITALPATH HELIPORT	Butte	Special	Private
DIRECTV 2230 HELIPORT	Los Angeles	Personal	Private
DISCOVERY BAY	Contra Costa	Special	Private
DOCTORS MED CTR-SAN PABLO	Contra Costa	Special	Private
DOCTORS MED. CTR. OF MODESTO	Stanislaus	Special	Private
DOMINICAN HOSPITAL	Santa Cruz	Special	Private
DREAMWORKS HELIPORT	Los Angeles	Special	Private
E. L. YEAGER CONSTRUCTION CO.	Riverside	Personal	Private
EAST VALLEY LAW ENFORCE. FAC.	Ventura	Special	Public
ECKMAN STEEL INC	San Bernardino	Personal	Private
EISENHOWER MEDICAL CENTER	Riverside	Special	Private
EJM Heliport	Orange	Personal	Private
EL CENTRO REGIONAL MEDICAL CENTER	Imperial	Special	Private
ELLWOOD	Santa Barbara	Personal	Private
EMANUEL MEDICAL CENTER	Stanislaus	Special	Private
EMANUEL MEDICAL CENTER #2 (TEMP GROUND-BASED)	Stanislaus	Special	Private
ENGLISH MOUNTAIN RANCH	Nevada	Personal	Private
ENLOE MEDICAL CENTER	Butte	Special	Private
EXECUTIVE TOWER HELIPORT	Los Angeles	Personal	Private
FIGUEROA TOWER HELIPORT	Los Angeles	Personal	Private
FINANCIAL PLAZA II	Ventura	Special	Private
FIRST INTERSTATE BANK (ORANGE)	Orange	Special	Private
FISHERMANS COVE HP	Los Angeles	Special	Private
FLYING ""W""	Riverside	Personal	Private
FLYING M RANCH	Merced	Personal	Private
FONTANA POLICE HEADQUARTERS	San Bernardino	Special	Public
FOOTHILL PRESBYTERIAN HOSPITAL	Los Angeles	Special	Private
FOSTER FARMS	Merced	Special	Private
FOX HILLS	Los Angeles	Personal	Private
FRESH POND	El Dorado	Exempt	Public
GATEWAY EAST	Los Angeles	Personal	Private
GEORGE L. MEE MEMORIAL HOSPITAL	Monterey	Special	Private
GLEN HELEN REGIONAL PARK HELIPORT	San Bernardino	Special	Public
GLENDALE ADVENTIST MED CTR	Los Angeles	Special	Private
GLENDALE CENTER HELIPORT	Los Angeles	Personal	Private
GLENDALE POLICE DEPARTMENT	Los Angeles	Special	Public

Name	County	Use	Ownership
GOLETA VALLEY COTTAGE HOSP.	Santa Barbara	Special	Private
GOOD SAMARITAN	Los Angeles	Special	Private
GOOD SAMARITAN HOSPITAL HELIPORT	Santa Clara	Special	Private
GROSSMONT HOSPITAL	San Diego	Special	Private
HACIENDA BUSINESS PARK	Alameda	Personal	Private
HADDICKS	Los Angeles	Personal	Private
HALL OF JUSTICE	San Francisco	Special	Public
HANFORD COMMUNITY MEDICAL CTR.	Kings	Special	Private
HANSON RANCH	San Luis Obispo	Personal	Private
HARBOR - UCLA MEDICAL CENTER	Los Angeles	Special	Public
HARBOR-UCLA MEDICAL CENTER INTERIM HP	Los Angeles	Special	Private
HAZEL HAWKINS MEMORIAL HOSPITAL	San Benito	Special	Private
HEAVENLY VALLEY	El Dorado	Personal	Private
HENRY MAYO NEWHALL MEMORIAL HOSPITAL	Los Angeles	Special	Private
HI-DESERT HOSPITAL	San Bernardino	Special	Private
HIGH HILL RANCH	El Dorado	Personal	Private
HOAG MEMORIAL HOSPITAL	Orange	Special	Private
HOKINSON HELIPORT	Los Angeles	Special	Private
HOLLYWOOD PARKING & ENFORCE	Los Angeles	Special	Public
HOLLYWOOD PRESBYTERIAN MEDICAL CENTER	Los Angeles	Special	Private
HONDA OF SANTA ANA	Orange	Special	Private
HRRP GARLAND CENTER HELIPORT	Los Angeles	Personal	Private
HUGHES CANOGA PARK	Los Angeles	Personal	Private
HUGHES FULLERTON - GL	Orange	Personal	Private
HUGHES FULLERTON BUILDING 618	Orange	Personal	Private
HUGHES MALIBU	Los Angeles	Exempt	Private
HUMMINGBIRD NEST HELIPORT	Ventura	Special	Private
HUNTERS RESERVOIR	Calaveras	Exempt	Private
HUNTINGTON BEACH PD-GOTHARD	Orange	Special	Public
HUNTINGTON MEM. HOSP. H/P #2	Los Angeles	Special	Private
INDIAN VALLEY HELIPORT	Plumas	Special	Private
INDUSTRY HILLS	Los Angeles	Personal	Public
INFINEON RACEWAY MEDICAL		Special	Private
INFINEON RACEWAY SHUTTLE		Special	Private
INLAND VALLEY MED. CENTER	Riverside	Special	Private
IPP ADELANTO	San Bernardino	Personal	Public
ISLAND EXPRESS HELIPORT	Los Angeles	Special	Public
JACKSON LAKE	Nevada	Personal	Private
JAMBOREE CENTER	Orange	Personal	Private
JOE HEIDRICK FARMS	Yolo	Personal	Private
JOHN C. FREMONT HEALTHCARE DISTRICT HOSPITAL	Mariposa	Special	Private
JOHN F. KENNEDY MEMORIAL HOSP.	Riverside	Special	Private
JOHN MUIR MED CENTER-WALNUT CREEK HP-Rooftop	Contra Costa	Special	Private
JOHN MUIR MEDICAL CENTER	Contra Costa	Special	Private
JOHN MUIR MT DIABLO MEDICAL CENTER	Contra Costa	Special	Private
JOHNSON	Riverside	Personal	Private
JONES	San Joaquin	Personal	Private
KAISER FOUNDATIONAL HOSPITAL, MANTECA	San Joaquin	Special	Private
KAISER LOS ANGELES MEDICAL CENTER	Los Angeles	Special	Private
KAISER PERMANENTE MED CTR	Orange	Special	Private
KAISER PERMANENTE MED CTR	Santa Clara	Special	Private
KAISER PERMANENTE MODESTO	Stanislaus	Special	Private
KAISER PERMANENTE VACAVILLE	Solano	Special	Private
KAISER SOUTH SACRAMENTO HP	Sacramento	Special	Private
KAISER-FONTANA HELIPORT	San Bernardino	Special	Private
KATHY'S TRAIL	Riverside	Personal	Private
KAWEAH DELTA DISTRICT MEDICAL CENTER	Tulare	Special	Private
KEARNEY	San Diego	Personal	Private
KERN MEDICAL CENTER ROOFTOP HP	Kern	Special	Public
KERN VALLEY HOSPITAL	Kern	Special	Private
KGTV CHANNEL 10	San Diego	Personal	Private
KILROY AC8-LONG BEACH	Los Angeles	Personal	Private
KILROY AIRPORT CENTER	Los Angeles	Personal	Private
KINGS COUNTY HOUSTON AVENUE PAD A	Kings	Special	Private
KINGS COUNTY HOUSTON AVENUE PAD B	Kings	Special	Private
KOVACS	Fresno	Personal	Private
KOVR HELISTOP	Yolo	Special	Private
L. A. TIMES - COSTA MESA	Orange	Personal	Private
L. A. TIMES - LOS ANGELES	Los Angeles	Personal	Private
LA CITY FD- STATION 108	Los Angeles	Special	Public
LA CITY FD- STATION 24	Los Angeles	Special	Public
LA CO FD/SHERIFF -ZUMA BEACH EMS	Los Angeles	Special	Public
LA CO FD-BARTON	Los Angeles	Special	Public
LA CO FD-CAMP 2	Los Angeles	Special	Public
LA CO FD-CAMP 11	Los Angeles	Special	Public
LA CO FD-CAMP 14	Los Angeles	Special	Public

Name	County	Use	Ownership
LA CO FD-CAMP 15	Los Angeles	Special	Public
LA CO FD-CAMP 13	Los Angeles	Special	Public
LA CO FD-CAMP 16	Los Angeles	Special	Public
LA CO FD-CAMP 18	Los Angeles	Special	Public
LA CO FD-CAMP 8	Los Angeles	Special	Public
LA CO FD-CAMP 9	Los Angeles	Special	Public
LA CO FD-STATION 107	Los Angeles	Special	Public
LA CO FD-STATION 123	Los Angeles	Special	Public
LA CO FD-STATION 125	Los Angeles	Special	Public
LA CO FD-STATION 129	Los Angeles	Special	Public
LA CO FD-STATION 63A	Los Angeles	Special	Public
LA CO FD-STATION 64	Los Angeles	Special	Public
LA CO FD-STATION 65	Los Angeles	Special	Public
LA CO FD-STATION 66	Los Angeles	Special	Public
LA CO SHERIFF-ATHENS	Los Angeles	Special	Public
LA CO SHERIFF-BISCAILUZ CENTER	Los Angeles	Special	Public
LA CO SHERIFF-CARSON STATION	Los Angeles	Special	Public
LA CO SHERIFF-CENTRAL JAIL	Los Angeles	Special	Public
LA CO SHERIFF-INDUSTRY STATION	Los Angeles	Special	Public
LA CO SHERIFF-LAKEWOOD STATION	Los Angeles	Special	Public
LA CO SHERIFF-LANCASTER STATION HELIPORT	Los Angeles	Special	Public
LA CO SHERIFF-LANCASTER SUPERIOR COURT	Los Angeles	Exempt	Public
LA CO SHERIFF-LOST HILLS	Los Angeles	Special	Public
LA CO SHERIFF-LYNWOOD R.J.C.	Los Angeles	Special	Public
LA CO SHERIFF-MALIBU ADMIN CTR	Los Angeles	Special	Public
LA CO SHERIFF-MENS DET. CENTER	Los Angeles	Special	Public
LA CO SHERIFF-MIRA LOMA HONOR FARM	Los Angeles	Exempt	Public
LA CO SHERIFF-NORWALK STATION	Los Angeles	Special	Public
LA CO SHERIFF-PALMDALE STATION HELIPORT	Los Angeles	Special	Public
LA CO SHERIFF-POMONA SUP COURT	Los Angeles	Special	Public
LA CO SHERIFF-SANTA CLARITA	Los Angeles	Special	Public
LA CO SHERIFF-SE SUPERIOR CRT	Los Angeles	Special	Public
LA CO SHERIFF-SEB	Los Angeles	Special	Public
LA CO SHERIFF-VAN NUYS SUP CT	Los Angeles	Special	Public
LA CO SHERIFF-WAYSIDE STATION	Los Angeles	Special	Public
LA CO SHERIFF-WEST HOLLYWOOD	Los Angeles	Special	Public
LA PD - ADMINISTRATION BUILDING	Los Angeles	Special	Public
LA PD - CENTRAL FACILITIES UNIT	Los Angeles	Special	Public
LA PD - CITY HALL	Los Angeles	Personal	Public
LA PD - CITY HALL EAST	Los Angeles	Personal	Private
LA PD - DEVONSHIRE	Los Angeles	Special	Public
LA PD - HARBOR STATION HELIPORT	Los Angeles	Special	Public
LA PD - JAY STEPHEN HOOPER MEM.	Los Angeles	Special	Public
LA PD - PARKER CENTER	Los Angeles	Special	Public
LA PD - RANDY CHAMPE/GARY HOWE MEMORIAL	Los Angeles	Special	Public
LA PD - SANTA FE DAM	Los Angeles	Special	Public
LA PD - VENICE	Los Angeles	Special	Public
LA PD - WEST VALLEY	Los Angeles	Special	Public
LA PD - WILSHIRE	Los Angeles	Special	Public
LAC USC MED CTR ROOFTOP HP	Los Angeles	Special	Public
LAC/USC MEDICAL CENTER	Los Angeles	Special	Public
LAGUNA NIGUEL	Orange	Personal	Public
LAKE PARK HELISTOP	Sacramento	Personal	Private
LANDELLS AVIATION	Riverside	Personal	Private
LAYMAN SPRINGS	Tehama	Personal	Private
LITTON INDUSTRIES	Los Angeles	Personal	Private
LOCKHEED	Riverside	Personal	Private
LODI MEMORIAL HOSPITAL	San Joaquin	Special	Private
LOMA LINDA UNIV MEDICAL CENTER-MURRIETA	Riverside	Special	Private
LOMA LINDA UNIV. MED. CNTR NO.	San Bernardino	Special	Private
LOMA LINDA UNIV. MED. CTR. SO.	San Bernardino	Special	Private
LOMA RIDGE COMMUNICATIONS CTR.	Orange	Special	Public
LONG BEACH MEMORIAL MEDICAL CENTER	Los Angeles	Special	Private
LOS ALTOS HELIPORT	Los Angeles	Special	Private
LOS ANGELES DEPARTMENT OF WATER & POWER	Los Angeles	Personal	Public
LOS ANGELES HILTON	Los Angeles	Personal	Private
LOS ROBLES REGIONAL MED. CTR.	Ventura	Special	Private
LOYOLA MARYMOUNT UNIV. H/P	Los Angeles	Personal	Private
LYON HELIPORT	Orange	Personal	Private
MAD RIVER HOSPITAL	Humboldt	Special	Private
MAGUIRE-CALIFORNIA HOSPITAL HELIPORT	Los Angeles	Special	Private
MANCLARK AIRWAY	Orange	Special	Private
MARIAN MEDICAL CENTER, CHW	Santa Barbara	Special	Private
MARK TWAIN MEDICAL CENTER	Calaveras	Special	Private
MARTIN LUTHER KING JR AMBULATORY CARE CENTER (1)	Los Angeles	Special	Public
MARTIN LUTHER KING JR AMBULATORY CARE CENTER (2)	Los Angeles	Special	Public

Name	County	Use	Ownership
McCLELLAN PUBLIC SAFETY AGENCY		Special	Private
McCONNELL FOUNDATION HELIPORT	Shasta	Special	Private
MEMORIAL HOSPITAL LOS BANOS	Merced	Special	Private
MEMORIAL MED CTR - MODESTO	Stanislaus	Special	Private
MENDOCINO COAST DIST. HOSP.	Mendocino	Special	Private
MERCY HOSPITAL OF FOLSOM HELIPORT	Sacramento	Special	Private
MERCY MED. CENTER REDDING	Shasta	Special	Private
MERCY MED. CTR. MERCED	Merced	Special	Private
MERCY MED. CTR. OF MT. SHASTA	Siskiyou	Special	Private
MERCY SAN JUAN HOSP HELIPORT	Sacramento	Special	Private
MERLE NORMAN - BUILDING 3	Los Angeles	Personal	Private
MERLE NORMAN - SYLMAR	Los Angeles	Personal	Private
MESQUITE	Imperial	Personal	Private
MET		Other	Public
METHODIST HOSPITAL OF SOUTHERN CALIFORNIA	Los Angeles	Special	Private
METROPOLITAN WATER DISTRICT	Los Angeles	Special	Private
MGA - CHATSWORTH HELIPORT	Los Angeles	Personal	Private
MICHAEL H. CLEMENT CORPORATION	Contra Costa	Personal	Private
MILLS PENINSULA MEDICAL CENTER HELIPORT	San Mateo	Special	Private
MISSION HOSPITAL	Orange	Special	Private
MONAGHAN COMPANY LONG POINT	Los Angeles	Personal	Private
MONO MEDICAL CENTER	Mono	Special	Public
MOUNTAINS COMMUNITY HOSPITAL	San Bernardino	Special	Private
N. R. SCIENCE CENTER	Ventura	Special	Private
NATIONAL ORANGE SHOW	San Bernardino	Personal	Private
NATIVIDAD MEDICAL CENTER	Monterey	Special	Private
NAVAL HOSPITAL	Alameda	Military	Navy
NBC TELEVISION	Los Angeles	Personal	Private
NEWPORT BEACH POLICE	Orange	Special	Public
NORTH NET FIRE TRAINING CENTER	Orange	Special	Public
NORTHBAY MEDICAL CENTER	Solano	Special	Private
NORTHRIDGE HOSPITAL MEDICAL CENTER	Los Angeles	Special	Private
NORTHROP CORPORATION	Los Angeles	Personal	Private
NORTHRUP PALOS VERDES	Los Angeles	Personal	Private
OAK VALLEY HOSPITAL HELIPORT	Stanislaus	Special	Private
OAKLEY HELIPORT	Orange	Special	Private
OCA HELIPORT	Los Angeles	Personal	Private
OCEANSIDE FIRE DEPT HP	San Diego	Special	Public
OJAI HONOR FARM	Ventura	Special	Public
OLIVE VIEW MEDICAL CENTER	Los Angeles	Special	Public
OMNINET WEST VALLEY LP HELIPORT	Los Angeles	Special	Private
OPERATING ENGINEERS	Los Angeles	Personal	Private
ORANGE COUNTY GLOBAL MED CTR	Orange	Special	Private
ORANGE COUNTY SHERIFF'S DEPT.	Orange	Special	Public
OROVILLE HOSPITAL	Butte	Special	Private
PACIFIC CORP TOWERS, TOWER "A"	Los Angeles	Personal	Private
PACIFIC ELECTRIC BUILDING	Los Angeles	Personal	Private
PACOIMA DAM HELIPORT	Los Angeles	Special	Private
PALM DESERT SHERIFF'S STATION	Riverside	Special	Public
PALM DRIVE HOSPITAL	Sonoma	Special	Private
PALMDALE MEDICAL CENTER HP	Los Angeles	Special	Private
PALOMAR HEALTH DOWNTOWN CAMPUS	San Diego	Special	Private
PALOMAR MEDICAL CENTER	San Diego	Special	Private
PARDEE CONSTRUCTION-CAMARILLO	Ventura	Special	Private
PARK PLACE I	Orange	Special	Private
PASADENA POLICE FACILITY HELIPORT	Los Angeles	Special	Public
PASADENA POLICE HELIPORT (EXEMPT)	Los Angeles	Special	Public
PAT COYLE MEMORIAL HP	San Diego	Special	Public
PENINSULA HOSPITAL (closed)	San Mateo	Special	Public
PETALUMA VALLEY HOSPITAL	Sonoma	Special	Private
PG&E AUBERRY HYDRO	Fresno	Special	Private
PG&E AUBURN SERVICE CENTER	Placer	Personal	Private
PG&E BALCH CAMP	Fresno	Exempt	Private
PG&E BURNEY SERVICE CENTER	Shasta	Personal	Private
PG&E DEER CREEK	Nevada	Special	Private
PG&E EL DORADO SERVICE CENTER	El Dorado	Special	Private
PG&E FRESNO SERVICE CENTER	Fresno	Special	Private
PG&E GRASS VALLEY SERVICE CTR	Nevada	Personal	Private
PG&E LAKE FORDYCE	Nevada	Special	Private
PG&E LAKE SPAULDING DAM	Nevada	Personal	Private
PG&E LIVERMORE TRAINING CENTER	Alameda	Special	Private
PG&E LODI SERVICE CENTER	San Joaquin	Special	Private
PG&E MOTHER LODE SERVICE CTR	Calaveras	Special	Private
PG&E NARROWS POWER HOUSE	Nevada	Personal	Private
PG&E ROCK PILE	Nevada	Personal	Private
PG&E ROGERS FLAT	Plumas	Personal	Private

Name	County	Use	Ownership
PG&E SPAULDING	Nevada	Special	Private
PG&E STOCKTON DIVISION	San Joaquin	Personal	Private
PIO PICO CAMPGROUND	San Diego	Personal	Private
PIONEERS MEMORIAL HOSPITAL	Imperial	Special	Public
PLAYA VISTA #1	Los Angeles	Special	Private
PLAYA VISTA #2	Los Angeles	Special	Private
PLAYA VISTA #3	Los Angeles	Special	Private
PLUMAS DISTRICT HOSPITAL	Plumas	Special	Private
POMERADO HOSPITAL	San Diego	Special	Private
POMONA POLICE DEPARTMENT	Los Angeles	Special	Public
POMONA VALLEY HOSTPITAL MECICAL CENTER HELIPORT		Special	Private
PORT OF LONG BEACH SECURITY COMMAND CENTER HP	Los Angeles	Special	Private
PORTS OCALL	Los Angeles	Personal	Private
PRADO HELIBASE #1 HELIPORT		Special	Private
PRADO HELIBASE 2 HELIPORT		Special	Public
PRESBYTERIAN INTERCOMM. HOSP.	Los Angeles	Special	Private
PROFICIENCY CAPITAL CORP.	Los Angeles	Personal	Private
PROVIDENCE HOLY CROSS MED CTR	Los Angeles	Special	Private
PROVIDENCE SAINT JOSEPH M.C.	Los Angeles	Special	Private
QUALCOMM BUILDING N HELIPORT	San Diego	Special	Private
QUEEN MARY HELIPORT 1	Los Angeles	Special	Private
QUEEN MARY HELIPORT 2	Los Angeles	Special	Private
QUEEN OF THE VALLEY HOSPITAL	Napa	Special	Private
QUINCY HELITACK BASE	Plumas	Special	Public
QUINN GROUP INC HELIPORT	Los Angeles	Personal	Private
R. I. SEAL BEACH B/80 - GL CLOSED	Orange	Personal	Private
RADY CHILDREN'S HOSPITAL-SAN DIEGO	San Diego	Special	Private
RANCH HELIPORT	Ventura	Special	Private
RANCHO CUCAMONGA PUBLIC SAFETY BUILDING HELISTOP	San Bernardino	Special	Public
RANCHO FIRE STATION 174	San Bernardino	Special	Public
RAYTHEON EL SEGUNDO SOUTH CAMPUS HELIPORT	Los Angeles	Personal	Private
RAYTHEON R01 NORTH CAMPUS HELIPORT	Los Angeles	Personal	Private
RED DOG PROPERTIES, LLC	San Bernardino	Special	Private
REGIONAL MEDICAL CENTER SAN JOSE	Santa Clara	Special	Private
RIDGECREST REGIONAL HOSPITAL	Kern	Special	Private
RIVER MEADOW FARM	Napa	Special	Private
RIVERSIDE COMMUNITY HOSPITAL HELIPORT	Riverside	Special	Private
RIVERSIDE COUNTY REGIONAL MEDICAL CENTER	Riverside	Special	Public
RIVERSIDE COUNTY SHERIFFS HELIPORT-THERMAL	Riverside	Special	Public
ROGERS HELICOPTERS INC.	Fresno	Exempt	Private
ROGERSON	Orange	Personal	Private
ROSSI FARMS	Kern	Personal	Private
ROTORCRAFT SUPPORT, RSI	Ventura	Special	Private
RYE CANYON	Los Angeles	Personal	Private
S. M. P. HELIPORT	Ventura	Special	Private
SADDLEBACK MEMORIAL MED. CTR.	Orange	Special	Private
SAINT AGNES HOSPITAL (Rooftop)	Fresno	Special	Private
SAINT HELENA HOSPITAL	Napa	Special	Private
SAINT HELENA HOSPITAL CLEAR LAKE HELIPORT	Lake	Special	Private
SAINT JOSEPH HOSPITAL	Humboldt	Special	Private
SAINT LOUISE REGIONAL HOSP	Santa Clara	Special	Private
SAINT ROSE HOSPITAL (closed)	Alameda	Special	Private
SAN ANTONIO COMMUNITY HOSPITAL	San Bernardino	Special	Private
SAN BERNARDINO COMM HOSP	San Bernardino	Special	Private
SAN GORGONIO MEMORIAL HOSPITAL	Riverside	Special	Private
SAN JOAQUIN GENERAL HOSPITAL	San Joaquin	Special	Private
SAN PEDRO HOSPITAL HELIPORT	Los Angeles	Special	Private
SAN RAFAEL PRIVATE	Marin	Special	Private
SANTA BARBARA COTTAGE HOSPITAL	Santa Barbara	Special	Private
SANTA CLARA TOWERS HELIPORT	Santa Clara	Personal	Private
SANTA CLARA VALLEY MED. CTR-RT	Santa Clara	Special	Public
SANTA ROSA MEMORIAL HOSPITAL	Sonoma	Special	Private
SAPPERSTIEN CRITICAL CARE TOWER HELIPORT	Los Angeles	Special	Private
SCE ANTELOPE VALLEY SERVICE CENTER	Los Angeles	Special	Private
SCE BARSTOW SERVICE CENTER	San Bernardino	Special	Private
SCE BIG CREEK	Fresno	Exempt	Private
SCE BLYTHE SERVICE CENTER	Riverside	Personal	Private
SCE DEVERS SUBSTATION	Riverside	Special	Private
SCE EASTERN DIVISION	San Bernardino	Special	Private
SCE ENERGY CONTROL CENTER	Los Angeles	Special	Private
SCE HIGH DESERT DISTRICT	San Bernardino	Special	Public
SCE HUNTINGTON BEACH SVC. CTR.	Orange	Special	Private
SCE LUGO SUBSTATION	San Bernardino	Special	Private
SCE MOORPARK SUBSTATION	Ventura	Special	Private
SCE NORTHERN DIVISION	Ventura	Special	Private
SCE ORD MOUNTAIN	San Bernardino	Personal	Private

Name	County	Use	Ownership
SCE PALM SPRINGS DISTRICT	Riverside	Special	Private
SCE PARDEE SUBSTATION	Los Angeles	Special	Private
SCE RIDGECREST SERVICE CENTER	Kern	Special	Private
SCE ROBERT D. CLOUD	Los Angeles	Personal	Private
SCE ROSEMEAD	Los Angeles	Special	Private
SCE SADDLEBACK SERVICE CENTER	Orange	Special	Private
SCE SAN JACINTO VALLEY SER CTR	Riverside	Special	Private
SCE SAN JOAQUIN DISTRICT	Tulare	Special	Private
SCE SAN ONOFRE	San Diego	Personal	Private
SCE SERRANO SUBSTATION	Orange	Special	Private
SCE SHAVER SUMMIT	Fresno	Special	Private
SCE SOLAR I	San Bernardino	Special	Private
SCE SOUTHEASTERN DIVISION	Orange	Special	Private
SCE TIFFANY PINES	Fresno	Special	Private
SCE VINCENT SUBSTATION	Los Angeles	Special	Private
SCE YUCCA VALLEY	San Bernardino	Special	Private
SCRIPPS MEMORIAL HOSPITAL #1	San Diego	Special	Private
SCRIPPS MEMORIAL HOSPITAL ENCINITAS HELIPORT	San Diego	Special	Private
SCRIPPS MEMORIAL HOSPITAL LA JOLLA	San Diego	Special	Private
SCRIPPS MERCY HOSPITAL	San Diego	Special	Private
SEQUOIA	Tulare	Personal	Private
SETON MEDICAL CENTER (closed)	San Mateo	Special	Private
SFI-VERNON HELIPORT	Los Angeles	Special	Private
SHARP CHULA VISTA MEDICAL CTR.	San Diego	Special	Private
SHARP MEMORIAL HOSPITAL	San Diego	Special	Private
SHASTA REGIONAL MEDICAL CENTER NORTH PAD	Shasta	Special	Private
SHASTA REGIONAL MEDICAL CENTER SOUTH PAD	Shasta	Special	Private
SHERMAN OAKS HOSP & HEALTH CTR	Los Angeles	Special	Private
SHINGLETOWN MEDICAL CENTER	Shasta	Special	Private
SIERRA ARMY DEPOT HELIPORT	Lassen	Military	Airforce
SIERRA NEVADA MEM. HOSPITAL RT	Nevada	Special	Private
SIERRA VISTA REGIONAL MEDICAL CENTER	San Luis Obispo	Special	Private
SIMI VALLEY HOSPITAL	Ventura	Special	Private
SNOW RANCH HELIPARK	Calaveras	Exempt	Private
SPEARS MANUFACTURING HELIPORT	Los Angeles	Special	Private
ST ELIZABETH COMMUNITY HOSPITAL	Tehama	Special	Public
ST FRANCIS MEDICAL CENTER	Los Angeles	Special	Private
ST GEORGE REEF LIGHTHOUSE	Del Norte	Special	Private
St Helena (delete)		Special	Public
ST JOHN'S REGIONAL MED CENTER	Ventura	Special	Private
ST JOSEPHS MEDICAL CENTER	San Joaquin	Special	Private
ST MARY MEDICAL CENTER	Los Angeles	Special	Private
ST MARY MEDICAL CENTER HELIPORT	San Bernardino	Special	Private
ST VINCENT MEDICAL CENTER	Los Angeles	Special	Private
STANFORD HEALTH CARE - EAST	Santa Clara	Special	Private
STANFORD HEALTH CARE - VALLEYCARE HELIPORT	Alameda	Special	Private
STAR HELICOPTERS HELIPORT	Los Angeles	Special	Private
SUPERIOR AIR GARDEN GROVE	Orange	Personal	Private
SUTTER AMADOR HOSPITAL	Amador	Special	Private
SUTTER LAKESIDE HOSPITAL	Lake	Special	Private
SUTTER MED. CTR. CASTRO VALLEY	Alameda	Special	Private
SUTTER MED. CTR. OF SANTA ROSA (Son-002H)	Sonoma	Special	Public
SUTTER MEDICAL CENTER OF SACRAMENTO	Sacramento	Special	Private
SUTTER MEDICAL CENTER of SANTA ROSA	Sonoma	Special	Private
SUTTER ROSEVILLE MEDICAL CTR RT	Placer	Special	Private
SUTTER SOLANO MEDICAL CENTER	Solano	Special	Private
SYVERTSON RESIDENTIAL	San Diego	Special	Private
TAHOE FOREST HOSPITAL	Nevada	Special	Private
TELEDYNE RYAN ELECTRONICS	San Diego	Personal	Private
TEMECULA VALLEY HOSP HELIPORT	Los Angeles	Special	Private
THE ALHAMBRA OFFICE COMUNITY, LLC	Los Angeles	Personal	Private
THE ATRIUM	Orange	Personal	Private
THE MET Heliport	Orange	Special	Private
THE PARTS DEPOT	Fresno	Personal	Private
TORREY PINES CORPORATE	San Diego	Personal	Private
TOYOTA	Los Angeles	Special	Private
TRI-CITY MEDICAL CENTER	San Diego	Special	Private
TRW MANHATTAN BEACH	Los Angeles	Personal	Private
TWIN CITIES COMMUNITY HOSPITAL	San Luis Obispo	Special	Private
U. C. RICHMOND	Contra Costa	Personal	Public
U.C. DAVIS MED CTR HELIPORT #3	Sacramento	Special	Public
UC DAVIS MED CTR TOWERII	Sacramento	Special	Public
UCI MEDICAL CENTER	Orange	Special	Private
UCLA HEALTH SCIENCES CENTER	Los Angeles	Special	Public
UCLA MEDICAL CENTER WESTWOOD EAST	Los Angeles	Special	Private
UCLA MEDICAL CENTER WESTWOOD WEST	Los Angeles	Special	Private

Name	County	Use	Ownership
UCLA WILSHIRE/GLENDON HP	Los Angeles	Personal	Private
UCSD HEALTH SYSTEM E CAMPUS INTERIM	San Diego	Special	Private
UCSD JACOBS MED CTR HELIPORT	San Diego	Special	Private
UCSD MEDICAL CENTER	San Diego	Special	Public
UCSF MEDICAL CENTER MISSION BAY	San Francisco	Special	Private
UNIVERSITY MEDICAL CENTER (Revoked 2/28/11)	Fresno	Special	Public
UPS SAN BRUNO	San Mateo	Personal	Private
UPS SUNNYVALE	Santa Clara	Personal	Private
USC UNIVERSITY HOSPITAL HELIPORT	Los Angeles	Special	Private
USFS AMBROSE FIRE STATION	Modoc	Special	Public
USFS ASH CREEK	Siskiyou	Exempt	Public
USFS BALD MOUNTAIN	Tuolumne	Special	Private
USFS BOGARD FIRE STATION	Lassen	Special	Public
USFS COFFEE CREEK	Trinity	Special	Public
USFS HAPPY CAMP STATION	Modoc	Special	Public
USFS TRINITY MOUNTAIN	Trinity	Special	Public
USFS WM. ARCHIBALD	Los Angeles	Personal	Public
VACA VALLEY HOSPITAL	Solano	Special	Private
VALLEY CHILDRENS HOSPITAL HELIPORT H-1	Madera	Special	Private
VALLEY CHILDRENS HOSPITAL HELIPORT H-2	Madera	Special	Private
VALLEY CHILDRENS HOSPITAL HELIPORT H-3	Madera	Special	Private
VENTURA CAMP	Ventura	Special	Public
VENTURA COUNTY MEDICAL CENTER	Ventura	Special	Public
VERDUGO HILLS HOSPITAL	Los Angeles	Special	Private
VICTOR VALLEY GLOBAL MED CTR	San Bernardino	Special	Private
WALLACE MACHINERY	Santa Barbara	Special	Private
WALLACE-CORCORAN	Kings	Personal	Private
WARNER CENTER PLAZA ONE	Los Angeles	Personal	Private
WASHINGTON HOSPITAL	Alameda	Special	Private
WASHINGTON HOSPITAL PARKING STRUCTURE HELIPORT	Alameda	Special	Private
WATERIDGE (VERIFY CLOSED)	San Diego	Personal	Private
WELLS FARGO BANK FREMONT OPS. CENTER HELIPORT	Alameda	Special	Private
WELLS FARGO CV	Los Angeles	Personal	Private
WELLS FARGO EL MONTE	Los Angeles	Personal	Private
WEST HILLS HOSPITAL HELIPORT	Los Angeles	Special	Private
WESTSIDE DISTRICT HEALTH CARE HOSPITAL HELIPORT (Susp.)	Kern	Special	Private
WESTWOOD GATEWAY #2	Los Angeles	Personal	Private
WESTWOOD GATEWAY I	Los Angeles	Personal	Private
WEYMOUTH FILTRATION PLANT	Los Angeles	Special	Public
WILLIAM E. POOLE HELIPORT	San Bernardino	Special	Private
WILLIAM SHIELLS COMPANY	Ventura	Special	Private
WORLD TRADE CENTER HELIPORT	Los Angeles	Personal	Private
WORLDPORT LA	Los Angeles	Personal	Public

Source: Caltrans Division of Aeronautics

Chapter 4:

Forecasts, Trends, and Needs

CASP 2020 has been cast as a vision for aviation in the State through its contributions to the State's multi-modal goals within CTP 2050. However, one event that could not be foreseen at the time CASP 2020 was initiated, was the coronavirus (COVID-19) pandemic. From the event's far-reaching economic impacts worldwide, aviation the United States was severely impacted.

In California, status reports furnished to the Aeronautics Division typically included the following information:

- 27 of 31 CA commercial service airports participated in Division reporting;
  - 48% (13) had substantial impacts
- Air Cargo showed 18 airports reporting levels at or above 80 %
  - 12 reported 100%

(Source: Aeronautics Division, partial report from 7/27/2020 to Department Operations Center)

While this chapter summarizes current and observed trends in commercial and general aviation nationwide, and the emerging technologies that could affect aviation in California, no new aviation forecast for CASP 2020 was planned. CASP 2020 does consider passenger enplanements, operational forecasts and capacity needs through existing data from the FAA forecasts because the information has a valid place within the parameters of CASP 2020 to serve the State efficiently, economically and safely with environmental responsibility.

But, consistent with CASP 2020 departing from traditional SASP elements that are "airport-centric," COVID-19 has revealed the need to envision new forecasts for aviation, principally from the questions and issues below that current methodology may not readily answer:

- As of mid-2020, no consensus to forecast what recovery will look like for U.S./global aviation
- Changes in aircraft fleet are expected to accelerate; FAA has received indications that of 3,000 parked aircraft, about 1,000 of them will not be returning to service

- FAA continues to closely watch the 50-seat Regional Jet to see if it will remain in fleet; demand and destinations are expected to change if the aircraft configuration is phased out
- FAA is not assuming the United States will return to prior activity levels just because we were there before; FAA expects lasting changes, especially on the individual airport level
- For airport forecasts currently in front of FAA (as of mid-2020), FAA is struggling with their utilization; all past forecasts are being considered out of date and current or soon-to-start forecast must be heavily qualified in relation to COVID-19
- Traditional forecast methodologies may not apply; forecasts may now be looking at various timeframes for recovery versus the usual standard of low, medium, and high activity levels[25]

According to FAA, the uncertainty associated with forward-looking approaches during a pandemic can lead to miscalculated reports, whether high or low. As mitigation, FAA evaluates all projects seeking federal funds on their own merit at the time of consultation or request.

Overall, then, the forecast and trend information that follows is useful for considering the factors necessary for aviation in California to serve the State's intermodal environment. The information also provides the backdrop of aviation's many facets of nationwide interest that can be addressed by states or locally. Finally, relevant discussion of new forecast potential is included to consider aviation's capabilities for addressing mobility, access, land use and sustainability.

4.1 GENERAL TRENDS (PRIOR TO COVID-19)

The FAA Aerospace Forecast (Forecast) summarizes historical and projected trends in the aviation industry for the 20-year period from 2019 to 2039 (FAA 2020b). Changes in the aviation industry are reflective of changes in socioeconomic conditions and available technology. The recession of 2007-2009 changed the aviation industry as airlines adapted their business models to address economic conditions at the time through industry-wide changes, such as airline mergers and consolidation, and changes to consumer pricing, such as a la cart baggage services and the introduction of additional economy passenger classifications.

[25] Findings reported by FAA for the Transportation Research Board "Mid-year Meeting" of 2020.

4.1.1 Commercial Service

The U.S. airline industry has grown in the past decade, with 2018 marking the tenth consecutive year of profitability. This indicates a shift from the typical boom-and-bust cycles that characterized the U.S. commercial air carrier industry to a more sustainable industry. The FAA projects that medium- and long-term aviation demand for the next 20 years will be driven by the domestic and global economy (FAA 2020b).

4.1.2 Aviation Trends

The FAA foresees the air carrier trends that were initiated in recent years continuing for the next several years, including:

- Selective capacity expansion
- Steady growth in the number of seats per aircraft
- Increased competitive pressure to ultra-low-cost carrier expansion; and
- Increased price discrimination (i.e., selling similar products to different customers at different prices.)

Overall enplanements have increased for both mainline air carriers (e.g. Delta Air Lines, United Airlines) and low-cost carriers (e.g. Southwest Airlines, Allegiant Air). The Forecast notes that "[mainline] carriers reported combined operating profits of $12.5 billion while the low-cost carriers report combined operating profits of $4.5 billion as all carriers posted profits." The growth of low-cost carriers creates competition in the airline industry, keeping fare increases low even while energy and labor costs rise. However, this expansion of low-cost carriers comes at the expense of regional carriers, which have been experiencing pilot shortages, rising labor costs, and unfavorable contracts with mainline carriers. Efforts to address the issues include replacing 50-seat regional jets with more fuel-efficient 70-seat jets. The Forecast estimates that most 50-seat jets will be phased out by 2030, which will enable airlines to accommodate more passengers without having to increase the number or frequency of flights.

General Aviation

General Aviation (GA) encompasses flight activities that do not include scheduled passenger or cargo operations or military flights. GA activities include, but are not limited to, flight training, recreational flying, private and corporate air transport, and emergency response operations.

The Forecast notes that general aviation has declined slightly in recent years but appears to be holding steady. In terms of fleet size, the number of aircraft nationwide declined from 2007 through 2016.

However, the total number of new aircraft deliveries increased in 2018. During the 20-year period from 2019 to 2039, the total GA fleet is projected to decrease by less than one percent; although the number of fixed-wing piston aircraft will decrease, the number of fixed-wing turbine aircraft, rotorcraft, and light sport aircraft will increase.

The more expensive and sophisticated fixed-wing turbine fleet is expected to grow an average rate of 1.8 percent annually over the forecast period. The growth in fleet size is matched by an increased number of hours flown, which reflects the growth in demand of the business jet fleet. The number of rotorcraft (helicopters) in the U.S. is expected to increase as well, with a projected 1.7 percent growth per year during the forecast period.

Light-sport aircraft make up the smallest and newest category among the fixed-wing, general aviation aircraft fleet. This type of aircraft is forecast to grow an average 3.5 percent annually, doubling the current fleet size by 2039. The advantages of light-sport aircraft come from lower cost to own and operate by way of lesser capabilities, based on lower horsepower and one or two seats, compared to other fixed-wing (piston) aircraft of greater power and two or more seats.

Change in Pilot Populations

The Forecast also monitors national aviation activity based on the number of active pilots, as determined by pilot certificates on record with the FAA's Certification Branch. FAA has eight levels of pilot certificates (sometimes referred to as licenses): student, recreational, sport pilot (for light sport aircraft), private, commercial, airline transport pilot (ATP), flight instructor and ground instructor. Each certificate (except student pilot) can have assorted ratings added by way of additional training and approvals; for example: rotorcraft, gliders, instruments, single or multi-engine aircraft, among others specified in the Title 14, CFR Part 61.5 (14 CFR Part 61.5).

The FAA Aerospace Forecast examines five pilot certificate levels in the U.S. for estimating the pilot population through 2039, as presented below in **Table 4-1**.

The total number of pilots is projected to increase from a total of 469,455, pilots in 2019 to a total of 478,015 in 2039, with a modest growth rate of 0.3 percent 2019 through 2039. Student pilots are not counted due to time limits for valid student certificates.

Table 4-1: Forecast of Active Pilots in the U.S. by Certificate

Year	Recreational	Sport	Private	Commercial	ATP	Rotorcraft	Glider	Total
2018	144	6,246	163,695	99,880	162, 145	15,033	18,370	465,513
2019	140	6,515	164,550	101,650	163,300	14,750	18,550	469,455
2024	120	7,925	162,800	102,300	168,400	14,650	18,300	474,495
2029	95	9,360	156,350	101,150	174,200	15,850	17,840	474,845
2034	80	10,680	149,100	99,650	180,800	17,550	17,420	475,280
2039	60	11,705	143,400	98,250	187,900	19,450	17,250	478,015
Projected Annual Growth								
2019–29	-3.8%	3.7%	-0.5%	0.0%	0.6%	0.7%	-0.4%	0.1%
2019–39	-4.1%	3.0%	-0.7%	-0.2%	0.7%	1.4%	-0.4%	0.1%
Note: An active pilot is a person with a pilot certificate and a valid medical certificate.								

Of the overall increase of 8,500 pilots, sport pilots are anticipated to see the most rapid growth, with an average annual growth rate of 3.0 percent from 2019 through 2039. The number of air transport pilots is projected to increase by 0.7 percent from 2019 to 2039, but the number of commercial pilots is anticipated to decrease by 0.2 percent during the same period. Recreational and private pilots are forecast to decrease by 4.1 percent to a total of 21,230 pilots by 2039. This decrease, which coincides with the decrease in piston-powered fixed wing aircraft, is due in part to demographic changes and the aging of the pilot population. The decreased number of GA and recreational pilots could potentially affect California's GA airports:

- The decrease in privately owned aircraft can lead to reduced revenues from hangar and tie-down areas at many GA airports.
- Small on-airport businesses that cater to GA pilots, such as aircraft maintenance and repair, flight training schools, parts manufacturers, and air cargo companies could suffer from reduced revenue if there are fewer pilots buying their products and services.

A Shortage of Aircraft Mechanics

Economists estimate that a deficit of maintenance personnel will emerge sooner in Asia, but recent forecasts indicate that there could be a shortage of more than 40,000 certified aviation mechanics in the U.S. between 2018 and 2036 (AMD, 2018).
Boeing predicts the need for 648,000 new commercial airline technicians by 2036, approximately 40 percent of which will be in the Asia Pacific Region (AMD 2018).

The anticipated shortage in aircraft maintenance is likely a consequence of an aging global population. Other causes result from the cost of training compared to corresponding wages and benefits. Moreover, anticipated fleet changes will require new skill sets in three emerging technologies: composite material repair and manufacture, data collection and reporting for use in advanced analytics, and knowledge of new avionics and electrical systems (Prentice and Costanza, 2017).

Air Cargo and E-commerce

E-commerce growth and demand for same-day and next-day delivery service is resulting in modest increases in air cargo at urban airports, such as San Francisco, San Jose, and Orange County. Amazon has opened nine "Prime Now" hubs near urban centers, airports, and seaports, enabling it to respond within hours to customer orders. The nine hubs are clustered around Los Angeles, San Francisco, San Diego, Sacramento, and San Jose, and this trend is likely to continue. One factor contributing to the rise of e-commerce sales compared to traditional retail sales is the availability of same-day and next-day delivery. Caltrans' latest California Air Cargo Groundside Needs data (updated from the 2013 study) indicates the cargo tonnage at airports is expected to grow at most airports by 2040, presented in section 3.4, **Table 4-4.**

4.2 EMERGING TECHNOLOGIES AND ISSUES

Increased globalization has given rise to concerns about the spread of disease that can grow from epidemics to pandemics. During the past 15 years, outbreaks of swine and bird flus, Severe Acute Respiratory Syndrome (SARS), Ebola, and the 2019-20 outbreak of the Coronavirus, have each affected aviation. For example, British Airways Asia Pacific region traffic fell 27 percent during the height of the 2003 SARS scare in April and May, resulting in a $68.8 million loss for the quarter. In 2015, the Zika virus intensified, and warnings for travel to the tropical and subtropical regions of the Americas are still in place today.

To address the fear of pandemics and their travel-related effects, global aviation and healthcare organizations formed the Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA).
One major objective of CAPSCA is to assist states and territories in the establishment of national aviation pandemic preparedness plans that could also adjusted for airport needs. (Skybrary, 2017; CAPSCA, 2020)

Other emerging trends are showing beneficial results:

4.2.1 Alternative Fuels

Emissions from aircraft fuel burn have been in decline since 1990, according to the U.S. Environmental Protection Agency (EPA). Reported in 2019, **Chart 4-1** below, shows aviation's net decrease of greenhouse gas (GHG) emissions through 2018 was 7.2%. And declines are reported in each segment of aviation: Commercial, Military and General. Technology has improved engine fuel efficiency and development continues for future reduction in GHG emissions. (IATA 2020)

U.S. Transportation GHG Emissions
(Tg CO_2 Equivalent)

								Change from 1990 to 2018	
Source	1990	2005	2014	2015	2016	2017	2018	Absolute	Percent
On-Road Vehicles[6]	**1,206.8**	**1,645.4**	**1,520.4**	**1,517.2**	**1,540.5**	**1,545.9**	**1,569.4**	**362.6**	**30.0**
Light-Duty Vehicles	966.3	1,231.6	1,095.0	1,083.9	1,103.4	1,094.1	1,105.8	139.5	14.4
Passenger Cars	639.6	693.1	760.3	760.2	770.6	767.3	777.5	137.9	21.6
Light-Duty Trucks	326.7	538.5	334.7	323.7	332.8	326.8	328.3	1.6	0.5
Motorcycles	1.7	1.6	3.8	3.7	3.9	3.8	3.9	2.1	123.7
Buses	8.5	12.2	19.0	19.4	19.0	20.4	21.9	13.4	158.8
Medium- and Heavy-Duty Trucks	230.3	400.1	402.5	410.1	414.2	427.6	437.9	207.5	90.1
Aircraft	**189.2**	**193.6**	**151.3**	**160.5**	**169.0**	**174.8**	**175.5**	**-13.7**	**-7.2**
Commercial Aviation	110.9	134.0	116.3	120.1	121.5	129.2	130.8	19.9	17.9
Military Aircraft	35.3	19.5	14.1	13.6	12.4	12.3	11.9	-23.4	-66.2
General Aviation	42.9	40.1	20.9	26.8	35.1	33.3	32.8	-10.2	-23.7
Ships and Boats	**47.4**	**45.7**	**29.2**	**33.8**	**40.9**	**44.0**	**41.2**	**-6.3**	**-13.3**
Rail	**35.8**	**46.1**	**41.7**	**39.8**	**36.4**	**37.7**	**39.4**	**3.6**	**10.0**
Pipelines[7]	**36.0**	**32.4**	**39.4**	**38.5**	**39.2**	**41.3**	**49.2**	**13.2**	**36.6**
Lubricants	**11.8**	**10.2**	**10.0**	**11.0**	**10.4**	**9.6**	**9.3**	**-2.6**	**-21.7**
Transportation Total	**1,527.1**	**1,973.4**	**1,792.0**	**1,800.8**	**1,836.3**	**1,853.3**	**1,883.9**	**356.9**	**23.4**

Chart 4-1 US DOT GHG Emissions Review (1990-2018)
Source: "Fast Facts" / U.S. Transportation Sector GHG Emissions (EPA), 1990-2018.
https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100ZK4P.pdf

Additionally, EPA announced final rulemaking at the end of December 2020 for aircraft emissions standards.

The rule finalizes GHG emission standards that apply to certain new commercial airplanes, including all large passenger jets. The standards match the international airplane carbon dioxide (CO2) standards adopted by (ICAO) in 2017, keeping U.S. manufactured aircraft competitive in the global marketplace. (EPA 2020)

As 2020 ended, a research team at Oxford University in England reported on the possibility of turning carbon dioxide (CO2) into jet engine fuel from "the organic combustion method."

Laboratory tests with heat added to citric acid, hydrogen, and a catalyst made of iron, manganese, and potassium to the carbon dioxide, produced a liquid fuel that would work in a jet engine (Niiler 2020). Large scale testing is next.

When examining GHG emissions specifically for California, data from 2000 through 2018 in **Chart 4-1a** appear encouraging from the California Air Resources Board (CARB):

- California statewide GHG emissions dropped below the 2020 GHG Limit in 2016 and have remained below the 2020 GHG Limit since then
- Transportation emissions decreased in 2018 compared to the previous year, which is the first year over year decrease since 2013

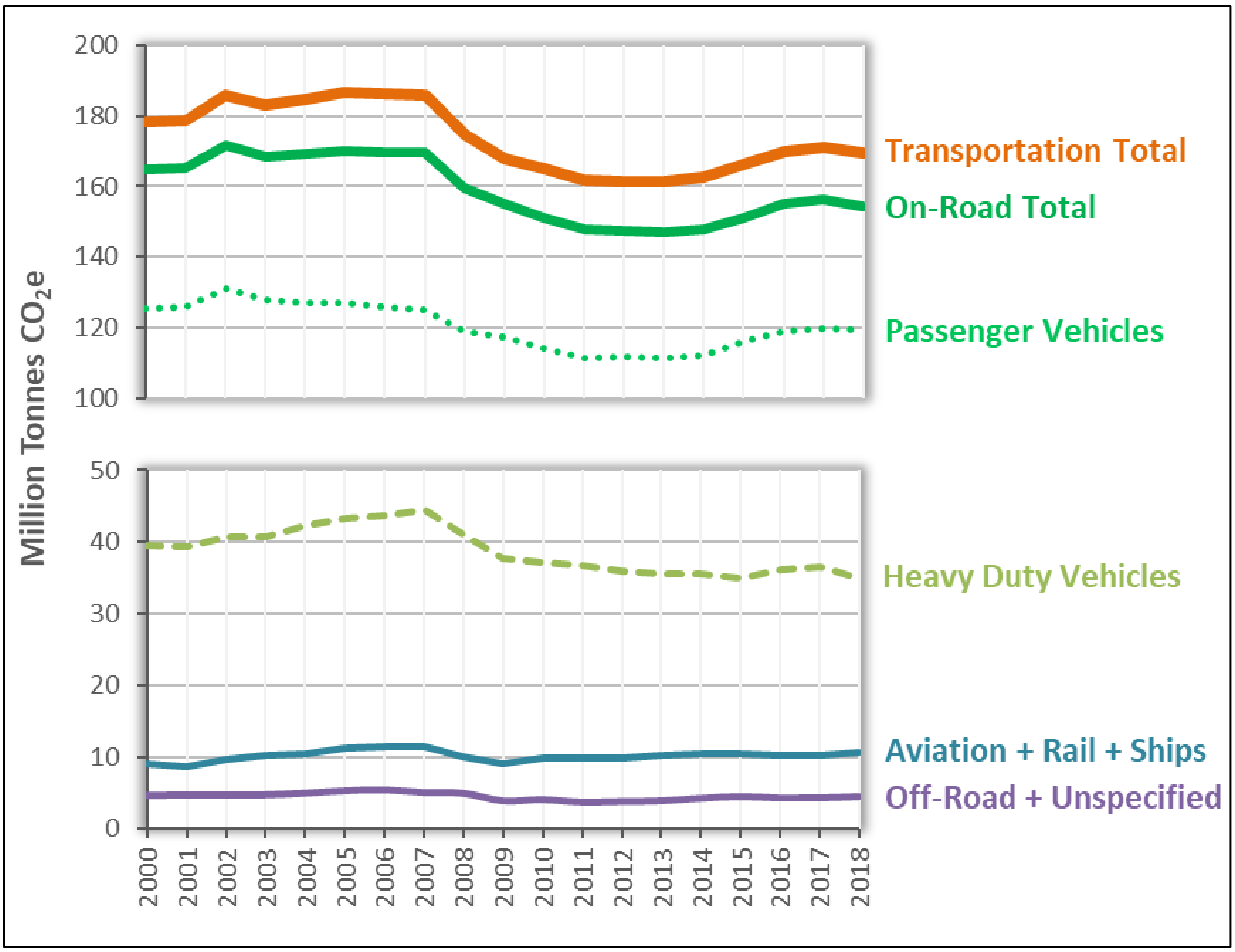


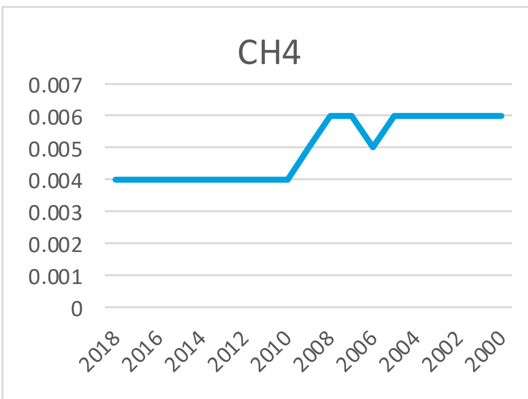
Chart 4-1a: CARB's Overview of GHG Emissions from the Transportation Sector (2000-2018)
https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

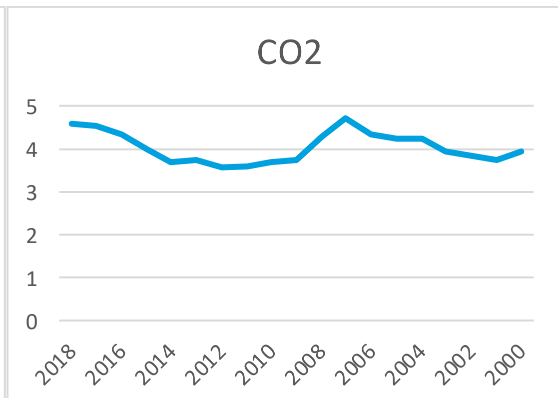
Consistent with nationwide data, Transportation remains the largest source of GHG emissions in California.

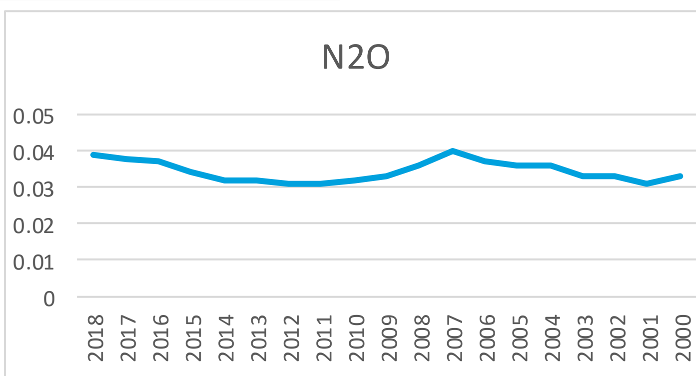
CARB reports that Aviation is 1.1% of the of the State's Transportation segment. Isolating aviation from other modes in the CARB data from Chart 4-1a, the information below shows the performance of the fuels used in piston-powered (aviation gasoline, or "avgas") and turbine/jet-powered aircraft (jet fuel) for the same period in Chart 4-1a. Total emission figures from both fuels for each greenhouse gas are graphed for the totals of avgas and jet fuel. (The three rows correspond to various segments of intra-state use of aircraft: e.g., general aviation or passenger operations.)

Fuel	GHG	2000	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Aviation gasoline	CH4	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.005	0.005	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Aviation gasoline	CO2	0.248	0.236	0.222	0.242	0.216	0.208	0.190	0.231	0.209	0.163	0.144	0.139	0.140	0.136	0.132	0.138	0.131	0.125	0.125
Aviation gasoline	N2O	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000
Jet fuel	CH4	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Jet fuel	CO2	3.663	3.508	3.635	3.702	3.997	4.031	4.129	4.479	4.068	3.683	3.538	3.457	3.426	3.615	3.566	3.854	4.182	4.423	4.470
Jet fuel	N2O	0.032	0.030	0.032	0.032	0.035	0.035	0.036	0.039	0.035	0.032	0.031	0.030	0.030	0.031	0.031	0.033	0.036	0.038	0.039
	Totals:	4.21	4.025	4.165	4.246	4.492	4.493	4.563	4.973	4.50	4.031	3.843	3.732	3/752	3.927	3.902	4.218	4.437	4.679	4.65

Source: https://www.arb.ca.gov/app/ghg/2000_2018/ghg_sector_data.php







Source: Division of Aeronautics

As illustrated above, there are concerns by way of CARB data that GHG emissions are increasing:[26]

[26] https://www.arb.ca.gov/app/ghg/2000_2018/ghg_sector_data.php

As noted in section 4.1.1, FAA foresees economic vitality as the key force in medium- and long-term aviation demand for the next 20 years (FAA 2020b), as reported before COVID-19. California's significant economy could be seen in the same way to drive aviation demand (also before COVID-19). In addition to GHG emissions trends, aircraft criteria air pollutant emissions in California have also increased and are projected by CARB to increase further through 2035 as illustrated below:

Average Annual Aircraft Emissions in California

	Year		
Pollutant (tons per day)	**2000**	**2020**	**2035**
Reactive Organic Gases	25.03	29.07	33.65
Oxides of Nitrogen	38.86	54.34	69.45
Oxides of Sulfur	3.65	4.94	6.15
Particulate Matter <2.5 microns	7.83	9.02	10.31

Source: California Air Resources Board,
https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php

With CARB's methodology for assessing GHG emissions by intra-state air travel, increased demand leading to increased operations is expected to impact both GHG and criteria pollutant emissions. In recognition of the significant challenges this issue poses, activities in the State and elsewhere discussed below provide critical opportunities to mitigate increases in GHG and criteria pollutant emissions.

Sustainable Alternative Jet Fuels (SAJF)

Like PAFI, the Commercial Aviation Alternative Fuels Initiative (www.caafi.org) is a collaboration among FAA, airlines and fuel producers to further develop jet fuel alternatives. FAA has its own research and development programs, and it remains in regulatory control of aviation fuels. To date, FAA has approved five "bio-feed" alternatives to the petroleum-based Jet-A. Airline and corporate operators are presently conducting operations with SAJFs. The examples that follow are especially noteworthy:

World Energy (based in Boston) has been converting its Paramount, California refinery to alternative fuel production. The company has reported it expects the project will enable World Energy to process 306 million (US) gallons annually. The conversion to renewable jet, diesel, gasoline, and propane fuels will reduce both refinery and fuel emissions while supporting more than 100 advanced, green economy jobs. (World Energy press release)

Notable not only for providing a California contribution to SAJF development, World Energy's alternative has been studied for the Bay Area Air Quality Management District (BAAQMD). Results appear to be promising. Using a metric from CARB called "Carbon Intensity" (as a measure of emissions), World Energy's "neat" (ready for use with no additive) alternative jet fuel from the Paramount refinery was found to have "reductions in carbon intensity ranging from 52 to 73%" when compared to conventional jet fuel. (BAAQMD 2020)
Early in 2019, Aviation Industry News (AIN) reported on an industry meeting at Van Nuys Airport (VNY): "For the first time, sustainable aviation fuel was available to the business aviation community on a trial basis, with World Fuel and Avfuel supplying the four Fixed Base Operators (FBOs) on the field with more than 14,000 gallons of blended SAF produced by World Energy and Gevo, respectively. The biofuel blend was in some cases pumped directly into the FBO's fuel farm to illustrate its absolute compatibility with the existing (conventional) jet fuel and the FBO's tanks and pumps, while others chose to keep it stored in a refueler and distributed on customer preference." (AIN, October 20, 2019)

Jet Blue Airways in 2019 issued a press release that announced plans "to start flying with sustainable aviation fuel in mid-2020 on flights from San Francisco International Airport."

Jet Blue positioned itself as "the first major U.S. airline to take this critical and measurable step toward reducing its contribution to global warming." (Jet Blue press release)

Phillips 66 is planning to fully convert its San Francisco area refinery from crude oil processing to renewable fuels, using feedstocks such as used cooking oil, fats, greases, and soybean oils. According to the company, cited in an AIN report, if approved by Contra Costa County officials and the Bay Area Air Quality Management District, the refinery could produce as much as 680 million gallons of renewable diesel, renewable gasoline, and SAF a year. The company says the plant's GHG emissions would be cut in half. (AIN, August 13, 2020)

California is well positioned to help advance these efforts that can help reduce GHG emissions worldwide. However, documenting results from operator use of SAJFs must still be determined. It is not within the scope of CASP 2020 to examine in SAJF in further detail. Subject matter sources cited for this report are among many available for readers to utilize for further study.

Meanwhile, aircraft fuel used by piston-powered GA aircraft, known as avgas (for aviation gas) or 100LL (low lead 100 octane), is the only transportation fuel in the U.S. that still contains lead. After leaded fuel was finally phased out from the U.S. in 1995, avgas is the single largest source of lead emissions in the country according to the U.S. Environmental Protection Agency (EPA), as reductions have been achieved from other sources. But, its continued use in GA regards safety.
Under conditions for aircraft engines that are not the same for automobile engines, lead protects against "engine knock" or detonation in piston aircraft to guard against engine failure. As FAA notes, "Aircraft operating on leaded aviation gasoline (avgas) are used for many critical purposes, including business and personal travel, instructional flying, aerial surveys, agriculture, firefighting, law enforcement, medical emergencies, and express freight." (FAA "Fact Sheet", Leaded Aviation Fuel and the Environment; November 20, 2019). Thus, the challenge is finding a successful alternative that is safe.

Since 2010, the FAA has worked with stakeholders, such as aircraft manufacturers, fuel producers, the EPA, and aviation industries, to develop a new, lead-free version of avgas and create the least impact on the current GA fleet. The effort has become known as The Piston Aviation Fuel Initiative (PAFI), and the program includes four elements:

- A fleet-wide Authorization Qualification Test Program
- New Alternative Fuel Proposals & Certification
- Establishing FAA safety standards for new alternative fuel
- Safe deployment and transition to a new fuel (FAA 2019a)

The PAFI Steering Committee is directing a collaborative government and industry process that includes members from FAA, the Aircraft Owner and Pilots Association (AOPA), the American Petroleum Institute, and others (FAA 2019a). The FAA envisioned a completion-of-testing target date of mid-2020, but 2019 test results indicated that additional refinements to a proposed fuel would be necessary. Approximately 170,000 aircraft in the piston-powered general aviation fleet still rely on avgas (Namowitz 2019.)

The potential for developing new "aviation-centric" forecasting follows FAA reporting in its 2012 "Aviation Greenhouse Gas Emissions Reduction Plan," prepared for ICAO: "Goals were set for using 2020 for a target date: The ambitious overarching goal of achieving carbon-neutral growth for U.S. commercial aviation by 2020, was set in 2012, using 2005 emissions as a baseline.[27] Given current forecasts for aviation growth this equates to about a 115 million metric tons (MT) reduction in carbon dioxide emissions from commercial aviation by 2020. By extending those approaches further there could be an additional 60MT reduction by 2026." The preceding information does not factor recovery from COVID-19.
In addition, FAA's Continuous Lower Energy, Emissions, and Noise (CLEEN) Program reported this year that Georgia Tech University reviewed the technologies of the CLEEN Program and found "they could reduce U.S. fleet-wide fuel burn by two percent from 2025 through 2050. That represents a cumulative savings of 22 billion gallons of jet fuel. The CO2 savings are the equivalent of taking 1.7 million cars off the road over the duration of this 25-year period." (CLEEN Fact Sheet, March 2020)

4.2.2 Next Generation Air Transportation System

NextGen is the FAA-led modernization effort to make flying safer, more efficient, and more predictable. Rather than a single technology, NextGen includes the implementation of several technologies to transform the NAS from a ground-based system of air traffic control to a satellite-based system of traffic management. Once

[27] Proposed by the U.S., Canada and Mexico at the ICAO Assembly in 2010. The 2005 baseline is calculated using the FAA Aviation Environmental Design Tool.

implemented, the system will allow a larger number of aircraft to safely fly closer together using more direct routes, resulting in reduced delays and unprecedented benefits to both the economy and the environment through reduced fuel and carbon consumption (FAA 2019b).

NextGen is composed of several components including:

- Automatic Dependent Surveillance – Broadcast (ADS-B)
- Collaborative Air Traffic Management Technologies (CATMT)
- Data Communications (DataComm)
- NAS Voice System (NVS)
- NextGen Weather
- System Wide Information Management (SWIM)
- En Route Automation Modernization (ERAM)
- Terminal Automation Modernization and Replacement (TAMR)

While components will help transform the air traffic control system from a radar-based system to a satellite-based system, two changes that have been implemented in recent years require specific discussion: Automatic Dependent Surveillance – Broadcast (ADS-B) and the Airports Data and Information Program (ADIP), which uses GIS.

Automatic Dependent Surveillance – Broadcast

One of the technologies supporting the NextGen system includes Automatic Dependent Surveillance – Broadcast (ADS-B).
ADS-B allows pilots of equipped aircraft and air traffic controllers on the ground to track aircraft traffic more accurately than radar. ADS-B relies on the Global Navigation Satellite System to determine an aircraft's precise location. The position data are combined with other information such as aircraft type, speed, altitude, and flight number. The information is converted into a digital message and broadcast using a radio transmitter. The advantage of ADS-B is that it can provide coverage in areas where radar is not available (e.g., low altitudes over the Gulf of Mexico), and it also provides crews with traffic avoidance guidance.

Airports Geographic Information Systems (AGIS)/Airport Data and Information Portal (ADIP)

The FAA implemented the Airports Geographic Information System (AGIS) Program in 2010 to establish standard formats for the collection and input of aviation data for individual airports. In support of NextGen implementation, the FAA initiated an effort to manage airport data nationwide using a Geospatial Information System (GIS). The purpose the AGIS effort is two- fold:

- to standardize the collection and presentation of airport data nationwide
- to have a single location for maintaining up-to-date information on airports in the NAS

Additional Applications for the Use of Geospatial Data

GIS technologies have been implemented by most local agencies and used effectively by multiple government departments. Many local governments employ enterprise-wide GIS systems and use them to make informed decisions or anticipate the effects of proposed projects. GIS or asset management systems are frequently used to capture information stored in planning, design, construction, engineering, and other information databases and leverage customized reports and applications to make better decisions.

The use of local GIS data and AGIS datasets can be used effectively to make informed decisions for airports and their communities, especially when it is used to perform land use compatibility analyses. As airports and their surrounding communities grow, the importance of compatible land use will continue to increase as the FAA, airport operators, and local jurisdictions promote safety for ongoing aircraft operations and for those living and working near airports and beneath regulated airspace. Some state agencies have developed specific GIS tools to promote informed decision making among local agencies, developers, and other stakeholders. For example, the South Carolina Aeronautics Commission (SCAC) developed an online GIS tool.
Known as the Airport Compatible Land Use Evaluation (CLUE) tool, which enables agencies and project sponsors to upload site-specific information. The web tool identifies the site of the proposals using GIS data to determine whether the project is in a designated Airport Safety Zone or Airport Land Use Zone. Based on the project location, the CLUE tool will provide information about the zone, potential land use restrictions, and SCAC permit review and coordination with local permitting officials.

The Division has initiated efforts to enable data sharing among heliports and their host communities. The Division provides a copy of all heliport "approach plates" (or, charts) for hospital airports, dubbed "heliplates." The data give users information about the locations, facilities, and approach paths of all hospital heliports in the State. In addition, the Division also uploads digitized airport boundary lines on the California State Geoportal. This data can be publicly downloaded in shapefile format.

Challenges / Opportunities

Most hub airports are operated by local agencies that are equipped with GIS tools and skilled staff to identify airport facilities and their geospatial locations; however, many GA airports may not include staff with GIS expertise or access to agency resources. As a result, some GA airports may not be able to generate AGIS data or gain access to the ADIP database easily or without incurring potentially significant cost. To offset this challenge, Caltrans and Division staff may have an opportunity to assist GA airports by providing funding or expertise to create ADIP accounts and prepare and enter AGIS data into the system.

As discussed in Land Use and Sustainability (Chapter 6), the Division has the means for promoting compatible land use near airports. These efforts could be further strengthened by providing a library that provides links to current ALP data, including data available from ADIP, heliport, and ALUC plans so that it could be accessible to local agencies, developers, and other stakeholders. The system would allow interested parties to review local land use maps and GIS data so that land use compatibility can be considered during project planning, design, and permitting processes.

Next Gen Implementation in California

As of 2019, the FAA reported that NextGen is about halfway through a multi-year investment and implementation plan. It is in use at California's international airports in Los Angeles, San Diego, and San Francisco.

4.2.3 Transportation Network Companies

Application-based, on-demand Transportation Network Companies (TNCs) have become a popular choice for passengers traveling among and throughout urban and suburban areas and for shippers who transport goods between fulfillment centers/retail establishments and consumers. As TNC use likely increases, there could be direct impacts on California airports. Fewer passengers parking in airport garages and parking lots lead to decreased revenues from airport parking and car rental services, which otherwise provide significant sources of revenue for commercial service airports. Although no recent studies quantifying the revenue impact of Uber, Lyft, and other ride-hailing firms are available, data reviewed from Southern California airports indicate that ride-hailing fees generated by TNCs have been sufficient to off-set decreased revenues when they occur in parking or from fewer taxi trips:

- Ride-hailing fees at LAX generated $44.3 million in fiscal year 2018, and $33.7 million in FY 2017, up sharply from the $8.9 million in 2015, when ride- haling services were prohibited from dropping off and picking up passengers in the same trip. Parking revenue were virtually unchanged from FY 2017 to 2018.
- Hollywood Burbank Airport (BUR) reported a 60 percent increase in ride-hailing service fees in FY 2018 and a small increase in parking revenue.
- Ontario International reported an 85 percent increase in ride-hailing services fees in 2018, no observable change in parking revenue, and a 13.4 percent increase in rental car fees.
- Long Beach airport reported increases in ride-hailing fees in FY 2018, parking revenues (up 10 percent from FY 2017), and slight increases in rental car fees.
- John Wayne/Orange County Airport (SNA) reported a decline in parking revenue of 7.4percent ($3 million), which was not offset by the $1.2 million earned from ride-hailing service fees, but that revenue gap is anticipated to close as ride-sharing fees increase in 2019 (Martin 2019).

Challenges / Opportunities

It is difficult to document a direct cause-effect between TNC use and reduced parking at this time, but TNC popularity has affected the operation and allocation of space at California's airports. Observed challenges include:

- Increased value and reallocation of curb space
- Increased congestion on terminal roadways and curbside areas (Smith 2018); and
- Reduced use of public transportation and multi-passenger shuttle services by air travelers

Airports may also realize opportunities from TNC if unused garage space and parking areas are reallocated for other revenue generating uses.

Large e-retailers, such as Amazon and Walmart, have used TNCs to expedite deliveries to customers. Beginning in 2018, Amazon hired 120,000 seasonal drivers to deliver packages from its fulfillment centers to customer doors. Such drivers serve as contractors and use personal vehicles to pick up packages from Amazon fulfillment centers and deliver them to consumers.

Wal-Mart and other large retailers have contracted with both Uber (UberRUSH) and Lyft to provide delivery capabilities that compete with Amazon. Services such as Postmates.com and DoorDash.com act in a similar capacity and deliver the items to customers within an hour.

TNC Effects on Freight or Cargo

The use of TNCs to deliver cargo to consumers can pose challenges to California's overall transportation system in several ways.

- Increased congestion in the airport vicinity and throughout urban areas
- The increased emphasis on fast delivery by retailers can have adverse environmental impacts. Orders for multiple items may be delivered in multiple trips when items are shipped from multiple locations or require multi-phased shipment (i.e., when different items are available at different times).

4.2.4 Unmanned Aircraft Systems

UAS consist of the unmanned aircraft platform and the associated elements necessary for the safe and efficient operation in the NAS, such as communication links, sensors, software, and a power supply. The use UAS has increased dramatically worldwide, with implications for the NAS.

Although remote-controlled aircraft have been used for decades, improvements in engine technology, battery life, and the reduced size of many components have resulted in substantially reduced costs and ease of operation. The use of UAS has grown steadily during the past five years as documented through UAS registration records. Under 14 CFR Part 107, the FAA requires UAS owners to register all UAS weighing more than 0.55 lbs. and less than 55 lbs. More than 900,000 UAS owners registered a UAS or "drone" from 2015 to 2019. Drones weighing 55 lbs. and more are treated as traditional aircraft and require registration under 14 CFR Part 47 (FAA 2020b).

UAS users include recreational users, such as modelers experimenting with small UAS (sUAS) and commercial operators. The FAA anticipates that the non-model UAS sector will include more than 835,000 aircraft by 2023. Non-model sUAS are being used increasingly to conduct research and development, support training and education, provide data for agricultural uses, and record news and entertainment events. UAS can also enhance safety for potentially dangerous/hazardous activities such as dam inspections, construction monitoring, search and rescue operations, etc. Some commercial operators have undertaken UAS use for package delivery and medical supply transport. Large and small delivery companies have been testing drone use for delivery of packages weighing less than 5 lbs.

State and local agencies have embraced the use of UAS to monitor engineering sites, waterways, pipelines, high crime areas, crowded settings, traffic, security situations, pollution levels, forest fire movement and crop surveillance, among many other applications. Caltrans has integrated UAS into its infrastructure inspection and maintenance programs, seen below in **Figure 4-1:**

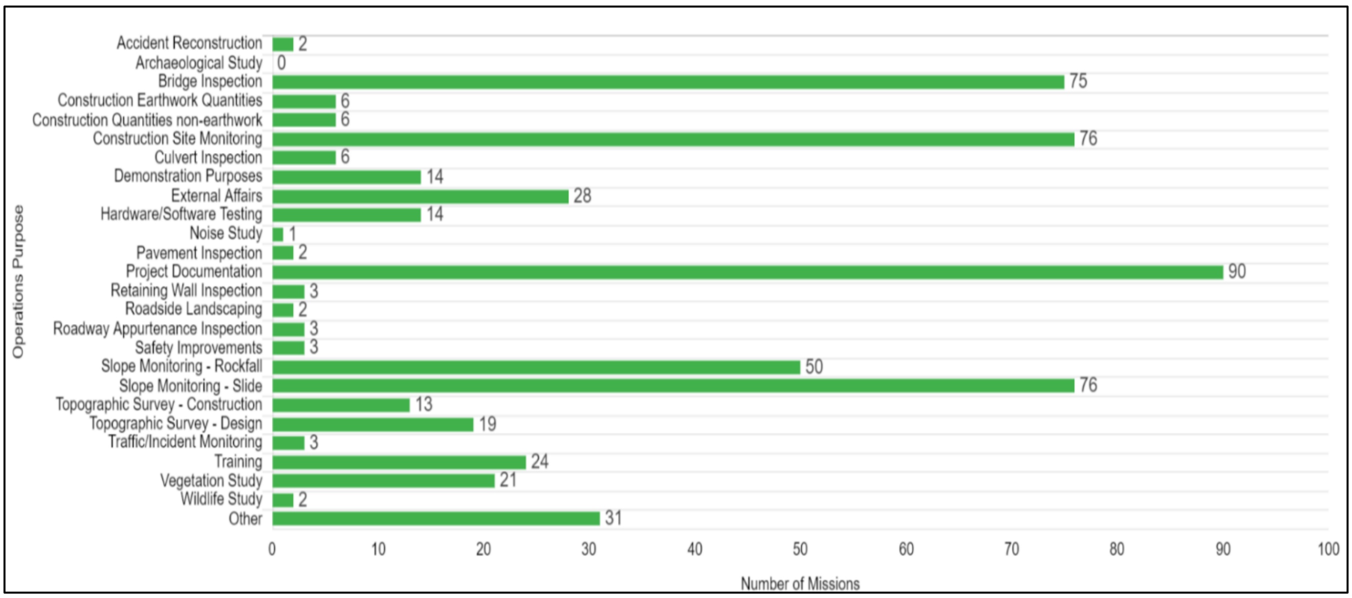


Figure 4-1: Caltrans Distribution of UAS Missions
Source: Caltrans Aeronautics Division, Office of Technical Services

Challenges / Opportunities

UAS rules and regulations from FAA remain subject to further development as the technology evolves and matures, including approvals for operations at night and over people (Reuters 2020). Specific measures for airports and local agencies will continue to evolve while fully integrating new aircraft types of UAS into the NAS with existing aircraft. At the State level, the Division performs the following:

- Coordinates UAS use on current Caltrans projects

- Works with the California Film Commission to provide permits for the use of UAS during filmmaking and to enable drone use over California highways.

UAS operations can also pose security challenges by passing into regulated airspace, passing over-populated areas, colliding with necessary infrastructure, or posing privacy concerns. Some jurisdictions have enacted "No Drone Zones" through land use and zoning regulations. The Division will continually evaluate aviation and land use compatibility to address inadvertent effects of increased UAS use. This evaluation includes Caltrans policy for proposed use of rights-of-way for landing sites, permitting requirements for landing sites, and power shutoffs from utility companies stemming from extreme weather and wildfires.

4.2.5 Electric Aircraft

The ongoing focus on sustainability throughout the aviation industry includes a focus on new aircraft technologies based on electric power. Major aircraft manufacturers are working to develop electric, battery-powered aircraft to address concerns about noise, environmental impact and safety. There is an issue with the range of electric aircraft to make them viable, so battery improvements and alternative fuels must be considered (Northwest News Network). Yet, the introduction of electric aircraft into the market may provide opportunities to expand employment and manufacturing opportunities associated with the aviation industry and make flying more affordable.

Potential benefits of electric aircraft include:

- Improved air quality from the reduction of GHG emissions
- Reduced maintenance and lifecycle costs
- Reduced aircraft purchasing costs, which could offset the trend in reduced aircraft ownership

The introduction of electric aircraft could affect California's aviation and power generation infrastructure. Additional electrical infrastructure will be necessary to provide aircraft operators with facilities to recharge the batteries used to power electric aircraft, and airport operators may need to increase the amount of electrical power available at hangars. New power infrastructure may require metering so that pilots can pay for their fair share of power use. The installation of this additional power infrastructure could challenge airport operators, who may not have additional space for the construction of solar panels or other potential fuel sources. Moreover, the installation of a new power source could represent a significant capital improvement for which resources might not be available through federal or state grants. In some cases, private public partnerships (P3s) may be plausible.

Nevertheless, the opportunity to provide additional power infrastructure, where feasible, could present new opportunities for airports in terms of revenue generation or provide a source of standalone power that could operate in the event of a regionwide power outage, earthquake, or severe storm event.

4.2.6 Urban Air Mobility

The potential use of electric aircraft has been championed by aircraft manufacturers and TNCs, such as Uber Elevate, who envision the use of electric aircraft to provide cost-effective intra-city, inter-city, and regional air travel in the nation's most congested areas. Areas targeted for the introduction of UAM use include Los Angeles and San Francisco.

UAM Grand Challenge Objectives

1. Accelerate technology certification and approval;
2. Develop flight procedure guidelines;
3. Evaluate communication, navigation, and surveillance options;
4. Demonstrate an airspace system architecture based on NASA's UAS/ Traffic Management (UTM) construct; and
5. Collect initial passenger and community perspectives on vehicle ground noise, cabin noise, and on-board ride quality) (NASA 2019).

UAM is defined as "a safe and efficient system for air passenger and cargo transportation within an urban area, inclusive of small package delivery and other urban unmanned aircraft systems (UAS) services, which supports a mix of onboard/ground-piloted and increasingly autonomous operations" (NASA 2018). The results of NASA-sponsored studies from 2017 to 2019 suggested the following:

- UAS may play a significant role in transforming short-haul urban air transportation, e.g., airport shuttle, air taxi, air ambulance, last-mile parcel delivery, etc.;
- Substantial financial and business opportunities exist, but there are significant technological, operational, and regulatory challenges including issues involving public perceptions and acceptance; and
- Gradual integration of sUAS into the overall system may facilitate integration of UAM by around 2030 (NASA 2018).

To better understand and address the challenges identified in its initial studies, NASA is undertaking a UAM ecosystem-wide Grand Challenge in 2020 to "promote public confidence in UAM safety and facilitate community- wide learning while capturing the public's imagination" (NASA 2019). The Grand Challenge will be a full field demonstration in an urban environment that tests the readiness of vehicles and airspace operators' systems to operate during a full range of passenger transport and cargo delivery scenarios under a variety of weather and traffic conditions.

"UAM" is being replaced by "AAM," for Advanced Air Mobility.

Challenges / Opportunities

UAM implementation is of interest to Caltrans and Californians. Several manufacturers of electric Vertical Takeoff and Landing (e-VTOL) have completed prototype aircraft to transport passengers within and between large metropolitan areas. The aircraft could operate in a range of altitudes from 500 to 5,000 feet (Mitre Corp. 2018), rely on battery power to reduce GHG emissions, and are expected to operate more quietly than rotor aircraft. Areas targeted for the initial implementation of on- demand e-VTOL travel include the San Francisco Bay Area and Los Angeles metropolitan area. Manufacturers estimate that aircraft technology could be ready for implementation as early as 2024. (ATI, 2019)

Despite the strides made by aircraft manufactures to develop viable aircraft, UAM challenges remain as neither the physical infrastructure (e.g., takeoff and landing infrastructure, power infrastructure, etc.) nor the regulatory and policy framework have been developed to address UAM operation in urban areas. As this technology is developed, Caltrans will be called upon to issue permits for the operation of new facilities (heliports and vertiports).
Also, Caltrans must consider the potential effects of such operations on land use and those living and working near such facilities. A regulatory framework must be established for issuing permits for new vertiports.

UAM will also pose challenges. As stated in previous policy documents "The Division considers promoting a safe aviation environment for pilots, passengers, and persons on the ground its most important obligation. It achieves this by applying one simple axiom; limit the number of people, both in the air and on the ground, from potentially hazardous conditions" (Division 2016). Current UAM models proposed would be implemented to serve urban populations. As proposed by one industry proponent, aircraft would fly above existing urban roads and highways to transport passengers to and from downtown areas.

General Aviation and UAM Infrastructure: Several GA airports located within or near urban areas may benefit from UAM. While UAM developers are keen to initiate operations within the next five years, little infrastructure is available for its implementation. Underutilized GA Airports with available ramp space may be available for the development and initiation of UAM operations. Airports with open areas may be able to promote the development of clean energy sources to support battery recharge.

UAM Funding: UAM proponents, such as Uber Elevate, propose the construction of "vertiports" at urban airports, as standalone terminals in downtown areas, or atop existing structures in urban areas. The cost of procuring land and constructing such facilities in congested urban areas will be substantial, as will the costs for developing sufficient electrical infrastructure and providing ongoing security measures. Funding for such facilities will require input from many public and private entities through P3s or similar cooperative arrangements.

Land Use and Policy Framework: The Division is well equipped to meet this challenge. The Division's Handbook are among the best in the nation, and the Division's current emphasis on land use compatibility provides it with the necessary policy framework for addressing the challenges posed by UAM technology. Such a framework will provide the Division with an important opportunity and enable it to become a leader in establishing a new policy framework for emerging UAS/UAM technologies.

4.2.7 Commercial Space Industry

The FAA licenses and regulates U.S. commercial space launch activities noting: "When a commercial space vehicle is scheduled to fly, the FAA uses regulatory and operational means to segregate launch and reentry operations from other flights in the NAS to ensure safety" (www.faa.gov/space/airspace_integration/). The exceptions are those missions operated by or for NASA or the Department of Defense. The FAA facilitates the integration of commercial space operations by coordinating airspace and regulatory oversight with air traffic managers and federal launch ranges. FAA further coordinates research into the safety, environmental, and operational implications of new technologies and the evolving commercial space transportation industry. California is home to five spaceport facilities:

- One FAA-licensed Non-Federal Launch Site – the Mojave Air and Space Port
- Two U.S. federal Launch Sites – Vandenberg AFB and Edwards AFB
- Two non-federal facilities for private-sector companies: one at Vandenberg and the other at the Port of Long Beach (under license from Mojave Air and Space Port)

The commercial space industry has been dynamic and anticipates that the number of commercial space operators and number of operations will likely increase over the next five years (FAA 2020b). New operators are seeking to incorporate new technologies, vehicle types, and operational models to advance the industry. However, FAA involvement supersedes a role for the Division in operations, other than airport safety inspections at Mojave Air an Space Port.

Challenges / Opportunities

As the commercial space industry continues to grow in California, Caltrans will need to evaluate the effects of commercial space flight at FAA-licensed, non-Federal launch sites and their potential effect on compatible land use for those living and working nearby. Specific policy concerns may include, but are not limited to, noise effects associated with launch activities and the use and storage of fuel and other hazardous materials used in launch activities. It may also be worthy to consider policy that responds to competition elsewhere. Cities are building spaceports to try to attract aerospace companies, even amid very limited launch activity. The Federal Aviation Administration has licensed space ports in Texas, Florida, Alaska, Virginia, Oklahoma, Colorado and New Mexico. Hawaii and Georgia are also establishing spaceports.

4.2.8 Space Force

On December 20, 2018, President Donald J. Trump signed the U.S. Space Force (USSF) into law as part of the 2020 National Defense Authorization Act. USSF will become the sixth organization in the Department of Defense along with the U.S. Army, Navy, Marines, Coast Guard, and Air Force. The USSF was established within the Department of the Air Force, meaning the Secretary of the Air Force has overall responsibility for the USSF. The formation of the USSF has a direct impact on California, as Air Force and civilian personnel previously assigned to Vandenberg AFB's 14th Air Force are now part of the Space Operations Command (SpOC). The organization of the Space Force, including the realignment of certain Air Force responsibilities, is yet to be determined. Meanwhile, U.S Space Command will continue to exist as a combatant command, much like Cyber Command, Special Operations Command, and others. While the potential changes to Vandenberg and other Air Force bases are unknown, the presence of newly designated Space Force facilities could result in changes to facility operations, such as new or alternative launch activities and resultant changes to noise exposure, security enhancements, or other measures that could affect nearby communities and adjacent land use.

4.2.9 Use of Airport Property for Non-Aeronautical Activity.

Following the economic downturn of 2007, GA airports have sought to increase revenues through the development of non-aeronautical activities. As needed, some requests to FAA are made to sell portions of the airport property for development and tax revenues for local agencies.

Challenges and Opportunities

Revenue generation will remain important to California airports, as insufficient revenues can lead to deferred maintenance, operational restrictions, or even closure. The presence of available land can provide new opportunities and revenue streams, especially for underutilized airports located outside of urban areas, such as job creation/employment opportunities for nearby residents that do not require daily commutes. However, some land use changes on or adjacent to an airport can result in hazards to ongoing aircraft operations and long-term airport viability when they lead to incompatible land uses, encroachment, and the loss of aeronautical revenue. Airport operators must consider the types of proposed development and review proposed design plans to ensure consistency with operations and future development.

4.3 DEMAND AND CAPACITY FORECASTS

Aviation activity forecasts evaluate current aircraft operations (the sum of aircraft take offs and landings) and activity and project future aviation demand. Such forecasts are essential in assessing the need for and timing of future airport development. The projections of future aviation activity are used to determine the ability for the existing aviation system to accommodate the forecasted aviation demand. Airport operators and local planning agencies can use the forecasts to identify and plan for facility needs.

4.3.1 Federal Aviation Forecast Data

FAA's Forecast is complemented by the Terminal Area Forecast (TAF). Both forecasts are based on the federal fiscal year of October 1 through September 30. Enplanements and operations at California airports for CASP 2020 are based on the TAF for the 26-year period from 2019 to 2045 (FAA 2020a).

4.3.2 National Aerospace Forecast

As indicated in section 4.1, discussion of trends and emerging technologies was developed using this forecast because it utilizes statistical models to identify, explain, and incorporate emerging trends in different segments of the aviation industry and to support FAA's overall budget and planning needs (FAA 2020b).

4.3.3 Terminal Area Forecast

The TAF is the official forecast for each airport in the NPIAS. The TAF contains forecasts for passenger enplanements, aircraft operations, and the number of based aircraft using data from the U.S. Department of Transportation (USDOT) T-100 database, Air Traffic Control Tower (ATCT) records, and FAA Master Records (Form 5010), which airport operators submit to the FAA annually. The TAF is based on historical aircraft operations, which are often estimated for smaller non-towered airports. With technological advances such as ADS-B technology, greater precision is anticipated in tracking and counting aircraft operations and small airports. In addition to the TAF, some individual states and individual airports develop their own forecasts of operations to address more the specific details of the systems, roles or operations, which may provide greater precision than the TAF estimates. FAA consulted the available forecasts for California's large and medium hub airports when developing the TAF.

4.3.4 Forecasted Operations for Commercial Service Airports

Commercial aircraft operations are summarized by scheduled passenger airlines, cargo aircraft, and on-demand air taxi operations in accordance with 14 CFR Part 135, "Air Carrier and Operator Certification" (FAA 2020a). This section covers passenger enplanements, commercial aircraft operations, and air cargo forecasts.

4.3.5 Enplanements and Airline Operations

The TAF defines a passenger enplanement as a passenger who boards a scheduled commercial or chartered aircraft that is either a jet aircraft or a turboprop with more than nine seats. Such aircraft must operate under Title 14, CFR Part 121 (14 CFR Part 121), which applies to air carriers and commercial operations. Passenger enplanements include both revenue and non- revenue passengers who pay taxes and air carrier PFCs. Pilots, flight attendants, and non-revenue airline crew members are not counted towards passenger enplanements. (FAA 2020a)

The FAA categorizes passenger enplanements into two types based on the carrier operating the flight:

- **Air carrier enplanements:** Passengers on flights operated by a mainline carrier. These are usually the marketing airline or the airline that sells the ticket (e.g., American Airlines, Delta Air Lines, Southwest Airlines, United Airlines, and Alaska Airlines).
- **Air taxi/commuter enplanements:** Passengers on flights from regional airlines. They fly on behalf of mainline carriers (as subsidiaries or independents, including in FAA's Essential Air Service program) and best represented by the Regional Airline Association (http://www.raa.org) (e.g., Cape Air, PSA Airlines, Pen Air, Seaborne, Skywest and Air Wisconsin). Similarly, commercial operations are split into two categories based on capacity rather than operator type:
- **Air carrier operations:** Takeoffs or landings of commercial aircraft with more than 60 seats and air cargo operations with maximum payload of 18,000 pounds and more.
- **Air taxi/Commuter operations:** Takeoffs and landings by commercial aircraft with 59 or fewer seats and cargo operations with a maximum payload of less than 18,000 pounds.

Using the data presented in the TAF, the total number of enplanements in California is expected to increase by an average of 2.28 percent per year for the next 30 years. Specifically, air carrier enplanements will increase at a faster rate (annual average of 2.29% compared to commuter enplanements (annual average of 2.19%). In terms of operations, air carrier operations are projected to increase at an average 2.27 percent annually while air taxi/commuter operations are forecasted to remain steady with a slight increase of an average 0.37 percent annually.

Table 4-2 shows the TAF projections for enplanement and operations at five- year intervals.

Table 4-2: Terminal Area Forecasts (TAF) for CA Commercial Service Airports: 2020 - 2050

Fiscal Year	Enplanements			Operations	
	Air Carrier	Commuter	Total	Air Carrier	Air Taxi and Commuter
2020	111,163,218	12,248,488	123,411,706	2,035,698	559,689
2025	125,777,670	13,688,553	139,466,223	2,325,901	494,093
2030	141,435,933	15,266,768	156,702,701	2,601,894	517,542
2035	159,068,407	17,080,249	176,148,656	2,914,903	542,374
2040	177,718,758	19,034,933	196,753,691	3,247,323	568,568
2045	197,538,561	21,144,882	218,683,443	3,602,728	596,275
2050	219,568,736	23,488,711	243,057,439	3,997,030	625,332
2020-2045 CAGR	2.33%	2.21%	2.31%	2.31%	0.25%
2040-2045 CAGR	2.14%	2.12%	2.14%	2.10%	0.96%
2020-2050 CAGR	2.29%	2.19%	2.28%	2.27%	0.37%

Notes:
1. CAGR = Compound Annual Growth Rate
2. The TAF provides forecasts are 2019-2045. Forecasts for the period from 2045 through 2050 were estimated using the same rate of increase forecasted in the TAF.

Source: FAA Terminal Area Forecast (Jan 2020). Available at: https://www.faa.gov/data_research/aviation/taf/

As shown in **Table 4-2**, The CAGR for passenger enplanements at California airports is expected to increase at a rate of 2.33 percent for the period from 2020 to 2045, which is slightly higher than the forecasted increase.

4.3.6 General Aviation Activity

The FAA identifies two main categories of GA operations in the TAF: itinerant operations and local operations:

- Itinerant operations are defined as operations that take off and land at different airports
- Local operations encompass flight activities that originate and terminate at the same airport. The FAA also considers the number of based aircraft when formulating the TAF.

The FAA categorizes aircraft by the propulsion system, weight, and engine configuration. The main classifications are single-engine piston (SEP), multi-engine piston (MEP), Jets (including turboprops and turbojets), helicopters, and other aircraft (which includes experimental, light sport, glider, and ultralight aircraft). The FAA forecasts that both itinerant and local GA operations will increase nationwide during the 30-year period from 2020 to 2050, with itinerant operations growing an average 0.97% annually while local operations increasing an average 0.21% annually.

The number of based aircraft nationwide is projected to grow at an average 0.78% annually. Military operations are not based on passenger demand and socioeconomics; they are determined entirely by the demands of the U.S. Department of Defense. For planning purposes, military operations are projected to remain flat throughout the 30-year forecast period. **Table 4-3** shows the forecasted general aviation and military operations for the State of California (FAA 2020a):

Table 4-3: TAFs for California's General Aviation Airports: 2020 to 2050

Fiscal Year	Itinerant Operations			Local Operations			Based Aircraft
	GA	Military	Total	GA/Civil	Military	Total	
2020	3,849,008	124,072	6,568,467	4,186,081	40,266	4,226,347	18,497
2025	3,879,482	124,047	6,823,523	4,229,075	40,266	4,269,341	19,248
2030	3,910,703	124,022	7,154,161	4,273,392	40,266	4,313,658	20,006
2035	3,942,719	123,997	7,523,993	4,319,112	40,266	4,359,378	20,783
2040	3,975,572	123,971	7,915,434	4,366,244	40,266	4,406,510	21,610
2045	4,009,299	123,946	8,332,248	4,414,861	40,266	4,455,127	22,466
2050	4,043,312	123,921	8,771,011	4,464,019	40,266	4,504,280	23,356
2020-2045 CAGR	0.16%	0.00%	0.96%	0.21%	0.00%	0.21%	0.78%
2040-2045 CAGR	0.17%	0.00%	1.03%	0.22%	0.00%	0.22%	0.78%
2020-2050 CAGR	0.16%	0.00%	0.97%	0.21%	0.00%	0.21%	0.78%

Notes for Table 4-3:
1. CAGR = Compound Annual Growth Rate
2. The FAA TAF forecast extends to 2045. The forecasts from 2045 to 2050 were calculated using the rates identified in the TAF.
3. GA/Civil Operations refer to touch and go operations conducted at a GA airport. Source: FAA TAF (January 2020)

4.3.7 Cargo

Air cargo traffic contains both domestic and international freight/express and mail, whether on scheduled airlines, dedicated cargo carriers or by charters. The demand for air cargo is a "derived demand" resulting from economic activity. Historically, air cargo activity tracks with economic variations and corresponds with the Gross Domestic Product (GDP). Cargo carriers face price competition from alternative shipping modes such as trucks, container ships, and rail. Nationwide, U.S. air carriers flew 42.8 billion revenue ton miles (RTMs) in 2018, showing an increase of 9.1 percent from 2017. Domestic cargo RTMs increased by 7.7 percent to 15.8 billion, while international RTMs rose 10.0 percent to 27.0 billion. Air cargo RTMs flown by all-cargo carriers comprised 78.7 percent of total RTMs in 2018, with passenger carriers the remainder. Total RTMs flown by the all-cargo carriers increased 9.5 percent in 2018 while total RTMs flown by passenger carriers grew by 6.7 percent (FAA 2020b).
More than 200 California airports participate in the movement of air freight, yet most goods move through California's 13 busiest airports as shown in **Table 4-4:**

Table 4-4: Freight

Airport	**Freight (U.S. Tons, 000)**								
Year	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2040**	**% Δ**
Los Angeles International (LAX)	2,310	2,444	2,387	2,199	2,124	2,000	1,917	3,016	20.50%
Ontario International (ONT)	868	826	720	567	510	474	461	972	88.29%
Metro Oakland International (OAK)	637	670	625	592	757	590	556	779	14.57%
San Francisco International (SFO)	601	628	618	531	505	440	400	592	50.25%
San Diego International (SAN)	168	192	190	190	179	172	162	278	3.70%
Sacramento International (SMF)	122	127	81	75	71	70	74	90	64.86%
Sacramento Mather (MHR)	83	77	67	57	59	57	55	69	50.91%
San Jose International (SJC)	55	61	61	60	54	53	47	49	17.02%
March ARB (RIV)	54	9	1	1	1	1	1	-	500% +
Bob Hope (BUR)	53	55	54	53	56	58	55	72	-3.64%
Stockton Metro (SCK)	63	45	50	29	NR	NR	NR	-	40.00%

Airport	Freight (U.S. Tons, 000)								
Year	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2040**	**% ∆**
Long Beach (LGB)	23	24	25	28	27	28	26	20	-11.54%
John Wayne (SNA)	18	20	19	18	18	17	18	22	-18.18%
Fresno Yosemite International (FAT)	14	11	10	10	13	13	12	-	16.67%
Chico Municipal	NR	NR	NR	NR	NR	NR	NR	-	
San Bernardino Int'l (SDB)	NR	NR	NR	NR	NR	NR	NR	-	
TOTAL	**5,069**	**5,189**	**4,908**	**4,410**	**4,374**	**3,973**	**3,784**	**5,959**	33.98%

Table 4-4 Legend and Notes:
NR = airports that do not report to Caltrans Aeronautics Division; data may be from carriers, not airport sponsors. Source: Caltrans Division of Aeronautics

As indicated in **Table 4-4**, all but two of California's largest airports with major cargo operations (Long Beach and Fresno-Yosemite International) saw growth from 2013 to 2018. Total cargo operations by the top cargo airports increased by more than 36%. (SNA is not assessed in the same manner since current information has not yet been reported.) The California Air Cargo Groundside Needs Study 2040 (from 2013) concluded that California airports have the capacity to meet 2040 demand:

> …the top airports at which cargo activities are currently focused should have the individual capacity to address their own future cargo growth. Although some new development or redevelopment will eventually be needed, there are no specific projects currently identified by the airports as critical to accommodating long-term cargo growth.

While the capacity of California's largest airports appears to be able to handle modest increases in freight movement in the near-term, the importance of ground transport of freight to and from the airports is a key consideration. Local roads provide access to airport cargo facilities and transportation to nearby cargo handling and transloading facilities. "Often these local arterials and roadways have not been designed to accommodate the largest combination vehicles and are not designated (by US DOT) as Surface Transportation Assistance Act (STAA) routes." (Caltrans 2020). The relationship between airport cargo facilities and road access is discussed in greater detail in the research paper No. 5 addressing mobility and access.

4.4 CAPACITY

The review of Capacity was developed before experiencing the impacts from the COVID-19 pandemic.

4.4.1 Commercial Service Airports

Aviation system capacity refers to the ability of the aviation system to meet the anticipated demands for air travel. Airport capacity refers to the ability of an airport to meet the anticipated or forecast demand for enplanement and operations. Airports without sufficient capacity can experience congestion and flight delays that affect the rest of the aviation system. Congestion and delays can also result in longer taxi time prior to takeoff and delays in landing, which increase fuel consumption and the generation of greenhouse gases.

Since 2003, the FAA has considered the capacity of the NAS to identify the airports that have the greatest need for additional capacity. In doing so, ensure that the long-term capacity of NAS to meet future demand. Three reports have been published to date, the most recent report, "FACT3: Airport Capacity Needs in the National Airspace System," (FACT3) was published in 2015. The capacity analysis performed for the report identified 48 airports with projected growth that could constrain operations. It also identified GA airports with substantial traffic that could affect airspace and air traffic in multiple airport areas (e.g., New York and California).

Of the 48 airports included in the last capacity analysis, eight were in California:

- Los Angeles International (LAX)
- Long Beach/Daugherty Field (LGB)
- Metropolitan Oakland International (OAK)
- San Diego International (SAN)
- San Francisco International (SFO)
- Norman Y. Mineta San Jose International (SJC)
- John Wayne Airport – Orange County (SNA)
- Van Nuys Airport (VNY)

Of the eight airports identified in California, only SFO was identified as having capacity-related constraints following improvements such as NextGen technology. SFO is constrained geographically, which prevents the construction of an additional runway for new capacity, for a status of "Caution." However, FAA acknowledged SFO's participation in regional planning efforts to address capacity needs in conjunction with other airports and transportation facilities within the greater San Francisco Bay Area.

In addition to SFO, FAA findings suggest that congestion should continue to be monitored at LAX, SAN and SNA, for which "Caution" was projected for 2020 (following FACT3 data reporting in 2015). The "Caution" status from FACT3 remains projected through 2030 for each airport except SFO, where the capacity status is projected to be "Severe." The airports were identified as experiencing congestion hours at a rate 20 percent or more for arrivals and departures or experiencing Annual Service Volumes (ASV) delays of 5 minutes or more. ASV is an estimate of an airport's annual capacity, accounting for such differences as runway use, aircraft mix, and weather conditions.

4.4.2 FAA Capacity Recommendations

The FACT3 conclusions acknowledge that efforts to achieve airport capacity needs will require new approaches as well as airport and technological improvements. Specific recommendations include:

- New Runways and airports
- New Gates and taxiways
- Regional Solutions
- Congestion Management
- High-Density Multimodal Transportation Modes
- Installation of NextGen Technologies

The construction of new airports and runways are long-term solutions that might not be available to California's most congested areas, and NextGen has been installed at California's busiest airports. Collaborative efforts are underway in the San Francisco Bay area to identify regional solutions to address congestion at SFO.

Opportunities may be available for the State of California to identify other multimodal transportation options in a goal of balancing needs and means. For example, ongoing efforts to construct the California High-Speed Rail System could lead to an alternative that eases capacity and operational pressures from the demand on air travel exemplified by SFO (webpage), to the extent that rail travel adequately goes where the public wants to be. Meanwhile, UAM's potential to help lessen demands on surface transportation to and from busy airports will need the assistance of collaboration among the various modal agencies within Caltrans, regional planning agencies, and local jurisdictions.

4.4.3 Further Considerations

FAA conclusions pertaining to the capacity of California's airports must be considered carefully. The activity forecasts used to develop the capacity analyses conducted for the FACT3 report were based on the 2012 TAF, and the analyses could not consider unforeseen factors such as steady economic growth, reduced oil costs, other demographic and socioeconomic shifts, or the realization of capacity improvements from NextGen improvements.

4.4.4 General Aviation

None of the small commercial service or general aviation airports considered in FACT3 analyses were identified as capacity constrained.

4.4.5 Air Cargo and "First-/Last-Mile" Connections

The ITSP of 2015 identifies specific corridors that support the interregional movement of freight, recreational tourism, and business travel throughout California. **See Appendix B.** A principal goal of the plan is to analyze and improve the transportation connections among major regions within the State (Caltrans 2015).

The ITSP acknowledges the contribution of aviation to statewide mobility and freight transport and focuses on the intermodal connections associated with air cargo. **See Table 4-5 below** (and see Chapter 5 for more information).
As stated in the ITSP, "Like other modes, ground access is critical to the efficient transportation of cargo to and from airports via freight vehicles." Also, "last-mile connectors," which provide the final segment of the freight delivery system (including roadways to seaports, inland ports, commercial airports, ships and pipelines), are often overlooked but are critical components of the freight system.

Table 4-5: Freight Volumes at Airports within 2 miles of Strategic Interregional Corridors

Corridor	Number of Airports	Freight / Mail (lbs.)
North-South Corridors		

San Diego/Mexico - Inland Empire	8	330,763,978
South Coast - Central Coast	10	7,364,302,042
Central Coast - San Jose/ San Francisco Bay Area	14	125,012,438
San Jose/San Francisco Bay Area - North Coast	17	2,822,764,232
San Jose/San Francisco Bay Area - Central Valley - Los Angeles	26	8,751,915,156
Sacramento – Oregon	10	256,981,821
High Desert - Eastern Sierras - Northern Nevada	11	1,154,077
East-West Corridors		
Southern CA - Southern Nevada/ Arizona	15	7,258,654,116
Central Coast - Central Valley East/West Connectors	17	6,721,304
San Jose/San Francisco Bay Area - Sacramento - Northern Nevada	12	3,349,648,689
North Coast - Northern Nevada	12	412,609,085

Sources: ITSP 2015; USDOT T-100 for calendar year 2018.

The ITSP identified eleven strategic interregional corridors that transport people and freight throughout California, and it considers the improvements that can be made to optimize the system's efficiency and further the development of a statewide, sustainable, multimodal transportation system. For each of the eleven corridors, the ITSP recommends improvements to regional connectors to major intermodal freight facilities, including airports. Such improvements are ranked as mid-level priorities that are necessary for the short and long term. However, funding such priorities could prove to be complex. The FAA will support surface transportation or transit improvements only on airport property, or within one mile of an airport or its property.
Options include local agencies, Regional Transportation Improvement Plans (RTIPs), or State Highway Operation and Protection Program (SHOPP) funds.

The corridor summaries below suggest considerations for adequate maintenance that can also benefit aviation. And, while not strict forecasts, the summaries point out factors that could be studied within forecasting tied to the goals of reducing congestion and emissions:

- **San Diego/Inland Empire Corridor:** San Diego International Airport (SAN) has limited space to expand air cargo operations. Opportunities to develop cargo facilities at other airports within the corridor may facilitate efficiencies for air and truck cargo.

- **South Coast-Central Coast:** The high concentration of air cargo at Los Angeles International (LAX) and Ontario International Airports (ONT) is driven by dedicated cargo carrier hubs at both airports and the relative proximity of the other eight airports in this corridor to these two hubs. As congestion increases at LAX and ONT, there may be an opportunity to move some air cargo to other airports, particularly those with established air cargo operations.
- **Central Coast-San Jose/San Francisco Bay Area Corridor** has over 96 percent of air cargo in the corridor moves through the San Jose airport (SJC) principally along congested U.S. 101.
- **San Jose/San Francisco Bay Area-North Coast Corridor** also relies on U.S. 101. The northern airports in Arcata and Ukiah may have opportunity to increase air cargo volume. Growth will likely be determined by population trends in these areas. Santa Rosa's airport (STS) has low levels of air cargo for a commercial service airport; however, its drive time from OAK or SFO likely reduces its ability to attract or retain air cargo.
- **San Jose/San Francisco Bay Area-Central Valley-Los Angeles Corridor:** The ITSP identifies that freight movement from the San Francisco Bay Area to Los Angeles is expected to increase from an estimated $14 billion and 8 billion metric tons in 2015 to nearly $26 billion and over 13 billion metric tons.
- **Sacramento Valley-Oregon Corridor:** There may be opportunity for air cargo growth along I-5. The primary products generated within the corridor are agricultural and are shipped to their consumers by truck. Overseas exports are moved through the corridor to international gateways in the San Francisco Bay area and cargo hubs in Sacramento.
- **High Desert-Eastern Sierra-Northern Nevada Corridor:** The corridor lies between, but does not include, cargo airports at San Bernardino (SBD) and Ontario (ONT) in California and Reno (RNO) in Nevada. Opportunity for air cargo growth exists in connection to high technology manufacturing at the Mojave Air and Space Port (MHV) and aircraft maintenance, repair, and overhaul facilities in Victorville (VCV), but the low volume of air cargo reported at VCV and the absence of air cargo reporting at MHV indicate that much of the cargo bound for these areas moves by truck or charter flight.
- **Southern California-Southern Nevada/Arizona corridor** is in the nation's largest and most important freight gateway and corridor for international trade. Opportunities for air cargo growth exist along two interstates, particularly in the Inland Empire region. Development of logistics centers in SBD and ONT illustrate an ongoing trend

by air cargo airlines towards less expensive real estate located outside of urban cores but with access to strong surface transportation links. (Sperance 2020)

- **Central Coast and San Joaquin Valley East-West Connections:** The areas included in this corridor are expected to see a 31% population increase between 2010 and 2040, which may increase the demand for air cargo and just-in-time shipping. I-5 intersects part of the corridor near Bakersfield, which may present air cargo development opportunities.
- **San Jose/San Francisco Bay Area-Sacramento-Northern Nevada Corridor:** Over 84% of air cargo in this corridor moves through SFO and OAK; however, Sacramento International Airport (SMF) and Mather Airfield (MHR) are seeing logistics warehouse development. (Moleski 2019)
- **North Coast-Northern Nevada Connections:** This corridor consists of two separate corridors between the coast to the eastern part of California and Nevada. The first corridor is from Humboldt County to Lassen County and on to Reno.

  The second corridor is from Mendocino County to Nevada County and I-80. Population centers are located on the coast, in Redding, and in Sacramento. Opportunity for air freight development is strongest in the Sacramento area and on the coast. While SMF and MHR process much of the air freight in this corridor, they have room for expansion and are several orders of magnitude less than the volume processed at larger hubs like ONT and OAK.

4.5 CALIFORNIA TRANSPORTATION PLAN 2050 POLICY RECOMMENDATIONS

CASP 2020 is one modal component of the forthcoming CTP 2050, which addresses California's statewide transportation network for the movements of people and freight and the integral relationship between transportation and the state's economy, environment, and communities. As such, CASP 2020 seeks to identify programs and directives to better support aviation in California while addressing changes in:

- Demographics
- Land Use
- Climate change (GHG reduction and sea-level rise)
- New and Emerging Technologies
- Social Equity
- Quality of Life
- Safety and Security

- California's Economy

The following discussion will focus on two key CTP Issue areas: demographic changes and new technology. While land use will also be affected, Chapter 6 (Land Use and Sustainability) will explore land use policy in detail.

4.5.1 Demographic Changes

TODAY: California is home to nearly 40 million residents, about 12 percent of the U.S. population. **BY 2050:** California's population will grow by an estimated six million residents by 2050. This reflects the most recent population projections developed by the California Department of Finance (DOF). California's MPOs have forecasted growth of up to 13 million new residents by 2050 (based on the sum of the MPOs forecast in 2016). Despite the difference in magnitude, both projections show that coastal urban areas such as the Bay Area, Los Angeles, and San Diego will retain most of the State's population. (Caltrans 2021)

California's population is aging. By 2030, about one in five Californians will be age 65 or older. Nevertheless, California has a relatively young population compared to the population nationwide. According to 2015 Census Bureau estimates, the median age in California is 36.2, compared to 37.8 for the entire country, making it the seventh-youngest population in the country (PPIC 2020).

The forecasted growth in California's population from 2020 to 2050 will provide both opportunities and challenges to California's aviation system and statewide system planning efforts. As California's population increases, aviation demand will also increase, leading to greater demand on a system that may be reaching capacity. Nationwide economic growth since 2010 and decreased oil prices have enabled enplanements and operations at commercial service airports to increase at rates exceeding those used by the FAA in its forecasting efforts for the NAS. The capacity estimates in FAA's FACT3 report reflected an annualized operational growth of 1.1 percent through 2020 and then 1.6 percent through 2030 (FAA 2015), which is lower than recent TAF calculations that identify an increase in operational growth at California that reaches up to 2.31% annually through 2050 (see **Table 4-3**). While a precise comparison is not possible due to the difference in forecast periods, it remains clear that operational activity in California has increased at a faster rate than the FAA considered when calculating its last nationwide capacity forecast.

While increased operations may generate opportunities for airport operators in terms of revenue and for consumers in terms of pricing, the increased number of operations in recent years suggests that California's busiest airports—and the especially the eight airports identified in the FACT3 report—will likely reach capacity sooner than federal forecasts anticipate. NextGen improvements are offering air traffic efficiencies that help address capacity issues, but their full effectiveness remains limited at SFO. To address forecasted activity at SFO, facility improvements to increase capacity are unlikely given the constraints posed by the airport's coastal location and associated SLR concerns. The constraints identified could lead to negative effects such as:

- Increased airfield congestion and aircraft emissions from delays for takeoff and landing
- Increased surface traffic congestion and GHG emissions from an increased number of passengers if airport access is not offset by transit opportunities, the use of Zero Emission Vehicles (ZEVs), or UAM potential
- Increased challenges in contributing to statewide GHG reduction mandates

Appendix C reviews a timeline of FACT reports.

4.5.2 Policy Goals and Recommendations

The Division has pursued a goal of preserving California's aviation system and assets historically through its ongoing program of safety inspections, pavement management, and by initiating a robust effort to prevent the development of incompatible land uses. These efforts could be strengthened through the following policy recommendation.

Policy Recommendation: RTPSa in the San Francisco Bay area have explored regional solutions to alleviate congestion at SFO. These collaborative efforts should extend to other areas of California, especially Southern California and the Central Valley. Regionalism should be explored to address and avoid both airspace and surface traffic congestion associated with passenger travel and air cargo.

4.5.3 Emerging Technologies

New technologies will provide foreseeable and unforeseeable challenges and opportunities. The Division will need to remain nimble to adapt or refine its current policy framework to accommodate new technologies.

4.5.4 TNC and Shared Vehicles

The use of app-based technologies by TNCs to promote shared vehicle use makes transportation opportunities affordable for those who do not have access to vehicles, thereby promoting transportation equity and social sustainability goals. The use of personal vehicles by TNC drivers to generate income also creates jobs. However, these new technologies do not reduce the number of vehicles on California's congested roadways or reduce airport terminal congestion. Preliminary studies also suggest that the availability of TNCs has coincided with decreased transit use. Long-time van services have all but disappeared from airports.

Policy Recommendation: The Division could work with transit agencies and airport operators to promote ridesharing and transit opportunities to airports to help reduce congestion near terminal areas.

4.5.5 UAS and UAM Technology

UAS and UAM technology have tremendous potential; the use of UAS for commercial uses such as infrastructure inspection and other dangerous activities can improve safety for workers, and UAM has the potential to reduce congestion—even slightly in urban areas—by replacing autos with electric aircraft. Both technologies pose challenges to traditional land use compatibility planning strategies. Privacy issues may arise from UAS use in residential areas, and UAM could bring low-flying aircraft to densely populated areas; they may also be prone to wildlife strikes due to their low altitudes.

The Division has long promoted land use compatibility near airports, but emerging technologies could challenge current strategies, which seek to separate aircraft and people. On the other hand, the introduction of new technologies presents the Division with an opportunity to be a leader in the development of a new policy framework to guide UAM and be a leader in the implementation of new technologies.

Policy Recommendation. Promote the implementation of new technologies that can safely reduce or replace transportation related emissions.

- Establish clear policy directions and frameworks
- Establish evaluation policies and protocols during technology development

As summarized below in **Table 4-6**, many of the key issues associated with aviation forecasts, trends and emerging technology can contribute to or challenge one or more CTP goals.

Table 4-6: Relationship Between CTP 2050 Issues and Aviation Forecasts, Trends, and Technology

CTP Issues and Goal	Aviation Issues: Challenges and Opportunities	Policy Goals and Recommendation
Demographic Changes Growth in Travel Demand Changing Travel Preferences (see emerging technology discussion)	Nationwide economic growth and reduced oil prices have increased travel demand nationwide. **Opportunities** Some airports have enjoyed increased revenues The introduction of low-cost carriers and new fee structures has made flying more affordable. The use of larger aircraft can reduce the number of operations and subsequent GHGs. **Challenges** Increased enplanements and operations at some California airports have increased at rates exceeding the federal forecasts used to evaluate capacity. Capacity is stressed by additional demand. California's busiest commercial service airports are constrained by geography and existing land use, especially SAN, SFO, and LAX.	Continue to preserve and optimize Aviation System components Continue to manage and maintain existing aviation infrastructure (pavements) Explore regional solutions in Southern California and the Bay Area.
Land Use Housing Shortage Growth in Southern California, Bay Area, and Central Valley Urban growth pressure Density, travel demand, and equity Consider the role of new and emerging technology	**Challenges** Many California airports are constrained by geography and existing land use, including busy commercial service airports, such as SFO and SAN. Housing shortages will put pressure on local agencies to build more housing, leading to greater development densities in previously developed areas and new development in outlying/previously undeveloped areas, making airports vulnerable to incompatible land use. Increased UAS use could lead to privacy concerns in communities and conflicts with regulated airspace. UAM use would occur in densely populated urban areas.	Increase education and outreach to airport operators, communities, and stakeholders. Monitor and participate in the development of new technologies, such as UAM, that conflict with legislative mandates and strategies for aviation and compatible land use

CTP Issues and Goal	Aviation Issues: Challenges and Opportunities	Policy Goals and Recommendation
Climate Change **(GHG Reduction and Sea-Level Rise)** Reduce Transportation- related GHGs Infrastructure Resilience and Adaptation Achieve Carbon Reduction Targets	**Opportunities** New technologies have the potential to reduce GHG emissions (CAV, ZEV, UAM, and UAS). **Challenges** Increased aircraft operations (as forecasted) could lead to additional congestion in the skies and on the ground near airport terminals, leading to increased GHG productions. Increased E-commerce could lead to increased congestion near airports, intermodal terminals, and on local roads. Some new technologies have led to increased congestion in terminal areas and through the reduced use of transit.	Continue to coordinate with other modal agencies to strengthen intermodal connections and reduce congestion. See also recommendations set for new technologies (below).
Technologies New Technology will alter the way we work and live, such as: Connected and Autonomous Vehicles (CAV) TNCs Shared vehicles ZEVs Other advancements	The effects of new technologies can be identified in association with all CTP issues and policy goals. **Opportunities** TNCs and shared rides will promote transportation access. UAM technology is being pursued in the face of little regulatory or policy framework. There is opportunity for agency leadership. **Challenges (see also "Land Use)** Landside areas will require reconfiguration to accommodate emerging technologies such as TNCs and automated vehicles. Increased UAS or drone use for recreational and commercial purposes may lead to privacy concerns. Potential data security concerns may be associated with application-based technologies.	Promote the implementation of new technologies that can reduce or replace transportation related emissions. Establish clear policy directions and frameworks Establish evaluation policies and protocols during technology development

Sources: Caltrans 2021

Chapter 5:

Mobility and Access

Transportation enhances quality of life, but mobility is not enough. Californians need access to transportation options that are timely, affordable, and safe (Mobility Lab, 2018). One of the key goals of the CTP 2050 is to improve mobility *and* access to destinations for all users by:

> "Transportation is conducted through two basic facilities, terminals (nodes) and routes (segments). Airports are terminals that connect surface access segments with airway segments. To meet this role, airports must always be considered critical elements of the total transportation system." (FAA, Undated)

- Optimizing system performance for all modes
- Increasing access to destinations
- Increasing the competitiveness of transit, shared mobility, and active transportation options
- Providing integrated and seamless travel connections (Caltrans 2021)

This chapter considers access to California's airports by passengers and employees and the role of aviation in transporting goods as part of an integrated and multimodal freight mobility system. Potential system improvements and funding opportunities, the roles of local and regional transportation agencies in maintaining and improving aviation access, and policy consideration are identified.

5.1 THE AIRPORT-GROUND ACCESS CONNECTION

Airports are more than buildings that connect people to aircraft, they are also employment centers and places where people gather to conduct business. The transportation link between airports and local activities is a critical and overlooked component of the transportation system. For regions that include more than one airport, consumer airport choices and decisions to fly rather than use another mode are often linked to the quality, cost, and travel time associated with the ground journey to the airport (ACRP 2008).

5.1.1 Commercial Service Airports and Passenger Access

In 2018, airports in the United States transported more than 2.7 million passengers daily for the year, more than one billion passengers, and 44.3 billion pounds of cargo (FAA, 2019). Access to commercial-service airports is provided by road networks that include terminal access roads, local roads, and highway systems. This also includes the infrastructure that supports local road access such as airport entrance and exit roads and ramps, parking garages and surface lots, cell phone lots, and terminal curbside areas for pick up and drop off.

Automobile Access

According to ACRP research, most U.S. airports are not managed to encourage the use of higher occupancy modes by passengers and employees and, from a national perspective, ground access to airports has been dominated by the private automobile (ACRP, 2008). Automobile parking has traditionally been a major source of revenue for U.S. airports, sometimes surpassing the fees collected from airlines for rent, landing fees, and other aeronautical services. Airport operators also collect revenue from tenant car rental companies. Consequently, automobile usage at or near airports is a very important element of both the physical structure as well as the financial aspects.

Many of California's CS airports are in some of the State's most congested areas. The use of private vehicles contributes to congestion, increases GHG emissions, and reduces mobility—especially when passengers are dropped off and picked up by others before and after travel (for two round trips per flight). While airport operators may benefit from parking revenues, the increased congestion and difficulty in accessing the airport by automobile could make the airport less attractive to passengers.

Access by Public Transportation

Access to California's 23 federally designated primary airports is also provided by public transportation systems such as local and regional bus routes (including express bus routes), commuter and passenger rail, and shuttle services. California includes some of the nation's busiest airports (Los Angeles, San Francisco, San Diego, and Oakland), and these metropolitan areas include mature public transportation systems that provide direct access to and from airports. Data below for San Francisco, Oakland, and Los Angeles, show comparatively more travelers chose public transportation and commuter rail service options to access the airport than other airports nationwide.

But the number of passengers is comparatively small compared to those who use private automobiles. A 2008 study of 27 of the nation's largest commercial airports nationwide identified the following comparisons in the use of bus/van options and available local rail service:

- #1 SFO: 23% of air passengers used passenger rail or commuter rail options (7%) or bus/van options (16%)
- #5 OAK: 15% of air passengers used passenger or commuter rail options (9%) or bus/van options (6%).
- #10 LAX: 13% of air passengers used bus/van options.
- #19 SAN: 9% of air passengers used airport bus/van options. (ACRP 2008)

The high ranking of California's Bay Area airports is not surprising. Both SFO and OAK may be accessed by multiple public transit options including commuter rail via Bay Area Rapid Transit (BART) and extensive heavy rail rapid transit system. And, LAX is served by an express bus route that has been very successful (the Van Nuys Flyaway). While SAN ranked only 19th out of 27 airports studies, its transit share of 9% allowed it to surpass other airports in major cities nationwide, e.g., Washington Dulles and New York LaGuardia.

Despite the relatively high ranking of California's airports compared to other commercial service airports nationwide, the number of passengers who accessed these airports by public transit remained low compared to the total number of passengers. Although SFO topped the list, 77% of passengers using the airport still used personal automobiles.

Factors Influencing Transit Use by Passengers

Research indicates that regardless of the transit services that are available, its frequency of use will be based on the needs of the traveler more than any other single characteristic (ACRP 2008). Nevertheless, some characteristics can influence passenger use, such as:

- Distance between airport and the passenger origin/destination (i.e., home, hotel, etc.)
- Quality of connection between airline operations and ground access vehicle (i.e., is the drop off location near the passenger's desired airline terminal?)
- Service coverage

- Regional travel time/length of transit trip and number of connections
- Frequency of service
- Consideration of passenger baggage
- Physical ability of passengers to walk between a transit station and their destination (from transit stop to airline gate, from transit stop to another mode choice and destination, etc.)
- Length and quality of walk or travel between the transit station and destination
- Passenger knowledge of alternatives to automobiles and taxis

5.1.2 Commercial-Service Airports and Employee Access

Airports are employment centers, and commercial-service airports provide thousands of jobs that require commuting and parking. At the time that a 2008 nationwide transit survey was conducted, LAX provided jobs for an estimated 40,000 employees and SFO provided jobs for an estimated 31,000 employees. Employee travel and parking can pose challenges to airport operators, as employee commutes can contribute congestion to nearby roads and employee parking can require large areas that could be used to generate revenue or serve aeronautical needs.

Employee parking can also challenge those who work at the airport. Airports in outlying areas may not be served by transit services. For urban airports, employees may live in outlying areas and have long commutes. For airports operating 24 hours a day, work shifts may not coincide with transit schedules. In addition, airports include employers with diverse schedules, constraints, and regulations regarding shift timing, work areas, and parking reimbursement, overtime, etc. Available data indicate that even at the California airports associated with comparatively higher levels of passenger transit use, few employees use transit: 2.5% at LAX and 2% at SAN (ACRP 2008).

5.1.3 Access to General Aviation (GA) Airports

California's aviation system includes 23 federally designated and 27 State-designated commercial service airports. Some of California's 241 public-use airports that do not provide scheduled passenger service are in metropolitan areas or near major business centers and serve large population areas to support business/corporate, recreational, and cargo services. Other regional airports are in suburban areas or serve local communities to support recreational flying, flight training, and emergency response.

Others located in non-urban rural or remote areas provide geographically specific services such as agriculture, firefighting, recreational access, or support during medical or other emergencies.

Access to California's GA airports varies according to each airport's location and the services it provides. Busy GA airports that include one or more fixed-based operators (FBOs), serve specific clients, or focus on private air travel (e.g. charters or corporate aviation) and are likely to have on-site rental car vendors and/or limousine services. GA airports located in urban areas may be served by regional bus service but airports in suburban and rural areas may not, due to specific challenges:

- Insufficient demand to support transit service
- Users of GA airports may draw from a large catchment area that involves multiple communities whose transit services might not cross jurisdictional boundaries

Regional transportation planning becomes critical for linking GA airports to nearby communities.

5.2 EMERGING TECHNOLOGIES AND TRANSPORTATION OPTIONS

Certain technologies have the potential to affect airport access by passengers and employees alike, and their implementation could affect future airport planning decisions.

5.2.1 Autonomous Vehicles

Automated vehicles (AVs) are driver-assisted vehicles. Currently, AV technology requires the presence of a driver in the car for most or all the trip, but the use of driverless technology is anticipated within the next five years. Personal AVs may not significantly affect airport access by passengers or employees, but they could affect activity in terminal area pick up and drop off areas as travelers depart their vehicles; direct the vehicles to a garage, parking lot, or home; or direct the vehicles to pick them up when returning from a trip, which could include circling the terminal area. Although AV technology can contribute to safer, cleaner, more affordable, and more accessible mobility—especially when they are powered by clean fuel — they are not expected to contribute to reduced congestion on or near airports. However, the use of AVs could lead to reduced parking revenues that would not be offset by fees, such as the fees charged to TNCs to drop off and pick up passengers.

5.2.2 MicroTransit

Microtransit includes the use of on-demand public transit services that can offer fixed or flexible routes for passengers and on-demand scheduling. Microtransit has the potential to provide affordable transportation options for airport employees who may not be able to access traditional transit services during non-traditional hours, and it may increase access for air travelers. While microtransit will not reduce congestion in the terminal area, it may offer other benefits compared to services that transport only single riders.

5.2.3 Transportation Network Companies

TNCs that provide ride-hailing services, such as Uber and Lyft, can improve airport access for travelers and employees, and in many cases, more affordably, too. However, the use of TNCs has also contributed to increased congestion (adding to GHG emissions) on and near the airport due to the greater number of cars and the subsequent decrease in the use of public transit, shared rides, and shuttles. Long-time shuttle services, such as SuperShuttle, have gone out of business nationwide (Hamm et al. 2019), and the availability of hotel shuttles has decreased.

5.2.4 California High Speed Rail

The CHSR project proposes the construction of electrified high-speed rail, including stops planned for certain airports in proximity to planned routing: https://www.buildhsr.com/. Conceivably, CHSR could then reduce auto travel contributions to the statewide GHG reduction effort. The CHSR can then potentially improve access to airports for airport employees and travelers.

5.3 AVIATION AND INTERMODAL FREIGHT AND GOODS MOVEMENT

The CFMP indicates, "California's freight transportation system is the most advanced, environmentally friendly, and multimodal in the nation." (Caltrans 2020). The CFMP is a component of CTP 2050 that provides a vision for California's freight transportation system. It includes all modes of transportation to achieve a truly integrated, intermodal freight network in accordance with federal freight transportation goals and objectives including "Moving Ahead for Progress in the 21st Century" (or, MAP-21, signed in 2012 by President Obama, updated as "Fixing America's Surface Transportation," or FAST Act, signed by President Obama in 2015).

The CFMP further aligns with CTP 2050 and the goals and objectives set forth in California's Sustainable Freight Action Plan. The overall goals of the CFMP include:

- Multimodal mobility
- Economic Prosperity
- Environmental Stewardship
- Healthy Communities
- Safety and Resiliency
- Asset Management
- Connectivity and Accessibility

California's freight movement is composed of various modal options that work together to provide redundancy of freight corridors, choices for maritime and air cargo, Class 1 freight railroads, and a strong logistics industry (Caltrans 2016). These facilities generate jobs, tax revenue, and positive economic impacts within communities. Californians are concerned about the potential loss of businesses and facilities that close due to out-of-state competition or relocation to other states. Although there are many possible variations and combinations, most location decisions fall under the following categories:

1. Choosing a location for a new production or distribution facility
2. Choosing whether to expand, contract, or close an existing location
3. Choosing how much production or distribution activity to allocate among locations

Within this integrated system, airports must balance passenger and cargo needs. Airports are freight and passenger gateways, nodes where goods, services, and people enter and leave the State. Airports also serve as freight and passenger hubs, where freight or people transfer between modes. Airports and other gateways and hubs are connected by highway and rail corridors as well as last-mile connectors. The CFMP recognizes that California's airports are an important component of this integrated freight transportation system, and airport operators must strike a balance to facilitate the efficient movement of passengers, freight, and related services.

Nevertheless, trucking is the predominate mode for moving freight overall and for moving freight to and from airports. According to Caltrans' 2013 "California Air Cargo Groundside Needs Study" from the Division, "rail [freight] cargos are typically incompatible with air from a time and bulk perspective."

Additionally, "there are no accessing rail lines for freight at the [largest cargo] airports…air and rail modes are suited for different cargoes." (Caltrans 2013)

5.3.1 Airports and Goods Movement

Data from the Division's 2013 "Air Cargo Groundside Needs Study" was confirmed in 2018 by more recent data from ACI-NA, the greatest amount of freight was moved by the State's commercial service airports. (**Table 5-1**).

Table 5-1: Top Air Cargo Airports 2011 and 2018

Groundside Air Cargo Needs Study (2011)	Airports Adjacent to Interregional Corridors (2018)
• Los Angeles International (LAX)	1. Los Angeles International (LAX)
• Oakland International (OAK)	2. Ontario International (ONT)
• San Francisco International (SFO)	3. San Francisco International (SFO)
• Ontario International (ONT)	4. Oakland International (OAK)
• San Diego International (SAN)	5. San Diego International (SAN)
• Sacramento International (SMF)	6. Sacramento International (SMF)
• Burbank (BUR)	7. Sacramento Mather (MHR)
• San Jose International (SJC)	8. San Jose International (SJC)
• Sacramento Mather Airport	9. Burbank (BUR)
• Long Beach (LGB)	10. Stockton (SCK)
• John Wayne (SNA)	11. Long Beach (LGB)
• Fresno-Yosemite (FAT)	12. John Wayne (SNA)
Sources: California Air Cargo Groundside Study, 2013, based on 2010 and 2011 data. ACI T-100 data, based on 2018 data (the most recent year for which data are available).	

Although the airports are in seven Caltrans Districts, approximately 50% of air freight and mail is concentrated in District 7 for Los Angeles, 27% in District 4 for the Bay Area, and 14% in District 3 for Sacramento. These districts have the greatest roadway congestion. Market concentration for 2018 was evaluated using the Herfindahl-Hirschman Index and the freight and mail market shares of California commercial service airports from the USDOT T-100 database produced a score of 2,940, which is characteristic of a highly concentrated market (U.S. Department of Justice, 2018).

The volume of goods moving by air cargo is forecast to grow 140% by 2045 (Caltrans 2020), suggesting that other California airports be used for freight handling. Yet, the selection of airports for cargo purposes is influenced by economies of scale that must find a return on investment from operations (National Academies of Sciences, Engineering, and Medicine, 2015).

5.3.2 Statewide Interregional Transportation Strategic Plan

The 2015 ITSP provides guidance for identifying and prioritizing interregional transportation projects. The ITSP, which is also a component of the CTP 2050, draws upon and complements the RTPs developed by RTPAs and MPOs by:

- Considering how local, regional, State, and national transportation needs are interconnected
- Providing a comprehensive look at specific transportation systems and networks
- Identifying how to enhance California's existing interregional transportation system (Caltrans, 2015)

The ITSP defines the interregional transportation system as a multifunctional network of transportation infrastructure and operational systems that support travel to, through and between geographic regions and includes the following major components:

- CHSR
- Existing and proposed intercity passenger rail services
- Freight rail
- The State Highway System (SHS), which includes interstates and highways. (Caltrans 2015)

The ITSP acknowledges the contribution of California's airports to mobility through their interregional, interstate, and international connectivity to other modes, and it acknowledges that surface transportation is vital to the air cargo industry by providing essential connections for the movement of goods.

Strategic Interregional Corridors and Adjacent Airports

The ITSP identifies 11 Strategic Interregional Corridors California, connecting cities in California to each other and connecting California to neighboring states and Mexico. Each corridor is characterized by high volumes of freight movement and significant tourism while providing communities with access to local and interregional markets, medical and social services, recreational facilities, and support emergency response/disaster recovery activities.

Because these corridors are considered the most significant interregional travel corridors in California, they are also identified as priorities for State transportation investment (Caltrans, 2015). More than half of California's 241 airports are located within two miles of these corridors as shown below with **Figures 5-1a and 5-1b**.

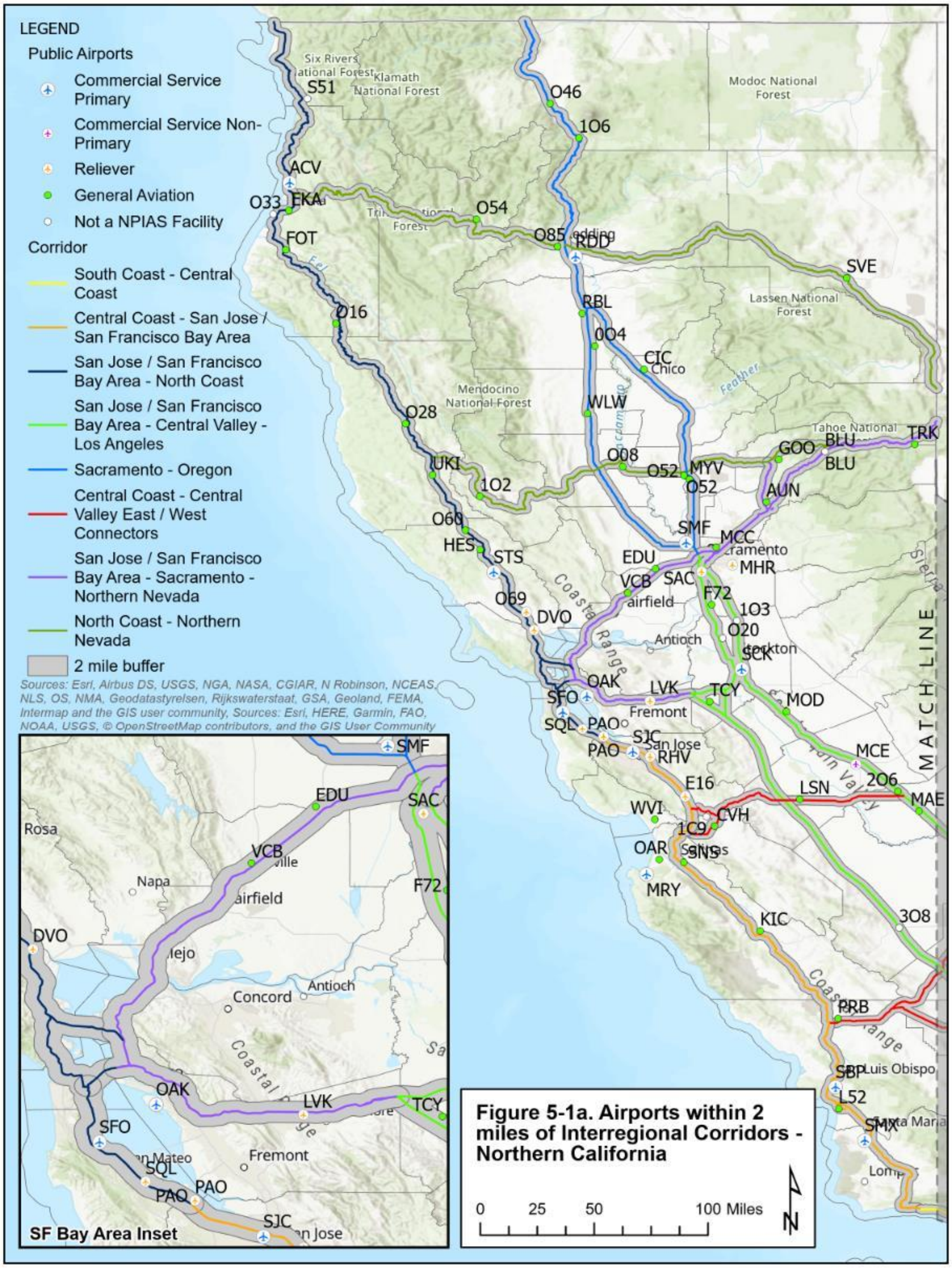


Figure 5-1a: Strategic Interregional Corridors/Northern California

Source: Mead & Hunt, 2020

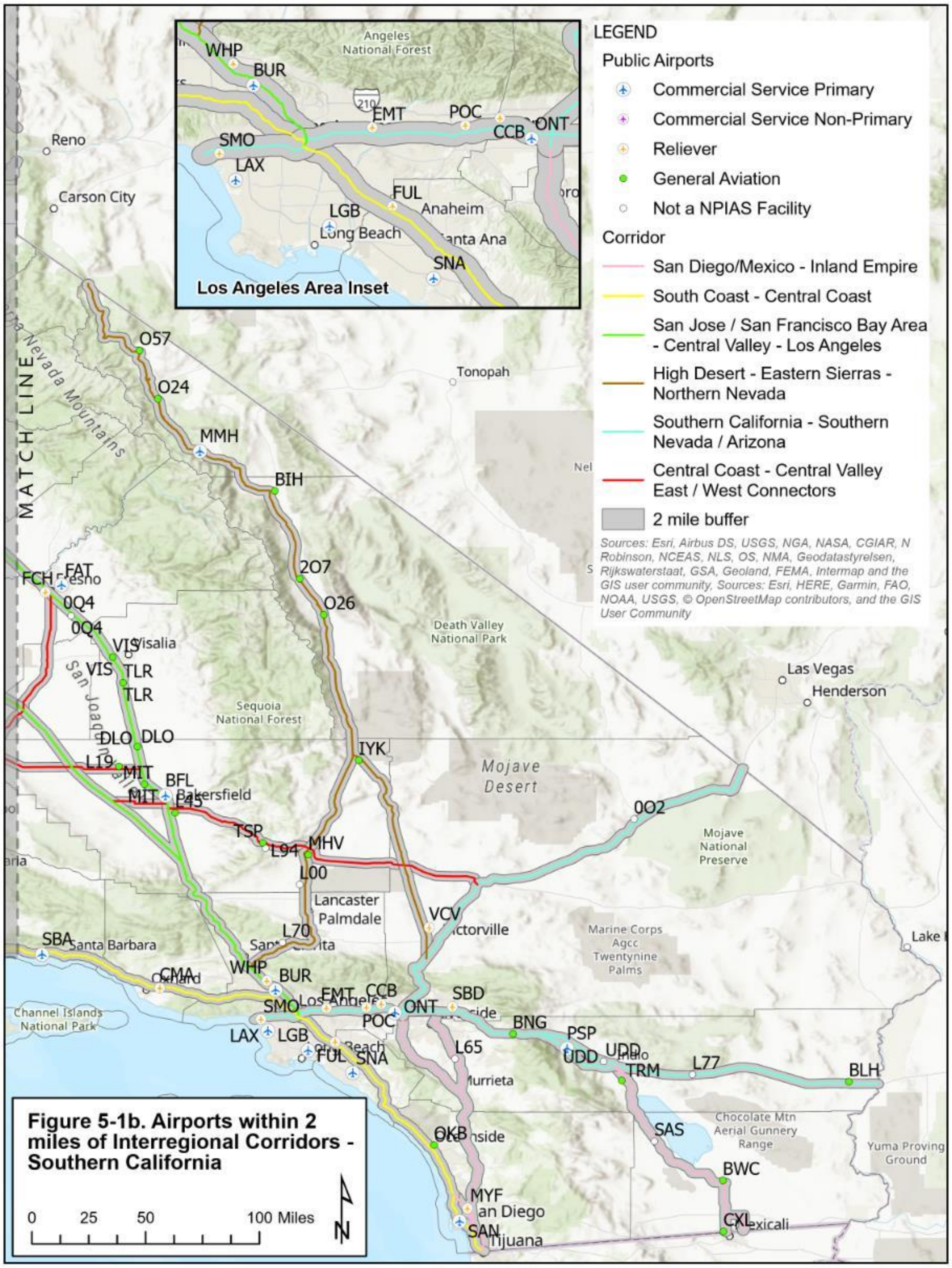


Figure 5-1b: Strategic Interregional Corridors/Southern California

Source: Mead & Hunt, 2020

The funding priority associated with the strategic interregional corridors can support development and diversification of California's air freight system in line with improvements to other modes like highway and freight rail. These improvements may also diffuse roadway congestion. The practice of investing in these key corridors can support routine business operations and can facilitate disaster response. Introduced in Chapter 4 for needs (Table 4-5), **Table 5-2 also** concerns mobility and access for cargo handling. The focus at certain airports for the specific reason that they have good access to ground routes.

Table 5-2: Freight Volumes at Airports within two miles of Strategic Interregional Corridors

Corridor	Number of Airports	Freight / Mail (lbs.)
North-South Corridors		
San Diego/Mexico - Inland Empire	8	330,763,978
South Coast - Central Coast	10	7,364,302,042
Central Coast - San Jose/ San Francisco Bay Area	14	125,012,438
San Jose/San Francisco Bay Area - North Coast	17	2,822,764,232
San Jose/San Francisco Bay Area - Central Valley - Los Angeles	26	8,751,915,156
Sacramento – Oregon	10	256,981,821
High Desert - Eastern Sierras - Northern Nevada	11	1,154,077
East-West Corridors		
Southern CA - Southern Nevada/Arizona	15	7,258,654,116
Central Coast - Central Valley East/West Connectors	17	6,721,304
San Jose/San Francisco Bay Area - Sacramento - Northern Nevada	12	3,349,648,689
North Coast - Northern Nevada	12	412,609,085

While ground access facilitated by airport location is necessary to move the freight, the dynamics leave many other airports underutilized as the corridor analyses that follow indicate. (Note: Total figures identify the volume of cargo moving through the airports in the corridors; not the volume from one part of the corridor to the other.)

San Diego/Mexico Border – Inland Empire Corridor

Table 5-3: The San Diego/Mexico Border – Inland Empire Connections Corridor forms the main link between Mexico and Southern California. The Corridor includes six land ports of entry (POEs) along the California-Mexico border (Caltrans, 2015). The highways that define this corridor are within two miles of eight airports. SAN is the only large hub passenger airport in the corridor, and it is the only airport to report air cargo to the U.S. DOT, although some of the other airports may serve as-needed air cargo operations by charter carriers.

Table 5-3: Airports within two miles of the San Diego/Mexico Border – Inland Empire Connections Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
San Diego (SAN)	Commercial Service – Primary	330,763,978
Montgomery (MYF)	General Aviation – Reliever	0
Brawley (BWC)	General Aviation	0
Calexico (CXL)	General Aviation	0
Jacqueline Cochran (TRM)	General Aviation	0
Perris Valley (L65)	Non-NPIAS	0
Salton Sea (SAS)	Non-NPIAS	0
Bermuda Dunes (UDD)	Non-NPIAS	0
Total		**330,763,978**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

South Coast – Central Coast Corridor

Table 5-4: The South Coast – Central Coast Corridor connects the central coast to Southern California. Every mode of freight is prevalent in the corridor. Almost the entire freeway system in the Los Angeles region has been identified by the Federal Highway Administration (FHWA) as a component of the National Primary Freight network. Challenges for freight movement are endemic due to competition for space on the transportation system by passenger modes. Ten airports reside within two miles of the highways defined in this corridor, including seven commercial service airports. Los Angeles and Ontario International airports include major air cargo operations and are responsible for moving 92 percent of the air cargo within the corridor.

Table 5-4: Airports within two miles of the South Coast-Central Coast Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
Los Angeles (LAX)	Commercial Service Primary	5,336,561,890
Ontario (ONT)	Commercial Service Primary	1,502,227,780
San Diego (SAN)	Commercial Service Primary	330,763,978
Burbank (BUR)	Commercial Service Primary	105,423,498
Long Beach (LGB)	Commercial Service Primary	46,839,298
John Wayne (SNA)	Commercial Service Primary	39,159,450
Santa Barbara (SBA)	Commercial Service Primary	3,326,148
Camarillo (CMA)	General Aviation – Reliever	0
Fullerton (FUL)	General Aviation – Reliever	0
Bob Maxwell (OKB)	General Aviation	0
Total		**7,364,302,042**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

Central Coast – San Jose / San Francisco Bay Area Corridor

Table 5-5: The Central Coast – San Jose/San Francisco Bay Area Corridor connects the Central Coast to San Jose and San Francisco Bay region. US Highway 101 (US 101) is the major interregional transportation facility that traverses the entire corridor; intercity rail services, including portions of the CHSR corridor, pass through the northernmost portion. The corridor passes through one of California's top agricultural production regions (Caltrans, 2015). Produce is generally seen as high in weight, low in value, and mostly moves by rail and truck. There are 14 airports, including four commercial-service airports, within two miles of the corridor's principal highways. The corridor includes US 101 from San Jose to the northern half of Santa Barbara County. Over 96 percent of air cargo in the corridor moves through SJC.

Table 5-5: Airports within two miles of the Central Coast- San Jose/San Francisco Bay Area Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
San Jose (SJC)	Commercial Service Primary	120,093,386
Santa Maria (SMX)	Commercial Service Primary	2,354,713
San Luis Obispo (SBP)	Commercial Service Primary	1,967,506
Monterrey (MRY)	Commercial Service Primary	569,378
Paso Robles (PRB)	General Aviation	13,728
Salinas (SNS)	General Aviation	13,727
San Martin (E16)	General Aviation - Reliever	0
Palo Alto (PAO)	General Aviation - Reliever	0
Reid Hillview (RVH)	General Aviation - Reliever	0
Mesa Del Rey (KIC)	General Aviation	0
Oceano (L52)	General Aviation	0
Watsonville (WVI)	General Aviation	0
Hollister (CVH)	General Aviation	0
Frazier Lake (1C9)	Not a NPIAS Facility	0
Total		**125,012,438**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

San Jose / San Francisco Bay Area – North Coast Corridor

Table 5-6: The San Jose/San Francisco Bay Area – North Coast Corridor is the coastal south-north connector linking the San Francisco Bay Area to California's remote North Coast. US 101 is the primary transportation facility used for interregional travel and serves as a lifeline for the movement of people, goods, and services, but much of US 101 passes through areas of geological instability, sensitive environmental resources, and cultural and historical resources. The corridor includes the portion of US 101 that extends northward from the San Francisco Bay Area to the Oregon border. There 17 airports within two miles of the highways that define the corridor, Including four commercial service airports. Six airports reported air cargo operations in 2018, four of which were commercial service airports. Over 99 percent of air cargo in the corridor moves through SFO and OAK.

Table 5-6: Airports within two miles of the San Jose / San Francisco Bay Area – North Coast Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
San Francisco (SFO)	Commercial Service Primary	1,468,184,837
Oakland (OAK)	Commercial Service Primary	1,352,063,003
Arcata (ACV)	Commercial Service Primary	1,612,721
Ukiah (UKI)	General Aviation	618,264
Murray Field (EKA)	General Aviation	284,070
Sonoma County (STS)	Commercial Service Primary	1,337
Gnoss Field (DVO)	General Aviation - Reliever	0
Palo Alto (PAO)	General Aviation - Reliever	0
Petaluma (O69)	General Aviation - Reliever	0
San Carlos (SQL)	General Aviation - Reliever	0
Cloverdale (O60)	General Aviation	0
Garberville (O16)	General Aviation	0
Healdsburg (HES)	General Aviation	0
Rhonerville (FOT)	General Aviation	0
Willits (O28)	General Aviation	0
Andy McBeth (S51)	Not a NPIAS Facility	0
Samoa Field (O33)	Not a NPIAS Facility	0
Total		**2,822,764,232**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

San Jose/San Francisco Bay Area – Central Valley – Los Angeles Corridor

Table 5-7: The San Jose/San Francisco Bay Area – Central Valley – Los Angeles Corridor links southern and northern California and is a significant business, recreational tourism, and freight movement corridor. The southern end of the San Joaquin Valley provides access to the Los Angeles area through I-5 (for autos, trucks, trains, and buses, including Amtrak Throughway Buses) and freight rail lines. It is also a vital link to the ports of Los Angeles and Long Beach. On the northern end of the San Joaquin Valley, connectivity is provided to the Port of Oakland, which serves as an essential international food export gateway, and Interstates 5 (I-5) and 80 (I-80), which provide connectivity to the north and east (Caltrans, 2015). The corridor has 24 airports within two miles of the principal highways, including 10 commercial service airports. Nine airports within the corridor reported air cargo in 2018, eight being commercial service airports.

Table 5-7: Airports within two miles of the San Jose / San Francisco Bay Area – Central Valley – Los Angeles Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
Los Angeles (LAX)	Commercial Service Primary	5,336,561,890
San Francisco (SFO)	Commercial Service Primary	1,468,184,837
Oakland (OAK)	Commercial Service Primary	1,352,063,003
San Jose (SJC)	Commercial Service Primary	120,093,386
Burbank (BUR)	Commercial Service Primary	105,423,498
Stockton (SCK)	Commercial Service Primary	89,399,267
Fresno (FAT)	Commercial Service Primary	20,468,771
Visalia (VIS)	General Aviation	2,583,878
Bakersfield (BFL)	Commercial Service Primary	2,136,193
Merced (MCE)	Commercial Service Non-Primary	0
Fresno Chandler (FCH)	General Aviation - Reliever	0
Whiteman (WHP)	General Aviation - Reliever	0
Shafter – Minter (MIT)	General Aviation	0
Tracey (TCY)	General Aviation	0
Modesto (MOD)	General Aviation	0
Madera (MAE)	General Aviation	0
Mefford Field (TLR)	General Aviation	0
Chowchilla (2O6)	General Aviation	0
Delano (DLO)	General Aviation	0
Franklin Field (F72)	General Aviation	0
Selma (0Q4)	Not a NPIAS Facility	0
Kingdon Airpark (O20)	Not a NPIAS Facility	0
Lodi (1O3)	Not a NPIAS Facility	0
Harris Ranch (3O8)	Not a NPIAS Facility	0
Total		**8,496,914,723**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

Sacramento Valley – Oregon Corridor

Table 5-8: The Sacramento Valley – Oregon Corridor links the Sacramento Valley through the northern part of the State to the Oregon border. This important connection between California and states to the north provides a connection to Canada.

Much of the Sacramento Valley depends on this corridor to export agricultural products and import farming and ranching supplies (Caltrans 2015). The roads that comprise this corridor pass within two miles of 10 airports, including two CS airports. Three airports reported air cargo in 2018, two of which were the commercial service airports. More than 99 percent of air cargo in the corridor moved through SMF.

Table 5-8: Airports within two miles of the Sacramento Valley -Oregon Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
Sacramento International (SMF)	Commercial Service Primary	255,000,433
Redding (RDD)	Commercial Service Primary	1,726,687
Chico (CIC)	General Aviation	254,701
Corning (0O4)	General Aviation	0
Dunsmuir (1O6)	General Aviation	0
Red Bluff (RBL)	General Aviation	0
Sutter County (O52)	General Aviation	0
Weed (O46)	General Aviation	0
Willows – Glenn (WLW)	General Aviation	0
Yuba County (MYV)	General Aviation	0
Total		**256,981,821**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018. Note 2 – CIC passenger service has been intermittent; none at the time of CASP 2020 publication.		

High Desert – Eastern Sierra – Northern Nevada Corridor

Table 5-9: The High Desert – Eastern Sierra – Northern Nevada Corridor links the Los Angeles region to northern Nevada, including Lake Tahoe and Reno. The corridor traverses the east side of the Sierra Nevada mountain range and provides a consistently high level of service for local trips and the interregional and interstate movement of people, goods, and recreational travel. The highways that define this corridor pass within two miles of 11 airports, including one commercial-service airport, MMH, which reported (limited) cargo activity with two general aviation airports, and one reliver airport report. Airports in this mostly rural region have added importance for air ambulance services and as staging areas in response to catastrophic events. (Caltrans, 2015)

Table 5-9: Airports within two miles of the High Desert-Eastern Sierra-Northern Nevada Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
Inyokern (IYK)	General Aviation	666,529
Bishop (BIH)	General Aviation	381,752
Southern CA Logistics (VCV)	Reliever	105,793
Mammoth Yosemite (MMH)	Commercial Service Primary	3
Agua Dulce (L70)	Not a NPIAS Facility	0
Bryant Field (O57)	General Aviation	0
Independence (2O7)	General Aviation	0
Lee Vining (O24)	General Aviation	0
Lone Pine (O26)	General Aviation	0
Mojave Air and Space Port (MHV)	General Aviation	0
Rosamond (L00)	Not a NPIAS Facility	0
Total		**1,154,077**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

Southern California – Southern Nevada/Arizona Corridor

Table 5-10: The Southern California – Southern Nevada/Arizona corridor is in the nation's largest and most important freight gateway and corridor for international trade. The corridor's seaports and the massive logistics and manufacturing sectors are connected to the rest of the country by three interstate highways (I-10, I-15, and I-40) and parallel freight rail routes. In addition, two interstate highways (I-15 and I-40) link the San Joaquin Valley to the southern United States. The I-15 corridor also provides a vital link between Mexico, Southern California, and locations to the north and east of the region (Caltrans 2015). This corridor includes the nation's highest density and most extensive warehousing facilities, which serve consumer markets in Southern California and the nation's southwest. The corridor and its connecting freeways are characterized by very high truck volumes and frequent traffic congestion (Caltrans 2015). The highways that define this corridor pass within two miles of 15 airports, including five commercial service airports. The commercial service airports and one reliever airport reported air cargo in 2018.

Table 5-10: Airports within two miles of the Southern California – Southern Nevada / Arizona Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
Los Angeles (LAX)	Commercial Service Primary	5,336,561,890
Ontario (ONT)	Commercial Service Primary	1,502,227,780
San Diego (SAN)	Commercial Service Primary	330,763,978
Long Beach (LGB)	Commercial Service Primary	46,839,298
San Bernardino (SBD)	Reliever	1,859,081
Palm Springs (PSP)	Commercial Service Primary	402,089
San Gabriel Valley (EMT)	General Aviation - Reliever	0
Santa Monica (SMO)	General Aviation - Reliever	0
Brackett Field (POC)	General Aviation - Reliever	0
Cable (CCB)	General Aviation - Reliever	0
Blyth (BLH)	General Aviation	0
Banning (BNG)	General Aviation	0
Chiriaco Summit (L77)	Not a NPIAS Facility	0
Bermuda Dunes (UDD)	Not a NPIAS Facility	0
Baker (0O2)	Not a NPIAS Facility	0
Total		**7,258,654,116**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

Development of logistics centers in SBD and ONT illustrate an ongoing trend by air cargo airlines towards less expensive real estate located outside of urban cores but with access to strong surface transportation links (Sperance, 2020).

Central Coast and San Joaquin Valley East/West Connections Corridor

Table 5-11: The Central Coast and San Joaquin Valley East-West Connections corridor provides connectivity between two major agricultural regions within central California. The corridor also supports connectivity for national defense and ensures the efficient movement of troops and equipment for Vandenberg Air Force Base, as well as four additional military bases along the coast (Caltrans 2015). 17 airports, including two with commercial service, are within two miles of the corridor's principal highways.

Both commercial service airports and four GA airports reported air cargo operations in 2018. The greatest amount of air cargo transited the Visalia Municipal Airport (VIS), which is within two miles of State Routes 99 (SR-99) and 198 (SR-198) and is a transportation hub for all cargo and corporate aircraft activity in the Tulare/Kings county area (City of Visalia, 2020).

Table 5-11: Airports within two miles of the Central Coast – San Joaquin Valley East/West Connections Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
Visalia (VIS)	General Aviation	2,583,878
Bakersfield (BFL)	Commercial Service Primary	2,136,193
San Luis Obispo (SBP)	Commercial Service Primary	1,967.506
Paso Robles (PRB)	General Aviation	13,728
Salinas (SNS)	General Aviation	13,727
Tehachapi (TSP)	General Aviation	6,272
Bakersfield (L45)	General Aviation	0
Delano (DLO)	General Aviation	0
Los Banos (LSN)	General Aviation	0
Mefford (TLR)	General Aviation	0
Marina Municipal (OAR)	General Aviation	0
Shafter – Minter (MIT)	General Aviation	0
Wasco – Kern (L19)	General Aviation	0
Hollister (CVH)	General Aviation	0
Mountain Valley (L94)	Not a NPIAS Facility	0
Selma (0Q4)	Not a NPIAS Facility	0
Frazier Lake (1C9)	Not a NPIAS Facility	0
Total		**6,721,304**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

San Jose/San Francisco Bay Area – Sacramento – Northern Nevada Corridor

Table 5-12: The San Jose/San Francisco Bay Area–Sacramento – Northern Nevada Corridor is the primary west-east connection between the San Francisco Bay Area northern Nevada and points east. Interstate-80 starts in San Francisco and terminates at the Hudson River at New York City. The portion of I-80 east of Sacramento is subject to storm-related delays and closures in winter. Ten airports, including four that reported air cargo in 2018, are within two miles of the corridor's main highways.

Table 5-12: Airports within two miles of the San Jose / San Francisco Bay Area – Sacramento – Northern Nevada Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
San Francisco (SFO)	Commercial Service Primary	1,468,184,837
Oakland (OAK)	Commercial Service Primary	1,352,063,003
[Mather (MHR) (See Aero Division note)	General Aviation - Reliever	154,269,244
San Jose (SJC)	Commercial Service Primary	120,093,386
McClellan (MCC)	General Aviation	37,786
Livermore (LVK)	General Aviation - Reliever	0
Truckee-Tahoe (TRK)	General Aviation	0
University (EDU)	General Aviation	0
Nut Tree (VCB)	General Aviation	0
Auburn (AUN)	General Aviation	0
Blue Canyon (BLU)	Not a NPIAS Facility	0
Total		**3,094,648,256**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

The ITSP of 2015 indicates this corridor includes U.S. highway 50. It passes Sacramento's Mather airport (MHR), but the airport is beyond the two-mile criterion applied to I-80 to examine the corridors and identify proximal airports. Although local streets are required for surface vehicles between MHR and the warehouses of cargo operators located in the industrial parks of southeast Sacramento, access to MHR remains viable to help ease congestion with passenger traffic at SMF.

North Coast – Northern Nevada Corridor

Table 5-13: The North Coast – Northern Nevada Connections corridor consists of two separate east-west highway corridors in northern California between the coast and the eastern part of California and western Nevada. These routes provide access to communities throughout the region, supporting the regional economy for moving goods and people and providing connection to emergency services and other vital health and human services.

The interregional facilities also provide the routes that further support the local economy for recreational tourism, and they are the major transportation corridors for response and recovery efforts during emergencies. (Caltrans 2015). The population centers are Redding and Eureka-Arcata. 12 airports are within two miles of the highways that define this corridor (**Table 5-13**), and those reporting air cargo in 2018 were the two commercial service airports.

Table 5-13: Airports within two miles of the North Coast-Northern Nevada Corridor

Airport	NPIAS Classification	Air Cargo (lbs.)
Redding (RDD)	Commercial Service Primary	1,726,687
Arcata (ACV)	Commercial Service Primary	1,612,721
Benton (O85)	General Aviation	0
Sutter County (O52)	General Aviation	0
Colusa (O08)	General Aviation	0
Lampson Field (1O2)	General Aviation	0
Lonnie Pool Field (O54)	General Aviation	0
Nevada County (GOO)	General Aviation	0
Susanville (SVE)	General Aviation	0
Blue Canyon (BLU)	Not a NPIAS Facility	0
Total		**3,339,408**
Note 1 – Air Cargo = Freight and Mail from USDOT T-100 for calendar year 2018.		

Corridor Summary

Congestion issues and access comprise the key factors to summarize the relationship between interregional corridors and airports. Congestion can remain burdensome if corridor planning fails to recognize connections needed between key freight terminals (e.g., spurs for major ports), or missing the potential that awaits utilization of airports outside of key metro hubs, assuming access is viable. Accordingly, support for corridor maintenance and improvements has impact beyond their use by surface vehicles and rail connections.

Air Cargo Needs: 2020 to 2045

In 2013, Caltrans completed an *Air Cargo Groundside Needs Study* to identify the extent to which key facilities in California's airport system would likely be challenged by air cargo growth over a 20- to 30-year planning horizon. Based on available economic data, the study concluded that between 2012 and 2040, the growing air freight traffic industry has the potential to create a total of 50,000 new full-time equivalent jobs in the region, or an increase of 98 percent (Caltrans 2013).

Consequently, mobility and travel time reliability would pose challenges, especially for LAX and SFO. However, the report underscored the relationship between air cargo services and the trucks that travel to and from the airport:
"Adequate access to the airport through the highway system is important and future highway needs and improvements must be coordinated appropriately among the airport, State, and city planning agencies. As air cargo grows, so will the volume of truck traffic that carries the cargo to and from the airport" (Caltrans 2013).

Caltrans' CFMP indicates that these concerns about mobility are ongoing, stating that traffic congestion cost the California trucking industry more than $5 billion in 2016, a 6.4 percent increase over the 2015 estimate (Caltrans, 2019). As shown in **Table 5-14**, air freight flows are expected to show substantial increases between 2015 and 2045, and truck traffic to and from airports will likely grow as well, further increasing congestion and delay:

Table 5-14: Forecast Growth of California Air Freight Trade Flows, 2015 to 2045

Origin / Destination	Imports to California	Exports from California
Major World Regions and California	124%	179%
Major World Regions Through California	2%	395%
California and other U.S. States	46%	109%
Major World Regions through other U.S. States, to California	219%	409%
Within California	85%	
Growth rates are shown based on weight, not value. Source: Caltrans, 2019.		

5.3.3 Industry Trends and Opportunities

One contributor to the strong growth in California air cargo traffic is the increase in e-commerce activity (Caltrans, 2019). Warehouses and distribution centers are being developed across the state to satisfy consumer expectations of a wide variety of goods available with short shipping times. This business practice presents an opportunity for dispersing air cargo volumes to less utilized airports. Distribution centers have recently opened adjacent to SMF in 2017 (Moleski, 2019) and San Bernardino International Airport (SBD) advanced the development of an air cargo facility in 2019 in response to proposed distribution center development (Dean, 2019). If these developments are successful, then similar developments may follow at other airports outside of congested urban areas.

Real estate economics is another contributing factor; the increased need for warehouses and the cost of real estate in urban areas continues to push logistics companies from urban areas to suburban or rural areas. Air cargo operations at airports in the Inland Empire of Southern California, such as ONT and SBD, are growing as shippers choose airports adjacent to less congested road networks rather than LAX (Emerson, 2018; Katzenik, 2020).

As logistics companies seek to reduce overhead, they may be attracted to utilize other airports along California's Strategic Interregional Corridors that include aviation facilities that can accommodate the air cargo activities, such as runways of sufficient length to accommodate their aircraft, parking aprons, and property for air cargo transport development. Airports can assess the adequacy of their facilities for air cargo development using the guidelines in the 2015 "Air Cargo Facility Planning and Development Final Report." (National Academy of Sciences, Engineering, and Medicine, 2015).

Air cargo is an important revenue generator for airports. Airports generally charge for cargo by landed weight and through ground leases to warehouse and processing facility operators (National Academies of Sciences, Engineering, and Medicine, 2017). As air cargo volumes grow, airport revenue associated with accommodating this demand is expected to increase in kind. The ability of some airports, such as SBD and MHR, to attract air cargo in lieu of passenger service identifies how airports with adequate airfield and adjacent transportation facilities can capitalize on growing air cargo volumes.

Improving Access for Freight and Goods Movement

The "California Air Cargo Groundside Needs Study" concluded that airports must position themselves as freight industry partners providing facilities that will optimize the value to tenants and uses (Caltrans 2013). The study identified opportunities for airport operators to improve the performance of the air cargo system that include:

- Linking phasing of actions to market triggers, rather than planning horizons
- Increasing the handling capacity and ability to consolidate shipments by constructing additional supporting facilities and/or improving and expanding existing areas to serve air cargo activity
- Identifying and providing/accommodating key elements for ground handling, fueling, tall and clear span cargo storage areas, screening facilities, and customs processing
- "Airside" space for aircraft, vehicle, and truck parking
- Re-designed roadway geometry to accommodate 53-foot tractor trailer trucks, to separate trucks from passenger vehicles
- Security elements and other amenities which may have peak demand windows

Supporting Freight Mobility Through Compatible Non-Aeronautical Development

Many GA airports, including county-owned and municipal airports, struggle financially. Airports that are not included in the NPIAS are not eligible for federal grants, and even routine maintenance can promote funding challenges. Few of the airports within two miles of interregional corridors currently offer freight handling facilities. While their proximity may make them attractive for such development, other opportunities may be available to enable these airports to contribute to the statewide passenger transportation system through compatible, non-aeronautical development.

Alternative Fuel Facilities

As of 2018, zero-emission electric trucks could travel 75 to 200 miles before requiring a 90-minute charging time. Hydrogen fuel cell trucks could produce the same output but required much less time to refill the tank. Initial costs are substantial, but 50% of the total near-dock miles traveled in the Ports of Los Angeles and Long Beach are predicted to come from Zero Emissions Vehicles (ZEVs) in 2035, suggesting a return on investment to be accepted over time.

As set forth in the Caltrans' "Sustainable Freight Action Plan of 2016," ZEVs "in the freight industry to zero-emission capabilities is particularly important to reduce pollution in local communities near freight transportation hubs."

ZEV success depends on a robust fueling infrastructure. California airports located near interregional corridors can support the transition to a statewide clean transportation system by:

- Installing ZEV charging stations for airport users and truckers passing on nearby highway corridors
- Installing hydrogen fuel recharging stations for truckers and users passing on nearby corridors
- Developing appropriate solar facilities to power airport operations and provide power to metered ZEV charging stations as a source of revenue generation

FAA and State programs encourage the development of electrical systems, and federal and State programs may be available to support facility development. In addition, public utility providers may offer programs to enable airports to construct these facilities and sell back a portion of the power to the provider. Caution must be taken to ensure that these facilities are constructed in appropriate landside areas and to prevent hazards to aircraft operations. The ITSP recognizes that the ability to fund projects to address corridor needs remains a "real and significant challenge" for the State and identifies potential funding options for improving regional connections, such as the Regional Transportation Improvement Program (RTIP), SHOPP, and local funding options (Caltrans 2015). **See Appendix D.**

On-site Logistics Complex/Cargo Village

Airports with room for compatible development have worked with private partners to develop a "cargo village" or on-airport logistics complex. A cargo village can refer to virtually any element of the air cargo industry but usually restricts commercial development. Development supports the activities of freight forwarders, customs brokers, and other directly supporting services. However, as identified in the 2013 "Caltrans Air Cargo Groundside Study," such complexes are unlikely to attract cargo operations; they are usually successful if there is an existing or strong potential market.

Some airport operators have used their excess land to develop aviation-compatible employment centers or industrial parks that include other aviation-compatible uses in addition to air cargo support, such as light industrial, office, and manufacturing or assembly uses. Such facilities can be developed on excess airport property or adjacent property to create synergies with airport uses. It is important, however, to remember that these types of development depend on demand and access to roadway infrastructure. Examples of successful industrial business parks near airports include McClellan Air Park in Sacramento, which was constructed at a former military airfield, and SBD, which includes a nearby rail connection.

5.4 RESILIENT AIRPORTS AND INTERREGIONAL CORRIDORS

The State's Natural Resource Agency has led statewide efforts to identify the effects of climate change and climate adaption. Caltrans has built upon these efforts by initiating district-specific Vulnerability Assessments to better understand the risk to the State's Highway System and other Caltrans assets. The assessments seek to:

- Understand the types of weather-related and longer climate change events that will occur with greater frequency or intensity in the future
- Assess and identify system assets that are vulnerable to various climate influences and natural hazards
- Develop a method to prioritize candidate projects that respond to climate change concerns as resources become available

The climate/extreme weather conditions evaluated for each District include temperature increase, precipitation volatility, SLR, storm surge, wildlife, and combined events (i.e., wildlife and flooding, SLR and storm surge). A summary is provided in **Appendix E**.

An example of the application of available data is provided in **Figures 5-2** and **5-3**. **Figure 5-2** uses available data to identify the airports in California that are vulnerable to SLR at various depths, and **Figure 5-3** identifies the portions of the strategic corridors that are also vulnerable to SLR. The data developed for the regional Vulnerability Assessments by wildfires and other regional effects could be applied in a similar manner to identify the risks posed to California's aviation system and interregional transportation system.

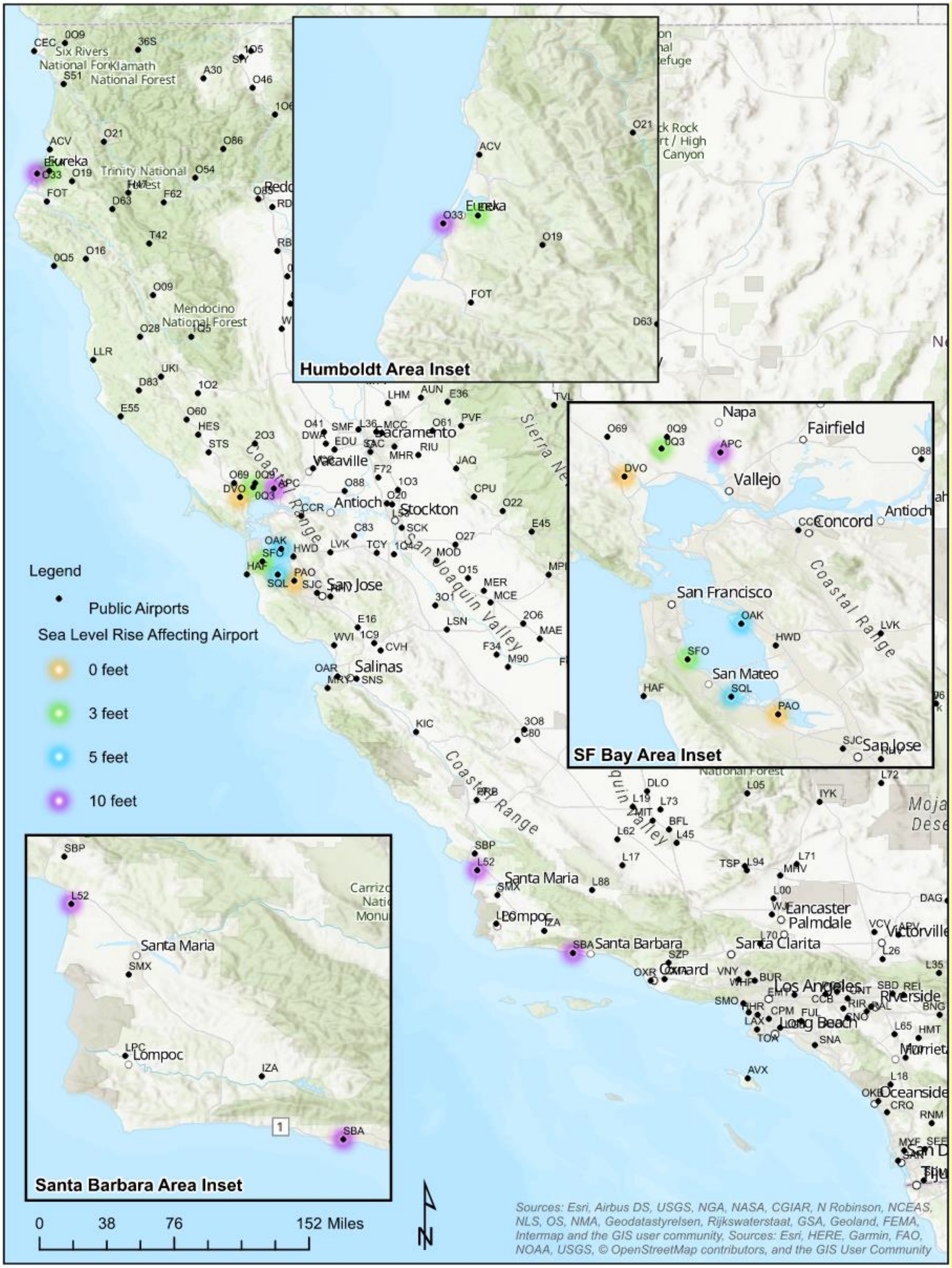


Figure 5-2: SLR and Potentially Affected Airports

Source: Caltrans, 2015 and Mead & Hunt, Inc. 2020.

Figure 5-3: SLR with Strategic Interregional Corridors and Airports Within Two Miles Source: Caltrans, 2015 and Mead & Hunt, Inc. 2020.

5.4.1 Climate Adaptation

Airports are vulnerable to damage or disruption in the event of a natural disaster or climate emergency. One or more of the key airports identified in California's intermodal transportation system could face operational disruptions that could include, but not be limited to:

- Smoke from fires that can effectively close airports when visibility drops below instrument minimums
- Potential SLR flooding for low-lying airports, which may render an entire facility unusable
- Earthquakes that can damage pavements and structures and require long-term relocation of aviation services
- Damage to nearby roads can isolate airports and disrupt passenger and air cargo operations

Of the 115 airports located within two miles of the State's interregional corridors, only 35 contribute to intermodal freight movement today, and nearly all are commercial service airports. The remaining 80 airports may offer opportunities to diversify and expand California's passenger and air cargo network to improve efficiency during normal operations and improve system resiliency in the event of an emergency or natural disaster. While only some of these airports will have the runway length and other facilities necessary to support the aircraft used by passengers and air cargo transport, they may support ongoing operations if airports or road networks were damaged following a natural disaster or more predictable effects associated with extreme weather, SLR, or wildfires. The right strategy shifts appropriate aircraft to smaller airports as staging areas for emergency support services.

The movement of supplies and personnel in emergency situations will test the intra-state cargo network, and the predictive data presented in the Vulnerability Assessments could be applied to the aviation system to identify the most vulnerable airports, including those near interregional corridors. The many airports located along the strategic corridors that are not currently used to move people or goods should be evaluated to identify opportunities to provide systemwide resiliency during an emergency response effort, and necessary improvements should be identified to make airports more resilient to climate change or to ready them for use in the event of an emergency.

The number and distribution of these airports is unparalleled in most places in the world, and with adequate investment, the airports could support routine air traffic during normal operations and the movement of specialists and supplies during emergencies.

5.5 PLANNING FOR ACCESS AND MOBILITY

5.5.1 Planning and Policy Framework

Access to airports and freight movement facilities depends on factors that extend beyond airport boundaries, including plans made by local and regional planning agencies spanning one or multiple jurisdictions, and decisions made by elected officials associated with multiple jurisdictions. Local and regional planning efforts are critical to ensure access to airports and air cargo facilities, but numerous agencies and processes summarized in **Table 5-15** influence effective mobility and access:

Table 5-15: Plans and Planning Agencies that influence Airport Mobility and Access

Plan/Process	Description	Agency Approvals/ Authorizations
Airport Master Plans or ALPs	Airport Master Plans and ALPs consider curbside internal roadways and connections to local and regional roadways. Master Plans must be prepared in accordance with FAA regulations and guidance	FAA approval for funding and local jurisdiction approval/acceptance as needed
ALUCP	ALUCPs consider proposed development within a designated AIA. ALUCs cannot influence airport development, they can evaluate the compatibility of proposed transportation facilities for their consistency with airport operations.	ALUC, affected jurisdictions, cities and counties/adjacent counties
Local General Plans and Zoning Ordinances	Local General Plans, Specific Plans, and Zoning Ordinances guide the locations of and types of proposed development, including land uses and transportation infrastructure.	Local agency (City, County, or Special District)

Plan/Process	Description	Agency Approvals/ Authorizations
RTPs and MPOs	RTPAs and MPOs prepare RTPs to identify the surface transportation projects, programs, and services needed to address current and future regional growth and specify major transportation projects to be programmed based on available financial resources. RTPs are prepared in accordance to guidance set forth by the FHWA and the CTC.	California Air Resources Board review via SCS plans prepared by the State's 18 MPOs
Caltrans	As the State's Transportation Planning Agency, Caltrans includes many divisions associated with long-range planning for the many modes that comprise the statewide transportation system. Each Caltrans division is responsible for preparing a long-range plan, which is incorporated into the overall California Transportation Plan, such as the California State Rail Plan, Freight Mobility Plan, Interregional Corridor Plan, and Aviation System Plan. Each plan is prepared using guidance provided by federal agency partners.	CTC
Office of Planning & Research	Within the Governor's Office, OPR has statutory guidance to work with Caltrans on aviation planning.	Not specified in Gov. Code 65040.1

Environmental reviews conducted pursuant to NEPA and/or CEQA also influence transportation planning projects and decisions.

5.5.2 Challenges and Opportunities

Challenges

Numerous agencies and stakeholders influence how Californians gain access to and use the statewide aviation system. In some cases, decisions made by local, regional, and state agency plans are made in isolation and miss helping the aviation system. Several factors, such as fundamental differences in regulatory frameworks among agencies, and their funding requirements, contribute to this "disconnect" between aviation and the decisions made by other agencies.

Regulatory Frameworks

The FAA is the sole federal authority charged with overseeing civil aviation in the U.S. Its regulations and guidance govern airport funding, development and the National Airspace System. The Division utilizes FAA grants for system plan studies, just as airports use grants for capital projects, limiting the opportunity to consider other funding sources since aviation (overall) is FAA jurisdiction.

In a similar manner, other Caltrans Divisions are also governed by federal agencies and their rules, regulations and guidance. For example, the CFMP is funded and governed by the FHWA; the California Rail plan is under the auspices of the Federal Railroad Administration (FRA), and State, regional, and local transit agencies collaborate with the Federal Transit Administration (FTA).

In terms of mobility and access for aviation, FAA guidance and funding focuses only on surface transportation facilities that are constructed on airport property. Airport operators are responsible for reviewing the potential effects of proposed facilities that occur in the airport vicinity for their potential effect on airport operations and infrastructure. Depending on the structure of the local MPO or RTPA, the airport manager may be involved only minimally—or isolated from—regional facility planning or decision-making processes. Moreover, the use of FAA grant funds to support industrial or non-aeronautical facilities can be viewed as a diversion of revenue from other airport needs (ACRP 2020).

Funding Decisions and Resources

Federally required transportation planning processes must result in the creation of a Transportation Improvement Program (TIP) that outlines the transportation investments that will occur in the region based on existing or forecasted needs. The planning process that is undertaken by MPOs and RTPAs are expected to identify the benefits and consequences of such the proposed improvements (ACRP 2020).

Opportunities

Although transportation planning agencies may have divergent goals associated with transportation planning and investments, the State has worked to provide a focused vision for its statewide transportation system—regardless of mode or funding source — through ongoing legislation, executive orders, and programs that contribute to the aggressive reductions in transportation-related GHG emissions. Constructive measures include:

- SB 375 which identifies the direct link between land use and transportation to reduce GHG emissions.
- SB 391, which requires Caltrans to update the CTP every five years while showing how the State will achieve the statewide GHG reduction goals.

SB 391 is revolutionary because it requires Caltrans to focus the transportation goals and investments associated with all transportation modes (transit, rail, aviation, highways and maritime) through the lens of a single statewide transportation plan that addresses and marks progress toward the single goal of GHG reduction. While the various Divisions within Caltrans will continue to adhere to federal agency planning and funding regulations and guidance, they will do so more cohesively and consistently as a result of:

- CTP development
- The increased focus of regional transportation planning and sustainable community strategies that link transportation and housing through SB 375
- The ongoing efforts of MPOs and RTPAs that consider aviation within their regional plans.

Regional Transportation Planning Efforts

Through SB 375 and the CTC's subsequent guidance to MPOs and RTPAs, California's transportation planning agencies are considering aviation more deliberately in their plans. For example: the joint Bay Area Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments' (ABAG) "Plan Bay Area 2040;" San Diego Association of Government's (SANDAG's) "2050 Regional Transportation Plan," and "Connect SoCal," known as the "2016-2040 Regional Transportation/Sustainable Communities Strategy" from the Southern California Area Government's (SCAG).

Plan Bay Area 2040

This Plan integrates transportation, land use, and housing planning to guide the area toward GHG emissions and improved quality of life in alignment with the State's goals and CTP 2040:

- The proliferation of goods movement hubs just east of the region's boundaries, which seek to take advantage of lower land prices and prevailing wages
- The ongoing desire of several firms to remain in the Bay Area, both to deliver goods to the region's residents and businesses and to maintain access to existing seaports, airports, and industrial facilities
- The increased congestion resulting from both trends

Although Plan Bay Area 2040 does not discuss specific airport-related measures, it includes airports in its discussion of regional transportation improvements, highway system improvements, and local transit system improvements over the planning period.

Metropolitan Transportation Commission

The Bay Area MTC is working collaboratively with the Sacramento and San Joaquin regions to improve transportation connectivity and boost the competitiveness of the "megaregional" economy. MTC, the Bay Area Urban Areas Security Initiative, and Caltrans are also engaged in collaborative planning workshops to enhance the role of aviation in critical transportation response and recovery operations during emergencies.

San Diego's 2050 Regional Transportation Plan

San Diego area residents are challenged by congested commutes and limited access to public transit. Goods are primarily moved by truck, with some use of air cargo, maritime, rail, and intermodal transportation. The 2050 SANDAG RTP seeks to promote to an enhance quality of life, sustainability, and offer more mobility options to the region's residents and visitors in order to achieve social equity and create a "world-class" transit system.

Commercial Service Airports and Transportation Access

The 2050 RTP describes the regions, three commercial airports and 12 public use airports that provide a mix of general aviation and corporate services.
These facilities are specifically identified in the 2050 RTP as areas for improvement of access and intermodal connections to "maximize the efficiency and effectiveness of existing and planned aviation facilities…using all the transportation infrastructure available." The 2050 RTP includes a specific discussion on San Diego International Airport (SAN) and notes that "capacity constraints are likely at SAN [and] will result in the inability of the region to accommodate all demand." This concern includes cargo. The plan proposes to address with improved access roads in order to support increasing cargo handling capacity and take advantage of the Airport's central location for connections to ground cargo.

Access and Air Cargo

San Diego International Airport is also a priority air cargo gateway, according to the State's Global Gateways Development Program. According to the 2050 Regional Transportation Plan, the Airport is constrained by infrastructure, which the plan proposes to address with improved access roads in order to support increasing cargo handling capacity and take advantage of the Airport's central location for connections to ground cargo. Regarding aviation more generally, the 2050 RTP includes several system development actions focused on aviation and ground access. Two of these are related to emissions reductions and air quality standards, one pertains to airport land use compatibility, one describes next steps multimodal airport planning (development of ITC at SDIA and regular coordination), and a fifth encourages "local jurisdictions and transit districts to incorporate airport ground access improvements in local plans."

Southern California Association of Governments' Connect SoCAL

AS the nation's largest MPO, SCAG represents six southern California counties and approximately 50 airports. The agency includes dedicated aviation planning staff.

SCAG understands that the ground access network serving a region's airports is critical to both the aviation system and the ground transportation system, as it influences airport choice, is essential to the efficient functioning of the aviation system and can contribute to local congestion in the airport vicinity (SCAG, 2016). "Connect SoCal" includes a technical report that addresses the regional socio-economic overview, demand forecasts, and identifies recent and proposed ground access projects.

5.6 CTP 2050 ACCESSIBILITY OBJECTIVES

According to CTP 2050, "mobility" has been one concept. Today, with "accessibility," transportation planning encourages both land use and transportation solutions for people's access to jobs, services, educational opportunities, recreation, and more.

5.6.1 Increase access to destinations

Accessibility can be improved not only through transportation system enhancements, but through compact, diverse land uses that support multiple modes and facilitate shorter and more convenient trips.

5.6.2 Increase the competitiveness of transit, shared mobility, and active transportation

This objective recognizes the need to address the current auto-oriented nature of our transportation system by leveling the playing field across modes. It requires expanding access to airports, transit, first-and last-mile options, biking and walking, and emerging forms of on-demand, shared and dockless mobility, in a way that is safe, affordable, and accessible to people of all ages, incomes, and abilities.

5.6.3 Provide integrated and seamless travel connections

Many Californians use multiple modes of transportation to reach their destinations. Integrating and connecting these modes, as well as addressing gaps in the existing transportation network, is essential to improving the convenience and reliability of travel throughout the State.

5.6.4 Optimize system performance for all modes

To maximize accessibility for future generations, California must address our growing traffic congestion and optimize system performance across all modes of travel. (Caltrans 2021)

With approximately half of California's 241 public-use airports located near highway corridors, and as California's airports become increasingly vital elements of the State's multimodal transportation system, the overarching goal of the CTP 2050 for aviation is enhancing future connectivity between air travel and other modes. This points to improving airport access in small and rural communities, expanding sustainable energy solutions to curb aviation-related emissions, and coordinated airport and local/regional planning.

Active Transportation

Travel by foot, wheeled devices (bicycles, wheelchairs, scooters), and the facilities that support intermodal shared ride travel (e.g., Park and Ride lots and transit centers) all comprise Active Transportation. Airports are excellent locations for applying Active Transportation for the benefit of several types of users. At commercial service airports they include passengers and crews, airline ground employees, and airport staff, vendors and volunteers may all benefit from using Active Transportation. Their movements span a variety of locations that are both "airside" and "landside," including employees moving between work locations or airport-based services from restaurants, retail, banking, and mail.

Active Transportation can be applied without transit facilities. For example: independent Active Transportation facilities include pedestrian walkways and bridges, bicycle paths, Park and Ride lots, shared bike/scooter docks and storage, and safe crossing locations. Yet, each example can be associated with a transit facility, such as bike paths that meet train stations or bus stops; walkways or pedestrian bridges that connect neighborhoods to a light rail system, or make a connection from transit stops to an airport's "landside" entries.

GA airports should also be considered for Active Transportation, as gateway to final destinations within walking distance, and where pedestrian or bicycle travel could reflect "last mile" personal travel from adjacent transit or walkable/bikeable roadways.

The State's Active Transportation Program was created by Senate Bill 99 and Senate Bill 101 in 2013, with the intent of enhancing active modes of transportation. Senate Bill 1 (SB 1) allocates funds for Active Transportation projects. An important element of Active Transportation concerns the specifications of Complete Streets in the plans, designs and construction of accommodating facilities (and, when appropriate, the reconstruction of existing facilities). Caltrans' policy regarding Complete Streets is articulated through Deputy Directive 64-R2. (Directive)

Chapter 6:

Airports, Land Use, and Environmental Sustainability

As described throughout Chapter 1, Regulatory Policy and Framework, California's Transportation Plan 2050 (CTP 2050) provides a vision for California's overall transportation system that will benefit all residents by:

- Promoting equity by eliminating transportation system disparities and maximizing accessibility to transportation for all users
- Enabling vibrant, heathy communities to improve the quality of life
- Providing a safe, secure transportation system with zero fatalities
- Maintaining an agile, resilient transportation system
- Protecting our environment through measures to reduce greenhouse gas (GHG emissions) and minimizing environmental impacts
- Supporting a vibrant and robust economy (Caltrans, 2021)

At first glance, California's airports might not seem directly related to achieving these goals, but the location of airports, their safe operation, and the ability of residents to access airports for jobs and travel contribute substantially to our quality of life. Moreover, the location of airports, flight paths, and their relationship to those living and working in communities near airports contribute to the safety of aviators, passengers, and those living and working nearby.

Just as aircraft operations can affect the safety of nearby communities, the land use decisions made by local jurisdictions can also affect the safety of aircraft operations. Land use decisions that can pose adverse effects to aircraft operations can degrade community safety and quality of life; these decisions can also lead to operational constraints at California's airports up to and including airport closure, which can detract from the local and statewide economies. Chapter 6 explores the relationship between airports, their host communities, and the critical role of identifying and preventing the development of incompatible land uses.

6.1 AVIATION AND LAND USE: A HISTORICAL PERSPECTIVE

Although aviation began as a hobby for the adventurous, it has evolved to become integral to our national security and economic prosperity. Air transportation is now an efficient transportation mode that is used to transport passengers and goods worldwide. As the industry continues to grow and demand for air transport increases, the risks posed by incompatible land use to the detriment of our airports and communities also increase (ACRP 2010).

Historically, most airports were built in farm fields and other places that were distant from the nearest towns. As populations increased and communities grew, the distance between airports and population centers decreased. Some of this growth was predictable as new development capitalized on the existing infrastructure that extended between or connected population centers and outlying airports. But as the distance between facilities decreased, the number of conflicts associated with noise, safety, and airspace protection has grown. In some cases, conflicts between airports and communities have resulted in airport closures or relocations to more distant areas.

The encroachment of incompatible land uses around airports can often place physical limits to safe and efficient aircraft operations as well as future development or expansion. Additionally, exposure to the undesirable effects of aviation operations, such as noise and safety concerns, can often contribute to community opposition to the airport and its ongoing operation.

6.1.1 Case Study: Sacramento Executive Airport

The City of Sacramento opened the Sutterville Aerodrome in 1930 with turf runways and made facility improvements throughout the decade. Efforts to pave and extend the airport's three runways were underway by 1941. The U.S. Army operated the airport during World War II; following the war, airport control was returned to the city and the facility was officially renamed Sacramento Municipal Airport.

During the late 1940s and early 1950s, airport improvement projects included parking and taxiway paving, the installation of water and sewer systems, and runway/taxiway lighting. A terminal building was constructed in 1955 along with navigational aids and T-hangars, and the airport conducted commercial operations. In October 1967, commercial airline operations were moved to a new airport located in an agricultural area north of the city which is today's Sacramento International Airport (SMF).

Sacramento Municipal Airport was subsequently renamed as Sacramento Executive Airport (SAC) and both airports are currently operated by Sacramento County. SAC remains owned by the City of Sacramento (Sacramento County, 2020).

Figures 6-1 through **6-4** illustrate historic development near SAC:

- **Figure 6-1** presents a 1947 aerial photo of the Sacramento Municipal Airport. The extent of the City of Sacramento is clearly visible north of the airport boundaries. Although residential development occurred throughout Sacramento during World War II and during the post-war years, the airport is located south of the City and surrounded by agricultural lands.
- **Figure 6-2** presents a 1957 aerial photo. Substantial residential development is present adjacent to the airport, some of which may have benefitted from the infrastructure developed throughout the 1940s after the City resumed airport operation. As shown, dense single-family residential development is present at the airport's northern, northeastern, and northwestern boundaries, and a golf course is present adjacent to the airport's southern boundary. At the same time, the City proposed the purchase of 6,000 acres of vacant land located 10 miles north of downtown Sacramento for the construction of a new passenger service airport (Sacramento County, 2020).
- **Figure 6-3** presents a 1966 aerial photo. New industrial and commercial development are present immediately west of the airport and additional residential development immediately southwest of the airport and the golf course. Additional residential development spans southeast, east, and southwest of the airport. The airport is virtually surrounded by the City and single-family residential development.
- **Figure 6-4** presents a 2016 aerial photo. Much like the 1966 photo, the airport remains surrounded by dense residential development of the city, plus some industrial development. The golf course has expended farther north and nearer to the airport boundary. The County implements a noise abatement program to address community noise complaints.

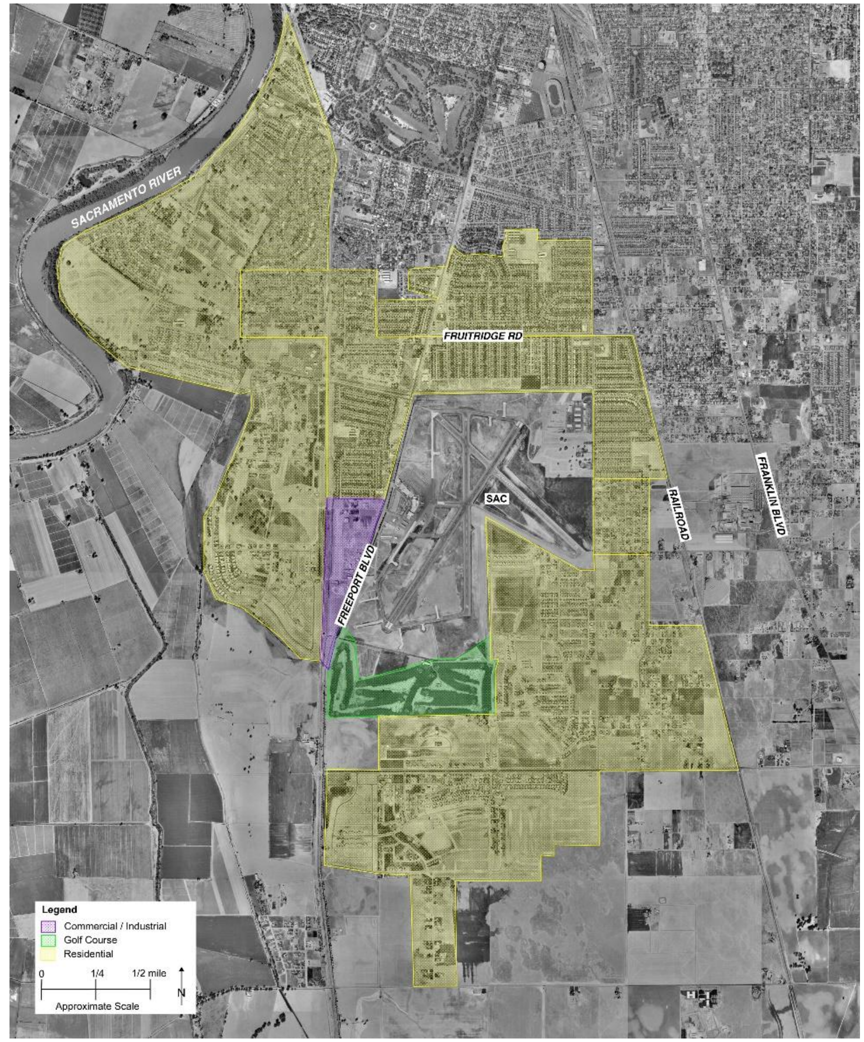


Figure 6-1: Sacramento Municipal Airport, 1947

Figure 6-2: Sacramento Municipal Airport, 1957

Nationwide Environmental Title Research, LLC. (NETR). 2020. NETROnline: Historic Aerials. https://www.historicaerials.com/ via Mead & Hunt, Inc.

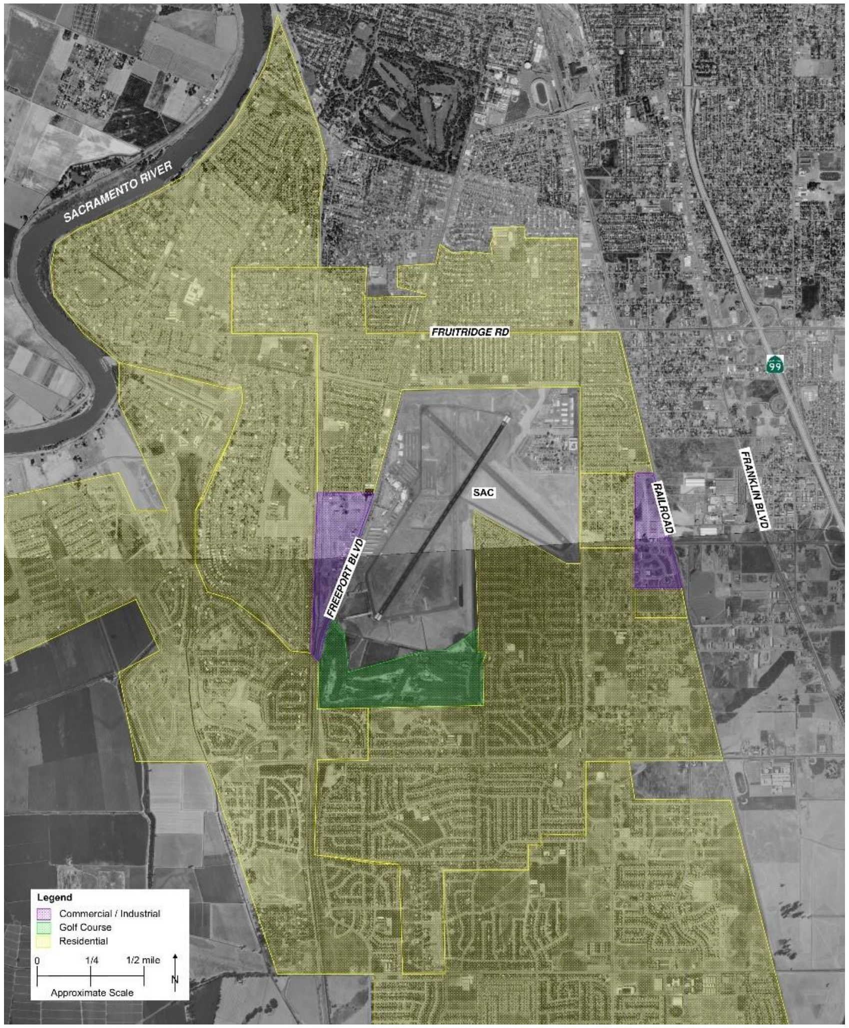


Figure 6-3: Sacramento (Municipal) Executive Airport, 1966 **Figure 6-4: Sacramento Executive Airport, 2016**

Nationwide Environmental Title Research, LLC. (NETR). 2020. NETROnline: Historic Aerials. https://www.historicaerials.com/ via Mead & Hunt, Inc.

Since the construction of SMF in 1967, SAC has been used exclusively for general aviation (GA). It currently supports 30 on-site businesses (Sacramento County, 2020); however, the airport is challenged by relatively stagnant revenues in the face of ongoing and significant maintenance costs and the results of earlier land use decisions that led to airport encroachment. The airport's current runways cannot be lengthened due to the presence of adjacent residential and commercial encroachment (Sacramento County, 2008), and RSA improvements and pavement rehabilitation are needed. The presence of tall trees and non-compliant RSAs may require the city to reduce the length of the primary runway. (Sacramento County, 2019).

Using the SAC case study is significant in relation to the consequences of encroachment. September 24, 1972: a privately owned "warbird" jet failed to take off while leaving the "Golden West Sport Aviation Air Show" at SAC, crashing into a Farrell's Ice Cream Parlor. Twenty-two people died; 28 were injured.

Safety measures for airshows, the aircraft and pilot certification were implemented from recommendations made by the National Transportation Safety Board (NTSB). However, just as FAA has no jurisdiction in local land use and zoning matters, NTSB could not comment about land use or encroachment.

Sacramento's experience with encroachment came earlier than other metropolitan airports, and relocation to a new site was a viable option. When SMF was constructed, it was the first CS airport west of the Mississippi River to be constructed entirely from the ground up (Sacramento County, 2020). Unfortunately, airport relocation is no longer an easy or viable remedy for most communities seeking to address the effects of airport encroachment. The construction of a new airport, and especially a commercial service airport, can require substantial land acquisition, dedicated infrastructure, and billions of investment dollars for construction and operation. Sites where new airports can be built have become increasingly rare, and when a new site is found, communities tend to expand toward the airport and the whole cycle begins again (ACRP, 2010).

As local planners, airport operators, and aviators know, similar challenges continue nationwide—within large urban areas and rural towns—as communities and airports struggle to find a balance between airport operations and compatible land use.

6.2 CONSEQUENCES OF INCOMPATIBLE LAND USES AND ENCROACHMENT

Encroachment from incompatible land uses can affect the aviation, airport operators, and their communities—especially those who live and work near airports.

6.2.1 Consequences on the Aviation System and Users

California's commercial-service and GA airports are not isolated facilities; they are part of the local, regional, and statewide systems, as well as the NAS. While incompatible land uses and encroachment may be perceived as local issues, their consequences can affect the system, such as, but not limited to:

- **Airport Development Constraints and Operational Delays:** Community opposition to aircraft operations can restrict or delay airport development or capacity improvements that may be important to the system as a whole or prolong planning and permitting efforts. Capacity constraints and resulting operational delays can also lead to additional environmental impacts associated with ongoing aircraft congestion and increased aircraft emissions (including GHG) as aircraft wait to take off/land or are diverted to less congested airports.
- **Operational Limitations or Restrictions:** Public opposition can result in political action to prevent facility upgrades or impose limitations on airport operations through noise impact studies. These efforts may affect the aviation system by limiting an airport's capacity, decreasing revenues, and increasing travel time.
- **Increased Risks to the Traveling Public:** Incompatible land use can compromise runway approach protection, restrict potential runway use, and pose safety hazards. Increased risks may be associated with obstructions (tall structures) in navigable airspace, the presence of wildlife attractants, or the absence of open space near runways that pilots can use in the event of a forced, off-airfield landing.
- **Increased Cost:** Community opposition can result in litigation associated with noise complaints, restrictions on allowable land uses and development densities/intensities, and longer development timeframes.

6.2.2 Consequences to Airport Neighbors and Communities

As shown in **Table 6-1,** incompatible land uses that create airport compatibility concerns include any airport impact that adversely affects the livability of surrounding communities or the safe operation of the airport. Incompatible land uses fall into two broad categories: exposure to aircraft noise and safety hazards.

Aircraft Noise Exposure

Aircraft noise exposure remains the primary concern for those living near airports. Effects of aircraft noise exposure include:

- Annoyance
- Vibration within nearby structures
- Learning challenges associated with schools near airports
- Non-auditory health effects
- Sleep disturbance

Exposure to Aviation Accident Risks

Available data indicate that areas most vulnerable in the event of an aircraft accident or incident are those lands nearest to runway ends. Land uses that attract a high concentration of people near the runway approach and departure areas can increase vulnerability in the event of an accident (Caltrans DOA, 2011). In addition, land uses that affect airspace near an airport can pose concerns because they impede the vision of pilots (ACRP, 2010).

6.2.3 Examples of Incompatible Land Use

Airport compatible land uses are defined as those uses that can coexist with a nearby airport without either constraining the safe and efficient operation of the airport or exposing people living or working nearby to unacceptable levels of noise or safety hazards (Schalk and Ward, 2010).

Airport compatibility concerns include any airport impact that adversely affects the livability of surrounding communities, as well as any community characteristic that can adversely affect the viability of an airport (see **Table 6-1**).

Table 6-1: Compatibility Concerns and Planning Strategies

Compatibility Concern/Description	Local and Use Planning Strategy/Goal
Aircraft Noise Exposure Aircraft noise can interrupt speech, learning, and sleep and cause low-level vibration near an airport. Potentially noise-sensitive land uses include residential uses, schools, libraries, congregate care facilities, and performance venues	Local agencies cannot regulate aircraft noise, but land use planning and zoning tools can: • Prevent the development of noise-sensitive uses • Reduce the number of people affected by aircraft noise exposure through land use and noise insulation requirements.
Safety Hazards – Aviators/Passengers Safety Hazards include airspace hazards to aviators and passengers associated with: • Tall structures • Visual obstructions • Wildlife/bird attractants • Electronic, electromagnetic, or other Interference with aircraft and navigation equipment	The FAA regulates airspace, but airport sponsors and local jurisdictions are responsible for implementing federal regulations. • Implement FAA regulations pertaining to navigable airspace through land use policies; and • Prevent the development of tall structures and incompatible land uses beneath navigable airspace.
Safety Hazards – Nearby Residents/Visitors Safety hazards include hazards or increased risk to people living and working on the ground in the event of an aircraft accident or mishap.	Local agencies can reduce the effects of a potential mishap by: • Using historical accident data and FAA guidance to identify the areas of greatest risk in the event of a mishap and discourage development in those areas; and • Implementing planning tools and policy to minimize the number of people exposed to the potential risk of aviation accidents (i.e., preventing the development of land uses that involve high concentrations of people)

What is and is not deemed compatible will vary according to each airport, its location and type of operations, and its surrounding communities.

When designating proposed land uses or updating zoning ordinances, local agencies should consider the role of the airport, review community concerns related to airport operations, and seek to identify compatible land uses that will minimize future issues. **Table 6-2** presents common compatibility concerns and Incompatible land uses.

Table 6-2: Common Compatibility Concerns and Incompatible Land Uses

Land Uses that Affect Aircraft Operations • Dust (mining operations, construction) • Smoke (stacks, refineries) • Glare (lights, open water, reflective structures, some types of solar facilities) • Electronic interference (communication/broadcast towers) • Wildlife attractants (wildlife reserves, landfills, open water ponds, seeds, and crops)	  Source: Istock
Land Uses that Affect Navigable Airspace/Create Obstructions • Wind Farms • Cell Towers or Antennas • Elevated Roads/Bridges • Drones	  Source: Istock, JHU.edu
Aircraft Noise Exposure • Residential use/Sleep interference • Learning/interruptions • Hospitals/assisted learning facilities • Schools and libraries • Places of worship	 Source: bu.edu
Safety concerns • Intensive land uses/high concentrations of people • Population centers	 Source: Istock

6.3 PREVENTING INCOMPATIBLE LAND USE: THE REGULATORY FRAMEWORK

The City of Sacramento's experience with encroachment near SAC illustrates that encroachment is not a new phenomenon. Airport development and commercial air service flourished after World War II, and land use conflicts soon followed.

A landmark study was completed in 1952 by General James Doolittle entitled "The Airport and Its Neighbors." The report was undertaken to address many of the same land use compatibility issues faced by the City of Sacramento in the 1950's and by airports today:

- Engaging and garnering local support of airport operations and development
- Integrating municipal and airport planning to avoid land use conflicts
- Coordinating current and future airport plans, including runway extension areas, into local planning documents to keep the land use protected
- Establishing effective zoning laws near airports
- Clarifying laws and regulations governing the use of airspace for planning agencies and the public
- Identifying/clarifying navigable airspace and approach/departure areas for planning agencies and the public

The Doolittle Report recognized the importance of airports to communities and their role in economic development, and it emphasized that airports and metropolitan areas should be jointly planned so that each develops to complement the other. Nearly 70 years after the Doolittle Report was published, FAA, individual states, local governments, and other stakeholders have worked to develop regulatory frameworks to prevent conflicts resulting from incompatible land uses. Despite these efforts, incompatible land uses and encroachment continue to occur.

6.3.1 Federal Regulations and Guidance

Federal Aviation Administration

Although the FAA is the primary federal agency responsible for airport-related land use issues, it recognizes that only local agencies—through the police power granted to them by the State—have the authority to make land use decisions through planning, policy, and zoning regulations. Nevertheless, the FAA can encourage local jurisdictions to promote land use compatibility near airports through the following measures:

- AIP funding and grant assurances
- Regulations pertaining to noise compatibility and navigable airspace
- Design standards and guidance
- Environmental review and compliance

Federal Grant Assurances

The FAA is the primary funding source for capital improvement projects at NPIAS airports. Federal grants are used to develop master plans, capital improvements, and to purchase land or easements on nearby property to prevent the development of incompatible land uses.

To accept a federal grant, an airport sponsor must agree to 34 conditions or ''grant assurances." Grant Assurance No. 21, Compatible Land Use, requires an airport sponsor to:

> take appropriate action… including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended (FAA, 2020a).

Airport projects are expensive, and many airport sponsors and their jurisdictions would be unable to undertake planning, maintenance, or capital improvements without FAA grants.
Since non-compliance with grant assurances can lead to the loss of FAA funding, grant assurances are important tools for encouraging airport operators to implement FAA guidance regarding compatible land use decisions at the local level.

Aviation Safety and Noise Abatement Act of 1979/FAA Part 150, Noise Compatibility Planning Program

The Aviation and Safety Noise Abatement Act of 1979 (ASNA) assists airport operators to carry out noise abatement programs.

The FAA regulations that implement ASNA are set forth in Title 14, CFR, Part 150 (14 CFR Part 150), Airport Noise Compatibility Planning Program (Part 150 Program). The regulations identified in the Part 150 Program provide guidance to airport operators and communities about aircraft noise exposure and noise-compatible land uses within the airport environs (ACRP, 2010).

Although local governments cannot regulate aircraft noise or alter aircraft approach and departure paths, they can reduce the number of people exposed to aircraft noise through careful land use policies, zoning ordinances, and decision making.

The Part 150 Program provides funding to airport operators to measure and monitor aircraft noise and develop noise exposure maps. The noise exposure maps identify the geographic areas exposed to current and anticipated aircraft noise based on airport planning documents. Airport operators can use the noise exposure maps to identify areas where noise mitigation may be needed, and local jurisdictions and planning agencies can use the noise exposure maps to prevent the development of noise-sensitive land uses to avoid conflicts.

Part 150 also provides for the use of standard metrics and land use guidance, such as:

- The A-weighted decibel [dB (A)] scale as the universal noise measurement tool
- DNL as the universal noise contour measure
- Identifying specific land uses that are acceptable in areas subject to aircraft noise (ACRP, 2010)

Figure 6-5 provides a comparison of noise levels associated with common activities including aircraft noise (FAA, 2018).

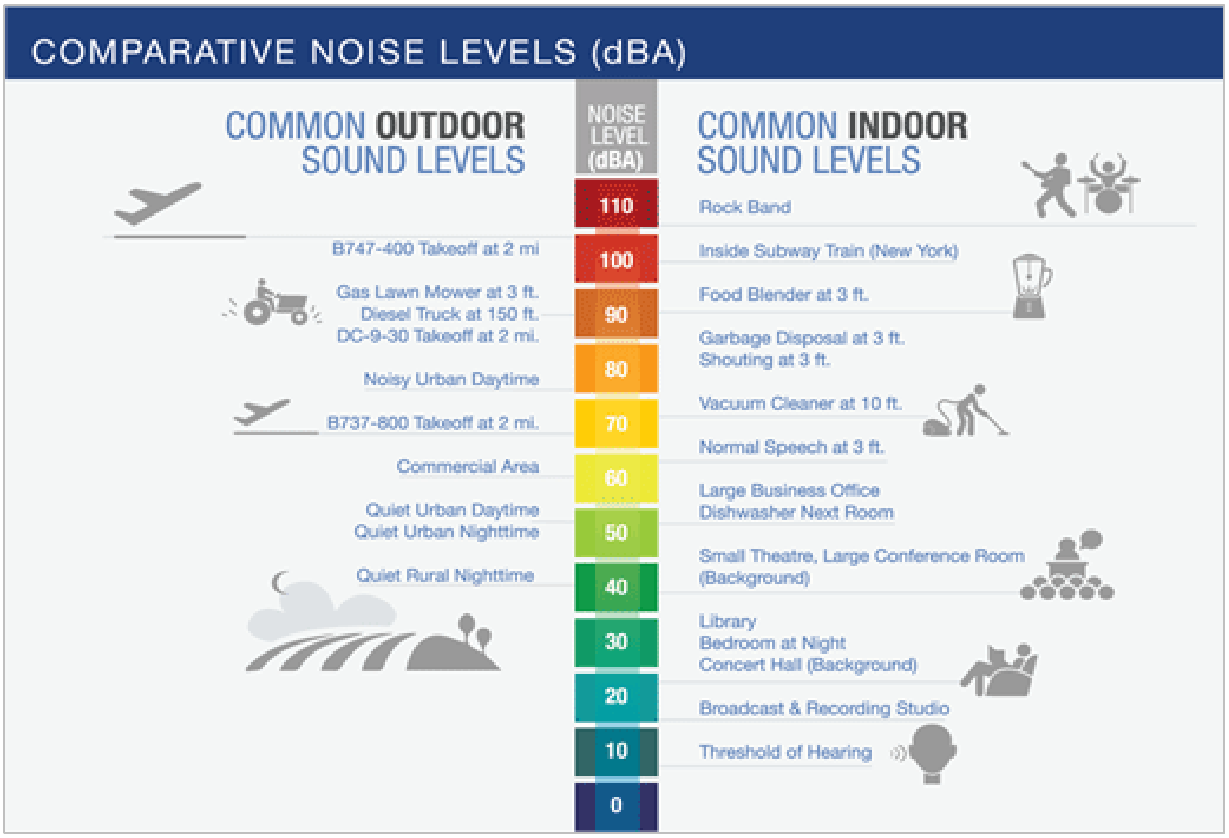


Figure 6-5: Comparative Noise Level as measured in A-weighted Decibels (DBA)

Source: FAA, 2019

14 CFR Part 77: Safe, Efficient Use, and Preservation of the Navigable Airspace

Recall that 14 CFR 1.1 says navigable airspace is the area needed by pilots to operate aircraft safely at or above minimum flight altitudes including takeoff and landing. Accordingly, 14 CFR Part 77, provides:

- Requirements to notify the FAA of certain proposed construction or the alteration of existing structures
- Standards to determine obstructions to air navigation and navigational and communication facilities
- The process for aeronautical studies of obstructions to air navigation or navigational facilities to determine the effect on the safe and efficient use of navigable airspace, air navigation facilities, or equipment
- The process to petition the FAA for discretionary review of Determinations or revisions

The FAA must be notified of the proposed construction or alteration of objects in an airport's vicinity, including temporary objects and natural growth.

If those objects reach a height that would penetrate navigable airspace, defined by FAA with "imaginary surfaces," they must be evaluated for airspace impacts. The "surfaces" have dimensions around an airport to indicate (and visualize) how an airport's immediate airspace is utilized. Those proposing to construct objects or structures, or make alterations to existing objects, near airports must submit a Notice of Proposed Construction or Alteration (FAA Form 7460-1) based on the following criteria:

- Any construction (new structure or object) or alteration (modification to an existing structure) greater than 200 feet above ground level
- Any construction or alteration:
- Within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet
- Within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
- Within 5,000 feet of a public use heliport which exceeds a 25:1 surface
- Any highway, railroad, or other traverse way whose prescribed adjusted height would exceed the above noted standards
- When requested by the FAA
- Any construction or alteration located on a public use airport or heliport regardless of height or location.

Figure 6-6 presents an illustration of 14 CFR Part 77 "Imaginary Surfaces:"

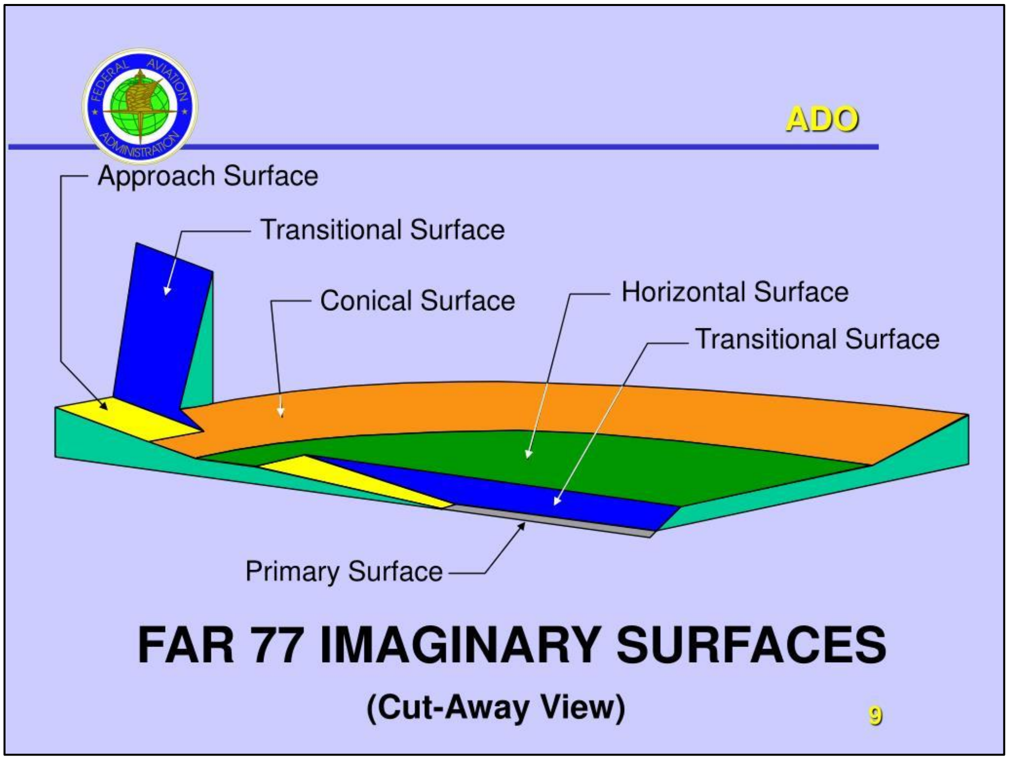


Figure 6-6: FAA 14 CFR Part 77 Surfaces
Source: FAA, Airport District Office (ADO), Western-Pacific Region

The FAA's airspace Determination does not approve or deny the construction of a proposed object, it merely acknowledges that the FAA has reviewed the proposal and determined whether it is or is not a hazard to air navigation. Through this process, the FAA may comment on the compatibility of a proposed land use or development, but it has no ability to regulate the construction or use at the local level. Local jurisdictions are responsible for implementing the 14 CFR Part 77 regulations and advising project proponents of the need to conduct airspace analyses through their land use policies and zoning ordinances. The State uses PUC Section 21659 in concert with 14 CFR Part 77 to prohibit hazards near airports while also having no role in local zoning matters.

When an object is determined to be a hazard to air navigation, pursuant to 14 CFR Part 77, three courses of mitigation are allowed by FAA:

- Reduce the object's height (assuming the option is practical)
- Remove the object (also with the assumption of practicality)
- Add lighting to the object according to AC 70/7460-1L, "Obstruction Marking and Lighting"

Airport Design Standards and Guidance

Airport Design Standards

As introduced in Chapter 3 (Infrastructure and Safety), the FAA also applies Airport Design Standards from AC150/5300-13. The standards allow flexibility of changing a volume of airspace that is not allowed in 14 CFR Part 77 (except for the 50:1 approach surface used with certain instrument approaches). For example, in **Figures 6-7 and 6-8** below, the AC design standards address how a given obstacle governs the need for a displaced threshold for the runway:

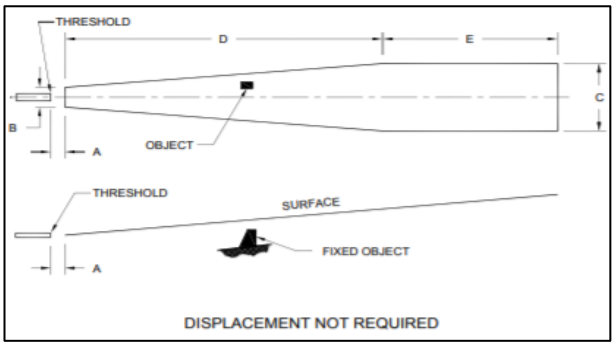


Figure 6-7: Runway Design without Displaced Threshold

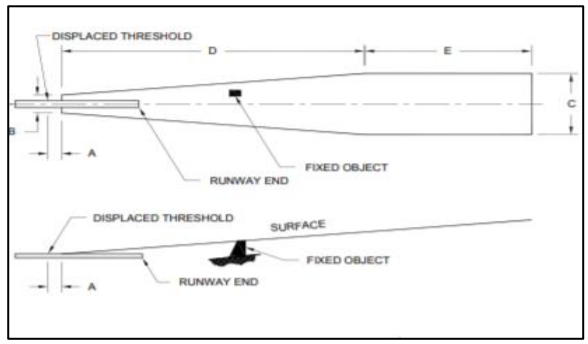


Figure 6-8: Runway Design Includes Displaced Threshold

Source: FAA AC 150/5300-13

Displaced thresholds change how airspace is used. They are markings on a runway that indicate the point from which aircraft can land, despite available pavement before the indicated point. They allow aircraft to clear obstructions and operate safely. However, in some cases, the utilization of the runway (and the airport itself) may be compromised for certain aircraft. Similar standards apply for departures, including additional criteria to ensure safety for departures conducted during inclement weather.

In general, FAA has indicated an interest to see design standards applied together with 14 CFR Part 77 airspace analyses for a more comprehensive means to address land use compatibility. Where 14 CFR Part 77 provides a baseline to determine if an obstruction should be removed, lowered or lighted, Airport Design Standards become the "next level" up in safety by considering how best to utilize the airspace. But, avoiding less than optimal runway and airport utilization, effective land use compatibility extends beyond the regulatory framework with coordinated efforts among airport and municipal planners.

Parameters from AC 150/5300-13 and FAA Order 8360.3B for Obstacle Clearance Surfaces (OCS) are occasionally closer to the ground than 14 CFR Part 77 surfaces. These surfaces are evaluated by OE/AAA when reviewing proposed development near airports submitted via form 7460-1. Land use regulators can require developers to provide the FAA determination to an airspace case prior to issuing permits, which will help protect the airspace surrounding airports from development that is incompatible due to height. A key consideration to this approach is that OE/AAA will protect future airspace if improvements are shown in an FAA-approved planning document, such as an ALP. If future runways and instrument procedures are not shown on an FAA-approved planning document, then OE/AAA will not consider them for evaluation. This could result in off-site development that leads to future new instrument procedures, or to add runways, that are costly.

Environmental Regulations and Compliance

The FAA must comply with NEPA by identifying and disclosing the potential environmental impacts of proposed "Federal Actions." Federal Actions include proposed projects where the FAA has authority to condition a permit, license, or approval, such as grants, loans, contracts, leases, or facility improvements, submitted to the FAA by state or local agencies for approval. Two FAA Orders describe FAA responsibilities and procedures for complying with NEPA:

- Order 5050.4B, NEPA Implementing Instructions for Airport Actions
- Order 1050.1F, Environmental Impacts: Policies and Procedures

To receive project approvals or funding, airport sponsors and the FAA must review the project and its potential environmental and social effects pursuant to NEPA to ensure compliance with federal special-status laws including the Clean Air Act, Environmental Species Act, Clean Water Act, and numerous others. FAA's orders for implementing NEPA require that the following environmental issue areas be considered and disclosed to the public before FAA authorizes or undertakes a Federal Action.

- Air quality
- Biological Resources
- Climate
- Coastal Resources
- Department of Transportation Section 4(f)
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Cultural, Architectural, and Archeological Resources
- Land Use

- Natural Resources and Energy Supply
- Noise and Noise Compatible Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects
- Water Resources
- Cumulative Impacts
- Irreversible and Irretrievable Commitment of Resources.

Impacts can occur when a proposed project would not comply with local land use plans or airport development plans or would create a hazard to air navigation by creating obstructions, producing glare, or attracting hazardous wildlife. The environmental review conducted pursuant to NEPA would identify and disclose these impacts as well as potential project modification or mitigation identified to avoid or reduce the impact.

Other FAA Guidance

In addition to design guidance, the FAA provides leadership to guide and educate airport operators and local agencies to promote land use compatibility planning at the local level. **Table 6-3** summarizes some of the federal statutes, regulations, and guidance applicable to the topic of land use.

Table 6-3: Federal Laws and Guidance Applicable to Airport Land Use Compatibility Planning

AC 150/5020-2 "Guidance on the Balanced Approach to Noise Management."	Provides guidance for noise control and compatibility planning for airport operators, including the preparation of airport noise exposure maps and implementation of the Part 150 Airport Noise Compatibility Program.
Title 49, USC, Transportation, Subtitle VII Aviation Programs, Part B, Chapter 471, Airport Development.	The law gives the FAA the ability to protect the public's freedom of airspace transit given to all airspace users, including national defense, commercial and general aviation, and space operations.
40 CFR Part 258, Subpart B, Criteria for Municipal Solid Waste Landfills.	Establishes criteria for the expansion and/or development of new landfills their distance from airports to prevent bird hazards to aircraft.
Land Use Compatibility and Airports	Provides FAA guidance to local planners, governments, and other interested parties about compatible land use.
AC150/5200-33 "Hazardous Wildlife Attractants On or Near Airports."	Some land uses are incompatible near airports because they can attract potentially hazardous wildlife such as large flocking birds or mammals; these uses include, but are not limited to: wastewater treatment facilities, wetlands, dredge spoil containment areas, and solid waste landfills. The FAA recommends these uses be at least 5,000 feet away from airports serving piston-type aircraft and 10,000 feet from airports serving turbojet aircraft.
14 CFR Part 139.337, Wildlife Hazard Management	FAA regulation that requires certificated airports to conduct a Wildlife Hazard Assessment to identify the presence and extent of potentially hazardous wildlife on or near the airport and, if necessary, prepare a Wildlife Hazard Management Plan. The FAA may request that non-certificated airports prepare these documents.

6.3.2 United States Department of Defense

The United States Department of Defense (DOD) acknowledges the relationship between its aviation facilities and nearby communities. The DOD established the Air Installations Compatible Use Zones (AICUZ) Program in 1973 to protect the federal government's investment in military airfields. The program was initiated to protect the public's health, safety, and welfare and to prevent encroachment from degrading the operational capability of military air installations in meeting national security objectives.

The military also conducts Joint Land Use Studies (JLUS) as a collaborative strategic planning process among localities, states, and military installations. JLUS goals are to encourage local governments to work closely with military installations to develop and execute measures that prevent the introduction of incompatible civilian development that may hinder operational utility of a military installation, and to preserve and protect the public health, safety, and welfare of those living near an active military installation.[28]

6.3.3 State of California Regulations and Guidance

The FAA is charged with the preservation and safe operation of the NAS, and it has a direct interest in preventing encroachment or other hazards to aviation associated with incompatible land use. However, as a federal agency, the FAA has no direct role in local land use decisions and can only promote land use compatibility through statutes, orders, and guidance.

> Only local agencies can regulate local land uses as mandated or enabled by State statute and the exercise of their police power.

A recent ACRP report identified 45 states, including California, that have enacted statutes that require or authorize local jurisdictions to adopt airport compatibility zoning ordinances. Twenty states mandate the adoption of local compatibility zoning laws and/or inclusion of compatibility in their local planning, and 25 states have adopted "enabling" legislation that authorizes, but does not require, local adoption of airport compatibility policies or zoning ordinances (ACRP, 2019).

[28] One of several JLUS examples readily available online: https://www.kingscog.org/nas_jlus

The State Aeronautics Act

The SAA is explained in PUC statutes, including provisions that support land use compatibility planning locally.

The purpose of the SAA is to "provide the State with regulatory guidance to protect the public interest in aeronautics and aeronautical progress" (PUC Section 21002 *et seq*.). The SAA is the bridge that connects federal land use compatibility laws, regulations, and guidance to the plans and policies set forth by local jurisdictions.

The SAA directs the Division to provide uniformity and consistency between federal and State aeronautics laws and regulations (Caltrans, DOA, 2016). To do so, the SAA:

- Requires Caltrans to adopt, to an extent not prohibited by federal law, noise standards applicable to all airports operating under a state permit (Section 21669)
- Establishes requirements for local governments to create an ALUC in most counties (where public-use airports are located)
- Requires local agencies to conduct compatible land use planning around each public-use and military airport in the State (Section 21670 et seq)

California Airport Land Use Planning Handbook

The SAA and PUC establish procedures that govern how ALUCs operate, but the statutes say little regarding the criteria used to prepare ALUCPs and compatibility policies. Instead, the SAA refers to the Handbook, which the Division publishes and updates periodically. Several PUC sections identify the Handbook as a resource for compatibility planning at the local level, stating that ALUCs shall be guided by the information contained in the Handbook (PUC Sections 21674.5 and 21674.7).

Although the Handbook is not regulatory, it provides guidance for ALUCs that serves as the starting point for compatibility planning around individual airports. The Handbook provides procedures and guidance for establishing the baseline safety and compatibility policies. ALUCs can be more restrictive as local conditions warrant (Caltrans, DOA, 2011).

California Department of Education Code

To prevent land use conflicts with airports, Sections 17215 and 81033 of the Education Code (EC) require that proposed school sites within two nautical miles of an existing or proposed airport runway be evaluated by the Division.

The requirement applies prior to property acquisition or lease. It also applies to school districts, county offices of education, charter schools regardless of the funding source, and community college districts.

The Division reviews the location of proposed school sites and makes a recommendation about the compatibility of the site. If the recommendation does not favor the lease or acquisition of a proposed site, the governing board may neither acquire the title to nor lease the property. Additionally, neither State funds nor local funds may be apportioned or expended for the acquisition or construction of any school building on, or for expansion of any existing school site to include the reviewed site (Caltrans, DOA, 2016). In addition to school sites, the Division also reviews proposed sites for State buildings within 2 nautical miles of an airport (PUC 21655).

California Environmental Quality Act

CEQA generally requires State and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects and to reduce those environmental impacts to the extent feasible. The laws and rules governing the CEQA process are contained in the CEQA statute in the Public Resources Code (PRC) Section 21000 et seq. Guidance is provided by the CEQA Guidelines (CCR, Title 14, Section 15000 et seq.). Like NEPA, CEQA requires project proponents to evaluate and disclose the effects of their proposed projects prior to public decision making. (PRC Section 21096 addresses projects near airports.)

CEQA identifies 19 environmental issue areas that should be discussed, at minimum:

- Aesthetics
- Biological Resources
- GHG Emissions
- Land Use/Planning
- Population/Housing
- Transportation/Traffic
- Mandatory Findings of Significance
- Agriculture and Forestry Resources
- Cultural Resources
- Hazards and Hazardous Materials
- Mineral Resources
- Public Services

- Tribal Cultural Resources
- Air Quality
- Geology/Soils
- Hydrology/Water Quality
- Noise
- Recreation
- Utilities/Service Systems

The CEQA statute identifies how proposed projects on an airport, or within 2 nautical miles of an airport, should be evaluated using Division resources.
However, potential direct and indirect impacts to airport operations should be considered during the review of other issue areas to identify potential incompatibility such as:

- Aesthetics (potential effects on aviation associated with lighting/glare)
- Biological resources and hydrology (wildlife habitat, open water, or other potential hazardous wildlife attractants habitat associated with proposed projects and their mitigation measures)
- Land use (conflicts with an adopted ALUCP, ALP, or General Plan policies associated with airports and airport development)
- Hazardous waste (the presence of hazardous waste that could be affected or increase risk to those nearby in an aircraft accident or mishap)
- Noise (aircraft noise exposure)
- Cumulative Impacts

The Division exercises this authority under the provisions extended to a Responsible Agency as defined in the CEQA Guidelines. The Division includes dedicated staff to review CEQA documents to identify the potential direct and indirect effects of proposed projects on airports and aircraft operations (Caltrans, DOA, 2016). But legislation adopted between 2016-2019 for “streamlining” the CEQA process concerning housing issues is noteworthy. Additional airport encroachment is possible when proposals that seek open (or “green”) space find it around an airport.

6.3.4 Local Government/Planning Agency Regulations and Tools

Two primary tools available to California land use and planning agencies to help local agencies, or to control land use and development within their jurisdictions, are general plans and zoning ordinances. Business and Professions Code, Sections 11000-11010, address Real Estate Disclosure Requirements.

General Plans

Local governments in California create General Plans, which serve as a long-term blueprint for the community's vision of future growth and the legal foundation for implementation (e.g., zoning) and subsequent land use decisions.

The contents of the general plan are set forth in the Code of California Regulations and the State's General Plan Guidelines. General Plans include goals, objectives policies, and implementation measures. The "elements" of General Plans are regulated by statute; California law requires each plan to address the mandatory elements listed in Government Code section 65302: Land Use, Circulation, Housing, Conservation, Open Space, Noise, and Safety.

The land use element identifies the types of land uses that are permitted in designated areas and the types of activities that can be conducted according to those land use designations. Government Code section 65302(a) describes the required content of a land use element. Specifically, the land use element must designate the proposed general distribution, general location, and extent of land uses. The element should include categories reflecting existing land uses as well as projected development. Additionally, the land use element must include "a statement of the standards of population density and building intensity recommended for the various districts and other territory covered by the plan" (OPR, 2017).

Zoning Ordinances

Zoning is the primary tool used to implement the General Plan, and it is a powerful tool for local governments because it classifies the specific, immediate uses of land. The typical zoning ordinance regulates land use by dividing the community into districts or "zones". Text and map(s) describe the distribution and intensity of land uses allowed in the districts. Specific land uses can be permitted, conditionally permitted, or prohibited within specific zoning districts (OPR, 2017).

In 2020, "current" ALUCPs have an average age of approximately **17 years**.

Addressing airport compatibility concerns as part of a community-wide zoning ordinance, or as an "overlay" to the underlying land use designations, is effective for ensuring that compatibility issues are not overlooked, and many ALUCPs are implemented as a zoning overlay. The FAA developed, and is currently revising, a model airport zoning ordinance to address airspace protection issues.

While the State overall has regulatory means to address land use, General Plan amendments may be made up to four times per year, creating the potential for gradual erosion of protections.

Land use elements are updated every 8 years[29] and General Plans can be updated every 10 years. Meanwhile, PUC 21675 allows for ALUCP updates, but not according to a specific timline. It has not been uncommon to find "current" ALUCPs dated in the 1990s or earlier. Their statewide average age is approximately 17 years.

From the next section, specific application of legislative measures or local policies to assist land use compatibility in airport areas can benefit from Division resources when used for guidance from subject matter expertise.

The Value of Compatible Land Use for Safety and the Environment

Solano County's Nut Tree Airport (VCB) in Vacaville has been an integral part of the City and County's economic development. The airport serves General Aviation needs between San Francisco and Sacramento for business and recreational travelers; it has flight training, an Aircraft Airframe & Powerplant Mechanic Certification Program (through the aeronautics program at Solano Community College), an aviation museum, and air operations for Pacific Gas & Electric.

In 2007, a safety inspection conducted by the Division identified the presence of numerous trees as obstructions to navigable airspace. To compensate for their removal, the California Department of Fish and Wildlife (CDFW) required the County to plant 2,650 trees of native species in a riparian area; on-site mitigation was not possible, and the cost to acquire property and plant trees would exceed $1 million.

[29] Via provisions within GOV 65300

The County collaborated with the Solano County Water Agency (SCWA), a private water agency that operates an irrigation canal adjacent to the airport, to identify a cooperative and cost-effective solution. SCWA, negotiated conservation agreements with adjacent landowners, but it did not have adequate funding for restoration. The County assisted SCWA and the Lower Putah Creek Restoration Project by providing $150,000 to plant 3,000 trees of native species on the privately-owned parcels. The collaboration enabled the County to enhance airport safety through obstruction removal, supported ongoing airport operations in accordance with State direction and federal regulations and provided the County with an opportunity to restore a regionally important creek segment for long-term ecological benefit.

6.4 CALIFORNIA'S AIRPORT LAND USE COMPATIBILITY PLANNING PROGRAM

California's Airport Land Use Compatibility Program has been recognized by other states for its well-established guidance and implementation on three fronts:

- State statute
- Funding
- Oversight provided by the Division.

Although the SAA has been amended at times, its fundamental purpose has not changed:

> ...to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses (PUC21670).

6.4.1 Airport Land Use Commissions

With limited exceptions, an ALUC must be established in every county. PUC Section 21670 identifies three ways in which an ALUC may be established:

- As a single-purpose ALUC that includes members of county and city supervisors, two representatives with aviation experience, and an appointee representing the public
- As a designated body in which another entity, such as a Regional Transportation Agency or Metropolitan Planning Agency, is designated to carry out airport land use compatibility planning duties

- As a designated body, or alternative process, in which the county and each affected city may incorporate airport compatibility concerns into their land use and permitting processes. (Designated bodies must also include participants with aviation experience.)

Five of California's 58 counties utilize statutory provisions to organize ALUCs within designated entities (such as municipal planning departments): Los Angeles, Santa Cruz, San Bernardino, and San Diego. San Francisco County does not include a public use airport within its boundaries and therefore is exempt from the requirement to establish and ALUC.

ALUC Goals and Objectives

The primary objective of an ALUC is to ensure that the land use actions taken by local agencies adhere to the purpose as stated in section 21670 of the SAA. ALUCs pursue this objective by:

- Preparing ALUCPs that consider the relationship between airport operations and development goals and the community planning and development goals of communities within the ALUC-defined AIA
- Reviewing the General Plans, specific plans, zoning ordinances, building regulations, and certain individual development actions of local agencies for consistency with the policies and criteria in the applicable ALUCP (provided that the Division as reviewed and approved the agency's review process)
- Reviewing master plans and other development plans for civilian airports proposed by airport operators to determine if those plans are consistent with the applicable ALUCP or require the ALUCP to reflect changes in the proposed airport plan.

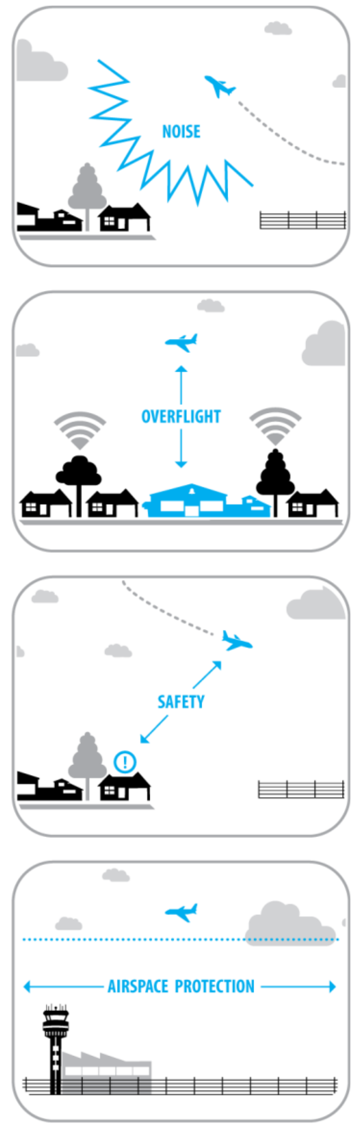
ALUC Limitations and Challenges

The SAA identifies two specific limitations on ALUC powers that are set in the statutes:

- ALUCs have no authority over areas "already devoted to incompatible uses." In general, ALUCs have no jurisdiction over existing land uses, even if those uses are incompatible with airport activities.
- ALUCs have no "jurisdiction over the operation of any airport." This limitation refers to anything concerning the configuration of runways and other airport facilities, the type of aircraft operating at the airport, or where aircraft fly.

- ALUCs have no authority over federal, State or tribal lands.
- The challenge for ALUCs is to keep their ALUCPs current. There's no specific schedule required of updates; the PUC simply says ALUCPs should not be updated more than once a year. The lack of specific updates has allowed ALUCPs to fall behind the steady (and continued) growth of California and related demands.

Relationship of the ALUCs to Local Governments



Source: Mead & Hunt, 2020

For the most part, ALUCs are independent of the local land use jurisdictions. ALUCs must consult with the involved agencies to establish the boundaries of an AIA (PUC Section 21675(c)), but otherwise have the authority to adopt compatibility plans without approval from county or city governing bodies. However, ALUCs do not have the authority to implement their own compatibility policies. Local agencies have two responsibilities:

- Implementing ALUC-adopted compatibility plans
- Forwarding projects to the ALUC for review

> While ALUCS can adopt ALUCPs, they do not have the authority to implement their own compatibility policies.

To align airport planning and community planning goals, each county, city, school districts, and special districts identified in an AIA, or an area otherwise affected by an ALUCP, must make its General Plan and any applicable specific plans consistent with the policies presented in the ALUCP. The same condition applies to development proposals in review by planning agencies. Otherwise, a series of steps are identified in the SAA to overrule the ALUC. When overruling, the proponent agency must adhere to specific procedures identified by statute, including the documentation of findings, to demonstrate that compatibility planning would be addressed through other means.

6.4.2 Compatibility Factors

Airport land use compatibility planning seeks to "minimize the public's exposure to excessive noise and safety hazards" while providing for the "orderly expansion of airports" (PUC Section 21670 (a)(2)), and land use compatibility policies apply only to "the area surrounding these airports" (PUC 21670 (a)). Since California includes diverse airports ranging from large hub commercial airports to small, privately-owned airstrips, each ALUCP may be customized to reflect individual airport conditions.

The Handbook identifies the types of compatibility concerns that ALUCs should consider:

1. Noise
2. Overflight
3. Safety
4. Airspace Protection

Taken together, the areas affected by these four compatibility factors comprise an airport-specific AIA. While these compatibility concerns were addressed earlier, the following sections discuss how each is addressed by the Division's guidance.

Aircraft Noise

ALUCs have no power to reduce aircraft noise or specify areas in which aircraft operate. The objective of airport compatibility planning associated with aircraft noise exposure is to minimize the number of people exposed to excessive levels of aircraft noise. To do so, ALUCs can work with local planning agencies to:

- Identify and promote the types of land uses and development that are less likely to be affected by aircraft noise, and
- Identify and avoid the types of land use and development that could expose people to aircraft noise while at work or at home.

Identifying Areas Exposed to Aircraft Noise

State statutes require aircraft noise to be measured using the CNEL metric (PUC Section 21669). CNEL is defined as the average A-weighted sound level as measured in decibels during a 24-hour period rather than the noise associated with a single flight. Although this varies from the metric cited in FAA regulations, the FAA allows the use of CNEL contours for airports in California (Caltrans DOA, 2011).

California Airport Noise Regulations are set forth in the Handbook:

> The level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a CNEL value of 65 dB for purposes of these regulations. This criterion level has been chosen for reasonable persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech, sleep, and community reaction.

To develop ALUCP policies, an ALUC will review aircraft noise contours based on an airport noise contour map that reflects current and anticipated airport operations for a 20-year period. For military airports, an AICUZ usually identifies noise contours and may also be used to prepare the ALUCP.

Figure 6-9 presents a generic example of noise contours. In the example shown, the purple noise contour indicates the area that would be exposed to aircraft noise levels ranging from 60 to 65 CNEL, the area designated in blue would be exposed to noise levels ranging from 55 to 60 CNEL, and the outlying green area would be exposed to noise levels ranging from 50 to 55 CNEL.

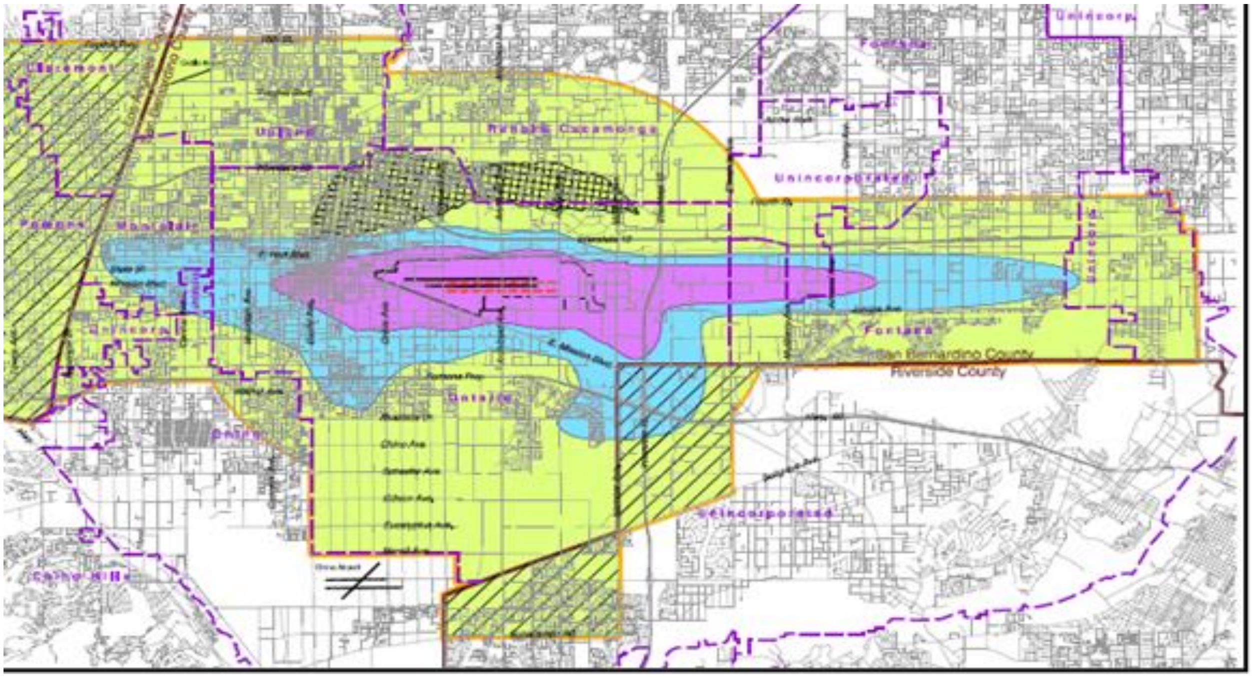


Figure 6-9: Example of Aircraft Noise Contours
Source: Mead & Hunt, Inc., 2020

The following noise uses are generally considered "incompatible" within the 65 CNEL contour unless certain mitigation is undertaken, such as noise insulation, to reduce interior noise levels:

- Residential uses of all types
- Public and private schools
- Places of worship
- Hospitals and nursing homes

An ALUC may recommend other potentially incompatible land uses based on the airport location, topography, and other considerations. In addition, the ALUC policies will include similar land use recommendations that may be offered in areas subject to lower levels of noise exposure (i.e., exposure of less than 65 CNEL contours).

Aircraft Overflight

Overflight concerns are associated with annoyance due to the frequency or perceived loudness of individual aircraft operations, such as noise or the sight of nearby aircraft. Overflight concerns are subjective, and they occur even in areas where noise levels do not exceed regulatory levels (65 CNEL) or no safety concerns arise.

In some cases, overflight may be associated with fear that aircraft are flying too low or too often. As identified in the Caltrans Handbook, overflight concerns may be important community concerns, but planning actions are not available to avoid or mitigate the concern. Therefore, providing notification of the presence of a nearby airport through buyer awareness measures is the primary strategy for reducing annoyance.

State airport proximity disclosure law applies to existing development but not to all transactions. State statutes require that, as part of many residential real estate transactions, information be disclosed regarding whether the property is situated within an AIA (Business and Professional Code Section 11010 and Civil Code Sections 1102.6, 1103.4, and 1353). These State requirements apply to the sale or lease of newly subdivided lands, condominium conversions, and to the sale of certain existing residential property. In general, Airport Proximity Disclosure is required with existing residential property transfer only when certain natural conditions (earthquake, fire, or flood hazards) warrant disclosure.

Overflight Notification Area

Zones reflect where aircraft routinely fly at pattern altitude or lower. When available, radar flight tracks can be used. At GA airports, defining standard airport traffic patterns is the best that can be done. In many cases, the overflight notification area for an airport will extend throughout the AIA, which usually coincides the area covered by Part 77 surfaces (see Sections 4.2.4 and 4.2.5).

Safety

The objective of land use safety compatibility criteria is to minimize the risks associated with an off-airport aircraft accident or emergency landing.
Safety policies focus on reducing the potential consequences of such events should they occur. Risks both to people and property in the vicinity of an airport and to people on board the aircraft are considered. Land use features that can be the cause of an aircraft accident are usually considered when formulating airspace protection policies.

Measures of Risk Exposure

The risk that potential aircraft accidents pose to lands and people near an airport is evaluated using two parameters:

- The likelihood of an accident occurring in a given location near the airport
- The potential consequences of an accident at a given location

Accident Location

The likelihood of an accident is measured in terms of the geographic distribution of where accidents have historically occurred around other airports with similar types of activity. However, aircraft accidents are infrequent occurrences, and the pattern of accidents at any one airport cannot be used to predict where future accidents may happen. Reliance must be placed on data about aircraft accident locations at comparable airports. Safety evaluations typically consider risk based on the location of the proposed project and the locations around an airport that are at the greatest risk of being affected in the event of an aircraft accident. Typically, accidents occur along the extended runway centerline. Proper safety and airspace protection minimize the number of people on and off the airport that are exposed to the risks associated with potential aircraft accidents and avoid flight hazards that interfere with aircraft navigation. Caltrans implemented this data when identifying the types of "safety zones" that could be applied to airports for safety. (Caltrans DOA, 2011).

Safety Zones

The Handbook provides generic safety zones to serve as initial templates to assist ALUCs in identifying safety zones for a specific airport.

Six zones are recommended, with Zone 1 representing the most vulnerable area. The safety zones are illustrated in **Figure 6-10** and summarized in **Table 6-4** below.

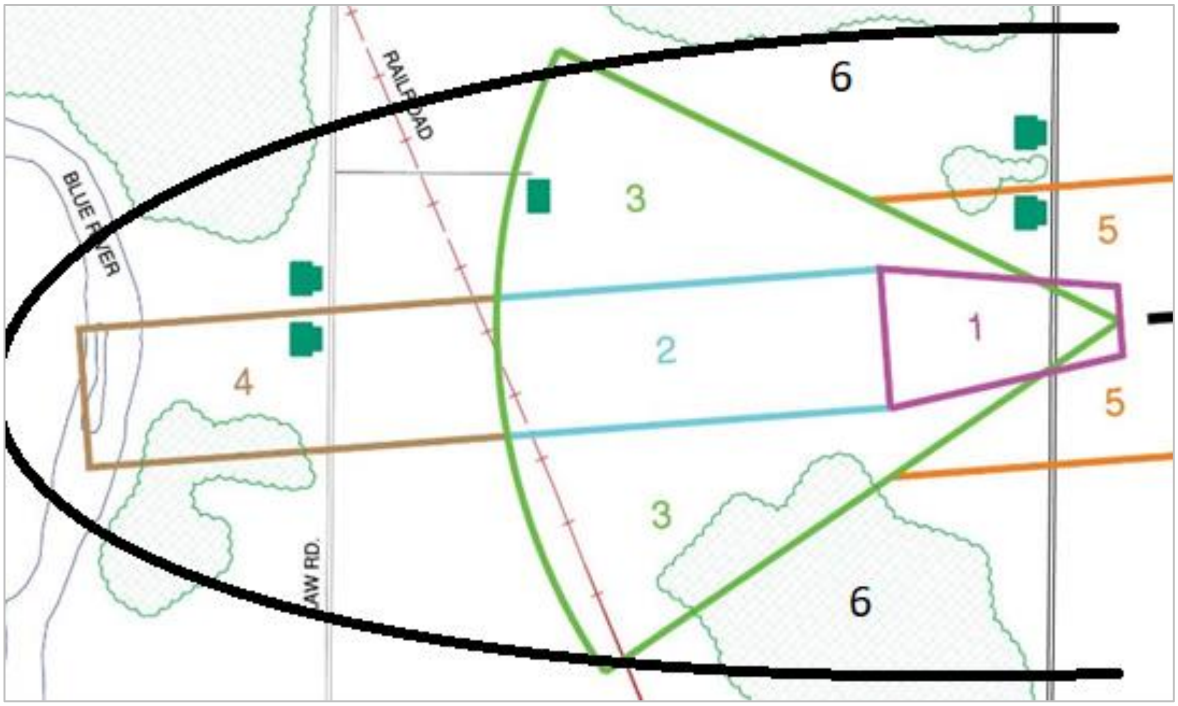


Figure 6-10: Recommended Safety Zone Configuration
Note: Zone dimensions will change based on site-specific factors.
Source: Mead & Hunt, Inc., 2020

Accident Consequences

For most non-residential development, potential consequences are measured in terms of the usage intensity—the number of people per acre on the site. For residential development, density—the number of dwelling units per acre—is substituted for intensity. Additional criteria are applicable to specific types of uses. To avoid or reduce potential consequences, the density/intensity of land uses should be reduced based on the level of risk associated with a specific location.

Table 6-4: Summary of Recommended Safety Zones

Zone	Summary of Generally Recommended Land Uses
Zone 1: RPZ and ROFA (Very high risk)	• Zone 1 should be void all residential and nonresidential use. • Airport ownership of the property is encouraged.
Zone 2: Inner Approach/Departure Zone (High risk)	• Low-intensity uses are suggested such as agriculture, warehouses, and low-intensity light industrial uses. • Residential uses should be avoided. • High-intensity uses should be prohibited (theaters, assembly uses, labor-intensive industrial uses, children's schools, daycare, hospitals, nursing homes, stadiums, and group recreational uses. Hazardous use should be prohibited.
Zone 3: Inner turning Zone (Moderate to high risk)	• Zone 2 uses, low-hazard storage, warehouses, and light industrial uses are allowed. • Commercial and other non-residential uses with higher intensities and hazardous uses should be avoided. • Assembly facilities, shopping centers, schools, daycare centers, hospitals, stadiums, etc., should be prohibited.
Zone 4: Outer Approach/Departure zone (moderate risk)	• Zone 3 uses, restaurants, retail, and industrial uses. • High-intensity retail or office uses should be avoided. • Children's schools, daycare, hospitals, nursing homes stadiums, and group recreation are prohibited.
Zone 5: Sideline Zone (Low to moderate Risk)	Zone 5 occurs on airport property, which affects they types of land uses that are appropriate. • Zone 4 uses and common aviation-related activities pending FAA height restrictions. • Residential uses unless airport-related and high-intensity non-residential uses should be avoided. • Stadiums, group recreational uses, children's schools, day care, hospitals, and nursing homes should be prohibited.
Zone 6 – Traffic Pattern Zone (Low Risk and generally no prohibitions)	• Residential uses are allowed • Children's schools, large daycare centers, hospitals and nursing homes should be limited. • Outdoor stadiums and similar high intensity use should be avoided.
Source: Caltrans, 2011	

Airspace

Given that airspace protection policies rely upon the regulations and standards enacted by the FAA and implemented by the State and local agencies, the objective of airspace protection is to prevent creation of land use features that can pose hazards to the airspace required by aircraft in flight and have the potential to cause an aircraft accident, without interfering with FAA jurisdiction.

Measures of Hazards to Airspace

Three categories of hazards to airspace present significant concerns:

- **Physical** hazards include tall structures that have the potential to intrude upon protected airspace as well as land use features that have the potential to attract birds and certain other potentially hazardous wildlife to the airport area.
- **Visual** hazards include certain types of lights, sources of glare, and sources of dust, steam, or smoke.
- **Electronic** hazards are ones that may cause interference with aircraft communications or navigation.

If an object is deemed to be a hazard based on an FAA aeronautical study, remedies may be available to reduce risk, such as:

- Marking and lighting the object as directed by the FAA aeronautical study or the Division in a manner consistent with FAA standards; or
- Procuring a dedicated avigation easement to the local agency that owns the airport

As previously mentioned, the following FAA regulations and documents, and any later versions of these documents, are specifically relevant:

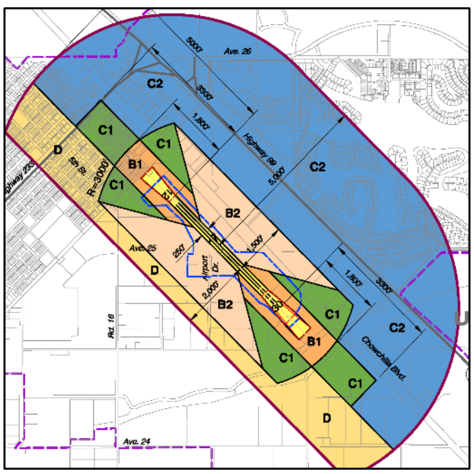
- 14 CFR Part 77 provides standards regarding FAA notification of proposed objects and height limits of objects near airports
- AC 150/5300-13 provides standards regarding safety-related areas close to runways and for at least two nautical miles from the runway end
- AC 70/7460-1L sets standards for essential marking and lighting should be designed

These regulations and standards do not give the FAA authority to prevent the creation of hazards to flight, as that authority rests with state and local governments.

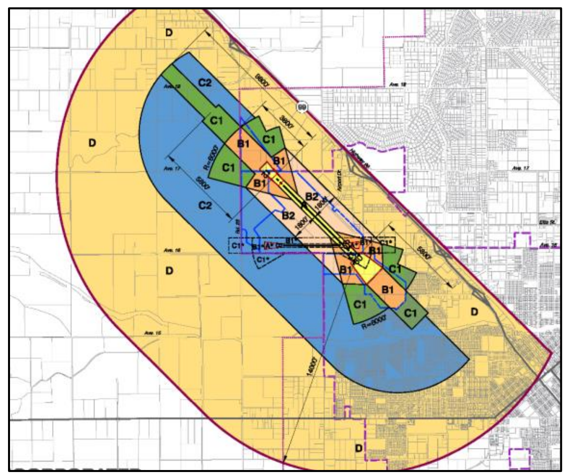
The State of California has enacted regulations that enable State and local agencies to enforce FAA standards. The ALUC policies are intended to help implement the federal and State regulations.

Airspace Protection Areas

From the California Airport Land Use Handbook (PUC Section 21674.7), an ALUCP is developed with airspace protection in accordance with ("but not limited to") 14 CFR Part 77 by establishing an AIA (PUC Section 21675) for reference against local zoning. The critical airspace protection zone is the portion of the Part 77 primary surface (the runway) and the area beneath portions of the approach and transitional surfaces to where these surfaces intersect with the horizontal surface (see **Figure 6-11**).



Chwchilla Airport safety zones/land uses



Madera Airport safety zones/land uses

Figure 6-11: Example of an Airspace Protection Area with Underlying Land Uses

Source: Madera County, CA ALUC via Mead & Hunt, Inc.

Identifying Airspace Conflicts

ALUCP development could benefit from also applying AC 150/5300-13. Combining the sources allows ALUCP use of the compatibility criteria for determining the acceptability of a project, with respect to height, to determine whether an obstruction is a hazard and, if so, to recommend mitigation, or adjust airport designs and planning to accommodate an obstruction.

If an object is deemed to be a hazard based on an FAA aeronautical study (from 14 CFR Part 77), remedies may be available to reduce risk, such as:

- Marking and lighting the object as directed by the FAA aeronautical study or the Division in a manner consistent with FAA standards; or
- Procuring a dedicated avigation easement to the local agency that owns the airport.

Other Flight Hazards

Land uses are considered incompatible when they cause visual or electronic hazards to aircraft in flight, taking off, or landing, such as:

- Sources of glare (such as from mirrored or other highly reflective buildings or building features) or bright lights (including search lights and laser light displays)
- Distracting lights that could be mistaken for airport lights
- Sources of dust, steam, or smoke that may impair pilots' vision
- Sources of steam or other emissions that cause thermal plumes or other forms of unstable air
- Sources of electrical interference with aircraft communications or navigation
- Any proposed use that creates an increased attraction for wildlife and that is inconsistent with FAA rules and regulations, particularly landfills, conservation areas, open water, and certain recreational or agricultural uses that attract large flocks of birds.

Relationship of Compatibility Zones to the Airport Influence Area

The AIA encompasses the total area affected by each compatibility zone (noise contours, overflight areas, safety zones, and the airspace protection area). When viewed in sum, airport land use planning and compatibility exists on multiple levels, as illustrated below in **Figure 6-12.**

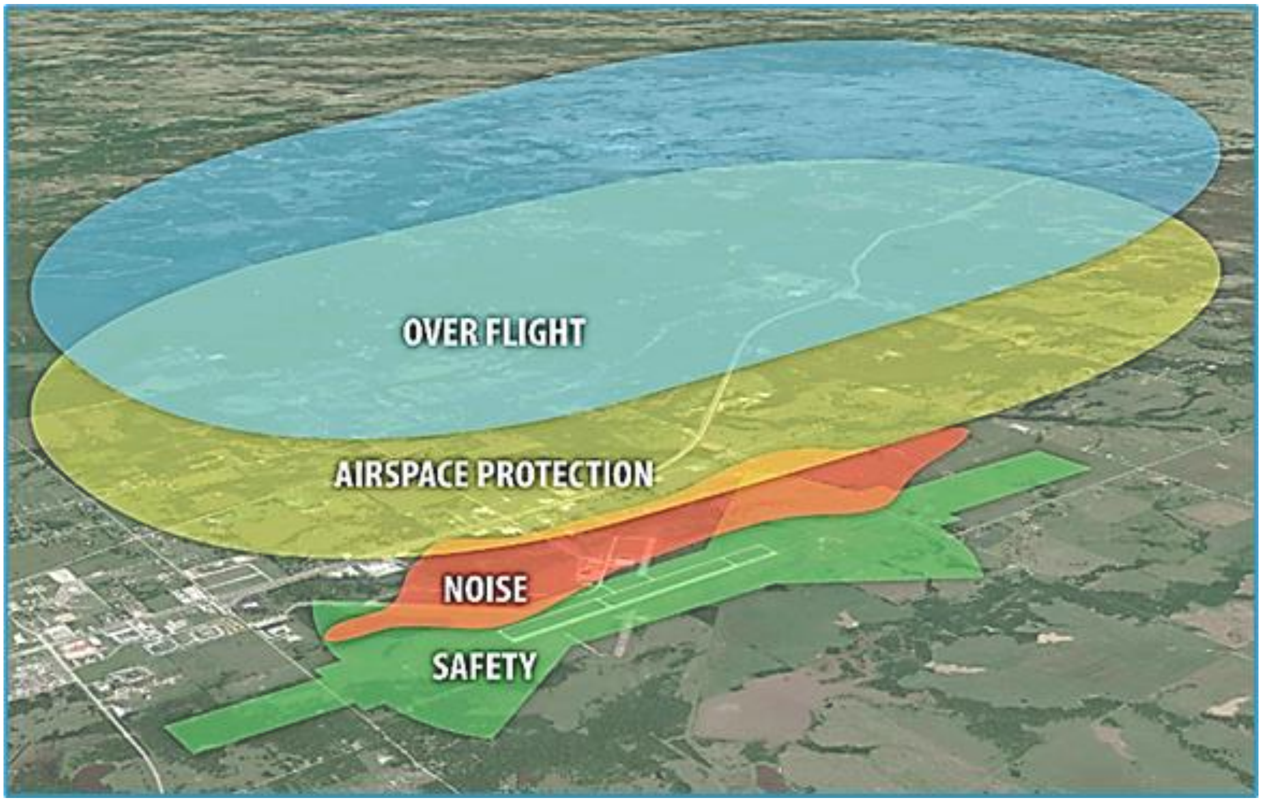


Figure 6-12: AIA Example
Note: The AIA includes areas identified for each compatibility zone.
Source: Mead & Hunt, Inc., 2019

Some exceptions may occur:

- Approach/departure surfaces for precision Instrument runways may extend nearly 10 miles from the runway's primary surface.
- Major flight routes to and from busy airports, especially those with major airline service and some military airfields, can produce overflight impacts and noise contours that extend beyond Part 77 boundaries.
- Limited-use airports or airports with seldom used runways may result in AIAs that do not provide coverage of the entire area encompassed by the Part 77 surfaces.
- Military airports operate with a different set of Part 77 surfaces that cover a much more extensive area.

If an ALUC has not adopted an AIA boundary, a "default study area boundary" may be used that extends over the land within 2 miles of the airport. (PUC 21675.1 (b) Ultimately, the resources exist within regulatory parameters and federal and State guidance to accomplish compatible airport land use for mutual benefits.

One crucial component that must still be satisfied is congruency between the practices used in planning airports and municipalities. Once coordinated, the two disciplines can assist from any local area in accomplishing goals of the California Transportation Plan 2050.

6.4.3 Land use and Emerging Technologies

Two emerging technologies have the potential to affect land use in ways that challenge the Division's approach to land use compatibility planning: UAS and UAM.

UAS

The use of UAS has increased dramatically worldwide, and UAS are playing an increased role in the NAS. UAS consist of the unmanned aircraft platform and the associated elements necessary for the safe and efficient operation in the NAS, such as communication links, sensors, software, and a power supply.

UAS and Land Use Considerations

The FAA is authorized to regulate the areas of airspace use and to prescribe air traffic regulations on the flight of aircraft (including regulations on safe altitudes). In order to operate the UAS, the FAA, consistent with its statutory authority, requires federal registration of UAS to help protect public safety in the air and on the ground. Also consistent with its authority, the FAA warns that substantial air safety issues may be raised when state or local governments attempt to regulate the operation or flight of aircraft in navigable airspace (FAA, 2015).

In 2015, the FAA provided guidance to states and localities when considering laws and regulations affecting UAS:

- FAA consultation for operational restrictions on UAS flight altitude, flight paths, and/or any regulation of the navigable airspace
- Mandating equipment or training for UAS related to aviation safety, such as geofencing, would likely be preempted
- Laws traditionally related to state and local police power—including land use, zoning, privacy, trespass, and law enforcement operations—generally are not subject to federal regulations (e.g. obtaining warrants prior to UAS surveillance, voyeurism, and prohibiting the attachment of firearms or similar weapons to UAS) (FAA, 2015)

Commercial UAS activities could pose concerns locally, as UAS fly at low altitudes and are being considered for use in areas that are not usually subject to aircraft overflight concerns. Local agencies may wish to establish restrictions on UAS use in certain areas of their communities to protect privacy and infrastructure and to prevent airspace conflicts with law enforcement or emergency services.

ALUCs may wish to consider restrictions on the use of UAS near airports, to the extent possible under PUC sections 21670 and 21674(e). The Division may wish to consider developing a role that provides education and outreach to local planning agencies about the types of regulations that may be permitted under their police powers and the need to coordinate with the FAA.

UAM

UAM is defined as "a safe and efficient system for air passenger and cargo transportation within an urban area, inclusive of small package delivery and other UAS services, which supports a mix of onboard/ground-piloted and increasingly autonomous operations" (NASA, 2019). Aircraft manufacturers, such as Airbus, and TNCs such as Uber Elevate, envision the use of electric aircraft to provide cost-effective intra-city, inter-city, and regional air travel in the nation's most congested areas. Los Angeles and San Francisco are identified as areas targeted for the introduction and early adoption of on-demand UAM use.

NASA has undertaken a national campaign to explore the regulatory and policy frameworks associated with UAM technology development, operation, and implementation, and it contends that UAM may play a significant role in transforming short-haul urban air transportation by 2030 (e.g., airport shuttle, air taxi, air ambulance, last-mile parcel delivery, etc.) (NASA, 2019). Early strategies for UAM implementation suggest that e-VTOL aircraft will be used to transport passengers within and between large metropolitan areas. The aircraft would operate in urban areas at elevations of 2,000 to 2,400 feet, rely on battery power to reduce GHG emissions, and are expected to operate more quietly than rotor aircraft. As envisioned by one industry proponent, aircraft would fly above existing urban roads and highways to transport passengers to and from downtown areas.

UAM and Land Use

Although airspace and flight paths will be subject to FAA regulation, UAM will likely pose land use challenges:

- Operations are proposed in densely populated urban areas that are not exposed to extensive overflight at regular intervals, which is likely to pose overflight concerns
- Although electric aircraft are quieter by comparison to other vehicles, they will operate a low altitude and will be perceptible, thereby posing overflight and potential noise concerns
- The construction or incorporation of e-VTOL takeoff and landing sites into existing urban areas may render safety evaluations ineffective based on the presence of existing land uses and land use conflicts

As stated in previously, "The Division considers promoting a safe aviation environment for pilots, passengers, and persons on the ground" its most important obligation. This is achieved by applying one simple axiom: "limit the number of people, both in the air and on the ground, from potentially hazardous conditions" (Caltrans DOA, 2016). Current UAM proposals would not be consistent with this axiom or the Division's existing compatible land use guidance. As this policy evolves, the Division will need to consider appropriate metrics and guidance to evaluate and identify the compatibility and consistency of UAM operations within an AIA.

6.4.4 ALUCP Integration with Local and Regional Planning Efforts

In the discussion that follows, consider that when utilizing the planning efforts for surface transportation projects—to facilitate intermodal interests—there are two broad issues: one each for "pro" and "con:" The general "pro" is derived from an overall lack of available land that mitigates impact or disruptions to business and residents. The general "con" comes from the fact that many California airports are already "landlocked" by the existing built environment (including that which gradually encroached on airport environs).

Consequently, future aeronautical uses could be further restricted, or for those projects that could be developed, constrained by excessive costs to "work around" an impeding surface mode.

General Plan Integration

Compatible land use around airports is the reconciliation of how land use, development, and airports function together. Airport land use planning efforts depend on careful coordination with affected jurisdictions and their planning agencies, landowners, and other community members to address potential concerns. In addition, ALUCPs are considered projects that are subject to CEQA evaluation and review.

Integrating Airport Land Use Compatibility Plans and Local Plans

As previously discussed, ALUCPs are prepared by ALUCs that have no direct land use authority, though the ALUC is responsible for preparing the compatibility plan. Each individual county and city included within an AIA must implement the compatibility plan through its own plans and zoning ordinances, and this is perhaps the greatest challenge associated with ALUCP integration with local planning efforts.

A recent study by the ACRP (Report 206), "Guidebook on Effective Land Use Compatibility Strategies for General Aviation Airports," considered the use and effectiveness of zoning codes to support compatibility planning near airports (ACRP, 2019). The report identified the benefits and challenges associated with integrating airport planning with local agency plans (ACRP, 2019).

Benefits of Integrated Airport Land Use Planning

Local General Plans articulate community goals and objectives for land use, transportation, and other factors. When a general plan is made consistent with an adopted ALUCP (as required in the PUC), it can also establish goals to address the airport and its surroundings for airport development. As described in ACRP Report 206, addressing airport compatibility as part of a general plan offers many advantages:

- The airport and its importance to the community can be examined in the context of community-wide needs and goals for the importance of maintaining land use compatibility
- Airport planning and compatibility policies and goals in the general plan provides a foundation for the zoning ordinances necessary to implement the ALUCP policy goals and reinforces the legality of the zoning ordinances
- Periodic re-examination of the general plan and ALUCP policies provides opportunities for planning agencies to address or update compatibility issues

Challenges

ACRP research also identified certain challenges when integrating airport and general plan policies:

- Comprehensive plans address a broad range of topics, but they do not usually provide the details of individual topics such as airport land use compatibility. The details necessary to regulate future land uses to accommodate airport needs are usually provided in other documents, such as ALUCPs, and must be cross-referenced
- Local land use planners responsible for the preparation of a general plan or plan policies may not be familiar with airport operations, terminology, FAA regulations and guidance (e.g., 14 CFR Part 77), or the planning implications associated with other compatibility concerns
- Local elected officials and residents may not understand the value of the airport to the community and may place little priority on compatible land use planning and compatibility measures (circumstances exacerbated by election turnover)
- Development pressures and economic development potential may negate or circumvent airport protection from encroachment and airspace protection from off-airport obstacles
- Communication between local government planning agencies and airport management may be poor, thereby preventing or complicating the review of development proposals
- General plans do not have regulatory power in and of themselves, and policies must be implemented through zoning codes

Agency and Regulatory Conflicts

Conflicts may occur among FAA regulations, the policies set forth in ALUCPs, and other laws and regulations.

Conflicts come to light during the environmental review process; yet, environmental review often occurs after significant project design has been completed and environmental mitigation strategies have been negotiated with regulatory agencies. Examples of conflicts that arise during NEPA/CEQA are presented in **Table 6-5.**

Table 6-5: Examples of Potential Agency Conflicts

Stormwater and Water Quality Management: **FAA Strategy – Discourage Open Water:** FAA guidance warns against the creation of open water features within 5,000 feet of movement areas at GA airports and 10,000 feet of movements areas at airports that support jet aircraft. If open water is necessary to protect water quality within the areas identified by these separation criteria, the FAA suggests the use of steep, hard-sided trenches or basins that will drain quickly so as not to attract hazardous wildlife. ALUCPs are likely to include policies to prevent the creation of wildlife hazards throughout the AIA to coincide with FAA guidance.	**Local Agency Strategy – Promote Low-Impact Design:** Many local agencies and regulators seek to implement Low-Impact Development (LID) stormwater management strategies, which include Best Management Practices (BMPs) such as the use of infiltration/recharge basins to promote water quality by allowing stormwater to infiltrate slowly into soils. Some agencies promote the use of Infiltration basins to create or restore habitat and propose vegetation that provide a food source and nesting opportunities for native species. Local agencies require the use of low-impact technologies to promote environmental quality and compliance with federal and state regulations.
Habitat Mitigation Preservation and Conservation: AC 150/5200-33C warns against the creation of habitat that could attract potentially hazardous wildlife (see above). The establishment of habitat near the airport can pose wildlife hazards, and the establishment of conservation easements in the airport vicinity could lead to encroachment that conflicts with future airport operations and development.	Regulatory agencies such as the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the CDFW promote the establishment of habitat mitigation close to the site of the disturbance to provide replacement habitat or promote water quality goals. Once mitigation is complete, agencies may require that an easement be established on the property that will remain in place in perpetuity. Local agencies and project proponents will work with agencies to identify and negotiate potential mitigation sites prior to CEQA review and without consulting ALUCP policies.

CEQA and ALUC Review Timeframes CEQA requires project proponents to demonstrate that their projects comply with other applicable plans for the project area, including ALUCPs, and require proponents to consider their effects on private airstrips within 2 miles. ALUCs are required to determine whether certain projects, including major land use changes, are consistent with ALUC policies and to provide their findings to decision makers prior to CEQA adoption or certification. Proposed projects might not be submitted for ALUC consideration until CEQA review timeframes, when projects have undergone significant design. Suggested changes or modifications to the project identified to promote ALUCP consistency may be unwelcome by project proponents.	Project proponents who are unfamiliar with aviation may be unaware of ALUCPs and policies until after designs have been well developed, mitigation strategies identified, and after other expenditures have been incurred. Design retrofits to address potential obstructions, wildlife hazards, or other conflicts will require additional effort and expenditures by the project proponent to achieve consistency with ALUCP policies. ALUCP policies will be viewed in a negative light.

On-going coordination between local planning agencies and ALUCs is imperative to avoid and prevent land use conflicts. Potential strategies to encourage better communication and understanding include:

- Providing local decision makers with education and tools to better understand the economic value of their airport, its community benefits, and the consequences of incompatible development on the airport and the community
- Involving the airport manager in the chain-of-review when proposed development applications for projects near the airport are submitted to the planning agency
- Alerting the development community about the presence of the ALUCP and compatibility concerns associated with projects proposed within the AIA (i.e., noise exposure, tall structures, density/intensity restrictions). For example, the Riverside County ALUC recently prepared stormwater management landscaping guidance for developers and their consultants
- Establishing a formal relationship between the airport manager and local planning department (ACRP, 2019)

Integration of Airport Land Use Compatibility Plans And Regional Transportation Plans

RTPAs and MPOs are responsible for preparing RTPs. For more than 30 years, the primary purpose of the RTP has been to identify the surface transportation projects, programs, and services to address both current conditions and future regional growth and to specify the major transportation projects to be programmed based on the available financial resources (CTC, 2017a and 2017b). Because these plans focused on surface transportation and were prepared with FHWA guidance and funding, airport planning was not often considered.

The State reconsidered its approach to RTPs in response to AB-32. It gives CARB authority over the sources of GHG emissions.

SB-375 requires MPOs to develop SCS plans or long-range plans to align transportation and land use decisions toward achieving GHG emissions reduction targets. The CTC issued new guidance to MPOs and RTPAs in 2017 to help incorporate this legislation and incorporate measures to address statewide GHG reduction goals during RTP preparation. Only MPOs are required to prepare SCS documents.

MPOs must work with local agencies to prepare the SCS and to align the SCS and RTP with the housing need and allocations identified in their Regional Housing Needs Assessments for regions and communities to identify:

- The general location of uses, residential densities, and building intensities within the region
- Areas to house all economic segments of the region's population over the course of the planning horizon
- Areas within the region to house an eight-year projection of the regional housing need for the region
- A transportation network to serve the transportation needs of the region (ILG, 2020).

An SCS plan identifies a forecasted development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, will reduce GHG emissions from automobiles and light trucks to achieve GHG emissions reduction targets (ILG, 2020).

RTPs must be prepared in accordance with federal laws and FHWA guidance, which requires MPOs and RTPAs to consult with stakeholders responsible for land use management, as appropriate. The 2017 CTC guidance to MPOs and RTPAs addresses the importance of protecting California's airports from encroachment by incompatible land uses and states that that even though the ALUCPs are not specifically named in statute, airports and ALUCs should be consulted during RTP preparation. The guidance also recommends that RTPAs and MPOs consider the needs of public-use airports, special-use heliports, and military airfields when planning transportation and infrastructure projects to further sustainable and compatible land use and circulation patterns (CTC, 2017a and 2017b).

Smart Growth

Smart Growth is a broad term that refers to a suite of local governments policies intended to protect, preserve, and economically develop established communities as well as natural and cultural resources; it encompasses a holistic view of development (CTC, 2017a and 2017b).

Strategic principles associated with smart growth include:

- Mixed land uses
- Compact building design
- A range of housing opportunities and choices
- Walkable neighborhoods
- Distinctive, attractive communities with a strong sense of place
- Preserved open space, farmland, natural beauty, and critical environmental areas
- Development directed towards existing communities
- A variety of transportation choices
- Predictable, fair, and cost-effective development decisions
- Community and stakeholder collaboration in development decisions (Maryland Department of Planning, 2020)

In terms of land use and transportation planning, Smart Growth refers more specifically to a suite of design, land use planning, and infrastructure investment policies that promote more livable, equitable, and economically vital urban neighborhoods and regions while minimizing environmental costs and sprawl. Smart growth principles emphasize better integration of interdependent land, thereby reducing dependence on automobiles, roads, and reducing GHG emissions (MTI, 2008). The passage SB-375 provided a legislative link between land use and transportation to reduce GHG emissions. Subsequent guidance to expand long-range transportation planning efforts to develop concurrent RTP/SCS plans supports smart growth principles; such plans forecast and influence patterns of growth and economic activity through accessibility to specific areas and recognize the critical links between transportation and other societal goals (CTC, 2017a and 2017b).

Smart Growth Policies and Airport Land Use Compatibility Planning

Smart growth policies and airport land use compatibility goals are commonly seen as different or even divergent, as smart growth focuses on dense and compact urban development while ALUCPs focus on open space and lower density development in the airport vicinity. Nevertheless, there are reasons to consider how these land use constructs can be better connected:

- To explore how the land use planning strategies pursued in response to smart growth policies can be adapted to meet airport land use compatibility goals
- To identify ways in which smart growth policies might adversely affect airport land use compatibility planning (for example, infill development and increased densities near airports)
- To understand how longer-term airport development strategies could conflict with smart growth policies (MTI, 2008)

A 2008 study by the Mineta Transportation Institute (MTI), "Applying Smart Growth Principles and Strategies to Resolving Land Use Conflicts around Airports," considered the potential role of smart growth principles to enhance airport land use compatibility planning and the implementation of regional airport development strategies as well as to identify potential conflicts between smart growth and airport land use planning.

The 2008 study, which was conducted prior to the implementation of SB-375, offered the following conclusions regarding airport land use compatibility planning and smart growth:

- Smart growth principles were not explicitly considered in compatibility planning adopted by ALUCs, even when local jurisdictions implemented smart growth policies
- Some San Francisco Bay Area developments that were identified as smart growth occurred near airports but were not directly under flight paths; and
- Some smart growth and planning policies collided head on as suburban growth that featured smart growth principles was proposed and found to be inconsistent with ALUCP policies.

To better incorporate smart growth, the MTI study offered the following suggestions:

- Develop explicit guidelines to address smart growth planning in the airport vicinity
- Incorporate economic planning considerations into airport planning guidance to actively promote airports as community assets that must be protected
- Promote increased action between ALUCs and local planning agencies.

Looking Ahead

Caltrans has made strides since 2008 to better align smart growth with its transportation policies and goals, and the Division has participated in those efforts. The 2014 "Caltrans Airport Forecasting Study, The Role of California Airports in Smart Growth and Economic Vitality" created tools for communities and regions for developing their local airports to their full economic potential.

Legislative efforts to align land use and transportation to reduce GHG emissions and subsequent CTC guidance for RTP preparation provide an increased focus on airports. The recent CTC guidance recognizes that the State's airports need to be protected through comprehensive planning practices at all levels of government. The increased effort to consider airports in regional transportation planning and acknowledge their value will help to promote coordination among regional transportation agencies, promote the inclusion of airports in long-range planning efforts, and further smart growth principles during statewide transportation planning.

6.5 SUSTAINABILITY

Caltrans' mission is to "Provide a safe and reliable transportation network that serves all people and respects the environment." The Caltrans mission is central to regional and State goals. The following discussion addresses sustainability as it is considered throughout Caltrans, within the context of aviation and the Division's efforts to promote sustainability at individual airports, and throughout the statewide aviation system.

6.5.1 Caltrans' Sustainability Vision

Every sustainability effort is unique, and an organization may define sustainability based on its goals and values. Most definitions are founded in the principles set forth by the United Nations and the concept of the "Triple Bottom Line" of benefits derived from environmental stewardship, economic growth, and social responsibility.

Factors Driving Sustainability

Caltrans created a Sustainability Implementation Plan that charts a course for achieving a sustainable transportation system. The Implementation plan was developed to address five factors and their associated legislation and executive orders beginning with AB-32, California's landmark Global Warming Solutions Act:

- **Climate Change**: The effects of a changing climate, including reduced snowpack, increased rain precipitation, and SLR. Adapting to climate change are essential for long-term sustainability.
- **Public Health:** The connections between transportation and public health are well documented; well-designed and maintained infrastructure improves safety, and multimodal travel options promote physical activity and improve access to essential goods and services.
- **Livability:** Transportation facilities influence local economic vitality, environmental quality, public health, and personal mobility. Efficient and accessible transportation systems are vital for long-term sustainability.
- **Economy:** California's economy relies on the efficient movement of goods and people. The ports of Los Angeles and Long Beach are the nation's busiest and handle about 40 percent of U.S. imports. Freight transport depends on multimodal surface transportation systems to reach destinations in California and across the nation. Sustaining economic vitality is essential to the State and the nation.
- **Limited Funding:** Funding limits have long constrained transportation improvements. The need to find more cost-effective ways to achieve Caltrans' mission and goals—to "do more with less"—is an important component of sustainability.

Climate Stewardship, Adaptation, and Resilience

California has embarked on strategies to address the effects of climate change for nearly two decades; legislation and initiatives have sought to address climate change through two approaches: mitigation and adaptation.

- **Mitigation** involves reducing and stabilizing the levels of greenhouse gases in the atmosphere that are produced by the burning of fossil fuels
- **Adaptation** involves adjusting to current and expected changes in the climate to reduce vulnerability to harmful effects, such as sea-level rise (SLR), more extreme weather events, and wildfires.

Reducing GHG Emissions

The reduction of GHG emissions is central to California's sustainability efforts. Although the Division does not operate individual airports and heliports on State-owned properties in the California Aviation System, and has no authority over how airports are managed, it can provide policy and guidance to airport operators to incorporate sustainability principles into their facility development and operations. Caltrans encourages airport operators to implement strategies to reduce GHG emissions. Areas of interest include on-site power plants, enhanced Active Transportation, multimodal transportation, fleet vehicles, diesel ground service equipment (GSE), purchased electricity, aircraft, passenger vehicles, and waste disposal. Reduction strategies include using renewable energy sources; using alternative aviation and vehicle fuels or electric alternatives; utilizing and promoting automated, shared, and electric vehicles; installing gate electrification; providing electric charging stations; and reducing waste generation and disposal. The Division's loan program has been used to purchase solar panel farms and help boost electrification.

Many of GHG reduction programs are associated with airport capital projects and supported by AIP grants from the FAA,

Voluntary Airport Low Emissions Program

In 2004, Vision 100 legislation established the Voluntary Airport Low Emissions program (VALE) to provide federal support for clean air and airport emissions reduction initiatives to encourage airport sponsors to implement clean technology projects that improve air quality. The VALE program is available to commercial service airports located in areas that are in non-attainment or maintenance of National Ambient Air Quality Standards (NAAQS). Eligible project types include the purchase of alternative fuel vehicles and recharging/refueling infrastructure, gate electrification units, and electric ground power converter units (FAA, 2020a). In one example, OAK received a $2.5 million grant to purchase and install power units and electrical infrastructure at aircraft "remain-over-night" parking positions (FAA, 2020a).

Zero Emissions Vehicle and Infrastructure Pilot Program

The FAA's Zero Emissions Vehicle and Infrastructure Pilot program promotes air quality improvement through the implementation of zero emissions technologies at airports. The program allows airport sponsors to use AIP funds to purchase ZEVs and to construct or modify infrastructure needed to accommodate ZEVs (FAA, 2019b).

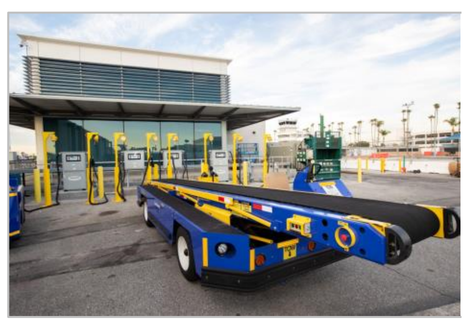
Any public-use airport in the NPIAS is eligible to receive AIP grants, but priority is given to airport sponsors located in federally designated air quality nonattainment areas. Airports in designated maintenance areas will only be considered after all proposals from nonattainment areas are considered for funding (FAA, 2019b).

Clean Energy Use

The FAA also encourages airport sponsors to evaluate their energy sources and turn to alternative sources that are more sustainable. California airports are well suited to use or lease airport property for the construction of aviation-compatible renewable energy generation systems, such as solar arrays, as airports nationwide have done. The power generated by these systems can be used to support airport operations or contribute excess power to the energy grid. Airports operators can also consider opportunities provided by local utilities to increase the percentage of energy derived from renewable sources. Numerous California airports have installed solar arrays to support airport operations and provide power that can be isolated from regional power grids to enable ongoing operations in the event of an emergency.

Although the Division cannot direct airports to undertake projects to reduce GHG emissions, it can encourage them to do so by providing matching grant funds to support projects undertaken with AIP funds.

At SMF: A solar facility at Sacramento International Airport generates nearly 15,500,000 kilowatt-hours per year which equates to 11,535 metric tons of GHG emissions expressed in carbon dioxide equivalent. The clean energy generated annually has the carbon reduction equivalent of removing nearly 2,500 cars from the road, not consuming 26,707 barrels of oil, or not burning 12,620,748 pounds of coal. (Sacramento County press release, 3/10/1010)
At LGB: At LGB: Installation of 15 electric chargers for ground support equipment, means LGB has now achieved 100% electrification for all 11 of its commercial gates. (LGB press release 2/6/2020)



Aviation is doing its part thanks to FAA supported airport projects. Press release photos; SMF and LGB

Adaptation and Resiliency

Caltrans has conducted research and analysis on climate change impacts on the State Highway System for a decade, and individual Caltrans Districts have undertaken Vulnerability Assessments to project future impacts from wildfire, precipitation, temperature, SLR, and storm surge. The Caltrans Adaptation Roadmap seeks to identify, plan, and prepare for climate change risks to department assets.

Airport managers face similar climate change challenges from extreme weather events and SLR for coastal areas. But extreme weather will also cause aviation-specific operational effects, such as reduced payloads for aircraft and airspace challenges during increasingly frequent wildfires.

Sea Level Rise

State SLR Guidance provides a step-by-step approach for State and local agencies to evaluate and adapt to SLR projections via climate change.

California's aviation system is particularly vulnerable to SLR, as shown in **Table 6-6,** and **Table 6-7** identifies the 11 California airports, four of which are commercial service airports, that will be affected by SLR as water increases above the existing mean higher highwater datum (MHHW). Two airports, Palo Alto (PAO) and Gnoss Field (DVO), are already vulnerable to flooding (SLR of 0 feet). While this suggests that these airports are underwater, this prediction does not account for site specific engineering modifications to elevate runways. One coastal airport in Humboldt Bay and four airports adjacent to the San Francisco bay are vulnerable to a 3-foot increase in SLR.

Table 6-6: California Airports Vulnerable to SLR

Airport (FAA ID)	**SLR (above MHHW)**			
	0 feet	**3 feet**	**5 feet**	**10 feet**
Humboldt Bay Area				
Murray Field Airport (EKA)		Y	Y	Y
Samoa Field (O33)				Y
San Francisco Bay Area				
Sonoma Valley Airport (0Q3)		Y	Y	Y
Napa County Airport (APC)				Y
Gnoss Field Airport (DVO)	Y	Y	Y	Y
Metropolitan Oakland International Airport (OAK)			Y	Y
Palo Alto Airport (PAO)	Y	Y	Y	Y

Airport (FAA ID)	SLR (above MHHW)			
	0 feet	3 feet	5 feet	10 feet
San Francisco International Airport (SFO)SFO		Y	Y	Y
San Carlos Airport (SQL)			Y	Y
San Luis Obispo County				
Oceano County Airport (L52)				Y
Santa Barbara Area				
Santa Barbara Municipal Airport (SBA)t				Y
Total Number of CA Airports Affected	**2**	**5**	***7***	***11***
Percentage of CA Airports Affected	**0.83 %**	**1.24 %**	**2.89 %**	**4.55 %**

Source: California Natural Resources Agency, *State of California Sea-Level Rise Guidance, 2018 Update*.

Additional data are available to identify the likelihood associated with SLR. **Table 6-7** predicts the extent of SLR that would occur at coastal airports based on three probability scenarios: high, medium, and low probability.

Table 6-7: Projected SLR: 2030-2050

Year	High probability (66%)	Medium probability (0.5%)	Extremely Low probability
North Spit Gauge (Humboldt County) – as measured in feet			
2030	0.7	1	1.2
2040	1.1	1.6	2
2050	1.5	2.3	3.1
San Francisco Gauge – as measured in feet			
2030	0.5	0.8	1
2040	0.8	1.3	1.8
2050	1.1	1.9	2.7
San Luis Obispo Gauge – as measured in feet			
2030	0.5	0.7	1 foot
2040	0.7	1.2	1.6
2050	1	1.8	2.6
Santa Barbara Gauge – as measured in feet			
2030	0.4	0.7	1
2040	0.7	1.1	1.6

Source: California Natural Resources Agency, State of California Sea-Level Rise Guidance, 2018 Update.

While **Table 6-6** indicated that five airports would be affected by a 3-foot rise, **Table 6-7** indicates that even in the extreme case, a rise of 3 feet or more is extremely unlikely in the San Francisco Bay Area. However, these projections do not consider the uncertainty of potential storm surges and other local conditions, indicating that measures to protect against SLR may be needed at these airports to preserve facilities and operations capacity through 2050. (CNRA, 2018)

While SLR is not the only effect of climate change, the preceding discussion illustrates that data is available to consider climate change and its effects on transportation infrastructure, and this data can be incorporated into infrastructure and system planning efforts.

Contributing to a Resilient Transportation System

Resilience is the ability to prepare for changing conditions and to withstand, respond to, and recover from disruptions. Resilient transportation systems absorb and recover from changes and interruptions. Mitigation, the identification of climate risks and vulnerability, and adaption are the building blocks necessary to create a resilient aviation system that contributes to a resilient State-wide transportation system.

Caltrans undertook the development of a Sustainability Initiative and prepared a "Sustainability Roadmap" in 2016, which is updated every two years. The 2018 update to the Sustainability Roadmap identified the inclusion of the CASP 2020 in CTP 2050 as an important goal. The roadmap provides specific initiatives and commitments to promote sustainability throughout all functional units and their operations (Caltrans, 2018).

The first initiative in the roadmap requires Caltrans to "identify, plan, and prepare for climate change risks to department assets" and provides specific commitments the Division can apply and build upon to support the creation of a resilient aviation system:

- Participate in State-wide efforts such as Safeguarding California
- Develop training and communications for airports focused on climate adaptation and resilience in connection with climate exchange and extreme weather
- Integrate climate planning and adaption into land use compatibility planning efforts
- Establish and implement a methodology to identify, document, and track climate vulnerability and risk at specific aviation facilities and use the data to prioritize the use of limited funds

6.5.2 Land Use Compatibility Planning and Sustainability Goals

Compatible land use planning contributes directly to people and the health and vitality of California's communities by reducing exposure to the effects of aircraft operations. When ALCUPs are considered within the context of regional planning efforts, they provide data that can be used to better integrate aviation with other modes of transportation for the conveyance of people and goods and to promote transportation access and increased mobility. Moreover, the integration of ALUCPs into regional planning efforts allows airports and encroachment concerns to be considered by regional agencies as they forecast future land use and development patterns to better link housing, land use, and transportation.

Compatible land use planning efforts also contribute to statewide GHG reduction goals. Encroachment by incompatible land uses may cause airports to operate less efficiently or at reduced capacity and lead to divisiveness between airports and their communities that can prevent or delay necessary infrastructure improvements. Preventing encroachment can contribute to reduced GHG emissions by enabling airports to work efficiently and avoid congestion and delays as aircraft wait to arrive, depart, or divert to other airports.

Finally, land use compatibility planning supports prosperity. A 2017 FAA study found that the impact from U.S. airports amounted to more than $1.7 trillion in output and 10.6 million jobs. Airports in California generated $189 billion (11 percent of the total) and supported more than 1 million jobs, or nearly 10 percent of all aviation-related jobs in the U.S. (FAA, 2017).

6.6 CTP 2050 AND COMPATIBLE LAND USE POLICY GOALS

CTP 2050 promotes eight overall policy goals that contribute to Caltrans' mission of providing a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability:

- **Equity:** Eliminate transportation burdens for low-income communities, communities of color, people with disabilities, and other disadvantaged groups
- **Quality of Life & Public Health:** Enable vibrant, healthy communities
- **Safety:** Provide a safe, secure transportation system with zero fatalities
- **Accessibility:** Improve multimodal mobility and access to destinations for all users
- **Infrastructure:** Maintain a high-quality, resilient transportation system

- **Environment**: Enhance environmental health and reduce negative transportation impacts
- **Economy:** Support a vibrant, resilient economy.
- **Climate:** Achieve the targets for GHG emissions set statewide and increase resilience to climate change

The following discussion summarizes the challenges and opportunities associated with land use planning near airports and identifies recommended goals to address them.

6.6.1 Enhance Education and Outreach to Address Knowledge Gaps Among Agencies and Stakeholders

PUC Section 21670 charges ALUCs to "protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses." The Division has worked for decades to fulfill its regulatory responsibility under the SAA by establishing land use compatibility policy framework and guidance, and these efforts have been lauded by planning agencies nationwide. Unfortunately, incompatible land uses continue to occur.

Encroachment is likely to continue throughout the CTP 2050 planning horizon as local jurisdictions continue to face development pressures that are exacerbated by a paucity of available land, affordable housing shortages, and anticipated population growth. Increased and ongoing education to ALUCs and local planning agencies will become increasingly important as development pressures mount to provide affordable housing.

Challenges and Opportunities

Research conducted by the ACRP and MTI has identified several gaps in knowledge or understanding that continue to challenge compatible land use efforts and implementation:

- Local communities may not understand the value of their airports and the role airports play in supporting the local and regional economies, promoting local businesses, law enforcement, and emergency services

- Local government/planning agency staff may not understand airport operations, associated regulations and guidance, or the issues and concerns associated with aviation and land use
- Airport operators/managers may not coordinate or communicate effectively with local planning agencies, or they may not be knowledgeable or involved in decision-making regarding proposed land use changes in the airport vicinity
- Little coordination occurs among airport operators, agency planners, and stakeholders in the community

Amid these issues, new technologies may cause the Division to reconsider or revise its planning guidance. Although the Division already embarks upon educational efforts through the publication of its Handbook and assistance to agencies, ongoing outreach to local agencies does not occur frequently; the Handbook is updated at approximately 10-year intervals, and ALUCPs must be prepared to address a 20-year timeframe.

The Division is well-qualified to provide ongoing outreach and education to local agencies and communities. Staff members may serve as subject-matter experts and prepare data that can be distributed through existing channels of communication such as the Division's website and newsletters.

Policy Recommendations

Enhance education and outreach to promote greater understanding by local decision makers of the relationship of aviation preservation and growth to future land use project proposals by:

- Promoting greater understanding of an airport's current value and planned growth
- Promoting better coordination between airport sponsors and managers with elected officials and local planning agency staff on airport compatible land use

Several lower-cost opportunities and approaches are available to the Division to initiate ongoing education and outreach to local airport managers, local agency staff, and communities including:

- Designate a current Division staff member to serve as a Land Use Education Coordinator responsible for the development and distribution of education and outreach materials as necessary

- Provide educational materials describing the value and economic impact of California airports for presentation to communities, chambers of commerce, and the development community
- Prepare a "tool kit" for distribution and use by airport managers, ALUCs, local planning agencies, and developers regarding airport operations, land use compatibility goals, and processes and make the materials available on the Division's webpage
- Prepare online training modules for ALUC staff and local planning agencies that can be made available on the Division's webpage
- Develop a curriculum that could be incorporated throughout the University of California Extension program and presented to the development community/chambers of commerce, etc.

Relationship to CTP 2050 Goals

Education and outreach can facilitate better decision making by local agencies and elected officials, prevent encroachment and community exposure to airport operations, and promote safe airport operations. Such benefits coincide with efforts to enhance safety, livability, and contribution to the local economy. Preventing land use conflicts contributes to the quality of life for those living and working near airports.

6.6.2 Integrate Airports, ALUCPs, and Compatible Land Goals into Regional Planning Efforts

SB-375 boldly linked land use and transportation to promote GHG reduction (CA Senate-2008). As noted previously, the 2017 CTC guidance to MPOs and RTPAs encourages regional transportation agencies to consider airports and ALUCPs during RTP development.

Challenges and Opportunities

Challenges

- Surface transportation projects and airport projects are supported by different agencies and funding sources
- ALUCs are unique to California and are not mentioned in FHWA planning documents
- Many MPOs and RTPAs are not familiar with aviation planning considerations

- The forecasted land use patterns identified in RTP/SCS planning efforts have the potential to affect the areas between communities and airports on their outskirts at risk for encroachment
- Although California's 2017 RTP guidance encourages regional planners to consider ALUCPs, it is not required

Opportunities

RTP guidance provides the Division with an opportunity to provide outreach and education to better link surface transportation and aviation planning by:

- Providing liaison with RTPAs to better explore aviation land use concerns and integrate ALUCP policies into regional planning efforts and goals, increase liaison with other functional units within Caltrans to share information, and to identify opportunities to participate or incorporate aviation into their programs
- Considering the ALUCP in RTP development to help link GA and remote airports to the surface transportation network and increase opportunities for aeronautical development, compatible non-aeronautical development, and subsequent job creation for those living nearby
- Enhancing ALUCP guidance to include a discussion of SB-375, RTP guidance, and the relationship between regional transportation planning efforts and land use

Policy Recommendation

Provide leadership, liaison, and information sharing to better integrate airports and ALUCPs with regional planning programs and efforts.

Policy Measures

Division staff can provide leadership by:

- Providing liaison with RTPA leadership to share information about airports and ALUCPs that can be considered during RTPA preparation
- Encouraging ALUCs to include RTPA representatives in ALUC preparation (i.e., technical advisory committees, etc.)
- Providing education and outreach for the consideration of regional transportation planning efforts during ALUCP preparation and updates

Relationship to CTP Goals

Efforts to consider ALUCPs during regional transportation planning efforts may prevent incompatible land uses near airports, better align aviation with the surface transportation system, and provide the potential for greater coordination and information sharing among local and regional transportation planning agencies with Caltrans. A more aligned aviation and surface transportation system will promote mobility, safety, and the preservation of aviation infrastructure.

6.6.3 Incorporate Smart Growth Principles in ALUC Planning Efforts

Regional transportation planning efforts were refocused in recent years to achieve GHG emissions reduction goals. To do so, regional transportation planning efforts reconsidered the relationship between transportation and land use and the incorporation of smart growth principles.

While not all smart growth principles are consistent with airport land use compatibility goals, some are applicable:

- Encouraging community and stakeholder collaboration in the development process
- Making development decisions predictable, fair, and cost effective
- Strengthening aid and directing development toward existing communities

Although the Handbook does not address smart growth directly, it encourages the smart growth principle of collaboration during the ALUCP preparation and consistency review processes. It fosters predictable development within the AIA, and discourages residential sprawl by identifying locations within portions of the AIA where residential development would be incompatible.

As the State's population increases and land area for development decreases, it will be important to provide a greater focus on policies that identify and promote compatible development near airports.

Challenges and Opportunities

Challenges

- Not all smart growth principles are consistent with ALUCP policy guidance, as many seek to limit the location of some land uses and their development densities and intensities. Smart growth is often perceived as contrary to land use compatibility planning principles.
- Smart growth principles are best suited for urban and suburban areas, yet many of California's GA airports are in rural areas.

Opportunities

- The Division can bolster Statewide efforts to apply smart growth principles during airport land use compatibility planning efforts.
- RTPAs and MPOs routinely promote smart growth policies through transit-oriented development and by providing mobility choices for CS airport passengers and employees. This approach could be modified to address GA airports and their AIAs. The pursuit of compatible development in the AIA can provide residents of rural areas with job opportunities and provide locally needed services that eliminate the need for commutes or other trips and reduce vehicle miles traveled (VMT). Moreover, such development can provide new revenue streams and economic stability for California's GA airports.

Policy Recommendation

Incorporate smart growth principles into land use compatibility planning and processes to encourage aviation-compatible development and reduce VMT.

Policy Measures:

- Provide outreach to ALUCs regarding statewide initiatives to consider using smart growth principles for reduced GHG emissions
- Provide a discussion of smart growth principles, GHG emissions, and VMT reduction goals in the next Handbook update
- Provide education and outreach materials to local economic development agencies and chambers of commerce that describe compatible land use near airports and the types of compatible development best suited within the AIA
- Encourage the participation of local economic development agencies and chambers of commerce during ALUCP preparation and updates

Relationship to CTP 2050 Policy Goals

Incorporating smart growth principles into compatible land use planning efforts can help provide a more unified policy context between aviation and other transportation modes. Moreover, it can help promote compatible economic development near airports to support local economies and reduce VMT. The incorporation of smart growth principles can contribute to CTP 2050 goals associated with safety, preservation of the transportation system, the environment, the economy, and quality of life.

6.6.4 Address New and Emerging Technologies

While several technologies are likely to be implemented during the CTP 2050 planning horizon, those with the greatest potential to affect land use near airports are commercial applications of UAS and UAM technologies.

In addition, UAS/UAM technologies are being designed to operate on electrical power and rechargeable battery systems to prevent or reduce GHG emissions. Energy infrastructure will need to be amended to generate enough electricity to support proposed UAS/UAM operations without adding new GHG emissions (if new power plants are envisioned to address new demand).

Although the Division is not involved in the technical research associated with UAS/UAM and only the FAA has the statutory authority over airspace, the Division will be required to authorize permits for UAM take/off and landing facilities. The Division will need to address the locations of UAM terminals/launch facilities and their potential effects on noise and safety to aircraft operators and those living and working nearby.

Challenges and Opportunities

Challenges

California has been cited as an early adapter of these technologies. Since some commercial applications of UAS (package delivery) and UAM will fly over metropolitan areas, traditional approaches that rely on the separation of people and aircraft operations may not be possible.

The Division will need to identify new metrics to evaluate the potential noise safety and airspace effects associated with these technologies and how land use policies can be used to avoid or mitigate these effects. Considerable education and outreach will be required to help ALUCs incorporate these technologies into ALUCPs and consistency evaluation processes within the statutory limits governing ALUC authority.

Opportunities

The Division and other units within Caltrans have a unique opportunity to lead policy development on these emerging technologies. Current UAM proposals would not be consistent with the Division's existing compatible land use guidance.
Preferably, land use near airports seeks to "limit the number of people, both in the air and on the ground, from potentially hazardous conditions." Potential opportunities include providing:

- Leadership in UAS/UAM implementation and a position of prominence in the evaluation of potential effects on airports and their nearby communities
- Policy leadership to avoid and mitigate potential effects
- Inter-agency leadership in planning for the integration of UAS/UAM technology in California's multimodal transportation system
- Transportation planning leadership through education and outreach to ALUCs, airport managers, and planning agencies to help them prepare for and implement UAS/UAM technologies as technology and implementation progresses

Policy Recommendation

Foster the safe implementation of new and emerging technologies.

Policy Measures

- Monitor and participate in industry research associated with UAM technology, such as NASA's ongoing Advanced Air Mobility National Campaign.
- Monitor changes in FAA regulations and guidance pertaining to UAS/UAM.
- Work with the San Francisco Bay Area MTC and Los Angeles County Metropolitan Transportation Authority as UAS/UAM projects are proposed for early adaptation in these regions.

- Work with other functional units within Caltrans to identify UAM considerations and prepare outreach and educational materials regarding UAM integration into the statewide transportation system.
- Prepare education and outreach materials for ALUCs and local agencies regarding UAS/UAM and its implementation in land use compatibility planning.

Relationship to CTP 2050 Policy Goals

UAS/UAM technologies have the potential to provide a new mode to move people and freight throughout and between congested metropolitan areas and reduce GHG emissions. These technologies have the potential to promote CTP 2050 planning goals associated with decreased carbon emissions, access, and mobility; however, the potential safety and quality of life effects have yet to be determined.

Caltrans is uniquely positioned to provide leadership identifying and offsetting potential impacts associated with these emerging technologies as it carries out its land use planning and permitting functions.

6.6.5 Address and Adapt to Climate Change

The State of California has championed research on climate change and enacted substantial legislation to promote mitigation, adaptation, and resiliency. Caltrans leadership has undertaken efforts to coordinate with other State agencies and develop a sustainability roadmap that can be used by all functional units to identify and incorporate sustainability processes.

The Division's advisory role with ALUCs can provide opportunities by helping to identify aviation facilities that are vulnerable to climate related effects and their relationship to other facilities in the transportation system. Such data can be shared with other Caltrans units and incorporated into regional transportation planning.

Challenges and Opportunities

Challenges

- Climate change is ongoing, and it will lead to increased stress on aviation infrastructure
- Climate-related events are not always predictable and can disrupt aircraft operations or result in system-wide delays
- Air quality impacts are an on-going concern to address in efforts balanced between State legislation and global standards used to guide engine manufacturers, aircraft operators, and fuel producers.

Opportunities

- Use available data from federal and State agencies that can be used to identify, plan, and prepare for climate change risks to California's aviation infrastructure
- Build upon climate change adaptation guidance prepared by other Caltrans offices and units to create aviation-specific guidance that can be included in the Division's Consultant guidelines
- Prepare educational information and training material for airport operators to prepare for climate adaptation, extreme weather events, and operational disruptions
- Integrate activities associated with climate change and adaptation into airport-related projects that seek Division funding
- Identify, track, and prioritize need throughout the aviation system so that the greatest needs can be considered when allocating limited grant funds

Policy Recommendation

Provide leadership in climate mitigation and adaptation to create resiliency to aviation facilities for the transportation system's benefit.

Policy Measures

- Provide leadership through coordination and collaboration with other functional units/modes within Caltrans and RTPAs to identify climate-related effects that could affect aviation and the transportation system.
- Establish Division activities that can advance the CTP 2050 airport strategy to require ZEV infrastructure to be included in ALUCPs

- Provide leadership and outreach to airport operators and management to identify climate risks, identify mitigation and adaption measures, and prepare for climate related events and operational interruptions.
- Identify, track, and prioritize climate-related risks and vulnerability throughout the aviation system so that the greatest needs can be considered when allocating the limited funds.

Relationship to CTP 2050 Goals

One of the guiding principles of CTP 2050 is climate stewardship and resiliency, which includes making the transportation sector carbon neutral and increasing climate resiliency. Safety goals include improving emergency preparedness, response, and recovery. The recommended policy goals identified for the aviation system align with CTP 2050 goals and will help to contribute to a more resilient multimodal transportation system.

Table 6-8: CTP 2050 Policy Recommendations: Land Use and Sustainability

<table>
<tr><td colspan="2">Planning Issue: Knowledge Gaps among Airport Managers, ALUCs, Planning Agencies, Communities and Stakeholders</td></tr>
<tr><td>Challenges/CTP 2050 Planning Goals

<u>Economy</u>
• Local communities and decision-makers may not understand the value and economic contribution of airports.
• ALUCPs are not developed or implemented consistently.

<u>Planning and Environment</u>
• Local planning agencies and decision makers may not understand airport operations, regulations, and guidance or the relationship between airports and land use.
• Incompatible land uses and encroachment can expose communities to the effects of airport operations.
• New technologies may challenge current land use planning approaches to address new concerns to communities and airport operators.

<u>Safety and Preservation</u>
• Incompatible land use can affect airport operations, diminish capacity, or cause operational limitations up to/including closure.</td><td>Opportunities/CTP 2050 Planning Goals

<u>Economy</u>
• Enhance understanding among communities and local planning agencies about the value of airports to their communities.

<u>Planning and Environment</u>
• Promote greater understanding of airport and land use compatibility and compatibility strategies among local agencies, elected officials, communities, and other stakeholders.
• Consider the effects of emerging technologies on ALUCP planning and policy development.

<u>Safety and Preservation</u>
• Identify vulnerabilities to infrastructure associated with climate change and adaptation strategies.
• Integrate smart growth principles into ALUCP policies.</td></tr>
<tr><td colspan="2">Policy Recommendations:

Promote greater understanding of the airports and their value to communities among local agencies, decisionmakers, communities, and stakeholders.

Promote greater understanding and better coordination of aviation and compatible land use planning among airport operators and managers, decision-makers, local agency staff, and stakeholders.

Policy Measures
• Designate a Division staff member to serve as a Land Use Education Coordinator.
• Develop and distribute educational materials describing the value and economic impact of California airports.
• Prepare a “tool kit” for airport managers, ALUCs, local planning agencies, and developers about land use compatibility goals. Make the tool kit available from the Division’s website.
• Prepare online training modules for ALUC staff and local planning agencies that can be made available for distribution on the Division’s webpage; and
• Develop a curriculum that could be incorporated throughout the University of California Extension program and presented to the development community/chambers of commerce, etc.</td></tr>
<tr><td colspan="2">Planning Issue: Integrate Airports, ALUCPs, and Compatible Land Goals into Regional Transportation Planning Efforts</td></tr>
<tr><td>Challenges

<u>Equity and Mobility</u>
• Airports and ALUCPs have not been consistently considered or integrated into RTPs and regional planning.
• Smart growth principles are not frequently considered within the context of airport land use planning.</td><td>Opportunities

<u>Equity and Mobility</u>
• Provide outreach to RTPs and MPOs to explore the relationship between airports and regional planning.
• Consider opportunities to better connect GA and remote airports to the surface transportation network and increase opportunities for aeronautical development, compatible non-aeronautical development, and subsequent job creation at those airports.

<u>Safety and Quality of Life</u></td></tr>
</table>

<table>
<tr><td><u>Safety and Quality of Life</u>
• MPOs/RTPAs are not familiar with aviation planning considerations.
• Forecasted land use patterns identified in RTP/SCS planning efforts have the potential to cause encroachment.
• Although California's 2017 RTP guidance encourages RTPAs to consider ALUCPs, it does not require it.</td><td>• Better coordination between ALUCP policies and RTPs can prevent conflicts between airports and communities.
• Enhance ALUCP guidance to include discussion of SB-375, RTPs, and land use.</td></tr>
<tr><td colspan="2">Policy Recommendation
Provide leadership, liaison, and information sharing to integrate airports and ALUCPs into regional planning efforts and documents.

Policy Measures
Division staff can provide leadership by:
• Providing liaison with RTPA leadership to share information about airports and ALUCPs that can be considered during RTPA preparation.
• Encourage ALUCs to include RTPA representatives in ALUC preparation (i.e., technical advisory committees, etc.)
• Provide education and outreach for the consideration of regional transportation planning efforts during ALUCP preparation and updates</td></tr>
<tr><td colspan="2">Promote Smart Growth Principles through Compatible Land Use Planning Efforts</td></tr>
<tr><td>Challenges
<u>Safety and Quality of Life</u>
• Smart growth is often perceived as contrary to land use compatibility planning principles.
• Smart growth principles are best suited for urban and suburban areas, and many of California's GA airports are located in rural areas.</td><td>Opportunities
<u>Safety and Quality of Life</u>
• Apply smart growth principles to airport land use compatibility planning efforts.
<u>Environment and Economy</u>
• Provide policies to identify compatible land uses that support development that will be specific to the airport and its community to reduce VMT.</td></tr>
<tr><td colspan="2">Policy Recommendation
Incorporate smart growth principles into land use compatibility planning and processes to encourage aviation-compatible development and reduce VMT.

Policy Measures:
• Provide outreach to ALUCs regarding statewide initiatives to implement smart growth principles, reduce GHG emissions and VMT, and incorporate a similar discussion in the next Handbook update.
• Provide education and outreach to local economic development agencies and chambers of commerce to describe compatible land use near airports and the types of compatible development that are best suited to the Airport Influence Area.
• Provide a discussion of smart growth principles, GHG emissions, and VMT reduction goals in the next Handbook update.</td></tr>
</table>

<table>
<tr><td colspan="2">Address and Integrate New and Emerging Technologies through Permitting and Compatible Land Use Planning Processes</td></tr>
<tr><td>Challenges

<u>Access and Mobility</u>
• UAS/UAM can provide another modal option for the statewide transportation system.

<u>Safety and Infrastructure</u>
• No physical infrastructure, regulatory structure, or policy framework is in place for UAS/UAM use and integration.
• The introduction of low-flying passenger aircraft in urban areas is antithetical to the Division's axiom of separating people and aircraft operations.
• New metrics, policies, and considerable outreach and education will be required to incorporate UAS/UAM into ALUCPs and local plans.
• California is identified as a site for early adoption of this technology.

<u>Environment/Quality of Life</u>
• Communities have posed privacy and safety concerns about commercial UAS applications and UAM transport.</td>
<td>Opportunities

<u>Safety and Infrastructure</u>
• Provide national leadership in UAS/UAM implementation, evaluation, and policy development associated with UAS/UAM implementation.
• Provide interagency leadership in planning for the integration of UAS/UAM technology with California's multimodal transportation system.

<u>Access, Mobility, and Quality of Life</u>
• Provide leadership in education and outreach to ALUCs and local agencies for the planning and integration of UAS/UAM technology.</td></tr>
<tr><td colspan="2">Policy Recommendation
Foster the Safe Implementation of New and Emerging Technologies.

Policy Measures
• Monitor and participate in industry research associated with UAM technology, such as NASA's ongoing Advanced Air Mobility National Campaign.
• Monitor changes in FAA regulations and guidance pertaining to UAS/UAM.
• Work with the MTC and Los Angeles County Metropolitan Transportation Authority as UAS/UAM projects are proposed for early adaptation in these regions.
• Work with other functional units within Caltrans to identify UAM considerations and prepare outreach and educational materials regarding the integration of UAM into the statewide transportation system.
• Prepare education and outreach materials to ALUCs and local agencies regarding UAS/UAM and its implementation in land use compatibility planning.</td></tr>
</table>

<table>
<tr><th colspan="2">Address and Adapt to Climate Change</th></tr>
<tr><td>Challenges

<u>Infrastructure and Safety</u>
• Climate change events are not entirely predictable.
• Climate change events can damage aviation infrastructure.
• Climate-related events, such as extreme weather events (increased rain precipitation and extreme heat), can disrupt aircraft operations resulting in system-wide delays.
• Operational disruptions can affect multiple modes, networks, and the transportation system as a whole.</td>
<td>Opportunities

<u>Infrastructure and Safety</u>
• Consider the predictability of climate change and its effects.
• Use available data from Federal and State agencies to identify, plan, and prepare for climate change risks.
• Encourage airport operators to pursue aviation-compatible GHG reduction strategies.
• Identify the risks of climate vulnerability to aviation resources on a systemwide basis.
• Identify climate related risks and vulnerability throughout the aviation system and its component facilities.
• Coordinate and collaborate with other functional unit/modes within Caltrans to identify risks to the transportation.
• Provide leadership and outreach to airport managers to identify climate-related risks, undertake mitigation and adaptive measures, and prepare for climate related events and operational interruptions.
• Identify and prioritize adaptation measures so that they can be considered during the allocation of limited grant funds.</td></tr>
<tr><td colspan="2">Policy Recommendation

Provide leadership in climate mitigation and adaptation to create resilient aviation facilities that contribute to a resilient transportation system.

Policy Measures
• Provide leadership through coordination and collaboration with other functional units/modes to identify climate-related effects.
• Provide leadership and outreach to airport operators and management to identify climate risks, identify mitigation and adaption measures, and prepare for climate related events and operational interruptions.
• Identify, track, and prioritize climate related risks and vulnerability throughout the aviation system so that the greatest needs can be considered when awarding limited grant funds.</td></tr>
</table>

Chapter 7:

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Appendices

APPENDIX A: 2019 AERONAUTICS DIVISION CAPITAL IMPROVEMENT PLAN

Executive Summary of The Division of Aeronautics Capital Improvement Plan 2021–2030

The Capital Improvement Plan (CIP) is a ten-year, fiscally unconstrained listing of capital and planning projects submitted to the California Department of Transportation (Caltrans). These projects are predominantly based on airport master plans or other comparable long-range planning documents. The CIP is compiled biennially (every two years) in accordance with the California Public Utilities Code (PUC) and is presented to the California Transportation Commission (Commission) for review, comment, and approval.

Not all projects listed in the CIP will be programmed or funded. Projects may be funded by various combinations of federal, State, and local sources or may be entirely locally funded projects (LFP).

California Aid to Airports Program

The approved CIP also serves as the planning document that allows Caltrans to program grants for the California Aid to Airports Program (CAAP). The CAAP provides financial assistance to local sponsors in order to establish, maintain, and improve the statewide system of airports. The CAAP includes two grant programs: the Acquisition and Development program and the Airport Improvement Program State match program.

Airport Improvement Program

The Airport Improvement Program (AIP), administered by the Federal Aviation Administration (FAA), provides grants to public agencies—and in some cases, to private owners and entities—for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). The NPIAS identifies nearly 3,400 existing and proposed airports nationwide that are significant to national air transportation and thus eligible to receive federal grants.

An AIP grant constitutes 90 percent of a project cost. The FAA requires that the local sponsor receiving the grant provide a 10 percent match. Depending on sponsor eligibility (including participation in the CIP) and available funds, the State may contribute up to 5 percent of the federal grant amount to the local sponsor to assist in meeting their 10 percent requirement.

Acquisition and Development Program

The Acquisition and Development (A&D) Program grants are provided by Caltrans for eligible projects in the CIP that are for General Aviation capital improvement and planning purposes. An A&D grant constitutes 90 percent of a project cost. The remaining 10 percent is matched by the local sponsor.

Every even-numbered year, Caltrans prepares, and the Commission approves, the Aeronautics Program, a two-year list of grant projects from the CIP for which funding is available. Projects are selected for the Aeronautics Program based on eligibility and ranking. The Priority Ranking Matrix is used to rank projects. The ranking is based on project category and project description. Project categories listed in priority are: safety, capacity, and security. Other selection criteria may be used as well, such as input from the Caltrans Office of Airports and the sponsor.

Airport Land Use Compatibility Plans

A&D grants are also provided to local sponsors to prepare or update Airport Land Use Compatibility Plans (ALUCP). ALUCPs are prepared by County Airport Land Use Commissions as required by the PUC and contain land use measures that minimize the public’s exposure to safety hazards within two-miles around public-use airports. Protecting people and property on the ground from the potential consequences of near-airport aircraft accidents is a fundamental land use compatibility planning objective.

The Division of Aeronautics recommends a comprehensive review and update of an ALUCP at least every five years. Consistent funding for ALUCPs is vital for the protection of the California air transportation system and those communities surrounding the airports. The Commission has historically set 25 percent of the A&D Grant Program to help fund the preparation of ALUCPs.

Ground Access Projects

Ground access projects include improvements to off-airport roadways, highways, public transit systems, passenger shuttle systems, parking lots, and other transportation-related modes and facilities. Enhancements to these facilities provide more convenient and predictable access for passengers, employees, air cargo traffic, and general aviation users. This CIP contains a listing of planned ground access projects; however, these projects are not eligible for federal AIP funding or funding through the State CAAP.

Facility Name	Project Name	Project Type	Program Year	FAA Grant Amount	State Grant Amount	Local Matching Amount	Total Project Cost
Adin	Engineering Design & Repave TW Tie Down Apron Areas	A&D	2021	$ -	$ 297,000	$ 33,000	$ 330,000
Adin	Engineering, Design, Construction Perimeter Fence	A&D	2021	$ -	$ 247,500	$ 27,500	$ 275,000
Adin	Engineer, Design & Slurry Seal RW	A&D	2022	$ -	$ 138,105	$ 15,345	$ 153,450
Adin	Engineering, Design and Slurry Seal all Surfaces	A&D	2028	$ -	$ 222,750	$ 24,750	$ 247,500
Alpine County	Chip Seal and restripe RW	A&D	2021	$ -	$ 126,000	$ 14,000	$ 140,000
Alpine County	AC Overlay and restripe RW	A&D	2026	$ -	$ 270,000	$ 30,000	$ 300,000
Alturas Municipal	Des.: Displace RW 31 Threshold 200 feet & Associated A	AIP	2022	$ 123,003	$ 6,150	$ 7,517	$ 136,670
Alturas Municipal	Design - Reseal Joints/Cracks in Airfield Pvmt RW 13-31 & TW B	AIP	2022	$ 24,237	$ 1,212	$ 1,481	$ 26,930
Alturas Municipal	Const: Displace RW 31 Threshold 200 feet & Associate	AIP	2023	$ 396,900	$ 19,845	$ 24,255	$ 441,000
Alturas Municipal	Design/Const - Reseal Joints & Cracks in Airfield Pave	AIP	2023	$ 367,110	$ 18,356	$ 22,435	$ 407,900
Alturas Municipal	FAA Reimb. Agreement - PAPI Des. & Site Surveys	AIP	2023	$ 378,000	$ 18,900	$ 23,100	$ 420,000
Alturas Municipal	Design/Const: TW E Relocation. Remove Ex. Conn TW	AIP	2024	$ 351,000	$ 17,550	$ 21,450	$ 390,000
Alturas Municipal	Pavement Maintenance Management Plan (PMMP)	AIP	2024	$ 90,000	$ 4,500	$ 5,500	$ 100,000
Alturas Municipal	Design: Rehabilitate and Widen RW 13-31	AIP	2025	$ 418,500	$ 20,925	$ 25,575	$ 465,000
Alturas Municipal	Construct: Rehabilitate and Widen RW 13-31	AIP	2026	$ 3,320,100	$ 166,005	$ 202,895	$ 3,689,000
Alturas Municipal	Acquire New Snow Removal Equipment	AIP	2028	$ 259,200	$ 12,960	$ 15,840	$ 288,000
Alturas Municipal	Airport Layout Plan Update	AIP	2029	$ 108,000	$ 5,400	$ 6,600	$ 120,000
Alturas Municipal	EA- Widen RW 13-31 Extend TWs A&B	AIP	2029	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Alturas Municipal	Obstruction Removal - Design and Implement	AIP	2029	$ 101,700	$ 5,085	$ 6,215	$ 113,000
Alturas Municipal	Design: Extend TW B to Serve Existing RW 13-31	AIP	2030	$ 147,600	$ 7,380	$ 9,020	$ 164,000
Andy McBeth	Perimeter Fencing	A&D	2022	$ -	$ 67,500	$ 7,500	$ 75,000
Andy McBeth	RW Rehabilitation - Phase 1 (Design)	A&D	2023	$ -	$ 67,500	$ 7,500	$ 75,000
Andy McBeth	RW Rehabilitation - Phase 2 (Construction)	A&D	2025	$ -	$ 315,000	$ 35,000	$ 350,000
Andy McBeth	Obstruction Removal - Phase 1 (Design)	A&D	2028	$ -	$ 45,000	$ 5,000	$ 50,000
Andy McBeth	Obstruction Removal - Phase 2 (Construction)	A&D	2030	$ -	$ 315,000	$ 35,000	$ 350,000
Apple Valley	Property Acquisition for Drainage Facility	A&D	2021	$ -	$ 135,000	$ 15,000	$ 150,000
Apple Valley	Safety Signs & Markings Update	A&D	2021	$ -	$ 36,000	$ 4,000	$ 40,000
Apple Valley	ALUCP Update	A&D	2022	$ -	$ 54,000	$ 6,000	$ 60,000
Apple Valley	Perimeter Fence Upgrade - Planning/Environmental	AIP	2022	$ 157,500	$ 7,875	$ 9,625	$ 175,000
Apple Valley	Perimeter Fence Upgrade Survey & Construction	AIP	2023	$ 1,192,500	$ 59,625	$ 72,875	$ 1,325,000
Apple Valley	RW 18-36 Rehab. & Reconfiguration-Construction	AIP	2024	$ 3,485,667	$ 174,283	$ 213,013	$ 3,872,963
Apple Valley	RW 18-36 Rehabilitation & Reconfiguration Design	AIP	2024	$ 142,272	$ 7,114	$ 8,694	$ 158,080
Apple Valley	RW 8-26 Rehab, Lighting & Add New Obstruct. Lighting	AIP	2024	$ 607,500	$ 30,375	$ 37,125	$ 675,000
Auburn Municipal	Construct New Helicopter Parking Area	AIP	2021	$ 688,500	$ 34,425	$ 42,075	$ 765,000
Auburn Municipal	Construct Perimeter Fence Phase 3	AIP	2022	$ 272,250	$ 13,613	$ 16,638	$ 302,500
Auburn Municipal	Construct Perimeter Fencing Phase 2	AIP	2022	$ 282,150	$ 14,108	$ 17,243	$ 313,500
Auburn Municipal	Wildlife Hazard Assessment	AIP	2022	$ 40,500	$ 2,025	$ 2,475	$ 45,000

Auburn Municipal	Construct RW Rehabilitation (pavement)	AIP	2023	$ 297,000	$ 14,850	$ 18,150	$ 330,000
Auburn Municipal	Design RW Rehabilitation (pavement)	AIP	2023	$ 40,500	$ 2,025	$ 2,475	$ 45,000
Auburn Municipal	Obstruction Removal	AIP	2023	$ 90,000	$ 4,500	$ 5,500	$ 100,000
Auburn Municipal	Design TW Rehabilitation (rejuvenation/maintenance)	AIP	2024	$ 30,375	$ 1,519	$ 1,856	$ 33,750
Auburn Municipal	Construct TW Rehab (rejuvenation/maintenance)	AIP	2025	$ 243,000	$ 12,150	$ 14,850	$ 270,000
Auburn Municipal	Des/Con East End Airfield Access/Run-up Area Impmnts	AIP	2026	$ 297,000	$ 14,850	$ 18,150	$ 330,000
Auburn Municipal	Design and Construction REIL	AIP	2027	$ 108,000	$ 5,400	$ 6,600	$ 120,000
Auburn Municipal	Access Road - Denham Property	AIP	2028	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Auburn Municipal	Design RW 7/25 Resurfacing	AIP	2029	$ 150,000	$ 7,500	$ 9,167	$ 166,667
Auburn Municipal	Construct RW 7/25 Resurfacing	AIP	2030	$ 1,474,200	$ 73,710	$ 90,090	$ 1,638,000
Baker	Fence-Entry Gate upgrade	A&D	2021	$ -	$ 13,500	$ 1,500	$ 15,000
Baker	Patent (Purchase) from BLM	A&D	2021	$ -	$ 180,000	$ 20,000	$ 200,000
Baker	Patent Application & Environmental	A&D	2021	$ -	$ 108,000	$ 12,000	$ 120,000
Baker	Safety Signs & Markings Update	A&D	2022	$ -	$ 45,000	$ 5,000	$ 50,000
Baker	Tiedowns and Restroom Facility	A&D	2022	$ -	$ 45,000	$ 5,000	$ 50,000
Baker	Fog Seal RW 15/33 & Parking Ramp	A&D	2023	$ -	$ 9,000	$ 1,000	$ 10,000
Baker	RW 002 Rehabilitation	A&D	2023	$ -	$ 486,000	$ 54,000	$ 540,000
Baker	ALUCP- Land Use Compatibility Plan Update	A&D	2024	$ -	$ 54,000	$ 6,000	$ 60,000
Baker	Fog Seal RW 15/33 & Parking Ramp	A&D	2024	$ -	$ 9,900	$ 1,100	$ 11,000
Baker	RW Rehabilitation & Striping	A&D	2024	$ -	$ 498,600	$ 55,400	$ 554,000
Baker	Re-Surface Parking Ramp	A&D	2025	$ -	$ 67,500	$ 7,500	$ 75,000
Baker	Survey for Ultimate Configuration	A&D	2026	$ -	$ 72,000	$ 8,000	$ 80,000
Baker	Fog Seal RW 15/33 & Parking Ramp	A&D	2028	$ -	$ 12,600	$ 1,400	$ 14,000
Bakersfield Municipal	Rehabilitate North Apron Pavement, Section A (Const)	AIP	2021	$ 1,022,283	$ 51,114	$ 62,473	$ 1,135,870
Bakersfield Municipal	New R/W 16 PAPI (Design)	AIP	2022	$ 54,000	$ 2,700	$ 3,300	$ 60,000
Bakersfield Municipal	Rehabilitate R/W 16-34 and T/W A Pavement (Design)	AIP	2022	$ 151,200	$ 7,560	$ 9,240	$ 168,000
Bakersfield Municipal	Rehabilitate RW MIRL (Design)	AIP	2022	$ 144,900	$ 7,245	$ 8,855	$ 161,000
Bakersfield Municipal	New R/W 16 PAPI (Construction)	AIP	2024	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Bakersfield Municipal	Rehabilitate R/W 16-34 (Construction)	AIP	2024	$ 745,200	$ 37,260	$ 45,540	$ 828,000
Bakersfield Municipal	Rehabilitate RW MIRL (Construction)	AIP	2024	$ 1,463,400	$ 73,170	$ 89,430	$ 1,626,000
Bakersfield Municipal	Rehabilitate T/W A Pavement (Construction)	AIP	2024	$ 459,000	$ 22,950	$ 28,050	$ 510,000
Bakersfield Municipal	Rehabilitate Main Apron Pavement (Design)	AIP	2026	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Bakersfield Municipal	Rehabilitate Main Apron Pavement (Construction)	AIP	2028	$ 2,123,100	$ 106,155	$ 129,745	$ 2,359,000
Bakersfield Municipal	Southwest Hangar TXLN & Access Rd Pvmt Rehab (Des)	AIP	2029	$ 68,400	$ 3,420	$ 4,180	$ 76,000
Bakersfield Municipal	S/W Hangar TXLN & Access Rd Pvmt Rehab (Con)	AIP	2030	$ 423,000	$ 21,150	$ 25,850	$ 470,000
Banning Municipal	Rehabilitate RW 8-26 (Const)	AIP	2021	$ 540,000	$ 27,000	$ 33,000	$ 600,000
Banning Municipal	Sign/Stripe Terminal Lot & Aprn & Relocate Light Obs (Des)	AIP	2028	$ 40,500	$ 2,025	$ 2,475	$ 45,000
Banning Municipal	Sign/Stripe Termnl Lot & Aprn & Relocate Light Obs -Con	AIP	2030	$ 90,000	$ 4,500	$ 5,500	$ 100,000
Barstow-Daggett	Rehabilitate Apron North of Txy B Ph 1: Environmental	AIP	2022	$ 225,000	$ 11,250	$ 13,750	$ 250,000

Barstow-Daggett	Rehabilitate Apron North of Txy B Ph 2: Design	AIP	2022	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Barstow-Daggett	Rehabilitate Apron North of Txy B Ph 3: Construction	AIP	2023	$ 9,525,600	$ 476,280	$ 582,120	$ 10,584,000
Barstow-Daggett	ALUCP - Land Use Compatibility Plan Update	A&D	2026	$ -	$ 54,000	$ 6,000	$ 60,000
Barstow-Daggett	TW B Extension and Electrical upgrades	AIP	2028	$ 5,400,000	$ 270,000	$ 330,000	$ 6,000,000
Barstow-Daggett	West Apron/Fire Suppression/Water System Ph I En	AIP	2029	$ 67,500	$ 3,375	$ 4,125	$ 75,000
Barstow-Daggett	West Apron/Fire Suppression/Water System Ph 2 Design	AIP	2030	$ 157,500	$ 7,875	$ 9,625	$ 175,000
Benton Field	ALP Update with Narrative & AGIS Aeronautical Survey	AIP	2021	$ 270,000	$ 13,500	$ 16,500	$ 300,000
Benton Field	Reconstruct Eastside Taxilanes and Drainage - Design	AIP	2021	$ 276,300	$ 13,815	$ 16,885	$ 307,000
Benton Field	Rehabilitate Taxiway A - Design	AIP	2021	$ 49,680	$ 2,484	$ 3,036	$ 55,200
Benton Field	CATEX Reimbursement - Taxiway A Rehabilitation	AIP	2022	$ 2,700	$ 135	$ 165	$ 3,000
Benton Field	Reconst. Eastside Taxilanes & Drainage Improvement	AIP	2022	$ 2,970,000	$ 148,500	$ 181,500	$ 3,300,000
Benton Field	Rehabilitate Parallel Taxiway A - Construct	AIP	2022	$ 427,500	$ 21,375	$ 26,125	$ 475,000
Benton Field	RW Pavement Preservation / MAGVAR - Slurry Seal	AIP	2022	$ 549,000	$ 27,450	$ 33,550	$ 610,000
Benton Field	RW Pavement Preservation/MAGVAR - Slurry Seal (Des)	AIP	2022	$ 70,560	$ 3,528	$ 4,312	$ 78,400
Benton Field	Northeast Apron and Taxilanes Reconstruction	AIP	2023	$ 1,530,000	$ 76,500	$ 93,500	$ 1,700,000
Benton Field	Security Fencing - North RPZ - Design Only	AIP	2023	$ 12,150	$ 608	$ 743	$ 13,500
Benton Field	Underground Powerline in the RPZ	LFP	2023	$ -	$ $ -	$ 100,000	$ 100,000
Benton Field	Westside T-Hangar Taxiway Reconstruction	AIP	2023	$ 2,880,000	$ 144,000	$ 176,000	$ 3,200,000
Benton Field	Construct T-Hangar Taxilane - Design Only	AIP	2024	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Benton Field	East Apron Pavement Rehab - Design	AIP	2024	$ 85,500	$ 4,275	$ 5,225	$ 95,000
Benton Field	Security Fencing - North RPZ	AIP	2024	$ 81,000	$ 4,050	$ 4,950	$ 90,000
Benton Field	Westside T-Hangar Taxilane Recon - Design	AIP	2024	$ 270,000	$ 13,500	$ 16,500	$ 300,000
Benton Field	Construct 10 unit T-Hangar (Design Only)	AIP	2025	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Benton Field	Construct New T-Hangar Taxilane	AIP	2025	$ 213,300	$ 10,665	$ 13,035	$ 237,000
Benton Field	East Apron Pavement Rehabilitation	AIP	2025	$ 855,000	$ 42,750	$ 52,250	$ 950,000
Benton Field	Construct 10 Unit T-Hangar	AIP	2026	$ 810,000	$ 40,500	$ 49,500	$ 900,000
Benton Field	East Parking Lot & Access Road Recons - Phase 1 (Des)	AIP	2026	$ 189,000	$ 9,450	$ 11,550	$ 210,000
Benton Field	Construct 10 Unit T- Hangar	AIP	2027	$ 810,000	$ 40,500	$ 49,500	$ 900,000
Benton Field	East Pkng Lot and Access Rd. Reconstruct - Phase 1	AIP	2027	$ 1,170,000	$ 58,500	$ 71,500	$ 1,300,000
Big Bear City	Prepare APMS, including PCNs	AIP	2021	$ 58,500	$ 2,925	$ 3,575	$ 65,000
Big Bear City	Construction of Snow Removal Equipment Building	AIP	2022	$ 2,700,000	$ 135,000	$ 165,000	$ 3,000,000
Big Bear City	Design (Reimb.) & Construction of Airfield Pvmt Rehab	AIP	2023	$ 1,350,000	$ 67,500	$ 82,500	$ 1,500,000
Big Bear City	Remove Obstructions on RW 26 Approach	AIP	2023	$ 90,000	$ 4,500	$ 5,500	$ 100,000
Big Bear City	Envir. Assessment (EA) for Land Acquisition (5.5 acre)	AIP	2024	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Big Bear City	ALP Update include Narrative Report and AGIS Survey	AIP	2025	$ 405,000	$ 20,250	$ 24,750	$ 450,000
Big Bear City	Acquire Snow Removal Equipment Phase 1	AIP	2026	$ 720,000	$ 36,000	$ 44,000	$ 800,000
Big Bear City	Acquire Snow Removal Equipment Phase 2	AIP	2026	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Big Bear City	Acquire Equipment: Sweeper	AIP	2027	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Big Bear City	Acquire Security Equipment: Perimeter Gates	AIP	2027	$ 90,000	$ 4,500	$ 5,500	$ 100,000

Bishop	Multiuse Terminal Expansion	AIP	2021	$	3,600,000	$	180,000	$	220,000	$	4,000,000
Bishop	RW 12-30 RSA Improvement Project	AIP	2023	$	1,755,000	$	87,750	$	107,250	$	1,950,000
Bishop	Environmental Assessment	AIP	2024	$	405,000	$	20,250	$	24,750	$	450,000
Bishop	Master Plan Update	AIP	2024	$	675,000	$	33,750	$	41,250	$	750,000
Bishop	Construct Central Terminal	AIP	2026	$	12,600,000	$	630,000	$	770,000	$	14,000,000
Bishop	Airport Perimeter Fence (design & construction)	AIP	2027	$	900,000	$	45,000	$	55,000	$	1,000,000
Bishop	Relocation of Parallel TW 'A' (Construction)	AIP	2029	$	7,065,000	$	353,250	$	431,750	$	7,850,000
Blythe	EA for Fencing	AIP	2022	$	214,113	$	10,706	$	13,085	$	237,903
Blythe	Airport Perimeter Fencing & Apron Lighting-Des & Con	AIP	2023	$	963,000	$	48,150	$	58,850	$	1,070,000
Blythe	RW 8-26 Rehabilitation - Design	AIP	2024	$	468,000	$	23,400	$	28,600	$	520,000
Blythe	RW 8-26 Rehabilitation - Construction	AIP	2025	$	5,580,000	$	279,000	$	341,000	$	6,200,000
Blythe	TW A (East) & TW Connectors Pavement-Design	AIP	2026	$	396,000	$	19,800	$	24,200	$	440,000
Blythe	TW A (East) & TW Connectors Pavement Reconst.-Const	AIP	2027	$	4,869,000	$	243,450	$	297,550	$	5,410,000
Blythe	Airport Layout Plan Update with Narrative Report	AIP	2028	$	150,000	$	7,500	$	9,167	$	166,667
Blythe	T/W AA Pvmt Recon - Design	AIP	2029	$	66,600	$	3,330	$	4,070	$	74,000
Blythe	T/W AA Pvmt Recon - Construction	AIP	2030	$	607,500	$	30,375	$	37,125	$	675,000
Bob Hope	Airfield Lighting Vault	AIP	2021	$	4,430,528	$	$ -	$	1,067,087	$	5,497,615
Bob Hope	Hollyona Property Acquisition	AIP	2021	$	1,899,404	$	$ -	$	457,472	$	2,356,876
Bob Hope	Part 150 Update - NEM and NCP	AIP	2022	$	805,900	$	$ -	$	194,100	$	1,000,000
Bob Hope	RPT Supplemental AIP Grant	AIP	2022	$	9,802,705	$	$ -	$	2,697,295	$	12,500,000
Bob Hope	TW Shoulders and Misc Rehabilitation	AIP	2022	$	1,433,696	$	$ -	$	345,304	$	1,779,000
Bob Hope	Wildlife Hazard Assessment/Management Plan	AIP	2022	$	157,150	$	$ -	$	37,850	$	195,000
Bob Hope	New ARFF Vehicle - Replacement of 2007 Vehicle	AIP	2023	$	653,664	$	$ -	$	246,336	$	900,000
Bob Hope	Residential Acoustical Treatment Program	AIP	2023	$	3,481,488	$	$ -	$	838,512	$	4,320,000
Bob Hope	RPT-PDB-NEQ - AIP (1)	AIP	2023	$	4,967,031	$	$ -	$	1,196,303	$	6,163,334
Bob Hope	RPT-PDB-NEQ - Non-AIP	LFP	2023	$	-	$	$ -	$	907,200,000	$	907,200,000
Bob Hope	RW and TW Shoulders Rehabilitation	AIP	2023	$	1,174,196	$	$ -	$	282,804	$	1,457,000
Bob Hope	Wildlife Mitigation/Bird Netting	AIP	2023	$	805,900	$	$ -	$	194,100	$	1,000,000
Bob Hope	Airport Master Plan	AIP	2024	$	805,900	$	$ -	$	194,100	$	1,000,000
Bob Hope	Residential Acoustical Treatment Program	AIP	2024	$	3,429,910	$	$ -	$	826,090	$	4,256,000
Bob Hope	RPT-PDB-NEQ - AIP (2)	AIP	2024	$	50,681,036	$	$ -	$	12,206,464	$	62,887,500
Bob Hope	RW/TW Shoulders and RSA Rehabilitation	AIP	2024	$	1,070,235	$	$ -	$	257,765	$	1,328,000
Bob Hope	RPT-Design-SEQ-Demolition, TW A and C Extension	AIP	2025	$	805,900	$	$ -	$	194,100	$	1,000,000
Bob Hope	RPT-PDB-NEQ - AIP (3)	AIP	2025	$	24,401,980	$	$ -	$	5,877,186	$	30,279,166
Bob Hope	RW shoulder, TW, and VSR rehabilitation	AIP	2025	$	1,373,254	$	$ -	$	330,746	$	1,704,000
Bob Hope	RPT-Demolition-SEQ-Existing Terminal Demol/Obst. Remvl	AIP	2026	$	13,700,300	$	$ -	$	3,299,700	$	17,000,000
Bob Hope	TW Connectors and Shoulders Rehabilitation	AIP	2026	$	772,858	$	$ -	$	186,142	$	959,000
Bob Maxwell Memorial Airfield	Rehab Tie-Down Apron & Infield Area Impr - Design	AIP	2021	$	225,000	$	11,250	$	13,750	$	250,000
Bob Maxwell Memorial Airfield	Infield Area Improvements, Phase I - Construction	AIP	2022	$	900,000	$	45,000	$	55,000	$	1,000,000

Bob Maxwell Memorial Airfield	Rehabilitate Tie-Down Apron, Phase I - Construction	AIP	2022	$ 1,890,000	$ 94,500	$ 115,500	$ 2,100,000
Bob Maxwell Memorial Airfield	Relocate TW A 61 Feet South - Design & Construction	AIP	2023	$ 297,000	$ 14,850	$ 18,150	$ 330,000
Bob Maxwell Memorial Airfield	Land Acquisition for RW Object Free Area	AIP	2024	$ 2,700,000	$ 135,000	$ 165,000	$ 3,000,000
Bob Maxwell Memorial Airfield	Relocate Eddy Jones Road	AIP	2024	$ 270,000	$ 13,500	$ 16,500	$ 300,000
Bob Maxwell Memorial Airfield	Maintenance Building - Design	AIP	2026	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Bob Maxwell Memorial Airfield	Fencing Improvements - Design	AIP	2027	$ 22,500	$ 1,125	$ 1,375	$ 25,000
Bob Maxwell Memorial Airfield	Maintenance Building - Construction	AIP	2028	$ 900,000	$ 45,000	$ 55,000	$ 1,000,000
Bob Maxwell Memorial Airfield	Fencing Improvements - Construction	AIP	2030	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Borrego Valley	Rehabilitate TW	AIP	2025	$ 3,960,000	$ 198,000	$ 242,000	$ 4,400,000
Brackett Field	Sewer Pump Project [Construction]	LFP	2021	$ -	$ $ -	$ 650,000	$ 650,000
Brackett Field	Replace Perimeter Fencing- (RSAT)	AIP	2022	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Brackett Field	Pavement Repairs & Mainten - Crack Sealing/Patching	AIP	2024	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Brawley Municipal	Design Rehabilitation of RW 8/26	AIP	2022	$ 297,000	$ 14,850	$ 18,150	$ 330,000
Brawley Municipal	Construction of the Reconstruction of RW 8/26	AIP	2023	$ 2,970,000	$ 148,500	$ 181,500	$ 3,300,000
Brawley Municipal	Airport Layout Plan Narrative	AIP	2024	$ 270,000	$ 13,500	$ 16,500	$ 300,000
Brawley Municipal	Seal Airfield Pavements and Stripe	AIP	2024	$ 810,000	$ 40,500	$ 49,500	$ 900,000
Brawley Municipal	Deign Aprn of Future Executive Hangars & Shade Struc	AIP	2025	$ 90,000	$ 4,500	$ 5,500	$ 100,000
Brawley Municipal	EA for Aprn of Future Executive Hangars & Shade Struc	AIP	2025	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Brawley Municipal	Const Apron for Future Executive Hangars & Shades	AIP	2026	$ 3,150,000	$ 157,500	$ 192,500	$ 3,500,000
Brawley Municipal	Reconstruct Ken Bemis Drive	AIP	2026	$ 585,000	$ 29,250	$ 35,750	$ 650,000
Brown Field	TW G (east) Reconstruction, Design & Construction	AIP	2023	$ 3,600,000	$ 180,000	$ 220,000	$ 4,000,000
Brown Field	Rehab of RW 8R-26L and TW G1, TW C Realign	AIP	2024	$ 3,856,500	$ 192,825	$ 235,675	$ 4,285,000
Brown Field	TW G (west) Rehab and New TW G2 Construction	AIP	2025	$ 6,642,900	$ 332,145	$ 405,955	$ 7,381,000
Brown Field	Permitter Fence Enhancements	AIP	2026	$ 534,600	$ 26,730	$ 32,670	$ 594,000
Brown Field	Transient/Customs Apron Rehab	AIP	2026	$ 1,457,316	$ 72,866	$ 89,058	$ 1,619,240
Buchanan Field	Design & Construct new ARFF facility	AIP	2021	$ 6,030,000	$ $ -	$ 670,000	$ 6,700,000
Buchanan Field	Design & Construct Terminal Building	AIP	2021	$ 3,150,000	$ $ -	$ 350,000	$ 3,500,000
Buchanan Field	Design & Install Security Upgrades	AIP	2021	$ 2,812,500	$ $ -	$ 312,500	$ 3,125,000
Buchanan Field	Airfield Electrical System Assessment	AIP	2022	$ 315,000	$ 15,750	$ 19,250	$ 350,000
Buchanan Field	Airport Master Plan and ALP Update	AIP	2022	$ 765,000	$ $ -	$ 85,000	$ 850,000
Buchanan Field	Asphalt Overlay and Reconst TW Golf and Runup Area	AIP	2023	$ 1,080,000	$ $ -	$ 120,000	$ 1,200,000
Buchanan Field	Design Repair of TW Golf Pavement	AIP	2024	$ 180,000	$ $ -	$ 20,000	$ 200,000
Buchanan Field	Replace Airfield Signs and Electrical Systems	AIP	2024	$ 2,250,000	$ 112,500	$ 137,500	$ 2,500,000
Buchanan Field	TW Golf Reconstruction & Pavement Replacement	AIP	2025	$ 1,786,500	$ $ -	$ 198,500	$ 1,985,000
Buchanan Field	Design Repair of Main Ramp Pavement	AIP	2026	$ 315,000	$ $ -	$ 35,000	$ 350,000
Buchanan Field	Design TW Alpha Repairs	AIP	2027	$ 652,500	$ $ -	$ 72,500	$ 725,000
Buchanan Field	Main Ramp Pavement Overlay and Reconstruction	AIP	2027	$ 1,350,000	$ $ -	$ 150,000	$ 1,500,000
Buchanan Field	Replace 1500 Gallon ARFF Vehicle	AIP	2028	$ 810,000	$ $ -	$ 90,000	$ 900,000
Buchanan Field	TW A and Run-up Areas Asphalt Overlay and Reconst	AIP	2028	$ 2,700,000	$ $ -	$ 300,000	$ 3,000,000

Buchanan Field	Design Replacement of TW Juliet Pavement	AIP	2029	$ 472,500	$ $ -	$ 52,500	$ 525,000
Buchanan Field	Design TW Lighting Upgrades	AIP	2029	$ 675,000	$ $ -	$ 75,000	$ 750,000
Buchanan Field	Pavement Surface Treatment RWs 14R/32L & 01R/19LT	AIP	2029	$ 3,420,000	$ $ -	$ 380,000	$ 3,800,000
Buchanan Field	Airfield Electrical System Replacement	AIP	2030	$ 3,150,000	$ $ -	$ 350,000	$ 3,500,000
Buchanan Field	FAR Part 150 Update	AIP	2030	$ 436,500	$ $ -	$ 48,500	$ 485,000
Buchanan Field	Noise Monitoring and Flight Track System	AIP	2030	$ 1,215,000	$ $ -	$ 135,000	$ 1,350,000
Buchanan Field	TW Juliet and Run-up Area Pvmnt. Overlay & Reconst	AIP	2030	$ 1,980,000	$ $ -	$ 220,000	$ 2,200,000
Byron	Wildlife Hazard Assessment	AIP	2023	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Byron	Install Safety perimeter Fencing Upgrades	LFP	2024	$ -	$ $ -	$ 1,187,000	$ 1,187,000
Byron	TW Edge Lighting Design, Engineering & Environmental	AIP	2025	$ 360,000	$ 18,000	$ 22,000	$ 400,000
Byron	TW Edge Lighting Installation	AIP	2026	$ 1,350,000	$ 67,500	$ 82,500	$ 1,500,000
Byron	Airport Master Plan and ALP with Narrative Study	AIP	2027	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Byron	Envir. Review for the Purchase of Three Parcels	LFP	2028	$ -	$ $ -	$ 275,000	$ 275,000
Byron	Land Purchase RSA RW 05/23	LFP	2029	$ -	$ $ -	$ 2,200,000	$ 2,200,000
Byron	RW 12/30 Extension 25% Design & Environmental	AIP	2029	$ 315,000	$ 15,750	$ 19,250	$ 350,000
Byron	RW 12/30 Design, Engineering & Environmental	AIP	2030	$ 360,000	$ 18,000	$ 22,000	$ 400,000
Calaveras Co. - Maury Rasmussen	RW Pavement Reconstruction (Design)	AIP	2021	$ 193,500	$ 9,675	$ 11,825	$ 215,000
Calaveras Co. - Maury Rasmussen	RW Pavement Reconstruction (Construction)	AIP	2022	$ 1,784,700	$ 89,235	$ 109,065	$ 1,983,000
Calaveras Co. - Maury Rasmussen	Design of (RW) TW Connectors Pavement Recon.	AIP	2023	$ 85,500	$ 4,275	$ 5,225	$ 95,000
Calaveras Co. - Maury Rasmussen	Design of Parallel TW & Apron Connectors Pvmt Recon.	AIP	2023	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Calaveras Co. - Maury Rasmussen	Design of RW 13 Precision Approach Path Indicator	AIP	2023	$ 15,750	$ 788	$ 963	$ 17,500
Calaveras Co. - Maury Rasmussen	Const. of Parallel T/W A & Apron Connectors Pvmt Recon.	AIP	2024	$ 1,210,500	$ 60,525	$ 73,975	$ 1,345,000
Calaveras Co. - Maury Rasmussen	Const. of RW 13 Precision Approach Path Indicator	AIP	2024	$ 67,500	$ 3,375	$ 4,125	$ 75,000
Calaveras Co. - Maury Rasmussen	Construction of (RW) TW Connectors Pvmt Recon.	AIP	2024	$ 562,500	$ 28,125	$ 34,375	$ 625,000
Calexico International	Construct TW Pavement Rehabilitation	AIP	2021	$ 3,716,905	$ 185,845	$ 227,144	$ 4,129,894
Calexico International	Design RW Seal	AIP	2022	$ 33,075	$ 1,654	$ 2,021	$ 36,750
Calexico International	Design Southeast Apron Pavement Rehabilitation	AIP	2022	$ 94,500	$ 4,725	$ 5,775	$ 105,000
Calexico International	Develop Pavement Management Program	AIP	2022	$ 14,175	$ 709	$ 866	$ 15,750
Calexico International	Construct SE Apron Pavement Rehab and RW Seal	AIP	2023	$ 661,500	$ 33,075	$ 40,425	$ 735,000
Calexico International	RW 26 End Safety Area Environmental / Design	AIP	2024	$ 236,250	$ 11,813	$ 14,438	$ 262,500
Calexico International	North Hangar Area Pavement Rehab Design	AIP	2025	$ 103,950	$ 5,198	$ 6,353	$ 115,500
Calexico International	Construct North Hangar Area Pavement Rehab	AIP	2026	$ 1,134,000	$ 56,700	$ 69,300	$ 1,260,000
Calexico International	RW 26 End Safety Area Design	AIP	2027	$ 165,375	$ 8,269	$ 10,106	$ 183,750
Calexico International	Construct RW End Safety Area	AIP	2028	$ 1,795,500	$ 89,775	$ 109,725	$ 1,995,000
Calexico International	Airfield Lighting Rehab Design	AIP	2029	$ 170,100	$ 8,505	$ 10,395	$ 189,000
Calexico International	Airfield Lighting Rehab and Widen Connectors Const	AIP	2030	$ 1,417,500	$ 70,875	$ 86,625	$ 1,575,000
California City Municipal	Airport Fencing and Security Upgrades (Const)	AIP	2021	$ 886,752	$ 44,338	$ 54,190	$ 985,280
California City Municipal	Airfield Lighting Electrical Upgrades Design	AIP	2022	$ 178,200	$ 8,910	$ 10,890	$ 198,000
California City Municipal	Airfield Lighting Electrical Upgrades Construction	AIP	2023	$ 790,452	$ 39,523	$ 48,305	$ 878,280

California City Municipal	Municipal Drainage Study	AIP	2025	$	231,840	$	11,592	$	14,168	$	257,600
California City Municipal	Run-Up Areas with Blast Fence Design Only	AIP	2026	$	196,211	$	9,811	$	11,991	$	218,012
California City Municipal	Run-Up areas with Blast Fence Construction	AIP	2028	$	1,011,678	$	50,584	$	61,825	$	1,124,087
California City Municipal	Center TW C Relocation and RW Run-Off Areas Design	AIP	2030	$	170,910	$	8,546	$	10,445	$	189,900
California Pines	Maintenance - Crack Seal and Repaint RW	A&D	2021	$	-	$	9,000	$	1,000	$	10,000
California Pines	Build Bathrooms with Lounge Area	A&D	2022	$	-	$	90,000	$	10,000	$	100,000
California Pines	Sweeper	A&D	2022	$	-	$	45,000	$	5,000	$	50,000
California Pines	Helio Pad	A&D	2024	$	-	$	180,000	$	20,000	$	200,000
Camarillo	EA for 2025 RW/TW Reconst. with 25% Conceptual Des	AIP	2021	$	354,375	$	17,719	$	21,656	$	393,750
Camarillo	Part 150 Noise Expo. Map Update w/Public Outreach	AIP	2022	$	540,000	$	27,000	$	33,000	$	600,000
Camarillo	Final Design Grant for 2025 RW/TW Reconstruction	AIP	2023	$	3,660,436	$	183,022	$	223,693	$	4,067,151
Camarillo	RW 8-26 Reconstruction	AIP	2025	$	33,850,359	$	1,692,518	$	2,068,633	$	37,611,510
Camarillo	TW Connector Reconstruction	AIP	2025	$	2,754,000	$	137,700	$	168,300	$	3,060,000
Camarillo	Design Grant - PCC Rehab TWs F, G1, Key Hangar Area	AIP	2026	$	355,541	$	17,777	$	21,728	$	395,046
Camarillo	Design Grant for Rehab TWs G, G2 & G3 & NE Taxil	AIP	2026	$	317,493	$	15,875	$	19,402	$	352,770
Camarillo	Design Grant for Rehabilitate Central Apron	AIP	2026	$	33,323	$	1,666	$	2,036	$	37,026
Camarillo	Design Grant for Rehabilitate East & West Aprons	AIP	2026	$	220,320	$	11,016	$	13,464	$	244,800
Camarillo	Design for Rehab West, Central & Key Hangar Areas	AIP	2027	$	403,578	$	20,179	$	24,663	$	448,420
Camarillo	Design for Rehabilitate Aviation Drive & Durley Ave.	AIP	2027	$	187,686	$	9,384	$	11,470	$	208,540
Camarillo	PCC Rehab TWs F, G1, Key Hangar & Main Apron	AIP	2028	$	2,370,276	$	118,514	$	144,850	$	2,633,640
Camarillo	Rehabilitate Central Apron	AIP	2028	$	222,156	$	11,108	$	13,576	$	246,840
Camarillo	Rehabilitate East & West Aprons	AIP	2028	$	220,320	$	11,016	$	13,464	$	244,800
Camarillo	Rehabilitate TWs G, G2 & G3 & NE Taxilane	AIP	2028	$	317,493	$	15,875	$	19,402	$	352,770
Camarillo	Rehabilitate Aviation Dr. & Durley Access Rds	AIP	2029	$	187,686	$	9,384	$	11,470	$	208,540
Camarillo	Rehabilitate West, Central & Key Hangar Areas	AIP	2029	$	403,578	$	20,179	$	24,663	$	448,420
Camarillo	Design for Airfield Lighting/Sign Improvements	AIP	2030	$	403,578	$	20,179	$	24,663	$	448,420
Cameron Park Airpark	Above Ground Fueling-engineering	AIP	2021	$	23,400	$	1,170	$	1,430	$	26,000
Cameron Park Airpark	ALP Update	AIP	2021	$	162,000	$	8,100	$	9,900	$	180,000
Cameron Park Airpark	Point of Sale Upgrade	AIP	2021	$	13,500	$	675	$	825	$	15,000
Cameron Park Airpark	Above Ground Fueling-Installation	AIP	2022	$	144,000	$	7,200	$	8,800	$	160,000
Cameron Park Airpark	Update fences and gates	AIP	2022	$	292,500	$	14,625	$	17,875	$	325,000
Cameron Park Airpark	Engineering Evaluation of Slope	AIP	2023	$	33,750	$	1,688	$	2,063	$	37,500
Cameron Park Airpark	Slurry seal apron and tiedown areas	AIP	2023	$	118,800	$	5,940	$	7,260	$	132,000
Cameron Park Airpark	Underground Tank Removal	AIP	2023	$	54,000	$	2,700	$	3,300	$	60,000
Cameron Park Airpark	Engineering of covered AC parking with solar	AIP	2024	$	49,500	$	2,475	$	3,025	$	55,000
Cameron Park Airpark	Hangar Door Replacement	AIP	2024	$	135,000	$	6,750	$	8,250	$	150,000
Cameron Park Airpark	Slurry seal TW and RW	AIP	2024	$	183,600	$	9,180	$	11,220	$	204,000
Cameron Park Airpark	AWOS Upgrade	AIP	2025	$	189,000	$	9,450	$	11,550	$	210,000
Cameron Park Airpark	Replace Pulse Light Approach Slope Indicator	AIP	2025	$	112,500	$	5,625	$	6,875	$	125,000

Cameron Park Airpark	Drainage Improvement East	AIP	2026	$	247,500	$	12,375	$	15,125	$	275,000
Cameron Park Airpark	Extend Existing Culvert Under RW	AIP	2026	$	337,500	$	16,875	$	20,625	$	375,000
Cameron Park Airpark	Drainage Improvement West	AIP	2027	$	270,000	$	13,500	$	16,500	$	300,000
Cameron Park Airpark	Resurface Tie Downs and Apron	AIP	2028	$	189,000	$	9,450	$	11,550	$	210,000
Cameron Park Airpark	Resurface RW and TW	AIP	2029	$	435,600	$	21,780	$	26,620	$	484,000
Cameron Park Airpark	Engineering Development of Widening RW to 75 ft	AIP	2030	$	67,500	$	3,375	$	4,125	$	75,000
Castle	Pavement Management Program	AIP	2021	$	180,000	$	9,000	$	11,000	$	200,000
Castle	AWOS III (Design)	AIP	2022	$	58,500	$	2,925	$	3,575	$	65,000
Castle	ATCT Equipment	AIP	2023	$	225,000	$	11,250	$	13,750	$	250,000
Castle	AWOS III (Construction)	AIP	2023	$	247,500	$	12,375	$	15,125	$	275,000
Castle	TW A Edge Lights (Design)	AIP	2024	$	202,500	$	10,125	$	12,375	$	225,000
Castle	TW A Reconstruction, Phase I (Design)	AIP	2024	$	234,000	$	11,700	$	14,300	$	260,000
Castle	TW A Edge Lights (Construction)	AIP	2025	$	270,000	$	13,500	$	16,500	$	300,000
Castle	TW A Reconstruction, Phase II (Construction)	AIP	2025	$	2,475,000	$	123,750	$	151,250	$	2,750,000
Castle	TW E Reconstruction, Phase I (Design)	AIP	2026	$	112,500	$	5,625	$	6,875	$	125,000
Castle	Guidance Sign Replacement (Design)	AIP	2027	$	76,500	$	3,825	$	4,675	$	85,000
Castle	New Beacon (Design)	AIP	2027	$	31,500	$	1,575	$	1,925	$	35,000
Castle	New Wind cones (Design)	AIP	2027	$	31,500	$	1,575	$	1,925	$	35,000
Castle	Perimeter Fencing (Design)	AIP	2027	$	166,500	$	8,325	$	10,175	$	185,000
Castle	Re-Pave Existing Service Road (Design)	AIP	2027	$	202,500	$	10,125	$	12,375	$	225,000
Castle	TW E Reconstruction, Phase II (Construction)	AIP	2027	$	990,000	$	49,500	$	60,500	$	1,100,000
Castle	Guidance Sign Replacement (Construction)	AIP	2028	$	585,000	$	29,250	$	35,750	$	650,000
Castle	New Beacon (Construction)	AIP	2028	$	112,500	$	5,625	$	6,875	$	125,000
Castle	New Wind cones (Construction)	AIP	2028	$	90,000	$	4,500	$	5,500	$	100,000
Castle	Perimeter Fencing (Construction)	AIP	2029	$	3,600,000	$	180,000	$	220,000	$	4,000,000
Castle	Re-Pave Existing Service Road (Construction)	AIP	2030	$	2,700,000	$	135,000	$	165,000	$	3,000,000
Cedarville	Pavement Management Maintenance Plan	A&D	2022	$	-	$	63,000	$	7,000	$	70,000
Cedarville	Replace Beacon And Add New Pole	A&D	2022	$	-	$	135,000	$	15,000	$	150,000
Cedarville	Design: Joint Seal Airfield Pavements: RW	AIP	2023	$	27,000	$	1,350	$	1,650	$	30,000
Cedarville	Construct: Joint Seal Airfield Pavements RW, TW & Apron	AIP	2024	$	204,300	$	10,215	$	12,485	$	227,000
Cedarville	ALP Update Narrative and Plans	AIP	2028	$	108,000	$	5,400	$	6,600	$	120,000
Chico Municipal	Reconstruct TW A Phase 3 (Construction)	AIP	2021	$	3,092,090	$	154,605	$	188,961	$	3,435,656
Chico Municipal	Reconstruct RW 13L-31R (Design)	AIP	2022	$	1,048,950	$	52,448	$	64,103	$	1,165,500
Chico Municipal	Reconstruct RW 13L-31R (Construction)	AIP	2023	$	12,840,188	$	642,009	$	784,678	$	14,266,875
Chico Municipal	Reconstruct Aircraft Parking Apron, Phase 4 (Design)	AIP	2024	$	708,750	$	35,438	$	43,313	$	787,500
Chico Municipal	Replacement of Rotating Beacon (Design)	AIP	2024	$	61,425	$	3,071	$	3,754	$	68,250
Chico Municipal	Reconstruct Aircraft Parking Apron Phase 4 (Construct.)	AIP	2025	$	6,153,840	$	307,692	$	376,068	$	6,837,600
Chico Municipal	Replacement of Rotating Beacon (Construction)	AIP	2025	$	145,436	$	7,272	$	8,888	$	161,595
Chico Municipal	Reconstruct Aircraft Parking Apron, Phase 5 (Design)	AIP	2026	$	581,175	$	29,059	$	35,516	$	645,750

Chico Municipal	Reconstruct Aircraft Parking Apron Phase 5 (Construct.)	AIP	2027	$	1,194,008	$	59,700	$	72,967	$	1,326,675
Chico Municipal	Rehab Apron A1b, A3b, A4a, & Hangar Taxilanes	AIP	2027	$	889,321	$	44,466	$	54,347	$	988,134
Chico Municipal	Terminal Facility Development Plan	AIP	2027	$	217,350	$	10,868	$	13,283	$	241,500
Chico Municipal	EA for Terminal & Auto Parking Lot Expansion	AIP	2028	$	122,850	$	6,143	$	7,508	$	136,500
Chico Municipal	Pave Pres RW 13R-31L; Rehab Apron A1a & A3a	AIP	2028	$	686,108	$	34,305	$	41,929	$	762,342
Chico Municipal	Design Automobile Parking Lot Expansion	AIP	2029	$	140,400	$	7,020	$	8,580	$	156,000
Chico Municipal	Design Terminal Expansion	AIP	2029	$	742,500	$	37,125	$	45,375	$	825,000
Chico Municipal	Construct Automobile Parking Lot Expansion	AIP	2030	$	1,221,300	$	61,065	$	74,635	$	1,357,000
Chico Municipal	Engineering Design - RW 13R-31L Reconstruct & Expand	AIP	2030	$	711,000	$	35,550	$	43,450	$	790,000
Chico Municipal	Environmental Assessment - Land Acquisition	AIP	2030	$	216,000	$	10,800	$	13,200	$	240,000
Chico Municipal	Terminal Expansion Construction	AIP	2030	$	10,710,000	$	535,500	$	654,500	$	11,900,000
Chico Municipal	West Side Access Road	LFP	2030	$	-	$	$ -	$	4,596,000	$	4,596,000
Chino	Perimeter Fence Upgrades	AIP	2022	$	76,104	$	3,805	$	4,651	$	84,560
Chino	Safety Signs & Markings Update	A&D	2022	$	-	$	72,000	$	8,000	$	80,000
Chino	Perimeter Fence Upgrade	AIP	2023	$	1,814,319	$	90,716	$	110,875	$	2,015,910
Chino	Safety Area Improvements for RW 26L	AIP	2023	$	202,500	$	10,125	$	12,375	$	225,000
Chino	Safety Area Improvements for RW 26L	AIP	2024	$	168,750	$	8,438	$	10,313	$	187,500
Chino	ALUCP- Land Use Compatibility Plan Update	A&D	2026	$	-	$	54,000	$	6,000	$	60,000
Chino	Land Acquisition for RPZ - Phase I	AIP	2026	$	2,700,000	$	135,000	$	165,000	$	3,000,000
Chino	Update Pavement Condition Index	AIP	2026	$	54,000	$	2,700	$	3,300	$	60,000
Chino	RW/TW Rehabilitation & Striping	AIP	2027	$	315,000	$	15,750	$	19,250	$	350,000
Chiriaco Summit	Rehabilitate TW Pavement	A&D	2023	$	-	$	315,000	$	35,000	$	350,000
Chiriaco Summit	Widen RW to 60 feet	A&D	2026	$	-	$	450,000	$	50,000	$	500,000
Chiriaco Summit	Install Rotating Beacon	A&D	2028	$	-	$	180,000	$	20,000	$	200,000
Chiriaco Summit	Reconstruct Apron	A&D	2030	$	-	$	585,000	$	65,000	$	650,000
Chowchilla	Construct Airfield Lighting and Rotating Beacon	AIP	2021	$	630,000	$	31,500	$	38,500	$	700,000
Chowchilla	Construct: Rehabilitate RW 12-30 and Airfield Electrical	AIP	2022	$	4,705,722	$	235,286	$	287,572	$	5,228,580
Chowchilla	Land Acquisition - RPZ - 6.34 acres	AIP	2022	$	450,000	$	22,500	$	27,500	$	500,000
Chowchilla	EA: Environmental Assessment - East Side Development	AIP	2023	$	216,140	$	10,807	$	13,209	$	240,155
Chowchilla	Land Acquisition - East Side Development (40 acres)	AIP	2025	$	1,485,000	$	74,250	$	90,750	$	1,650,000
Chowchilla	Design/Construct: Perimeter Fence	AIP	2026	$	264,375	$	13,219	$	16,156	$	293,750
Chowchilla	Design: Relocate (25' x 960') and Extend TW B on North	AIP	2026	$	207,000	$	10,350	$	12,650	$	230,000
Chowchilla	Construct: Relocate and Extend TW B on NEast Side	AIP	2027	$	1,620,000	$	81,000	$	99,000	$	1,800,000
Chowchilla	Design: East Side Access Road-Phase 1	AIP	2028	$	144,000	$	7,200	$	8,800	$	160,000
Chowchilla	Design: NEast Side Hangar Taxilanes - Phase 1	AIP	2028	$	306,000	$	15,300	$	18,700	$	340,000
Chowchilla	Construct NEast Side Access Road - Phase 1	AIP	2029	$	972,000	$	48,600	$	59,400	$	1,080,000
Chowchilla	Pavement Maintenance Management Plan (PMMP)	AIP	2029	$	108,000	$	5,400	$	6,600	$	120,000
Chowchilla	Airport Layout Plan Narrative incl. ALP Updated Plans	AIP	2030	$	144,000	$	7,200	$	8,800	$	160,000
Chowchilla	Construct: Northeast Side Hangar Taxilanes	AIP	2030	$	2,592,000	$	129,600	$	158,400	$	2,880,000

Cloverdale Municipal	Environmental Studies for Infield Area Drainage Improv.	AIP	2021	$ 202,500	$ 10,125	$ 12,375	$ 225,000
Cloverdale Municipal	Design Infield Area Drainage Improvements	AIP	2022	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Cloverdale Municipal	Construct Infield Area Drainage Improvements	AIP	2023	$ 391,500	$ 19,575	$ 23,925	$ 435,000
Cloverdale Municipal	Design Apron Pavement Reconstruct & Apron Lighting	AIP	2024	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Cloverdale Municipal	Construct Apron Lighting	AIP	2025	$ 90,000	$ 4,500	$ 5,500	$ 100,000
Cloverdale Municipal	Construct Apron Pavement Reconstruction	AIP	2025	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Cloverdale Municipal	Automated Weather Observation System (AWOS)-Des	AIP	2027	$ 76,500	$ 3,825	$ 4,675	$ 85,000
Cloverdale Municipal	Automated Weather Observation System (AWOS)-Const.	AIP	2028	$ 247,500	$ 12,375	$ 15,125	$ 275,000
Cloverdale Municipal	Design Pave Access within Property	AIP	2028	$ 67,500	$ 3,375	$ 4,125	$ 75,000
Cloverdale Municipal	Construct Pave Access within Property	AIP	2029	$ 315,000	$ 15,750	$ 19,250	$ 350,000
Cloverdale Municipal	Design Segmented Circle and Lighted Wind Cone	AIP	2030	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Cloverdale Municipal	Wildlife Hazard Assessment	AIP	2030	$ 112,500	$ 5,625	$ 6,875	$ 125,000
Columbia	ALUC Plan Update	A&D	2021	$ -	$ 225,000	$ 25,000	$ 250,000
Columbia	AWOS Replacement	AIP	2021	$ 150,000	$ 7,500	$ 9,167	$ 166,667
Columbia	B-II Environmental Assessment and Pre-Design	AIP	2022	$ 2,250,000	$ 112,500	$ 137,500	$ 2,500,000
Columbia	Columbia RW Rubber Removal	AIP	2022	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Columbia	B-II Standards Design	AIP	2023	$ 4,500,000	$ 225,000	$ 275,000	$ 5,000,000
Columbia	B-II Standards Construction Phase 1	AIP	2024	$ 13,500,000	$ 675,000	$ 825,000	$ 15,000,000
Columbia	B-II Standards Construction Phase 2	AIP	2025	$ 13,500,000	$ 675,000	$ 825,000	$ 15,000,000
Columbia	B-II Standards Construction Phase 3	AIP	2026	$ 13,500,000	$ 675,000	$ 825,000	$ 15,000,000
Columbia	B-II Standards Construction Phase 4	AIP	2027	$ 7,200,000	$ 360,000	$ 440,000	$ 8,000,000
Columbia	RW 17/35 Rehab Construction	AIP	2027	$ 6,300,000	$ 315,000	$ 385,000	$ 7,000,000
Columbia	VASI to PAPI	AIP	2027	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Columbia	Parking Apron Rehab Design	AIP	2028	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Columbia	Parking Apron Rehabilitation Construction - Phase 1	AIP	2028	$ 927,000	$ 46,350	$ 56,650	$ 1,030,000
Columbia	Parking Apron Rehabilitation Construction - Phase 2	AIP	2028	$ 927,000	$ 46,350	$ 56,650	$ 1,030,000
Columbia	TW A Rehabilitation Design	AIP	2029	$ 405,000	$ 20,250	$ 24,750	$ 450,000
Columbia	TW A Rehabilitation	AIP	2030	$ 4,050,000	$ 202,500	$ 247,500	$ 4,500,000
Colusa County	Construct: RW Pavement Preservation Phase 1	AIP	2021	$ 262,800	$ 13,140	$ 16,060	$ 292,000
Colusa County	Design/Construct: Perimeter Fence	AIP	2022	$ 62,100	$ 3,105	$ 3,795	$ 69,000
Colusa County	Design/Const: RW Preservation Phase 2, Airfield Signage	AIP	2023	$ 307,125	$ 15,356	$ 18,769	$ 341,250
Colusa County	Design: AWOS III	AIP	2024	$ 37,800	$ 1,890	$ 2,310	$ 42,000
Colusa County	Construct: AWOS	AIP	2025	$ 267,750	$ 13,388	$ 16,363	$ 297,500
Colusa County	Des: Infield Area Drainage and Erosion Improvements	AIP	2025	$ 74,700	$ 3,735	$ 4,565	$ 83,000
Colusa County	Const: Infield Area Drainage and Erosion Improvements	AIP	2026	$ 562,500	$ 28,125	$ 34,375	$ 625,000
Colusa County	Helipad - Design	AIP	2027	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Colusa County	RW, TW & Ramp Pavement Rehabilitation	AIP	2027	$ 675,000	$ 33,750	$ 41,250	$ 750,000
Colusa County	Helipad - Construction	AIP	2028	$ 315,000	$ 15,750	$ 19,250	$ 350,000
Colusa County	ALP Update Narrative and Plans	AIP	2030	$ 144,000	$ 7,200	$ 8,800	$ 160,000

Colusa County	Pavement Maintenance Management Plan (PMMP)	AIP	2030	$	90,000	$	4,500	$	5,500	$	100,000
Compton-Woodley	Terminal Building Project - Design	LFP	2021	$	-	$	$ -	$	350,000	$	350,000
Compton-Woodley	Airport Land Use Compatibility Plan (ALUCP)	A&D	2022	$	-	$	270,000	$	30,000	$	300,000
Compton-Woodley	Pvmt Repairs & Maintenance - Crack Sealing/Patching	AIP	2023	$	45,000	$	2,250	$	2,750	$	50,000
Compton-Woodley	Terminal Building Project [Construction]	A&D	2023	$	-	$	2,700,000	$	2,700,000	$	5,400,000
Compton-Woodley	Rehab. South Taxi Lanes & Parking Ramp/Apron (Des)	AIP	2024	$	180,000	$	9,000	$	11,000	$	200,000
Compton-Woodley	Rehab. South Taxi Lanes & Parking Ramp/Apron - Cons	AIP	2027	$	720,000	$	36,000	$	44,000	$	800,000
Corning Municipal	Develop Pavement Maintenance Management Plan	AIP	2021	$	31,500	$	1,575	$	1,925	$	35,000
Corning Municipal	Update Layout Plan, including Aeronautical Survey	AIP	2021	$	300,000	$	15,000	$	18,333	$	333,333
Corning Municipal	Rehabilitate Aprons (Design, Bid & Const)	AIP	2023	$	150,000	$	7,500	$	9,167	$	166,667
Corning Municipal	Rehabilitate RW 17/35 (30'x2,699') (Design, Bid & Const)	AIP	2023	$	150,000	$	7,500	$	9,167	$	166,667
Corning Municipal	Rehabilitate TW A and Associated Connector TWs	AIP	2023	$	150,000	$	7,500	$	9,167	$	166,667
Corning Municipal	Rehabilitate Airfield Lighting System	AIP	2026	$	450,000	$	22,500	$	27,500	$	500,000
Corning Municipal	Rehabilitate Aprons (Design, Bid & Const)	AIP	2029	$	165,001	$	8,250	$	10,083	$	183,334
Corning Municipal	Rehabilitate RW 17/35 (Design Bid & Const)	AIP	2029	$	165,001	$	8,250	$	10,083	$	183,334
Corning Municipal	Rehabilitate TW A and Associated Connector TWs	AIP	2029	$	165,001	$	8,250	$	10,083	$	183,334
Corona Municipal	Airport Lighting Upgrades to LED	AIP	2021	$	45,000	$	2,250	$	2,750	$	50,000
Corona Municipal	RW/TW Surface Treatment	AIP	2022	$	396,000	$	19,800	$	24,200	$	440,000
Corona Municipal	Corona Obstruction Reduction	AIP	2023	$	90,000	$	4,500	$	5,500	$	100,000
Corona Municipal	Security Upgrades	AIP	2024	$	135,000	$	6,750	$	8,250	$	150,000
Corona Municipal	Construct Public Restroom	AIP	2025	$	225,000	$	11,250	$	13,750	$	250,000
Corona Municipal	Upgrade City Tie-Down area for transient planes	AIP	2026	$	112,500	$	5,625	$	6,875	$	125,000
Corona Municipal	Install New PAPI System	AIP	2027	$	180,000	$	9,000	$	11,000	$	200,000
Corona Municipal	Airport Master Plan	AIP	2028	$	225,000	$	11,250	$	13,750	$	250,000
Corona Municipal	Repair Storm Drain System	A&D	2029	$	-	$	90,000	$	10,000	$	100,000
Corona Municipal	RW/TW Surface Treatment	AIP	2030	$	315,000	$	15,750	$	19,250	$	350,000
Delano Municipal	Slurry Seal RW and TWs	AIP	2021	$	405,000	$	20,250	$	24,750	$	450,000
Delano Municipal	Slurry Seal Hangers and Parking areas	AIP	2022	$	135,000	$	6,750	$	8,250	$	150,000
Delano Municipal	Resurface Parking Lot	AIP	2023	$	149,400	$	7,470	$	9,130	$	166,000
Delano Municipal	Perimeter Access Gates	AIP	2024	$	112,500	$	5,625	$	6,875	$	125,000
Delano Municipal	Perimeter Access Control	AIP	2025	$	99,000	$	4,950	$	6,050	$	110,000
Delano Municipal	Construct Access Road and Infrastructure	AIP	2026	$	400,500	$	20,025	$	24,475	$	445,000
Delano Municipal	Construct Individual Hangers in NW Area	AIP	2027	$	292,500	$	14,625	$	17,875	$	325,000
Delano Municipal	Application of Rejuvenation & Stripe on TW, Apron, T-	AIP	2028	$	148,500	$	7,425	$	9,075	$	165,000
Delano Municipal	Construct Wash Rack in NW Area	AIP	2029	$	162,000	$	8,100	$	9,900	$	180,000
Delano Municipal	Parking Lot Rehabilitation Project	AIP	2030	$	270,000	$	13,500	$	16,500	$	300,000
Dunsmuir Muni-Mott	Northend TW and Aircraft Parking Apron (design)	AIP	2021	$	144,000	$	7,200	$	8,800	$	160,000
Dunsmuir Muni-Mott	Northend TW and Aircraft Parking Apron (construction)	AIP	2022	$	1,287,000	$	64,350	$	78,650	$	1,430,000
Dunsmuir Muni-Mott	Southend TW and Aircraft Parking Apron (design)	AIP	2023	$	135,000	$	6,750	$	8,250	$	150,000

Dunsmuir Muni-Mott	Southend TW and Aircraft Parking Apron (construction)	AIP	2024	$	1,233,000	$	61,650	$	75,350	$	1,370,000
Dunsmuir Muni-Mott	Segmented Circle with Windsock	AIP	2025	$	112,500	$	5,625	$	6,875	$	125,000
Dunsmuir Muni-Mott	Refurbish Beacon/Power	AIP	2026	$	135,000	$	6,750	$	8,250	$	150,000
Dunsmuir Muni-Mott	Update Layout Plan	LFP	2027	$	-	$	$ -	$	150,000	$	150,000
Dunsmuir Muni-Mott	Expand Apron and Aircraft Parking	AIP	2028	$	135,000	$	6,750	$	8,250	$	150,000
Dunsmuir Muni-Mott	Design TW extensions north and south end	AIP	2029	$	180,000	$	9,000	$	11,000	$	200,000
Dunsmuir Muni-Mott	Construct additional TWs north/south end	AIP	2030	$	1,800,000	$	90,000	$	110,000	$	2,000,000
Fall River Mills	Design Reimb. & Rehab Parallel TW, Hanger TW & Apron	AIP	2023	$	450,000	$	22,500	$	27,500	$	500,000
Fall River Mills	Airport Land Use Compatibility Plan Update	A&D	2026	$	-	$	225,000	$	25,000	$	250,000
Fallbrook Community Airpark	Rehabilitate RW 18	AIP	2024	$	198,000	$	9,900	$	12,100	$	220,000
Fallbrook Community Airpark	Rehabilitate TWs A/B/C/D	AIP	2026	$	594,000	$	29,700	$	36,300	$	660,000
Fallbrook Community Airpark	Rehabilitate Transient Apron	AIP	2028	$	166,500	$	8,325	$	10,175	$	185,000
Firebaugh	Pavement Maintenance Management Plan	AIP	2021	$	162,000	$	8,100	$	9,900	$	180,000
Firebaugh	ALP Narrative Report	AIP	2022	$	180,000	$	9,000	$	11,000	$	200,000
Firebaugh	RSA Obstruction Removal	AIP	2024	$	72,000	$	3,600	$	4,400	$	80,000
Firebaugh	RSA Obstruction Removal	AIP	2025	$	540,000	$	27,000	$	33,000	$	600,000
Firebaugh	Additional Aircraft Apron	AIP	2026	$	67,500	$	3,375	$	4,125	$	75,000
Firebaugh	Additional Aircraft Apron	AIP	2027	$	387,000	$	19,350	$	23,650	$	430,000
Firebaugh	Install Medium Intensity TW Lighting	AIP	2028	$	162,000	$	8,100	$	9,900	$	180,000
Firebaugh	Fuel Island and Segmented Circle	AIP	2029	$	27,000	$	1,350	$	1,650	$	30,000
Firebaugh	Fuel Island and Segmented Circle	AIP	2030	$	324,000	$	16,200	$	19,800	$	360,000
Fort Bidwell	Engineering, Design and Add New Gravel for RW	A&D	2022	$	-	$	45,000	$	5,000	$	50,000
Fort Bidwell	Engineering, Design and Add New Gravel for RW	A&D	2026	$	-	$	49,500	$	5,500	$	55,000
Franklin Field	Rehabilitate TW A	AIP	2021	$	450,000	$	22,500	$	27,500	$	500,000
Franklin Field	Rehabilitate RW 9/27	AIP	2022	$	990,000	$	49,500	$	60,500	$	1,100,000
Franklin Field	Rehabilitate Aircraft Parking Apron	AIP	2023	$	945,000	$	47,250	$	57,750	$	1,050,000
Franklin Field	Rehabilitate Access Road	AIP	2024	$	247,500	$	12,375	$	15,125	$	275,000
French Valley	Apron Pavement Rehabilitation - Design	AIP	2023	$	486,000	$	24,300	$	29,700	$	540,000
French Valley	Middle Apron Pavement Rehabilitation - Phase 1 Const.	AIP	2024	$	4,275,000	$	213,750	$	261,250	$	4,750,000
French Valley	North Apron Pavement Rehabilitation - Phase 2 Const.	AIP	2025	$	981,000	$	49,050	$	59,950	$	1,090,000
French Valley	Apron Pavement Rehab - Phase 3 South Apron Const.	AIP	2027	$	328,500	$	16,425	$	20,075	$	365,000
French Valley	South Apron W/Tiedowns Design	AIP	2028	$	108,000	$	5,400	$	6,600	$	120,000
French Valley	South Apron W/Tiedowns Construction	AIP	2029	$	1,153,800	$	57,690	$	70,510	$	1,282,000
French Valley	Airport Layout Plan with Narrative Report	AIP	2030	$	150,000	$	7,500	$	9,167	$	166,667
Fresno Chandler Executive	Beacon Replacement & Relocation	AIP	2022	$	135,000	$	6,750	$	8,250	$	150,000
Fresno Chandler Executive	Tower Removal & Hangar Develop. (Env/Design)	AIP	2023	$	135,000	$	6,750	$	8,250	$	150,000
Fresno Chandler Executive	Tower Removal & Hangar Develop. (Const Phase 1)	AIP	2024	$	270,000	$	13,500	$	16,500	$	300,000
Fresno Chandler Executive	Tower Removal & Hangar Develop. (Const Phase 2)	AIP	2025	$	270,000	$	13,500	$	16,500	$	300,000
Fresno Chandler Executive	Tower Removal & Hangar Develop. (Const Phase 3)	AIP	2026	$	270,000	$	13,500	$	16,500	$	300,000

Fresno Chandler Executive	Tower Removal & Hangar Develop. (Const Phase 4)	AIP	2027	$ 2,700,000	$ 135,000	$ 165,000	$ 3,000,000
Fresno Chandler Executive	Replace RW 12 PAPI	AIP	2028	$ 162,000	$ 8,100	$ 9,900	$ 180,000
Fresno Chandler Executive	Replace Perimeter Fence (Env/Design)	AIP	2029	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Fresno Chandler Executive	Replace Perimeter Fence (Construction)	AIP	2030	$ 1,980,000	$ 99,000	$ 121,000	$ 2,200,000
Fresno Yosemite International	Part 150 Residential Sound Insulation Program	AIP	2021	$ 1,999,998	$ -	$ 222,222	$ 2,222,220
Fresno Yosemite International	Pavement Management Update	AIP	2021	$ 112,928	$ -	$ 12,548	$ 125,475
Fresno Yosemite International	Terminal East Apron Expansion (Design/Con. Ph. 1)	AIP	2021	$ 8,484,286	$ -	$ 942,698	$ 9,426,984
Fresno Yosemite International	Part 150 Residential Sound Insulation Program	AIP	2022	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	Terminal East Apron Expansion (Con. Ph. 2)	AIP	2022	$ 4,725,149	$ -	$ 525,017	$ 5,250,165
Fresno Yosemite International	Part 150 Residential Sound Insulation Program	AIP	2023	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	Reconstruct RW 11L-29R PCC (Design)	AIP	2023	$ 2,250,000	$ -	$ 250,000	$ 2,500,000
Fresno Yosemite International	Part 150 Residential Sound Insulation Program	AIP	2024	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	Reconstruct RW 11L-29R PCC (Const. Phase I)	AIP	2024	$ 13,500,000	$ -	$ 1,500,000	$ 15,000,000
Fresno Yosemite International	Part 150 Noise Mitigation Program	AIP	2025	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	Reconstruct RW 11L-29R PCC (Const. Phase II)	AIP	2025	$ 13,500,000	$ -	$ 1,500,000	$ 15,000,000
Fresno Yosemite International	Part 150 Noise Mitigation Program	AIP	2026	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	Pavement Management Update	AIP	2026	$ 117,900	$ -	$ 13,100	$ 131,000
Fresno Yosemite International	Reconstruct RW 11L-29R PCC (Const. Phase III)	AIP	2026	$ 13,500,000	$ -	$ 1,500,000	$ 15,000,000
Fresno Yosemite International	High Speed Ext Remvl B6,B4,B3/Replace w/90o Connect	AIP	2027	$ 2,970,000	$ -	$ 330,000	$ 3,300,000
Fresno Yosemite International	Part 150 noise Mitigation Program	AIP	2027	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	ARFF Station (Env/Des)	AIP	2028	$ 1,260,000	$ -	$ 140,000	$ 1,400,000
Fresno Yosemite International	Construct 29L Holdpad (Env/Des/Const)	AIP	2028	$ 1,404,000	$ -	$ 156,000	$ 1,560,000
Fresno Yosemite International	Part 150 noise Mitigation Program	AIP	2028	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	Reconstruct Taxiway A to Group III STDS (Env/Des)	AIP	2028	$ 252,000	$ -	$ 28,000	$ 280,000
Fresno Yosemite International	Rehabilitate GA Apron And Crossings (Env/Des)	AIP	2028	$ 396,000	$ -	$ 44,000	$ 440,000
Fresno Yosemite International	Rehabilitate Terminal North Apron (Env/Des)	AIP	2028	$ 189,000	$ -	$ 21,000	$ 210,000
Fresno Yosemite International	Part 150 noise Mitigation Program	AIP	2029	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	Reconstruct Taxiway A to Group III STDS (Const)	AIP	2029	$ 1,305,000	$ -	$ 145,000	$ 1,450,000
Fresno Yosemite International	Rehabilitate Terminal North Apron (Const)	AIP	2029	$ 1,323,000	$ -	$ 147,000	$ 1,470,000
Fresno Yosemite International	SMGCS Implementation (Des)	AIP	2029	$ 243,000	$ -	$ 27,000	$ 270,000
Fresno Yosemite International	Part 150 noise Mitigation Program	AIP	2030	$ 999,999	$ -	$ 111,111	$ 1,111,110
Fresno Yosemite International	Rehabilitate GA Apron And Crossings (Const)	AIP	2030	$ 4,050,000	$ -	$ 450,000	$ 4,500,000
Fresno Yosemite International	SMGCS Implementation (Const)	AIP	2030	$ 2,610,000	$ -	$ 290,000	$ 2,900,000
Fullerton Municipal	Enhance RW 06/24 Edges	AIP	2021	$ 2,452,550	$ 122,627	$ 149,878	$ 2,725,055
Fullerton Municipal	RW 06 PAPI Installation	AIP	2023	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Fullerton Municipal	Slurry Seal Aircraft Parking Ramp	AIP	2025	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Gansner	Wildlife Hazard Assessment & Management Plan	AIP	2021	$ 162,450	$ 8,123	$ 9,928	$ 180,500
Gansner	Des: Reseal Airfield Pavement Joints in TW A & Apron	AIP	2022	$ 41,400	$ 2,070	$ 2,530	$ 46,000
Gansner	Environmental Assessment - Perimeter Fence	AIP	2022	$ 278,411	$ 13,921	$ 17,014	$ 309,345

Gansner	Const: Reseal Airfield Pavement Joints in TW A & Apron	AIP	2023	$	530,100	$	26,505	$	32,395	$	589,000
Gansner	Design/Construct - Perimeter Fencing - 11,500 In. ft.	AIP	2024	$	497,700	$	24,885	$	30,415	$	553,000
Gansner	Design - New Beacon Tower and Beacon	AIP	2025	$	25,200	$	1,260	$	1,540	$	28,000
Gansner	Construct - New Beacon Tower and Beacon	AIP	2026	$	99,000	$	4,950	$	6,050	$	110,000
Gansner	Engineering Design - Hangar Development	AIP	2026	$	265,500	$	13,275	$	16,225	$	295,000
Gansner	Design/Construct: Snow Removal Equipment Building	AIP	2027	$	432,000	$	21,600	$	26,400	$	480,000
Gansner	Environmental Assessment - Fuel Facilities	AIP	2027	$	45,000	$	2,250	$	2,750	$	50,000
Gansner	Site Preparation - New Tee Hangars	AIP	2027	$	559,800	$	27,990	$	34,210	$	622,000
Gansner	Envir. Assessment (EA) - Tee Hangars Development	AIP	2028	$	55,800	$	2,790	$	3,410	$	62,000
Gansner	New 12-unit Tee Hangar Building	AIP	2028	$	1,049,400	$	52,470	$	64,130	$	1,166,000
Gansner	Design - Fuel Facilities	AIP	2029	$	18,000	$	900	$	1,100	$	20,000
Gansner	Update PMMP	AIP	2029	$	108,000	$	5,400	$	6,600	$	120,000
Gansner	ALP Narrative including Updated ALP Drawings	AIP	2030	$	144,000	$	7,200	$	8,800	$	160,000
Gansner	Construct: Fuel Facilities	AIP	2030	$	214,200	$	10,710	$	13,090	$	238,000
Gansner	Land Acquisition for R/W Extension, RPZ & Hangar	AIP	2030	$	301,500	$	15,075	$	18,425	$	335,000
General William J Fox	Pvmt. Repairs & Maintenance - Crack Sealing/Patching	AIP	2022	$	45,000	$	2,250	$	2,750	$	50,000
General William J Fox	Rehab S Taxi Lanes & Aircraft Parking Ramp/Apron Des	AIP	2023	$	180,000	$	9,000	$	11,000	$	200,000
General William J Fox	Rehab S Taxi Lanes & Aircraft Parking Ramp/Apron Con	AIP	2025	$	900,000	$	45,000	$	55,000	$	1,000,000
Georgetown	New Beacon (Design and Construct)	AIP	2021	$	135,000	$	6,750	$	8,250	$	150,000
Georgetown	On-Airport Obstruction Removal	AIP	2021	$	79,200	$	3,960	$	4,840	$	88,000
Georgetown	RW Pavement Removal for RSA (Design)	AIP	2022	$	90,000	$	4,500	$	5,500	$	100,000
Georgetown	RW Pavement Removal for RSA (Construct)	AIP	2023	$	382,500	$	19,125	$	23,375	$	425,000
Georgetown	New Connector TW (Design)	AIP	2024	$	81,000	$	4,050	$	4,950	$	90,000
Georgetown	New Connector TW (Construction)	AIP	2025	$	382,500	$	19,125	$	23,375	$	425,000
Georgetown	New Automated Weather Observation Station	AIP	2026	$	45,000	$	2,250	$	2,750	$	50,000
Gillespie Field	Acquire Sweeper	AIP	2022	$	270,000	$	13,500	$	16,500	$	300,000
Gillespie Field	Construct Svc Road to W Transient Ramp	AIP	2022	$	594,000	$	29,700	$	36,300	$	660,000
Gillespie Field	Rehabilitate RW 27R	AIP	2023	$	4,500,000	$	225,000	$	275,000	$	5,000,000
Gillespie Field	Improve Drainage	AIP	2027	$	720,000	$	36,000	$	44,000	$	800,000
Gillespie Field	Rehabilitate TW C	AIP	2027	$	1,350,000	$	67,500	$	82,500	$	1,500,000
Gillespie Field	Rehabilitate RW 27L	AIP	2028	$	3,150,000	$	157,500	$	192,500	$	3,500,000
Gillespie Field	Electrical Vault & Airfield Sign/Lighting Upgrade to LED	AIP	2029	$	4,500,000	$	225,000	$	275,000	$	5,000,000
Gillespie Field	Rehabilitate TW Delta	AIP	2029	$	2,700,000	$	135,000	$	165,000	$	3,000,000
Gillespie Field	Rehabilitate the East Apron	AIP	2030	$	1,800,000	$	90,000	$	110,000	$	2,000,000
Gillespie Field	Rehabilitate TWs A & B	AIP	2030	$	2,700,000	$	135,000	$	165,000	$	3,000,000
Gnoss Field	RW 13-31 Reconstruction Reimbursement	AIP	2021	$	150,000	$	7,500	$	9,167	$	166,667
Gnoss Field	Envir. Mitigation Plan Development & Permit Application	AIP	2022	$	900,000	$	45,000	$	55,000	$	1,000,000
Gnoss Field	RW 13-31 and Parallel TW Extension Design Phase 1 & 2	AIP	2023	$	765,000	$	38,250	$	46,750	$	850,000
Gnoss Field	Environmental Mitigation for RW 13-31 Extension	AIP	2024	$	5,580,000	$	279,000	$	341,000	$	6,200,000

Gnoss Field	RW 13-31 and Parallel TW Extension Construction #1	AIP	2024	$	3,690,000	$	184,500	$	225,500	$	4,100,000
Gnoss Field	RW 13-31 & Parallel TW Extn. Const Ph 2 & CEQA Reimb.	AIP	2025	$	2,006,934	$	100,347	$	122,646	$	2,229,927
Gnoss Field	RW 13-31 Seal Coat and APMP Update - Design	AIP	2026	$	135,000	$	6,750	$	8,250	$	150,000
Gnoss Field	RW 13-31 Seal Coat - Construction	AIP	2027	$	387,000	$	19,350	$	23,650	$	430,000
Gnoss Field	Master Plan Update	AIP	2030	$	1,080,000	$	54,000	$	66,000	$	1,200,000
Gustine	Pavement Maintenance Management Plan	AIP	2021	$	117,000	$	5,850	$	7,150	$	130,000
Gustine	ALP Narrative Report	AIP	2022	$	315,000	$	15,750	$	19,250	$	350,000
Gustine	RW Rehabilitation	AIP	2024	$	420,750	$	21,038	$	25,713	$	467,500
Gustine	Extend Parallel TW (Design)	AIP	2025	$	202,500	$	10,125	$	12,375	$	225,000
Gustine	Extend Parallel TW (Construction)	AIP	2028	$	445,500	$	22,275	$	27,225	$	495,000
Gustine	Extend Parallel TW (Construction)	**AIP**	2030	$	360,000	$	18,000	$	22,000	$	400,000
Haigh Field	Apron Drainage and Pavement Rehab, Design	AIP	2022	$	180,000	$	9,000	$	11,000	$	200,000
Haigh Field	Pavement Condition Study	AIP	2022	$	45,000	$	2,250	$	2,750	$	50,000
Haigh Field	TW Construction Project, Design	AIP	2022	$	72,000	$	3,600	$	4,400	$	80,000
Haigh Field	Apron Drainage and Pavement Rehab, Construction	AIP	2023	$	261,000	$	13,050	$	15,950	$	290,000
Haigh Field	TW Construction Project, Construction	AIP	2023	$	162,000	$	8,100	$	9,900	$	180,000
Half Moon Bay	Pavement Maintenance Management Program	AIP	2021	$	54,000	$	2,700	$	3,300	$	60,000
Half Moon Bay	Rehabilitate RW 12/30, Phase I - Design	AIP	2021	$	112,500	$	5,625	$	6,875	$	125,000
Half Moon Bay	Airfield Electrical Improvements, Phase I - Design	AIP	2022	$	76,500	$	3,825	$	4,675	$	85,000
Half Moon Bay	Airfield Electrical Improvements, Phase II - Design	AIP	2023	$	36,000	$	1,800	$	2,200	$	40,000
Half Moon Bay	Airfield Electrical Improvements, Phase III - Design	AIP	2023	$	36,000	$	1,800	$	2,200	$	40,000
Half Moon Bay	Airfield Electrical Improvements, Phase IV - Design	AIP	2023	$	45,000	$	2,250	$	2,750	$	50,000
Half Moon Bay	Rehabilitate RW 12/30, Phase I - Construction	AIP	2023	$	585,000	$	29,250	$	35,750	$	650,000
Half Moon Bay	Airfield Electrical Improvements, Phase I- Construction	AIP	2024	$	621,000	$	31,050	$	37,950	$	690,000
Half Moon Bay	Airfield Electrical Improvements, Phase II- Construction	AIP	2025	$	630,000	$	31,500	$	38,500	$	700,000
Half Moon Bay	Airfield Electrical Improvements, Phase III- Construction	AIP	2025	$	189,000	$	9,450	$	11,550	$	210,000
Half Moon Bay	Airfield Electrical Improvements, Phase IV- Construction	AIP	2026	$	1,530,000	$	76,500	$	93,500	$	1,700,000
Half Moon Bay	Terming Building - Design	AIP	2026	$	225,000	$	11,250	$	13,750	$	250,000
Hanford Municipal	South Transient Apron Pavement Reconstruction - Des	AIP	2022	$	342,720	$	17,136	$	20,944	$	380,800
Hanford Municipal	South Transient Apron Reconstruction-Phase 1	AIP	2023	$	2,769,300	$	138,465	$	169,235	$	3,077,000
Hanford Municipal	South Transient Apron Reconstruction-Phase 2	AIP	2024	$	1,404,000	$	70,200	$	85,800	$	1,560,000
Hanford Municipal	TW A, Conn. TWs & Large Apron Rehab-Design	AIP	2025	$	85,500	$	4,275	$	5,225	$	95,000
Hayward Executive	TW A West & Z West Design	AIP	2022	$	810,000	$	40,500	$	49,500	$	900,000
Hayward Executive	Sulphur Creek Safety Area Improvements - Const	AIP	2023	$	5,781,600	$	289,080	$	353,320	$	6,424,000
Hayward Executive	TW A West & Z West Rehab - Construction	AIP	2024	$	8,730,000	$	436,500	$	533,500	$	9,700,000
Hayward Executive	ALP with Narrative	AIP	2025	$	450,000	$	22,500	$	27,500	$	500,000
Hayward Executive	RW Safety Area EA & Conceptual Design 10%	AIP	2026	$	540,000	$	27,000	$	33,000	$	600,000
Hayward Executive	RW Safety Area Improvements Design	AIP	2027	$	585,000	$	29,250	$	35,750	$	650,000
Hayward Executive	RW Safety Area Improvements- Construction	AIP	2028	$	12,487,500	$	624,375	$	763,125	$	13,875,000

Hayward Executive	Airfield Lighting Upgrade Design	AIP	2029	$	342,000	$	17,100	$	20,900	$	380,000
Hayward Executive	Airfield Lighting Upgrade Construction	AIP	2030	$	4,500,000	$	225,000	$	275,000	$	5,000,000
Healdsburg Municipal	Pavement Maintenance Management Plan (PMMP)	AIP	2021	$	90,000	$	4,500	$	5,500	$	100,000
Healdsburg Municipal	Design: TW A, East & WestApron Pavement Rehab	AIP	2022	$	42,300	$	2,115	$	2,585	$	47,000
Healdsburg Municipal	Const: TW A, East & West Apron Pavement Rehab	AIP	2023	$	344,880	$	17,244	$	21,076	$	383,200
Healdsburg Municipal	RW 13-31 Pavement Rehabilitation - Design	AIP	2025	$	121,500	$	6,075	$	7,425	$	135,000
Healdsburg Municipal	RW 13-31 Pavement Rehabilitation - Construction	AIP	2026	$	803,250	$	40,163	$	49,088	$	892,500
Healdsburg Municipal	Airport Layout Plan Narrative with Updated Layout Pl	AIP	2029	$	144,000	$	7,200	$	8,800	$	160,000
Hemet-Ryan	Rehabilitation TW B, East/West Apron Pavement-Design	AIP	2021	$	327,330	$	16,367	$	20,004	$	363,700
Hemet-Ryan	Rehab of East/West Apron Pavement-Construction	AIP	2022	$	3,087,000	$	154,350	$	188,650	$	3,430,000
Hemet-Ryan	Land Acquisition for RPZ	AIP	2027	$	1,258,276	$	62,914	$	76,895	$	1,398,084
Hemet-Ryan	PCC Apron Pavement Rehab Design	AIP	2028	$	143,100	$	7,155	$	8,745	$	159,000
Hemet-Ryan	PCC Apron Pavement Rehab Construction	AIP	2029	$	945,329	$	47,266	$	57,770	$	1,050,365
Hemet-Ryan	T/W B and Western Hangar T/L AC Pvmt Recon Design	AIP	2030	$	121,500	$	6,075	$	7,425	$	135,000
Herlong	ALUCP-Airport Land Use Compatibility Plan-County Wide	A&D	2022	$	-	$	225,000	$	25,000	$	250,000
Herlong	Pavement Maintenance & Remarking; RW & TW	A&D	2022	$	-	$	108,000	$	12,000	$	120,000
Hollister Municipal	Remove TW Proceeding RW 6 Design	AIP	2021	$	1,133,325	$	56,666	$	69,259	$	1,259,250
Hollister Municipal	Remove TW Proceeding RW 6 Construction	AIP	2022	$	1,172,250	$	58,613	$	71,638	$	1,302,500
Hollister Municipal	Airport Layout Plan Narrative	AIP	2023	$	198,000	$	9,900	$	12,100	$	220,000
Hollister Municipal	Extend RW 13, NEPA and Design southwest hangar	AIP	2024	$	324,000	$	16,200	$	19,800	$	360,000
Hollister Municipal	ARFF equipment procurement	AIP	2025	$	454,500	$	22,725	$	27,775	$	505,000
Hollister Municipal	Airport Perimeter Fence Rehab -Construction	AIP	2026	$	821,250	$	41,063	$	50,188	$	912,500
Hollister Municipal	RW Pavement Marking RW 31 PAPI - Construct	AIP	2027	$	362,925	$	18,146	$	22,179	$	403,250
Imperial County	Pavement Rehabilitation - Construction (APMS Phase I)	AIP	2021	$	3,240,000	$	$ -	$	360,000	$	3,600,000
Imperial County	Pavement Rehabilitation - Construction (APMS Phase II)	AIP	2023	$	3,544,774	$	$ -	$	393,864	$	3,938,638
Imperial County	Pavement Management Study (APMS)	AIP	2024	$	180,000	$	$ -	$	20,000	$	200,000
Imperial County	Rehabilitate RW 8/26 & TW A & Erosion Control - Design	AIP	2025	$	211,500	$	$ -	$	23,500	$	235,000
Imperial County	Rehabilitate RW 8/26 & TW A & Erosion Control - Constr	AIP	2026	$	2,478,600	$	$ -	$	275,400	$	2,754,000
Imperial County	ALP Update and Narrative Report	AIP	2027	$	247,500	$	$ -	$	27,500	$	275,000
Imperial County	Acquire Sweeper	AIP	2028	$	270,000	$	$ -	$	30,000	$	300,000
Imperial County	Reconstruct Terminal Parking Lot - Design	AIP	2028	$	124,200	$	$ -	$	13,800	$	138,000
Imperial County	Reconstruct Terminal Parking Lot - Construction	AIP	2029	$	1,450,800	$	$ -	$	161,200	$	1,612,000
Imperial County	Install Perimeter Fencing & Gates & Video Surveillance	AIP	2030	$	31,500	$	$ -	$	3,500	$	35,000
Independence	Install Rotating Beacon	A&D	2024	$	-	$	94,737	$	10,526	$	105,263
Independence	RW 14-32 Rehabilitation	AIP	2025	$	1,350,000	$	67,500	$	82,500	$	1,500,000
Independence	Terminal Area Fencing and Access Gate (Des/Constr)	A&D	2028	$	-	$	70,200	$	7,800	$	78,000
Inyokern	Fire Protection Improvements	AIP	2021	$	468,000	$	23,400	$	28,600	$	520,000
Inyokern	Reconstruct RW 15-33. PCI = 63.0	AIP	2022	$	14,310,000	$	715,500	$	874,500	$	15,900,000
Inyokern	TW rehabilitation	AIP	2023	$	2,430,000	$	121,500	$	148,500	$	2,700,000

Inyokern	Reconstruct RW 10-28. PCI = 29.0	AIP	2024	$	4,770,000	$	238,500	$	291,500	$	5,300,000
Inyokern	North Ramp Expansion	AIP	2025	$	2,340,000	$	117,000	$	143,000	$	2,600,000
Inyokern	Service Road Rehabilitation	AIP	2026	$	1,395,000	$	69,750	$	85,250	$	1,550,000
Inyokern	Master Drainage Study	AIP	2027	$	108,000	$	5,400	$	6,600	$	120,000
Inyokern	EA: Drainage Improvements	AIP	2028	$	315,000	$	15,750	$	19,250	$	350,000
Inyokern	Pavement Rehabilitation - Various Locations	AIP	2029	$	450,000	$	22,500	$	27,500	$	500,000
Inyokern	Drainage Improvements	AIP	2030	$	1,350,000	$	67,500	$	82,500	$	1,500,000
Jack McNamara Field	ARFF Truck and Equipment Replacement	AIP	2021	$	495,000	$	$ -	$	55,000	$	550,000
Jack McNamara Field	RW 18/36 Rehabilitation - Phase 2 (Design)	AIP	2021	$	360,000	$	$ -	$	40,000	$	400,000
Jack McNamara Field	Obstruction Removal - Phase 2 (Construction)	AIP	2022	$	360,000	$	$ -	$	40,000	$	400,000
Jack McNamara Field	RW 18/36 Rehabilitation - Phase 3 (Construction)	AIP	2023	$	7,200,000	$	$ -	$	800,000	$	8,000,000
Jack McNamara Field	TWs A and B Rehabilitation - Phase 1 (Design)	AIP	2024	$	288,000	$	$ -	$	32,000	$	320,000
Jack McNamara Field	TWs A and B Rehabilitation - Phase 2 (Construction)	AIP	2025	$	2,250,000	$	$ -	$	250,000	$	2,500,000
Jack McNamara Field	Airport Land Acquisition	AIP	2026	$	180,000	$	$ -	$	20,000	$	200,000
Jack McNamara Field	RW 12/30 Rehabilitation - Phase 1 (Design)	AIP	2027	$	585,000	$	$ -	$	65,000	$	650,000
Jack McNamara Field	RW 12/30 Rehabilitation - Phase 2 (Construction)	AIP	2029	$	6,750,000	$	$ -	$	750,000	$	7,500,000
Jack McNamara Field	Airport Master Plan Update	AIP	2030	$	450,000	$	$ -	$	50,000	$	500,000
Jack Northrop Field-Hawthorne Municipal	TW S Reconstr bet TW G & H & Slurry Seal TW S & N	AIP	2021	$	1,533,389	$	76,669	$	93,707	$	1,703,766
Jack Northrop Field-Hawthorne Municipal	RW & TW Lighting Upgrade / Replace Perimeter Fence	AIP	2023	$	861,300	$	43,065	$	52,635	$	957,000
Jack Northrop Field-Hawthorne Municipal	Feasibility Study for Design & Constr of New ATCT Building	AIP	2025	$	89,100	$	4,455	$	5,445	$	99,000
Jack Northrop Field-Hawthorne Municipal	Construction of new Air Traffic Control Tower	AIP	2026	$	3,870,000	$	193,500	$	236,500	$	4,300,000
Jack Northrop Field-Hawthorne Municipal	Pavement Rehab RW 7-25 & TW Ramps & pavement marking	AIP	2027	$	2,700,000	$	135,000	$	165,000	$	3,000,000
Jack Northrop Field-Hawthorne Municipal	Pavement Rehab TWs S and N and striping	AIP	2028	$	2,160,000	$	108,000	$	132,000	$	2,400,000
Jack Northrop Field-Hawthorne Municipal	Drainage Study & Design of New Storm Drain Facilities	AIP	2029	$	90,000	$	4,500	$	5,500	$	100,000
Jack Northrop Field-Hawthorne Municipal	Construction of new storm drain facilities	AIP	2030	$	270,000	$	13,500	$	16,500	$	300,000
Jacqueline Cochran Regional	New RW 35 PAPI and RW Lighting-Design	AIP	2022	$	99,000	$	4,950	$	6,050	$	110,000
Jacqueline Cochran Regional	New RW 35 PAPI, RW 17 PAPI, & RW Lighting - Const	AIP	2023	$	1,233,000	$	61,650	$	75,350	$	1,370,000
Jacqueline Cochran Regional	Approach Protection RPZ Land Acquisition (R/W 35)	AIP	2025	$	324,000	$	16,200	$	19,800	$	360,000
Jacqueline Cochran Regional	TW A Pavement Rehabilitation-Design	AIP	2026	$	126,000	$	6,300	$	7,700	$	140,000
Jacqueline Cochran Regional	TW A Pavement Rehabilitation - Construction	AIP	2027	$	810,000	$	40,500	$	49,500	$	900,000
Jacqueline Cochran Regional	R/W 12-30 Pavement Rehabilitation - Design	AIP	2028	$	54,000	$	2,700	$	3,300	$	60,000
Jacqueline Cochran Regional	T/W C Pvmt Rehab - Design	AIP	2029	$	207,000	$	10,350	$	12,650	$	230,000
Jacqueline Cochran Regional	T/W C Pvmt Rehab - Construction	AIP	2030	$	2,475,000	$	123,750	$	151,250	$	2,750,000
Jacumba	Install Perimeter Fencing	A&D	2022	$	-	$	270,000	$	30,000	$	300,000
Jacumba	Improve Drainage	A&D	2023	$	-	$	225,000	$	25,000	$	250,000

John Wayne, Orange Co.	Airport Zero Emission Shuttles & Charging Infrast. (Ph 1)	AIP	2021	$ 1,724,574	$ -	$ 415,361	$ 2,139,935
John Wayne, Orange Co.	Airport Zero Emission Shuttles & Charging Infrast. (Ph 2)	AIP	2022	$ 2,274,006	$ -	$ 547,692	$ 2,821,698
John Wayne, Orange Co.	TW A, D, E Recon. & Vehicle Service RD Safety Imp.	AIP	2022	$ 1,350,000	$ -	$ 150,000	$ 1,500,000
John Wayne, Orange Co.	Airfield Perimeter Security Imp. (Const. Phase)	AIP	2023	$ 3,223,600	$ -	$ 776,400	$ 4,000,000
John Wayne, Orange Co.	Terminal Elevator & Escalator Replacement Ph. 1 (Con)	AIP	2023	$ 1,208,850	$ -	$ 291,150	$ 1,500,000
John Wayne, Orange Co.	TW A, D, E Recon & Vehicle Service Rd Safety Imp (Con)	AIP	2023	$ 8,059,000	$ -	$ 23,941,000	$ 32,000,000
John Wayne, Orange Co.	Terminal Elevator & Escalator Replacement Ph. 2 (Con)	AIP	2024	$ 1,208,850	$ -	$ 291,150	$ 1,500,000
John Wayne, Orange Co.	Terminal Apron Rehabilitation (Construction Phase)	AIP	2025	$ 12,088,500	$ -	$ 2,911,500	$ 15,000,000
John Wayne, Orange Co.	Terminal Elevator & Escalator Replacement Ph. 3 (Con)	AIP	2025	$ 3,143,010	$ -	$ 756,990	$ 3,900,000
John Wayne, Orange Co.	Airfield RW 2L-20R Rehabilitation (Const. Phase)	AIP	2026	$ 1,208,850	$ -	$ 291,150	$ 1,500,000
John Wayne, Orange Co.	Terminal Elevator & Escalator Replacement Ph. 4 (Con)	AIP	2026	$ 3,510,000	$ -	$ 390,000	$ 3,900,000
Kern Valley	Install Partial Perimeter fencing to North/East	AIP	2021	$ 90,000	$ 4,500	$ 5,500	$ 100,000
Kern Valley	Land Acquisition Reimbursement	AIP	2021	$ 148,500	$ 7,425	$ 9,075	$ 165,000
Kern Valley	Design RW Widening Project	AIP	2022	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Kern Valley	Design TW and RSA Project	AIP	2022	$ 405,000	$ 20,250	$ 24,750	$ 450,000
Kern Valley	Construction TW and RSA Project	AIP	2023	$ 2,700,000	$ 135,000	$ 165,000	$ 3,000,000
Kern Valley	Construction of RW widening project	AIP	2024	$ 1,440,000	$ 72,000	$ 88,000	$ 1,600,000
Kern Valley	Install AWOS/ASOS Including Site Prep	AIP	2026	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Lake Tahoe	Airport Pavement Maintenance Plan Update	AIP	2022	$ 150,000	$ 7,500	$ 9,167	$ 166,667
Lake Tahoe	ALP Update with Narrative Report Planning Study	AIP	2023	$ 540,000	$ 27,000	$ 33,000	$ 600,000
Lake Tahoe	Rehabilitate RW 18/36 (Design, NEPA & Engineering)	AIP	2024	$ 1,125,000	$ 56,250	$ 68,750	$ 1,250,000
Lake Tahoe	Rehabilitate RW 18/36 (Construction)	AIP	2025	$ 3,375,000	$ 168,750	$ 206,250	$ 3,750,000
Lake Tahoe	Rehabilitate General Aviation Apron	AIP	2026	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Lake Tahoe	NEPA Conduct Envir. Study (EIS) Tree Obstructions	AIP	2027	$ 900,000	$ 45,000	$ 55,000	$ 1,000,000
Lake Tahoe	Airport Obstruction Removal-Trees (design)	AIP	2029	$ 675,000	$ 33,750	$ 41,250	$ 750,000
Lake Tahoe	Tree Hazard Removal (Construction)	AIP	2030	$ 1,575,000	$ 78,750	$ 96,250	$ 1,750,000
Lampson Field	East Apron Pavement Rehabilitation - Design	AIP	2023	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Lampson Field	East Apron Pavement Reconstruction - Construction	AIP	2024	$ 1,012,500	$ 50,625	$ 61,875	$ 1,125,000
Lincoln Regional - Karl Harder Field	Design: Reconstruct RW 15--33, Regrade Shoulders & RSA	AIP	2022	$ 756,000	$ 37,800	$ 46,200	$ 840,000
Lincoln Regional - Karl Harder Field	Reconstruct RW 15-33, Rehabilitate RW Safety Areas	AIP	2023	$ 8,977,500	$ 448,875	$ 548,625	$ 9,975,000
Lincoln Regional - Karl Harder Field	Design - Reconstruct TWs A,D,E, G,J, & K, Replace TW Lights,	AIP	2024	$ 598,500	$ 29,925	$ 36,575	$ 665,000
Lincoln Regional - Karl Harder Field	PMMP Update	AIP	2025	$ 108,000	$ 5,400	$ 6,600	$ 120,000
Lincoln Regional - Karl Harder Field	Reconstruct:TWsA,D, E, G, J, & K, Replace TW lights, Transfo	AIP	2025	$ 5,686,200	$ 284,310	$ 347,490	$ 6,318,000
Lincoln Regional - Karl Harder Field	Land Acquisition - 1.6 Acre	AIP	2026	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Lincoln Regional - Karl Harder Field	Flightline Drive Rehabilitation Phase 2	AIP	2027	$ 603,000	$ 30,150	$ 36,850	$ 670,000
Lincoln Regional - Karl Harder Field	Engineering Design - Apron Rehabilitation	AIP	2028	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Lincoln Regional - Karl Harder Field	Airport Layout Plan Narrative including ALP Updated Plans an	AIP	2029	$ 171,000	$ 8,550	$ 10,450	$ 190,000
Lincoln Regional - Karl Harder Field	Apron Rehabilitation	AIP	2029	$ 2,497,500	$ 124,875	$ 152,625	$ 2,775,000
Lincoln Regional - Karl Harder Field	Design: East Side Hangar Development	AIP	2030	$ 684,000	$ 34,200	$ 41,800	$ 760,000

Lincoln Regional - Karl Harder Field	New Tee Hangar and Box Hangar Development - East Side	AIP	2030	$ 11,664,000	$ 583,200	$ 712,800	$ 12,960,000
Little River	T/W A Pavement Reconstion - Bidding/Construction	AIP	2022	$ 6,961,311	$ 348,066	$ 425,413	$ 7,734,790
Little River	ALP with Narrative and GIS Survey	AIP	2023	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Little River	RW and RW Shoulder Rehab. Design	AIP	2023	$ 371,430	$ 18,572	$ 22,699	$ 412,700
Little River	RW and RW Shoulder Rehab. Const.	AIP	2024	$ 4,101,121	$ 205,056	$ 250,624	$ 4,556,801
Little River	Ramp Pavement Reconstruction Construction	AIP	2025	$ 135,608	$ 6,780	$ 8,287	$ 150,675
Little River	Ramp Pavement Reconstruction Design	AIP	2027	$ 1,080,000	$ 54,000	$ 66,000	$ 1,200,000
Livermore Municipal	Airport Geometry Improvements (Hot Spots 1-6) (Const.)	AIP	2021	$ 7,110,000	$ 355,500	$ 434,500	$ 7,900,000
Livermore Municipal	Northside Apron Pavement Pres and Rehab (Des)	AIP	2022	$ 112,500	$ 5,625	$ 6,875	$ 125,000
Livermore Municipal	Northside Apron Pavement Pres & Rehab Ph. 1 (Con)	AIP	2023	$ 630,000	$ 31,500	$ 38,500	$ 700,000
Livermore Municipal	Perimeter Fencing and Security Upgrades	AIP	2023	$ 360,000	$ 18,000	$ 22,000	$ 400,000
Livermore Municipal	Northside Apron Pavement Pres & Rehab Ph. 2 (Const)	AIP	2024	$ 697,500	$ 34,875	$ 42,625	$ 775,000
Livermore Municipal	Southside Apron Pavement Preservation (Design)	AIP	2024	$ 85,500	$ 4,275	$ 5,225	$ 95,000
Livermore Municipal	Southside Apron Pavement Preservation (Construction)	AIP	2025	$ 675,000	$ 33,750	$ 41,250	$ 750,000
Livermore Municipal	ALP Narrative Update & RW Length Analysis	AIP	2026	$ 270,000	$ 13,500	$ 16,500	$ 300,000
Lompoc	Airfield Electrical upgrade, RW/TW rehabilitation Constr	AIP	2021	$ 4,950,000	$ 247,500	$ 302,500	$ 5,500,000
Lompoc	Construct Perimeter Access Road	AIP	2025	$ 276,300	$ 13,815	$ 16,885	$ 307,000
Lone Pine	Airport Lighting, Signs, and Visual Aids (Ph 2 Construct)	AIP	2023	$ 634,500	$ 31,725	$ 38,775	$ 705,000
Lone Pine	TW Rehabilitation	AIP	2024	$ 1,080,000	$ 54,000	$ 66,000	$ 1,200,000
Lone Pine	Airport Apron/Hanger Areas Pavement Rehab	AIP	2026	$ 405,000	$ 20,250	$ 24,750	$ 450,000
Lone Pine	Terminal Building Replacement (design & construction)	AIP	2028	$ 300,001	$ 15,000	$ 18,333	$ 333,334
Los Angeles International	Construct N Airfield Safety Imprvmt Prg (Phase 1)	AIP	2022	$ 112,410,000	$ -	$ 12,490,000	$ 124,900,000
Los Angeles International	Construct N Airfield Safety Imprvmt Prg (Phase 2)	AIP	2023	$ 84,015,000	$ -	$ 9,335,000	$ 93,350,000
Los Angeles International	Construct N Airfield Safety Imprvmt Prg (Phase 3)	AIP	2024	$ 52,110,000	$ -	$ 5,790,000	$ 57,900,000
Los Angeles International	Taxilane C Eastern Extension	AIP	2025	$ 83,700,000	$ -	$ 9,300,000	$ 93,000,000
Los Angeles International	TW D and E Eastern Extension	AIP	2025	$ 87,300,000	$ -	$ 9,700,000	$ 97,000,000
Los Angeles International	Reconstruct TW A	AIP	2026	$ 103,050,000	$ -	$ 11,450,000	$ 114,500,000
Los Angeles International	TW D Westerly Extension between TW AA & Txln E17	AIP	2026	$ 40,950,000	$ -	$ 4,550,000	$ 45,500,000
Los Banos Municipal	Site Selection for Replacement	AIP	2022	$ 300,000	$ 15,000	$ 18,333	$ 333,333
Los Banos Municipal	Central Apron Rehabilitation	AIP	2023	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Los Banos Municipal	Parallel TW Overlay	AIP	2023	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Los Banos Municipal	RW 14-32 Overlay	AIP	2023	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Los Banos Municipal	South Apron Pavement Rehabilitation	AIP	2023	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Los Banos Municipal	Central Apron Rehabilitation	AIP	2024	$ 540,000	$ 27,000	$ 33,000	$ 600,000
Los Banos Municipal	Parallel TW Overlay	AIP	2024	$ 2,250,000	$ 112,500	$ 137,500	$ 2,500,000
Los Banos Municipal	RW 14-32 Overlay	AIP	2024	$ 1,350,000	$ 67,500	$ 82,500	$ 1,500,000
Los Banos Municipal	South Apron Pavement Rehabilitation	AIP	2025	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Los Banos Municipal	Internal Access Road Extension	AIP	2026	$ 567,000	$ 28,350	$ 34,650	$ 630,000
Los Banos Municipal	New Hangar TWs	AIP	2027	$ 337,500	$ 16,875	$ 20,625	$ 375,000

Los Banos Municipal	T-Hangars (12 Units)	AIP	2028	$	540,000	$	27,000	$	33,000	$ 600,000
Los Banos Municipal	Apron and TW Sealing & Marking	AIP	2029	$	180,000	$	9,000	$	11,000	$ 200,000
Los Banos Municipal	Sealing and Marking RWs	AIP	2030	$	225,000	$	11,250	$	13,750	$ 250,000
Madera Municipal	Construct: Airfield Drainage Improvements	AIP	2021	$	1,058,400	$	52,920	$	64,680	$ 1,176,000
Madera Municipal	Pavement Maintenance Management Plan (PMMP)	AIP	2021	$	99,000	$	4,950	$	6,050	$ 110,000
Madera Municipal	Design: RW 12-30 (150' x 5,545' Mill & Fill	AIP	2024	$	267,300	$	13,365	$	16,335	$ 297,000
Madera Municipal	Construct: RW 12-30 (150' x 5,545") Mill & Fill	AIP	2025	$	2,891,700	$	144,585	$	176,715	$ 3,213,000
Madera Municipal	ALP Narrative including ALP Updated Plans	AIP	2026	$	112,500	$	5,625	$	6,875	$ 125,000
Madera Municipal	Design: T/Ws P, A, B, C (north), D, & E Mill & Fill	AIP	2026	$	161,100	$	8,055	$	9,845	$ 179,000
Madera Municipal	Construct TWs P,A,B,C (North) D & E - Mill and Fill	AIP	2027	$	1,339,200	$	66,960	$	81,840	$ 1,488,000
Madera Municipal	Design/Construct T-Hangar Devel. Phase I	AIP	2028	$	963,900	$	48,195	$	58,905	$ 1,071,000
Madera Municipal	Design/Construct: Tee Hangar Dev Phase II	AIP	2029	$	1,285,200	$	64,260	$	78,540	$ 1,428,000
Madera Municipal	Pavement Maintenance Management Plan (PMMP)	AIP	2029	$	90,000	$	4,500	$	5,500	$ 100,000
Madera Municipal	ALP Update	AIP	2030	$	171,000	$	8,550	$	10,450	$ 190,000
Madera Municipal	Engineering Design - Extend Hang Dev Area III	AIP	2030	$	215,100	$	10,755	$	13,145	$ 239,000
Mammoth Yosemite	Design/Construct: Recon East General Aviation Apron	AIP	2021	$	3,035,003	$	$ -	$	337,223	$ 3,372,225
Mammoth Yosemite	8 bay ARFF & Maintenance Bldg - Apron & Access Rd	AIP	2022	$	4,612,500	$	$ -	$	512,500	$ 5,125,000
Mammoth Yosemite	Wildlife/Security Fence	AIP	2023	$	1,927,800	$	$ -	$	214,200	$ 2,142,000
Mammoth Yosemite	Rehabilitate Tee Hangar Taxilanes (25' x 1,280)	AIP	2024	$	826,875	$	$ -	$	91,875	$ 918,750
Mammoth Yosemite	Design/Construct: Helicopter Parking Apron	AIP	2025	$	3,780,000	$	$ -	$	420,000	$ 4,200,000
Mammoth Yosemite	RW RSA and OFA Grading	AIP	2025	$	3,150,000	$	$ -	$	350,000	$ 3,500,000
Mammoth Yosemite	Architectural Design - Airline Terminal Building	AIP	2026	$	1,575,000	$	$ -	$	175,000	$ 1,750,000
Mammoth Yosemite	Des - Airline Terminal Aprn, Deicing Pad, and Terminal A	AIP	2026	$	603,000	$	$ -	$	67,000	$ 670,000
Mammoth Yosemite	Des -Terminal Access Rd, Auto Parking Lot, Terminal	AIP	2026	$	698,400	$	$ -	$	77,600	$ 776,000
Mammoth Yosemite	Design/Construct - Construct TW A Shoulders - 7.5 feet	AIP	2026	$	2,137,500	$	$ -	$	237,500	$ 2,375,000
Mammoth Yosemite	General Aviation Aprn. N. Expansion (long term parking)	AIP	2026	$	3,150,000	$	$ -	$	350,000	$ 3,500,000
Mammoth Yosemite	Reconst. General Aviation & Temp. Terminal Auto Park	AIP	2026	$	1,378,125	$	$ -	$	153,125	$ 1,531,250
Mammoth Yosemite	Airline term apron, deicing pad, TWs, ramp connectors	AIP	2027	$	7,175,700	$	$ -	$	797,300	$ 7,973,000
Mammoth Yosemite	Airline Terminal Building	AIP	2027	$	18,769,275	$	$ -	$	2,085,475	$ 20,854,750
Mammoth Yosemite	New Terminal Access Rd, Auto Parking Lot, Terminal A	AIP	2027	$	4,391,100	$	$ -	$	487,900	$ 4,879,000
Mammoth Yosemite	Replace ARFF Vehicle	AIP	2027	$	931,500	$	$ -	$	103,500	$ 1,035,000
Mammoth Yosemite	Environmental Assessment - Land	AIP	2028	$	548,820	$	$ -	$	60,980	$ 609,800
Mammoth Yosemite	Pavement Maintenance/Management Plan	AIP	2029	$	99,000	$	$ -	$	11,000	$ 110,000
Mammoth Yosemite	Airport Layout Plan Narrative incl. ALP Updated Plans	AIP	2030	$	171,000	$	$ -	$	19,000	$ 190,000
Mammoth Yosemite	LADWP and USFS Land Acquisition and/or Use Permits	AIP	2030	$	630,000	$	$ -	$	70,000	$ 700,000
Marina Municipal	EA RW Extension to West & Acquire 11.4 Acres for RPZ	AIP	2021	$	432,000	$	21,600	$	26,400	$ 480,000
Marina Municipal	Rehabilitate TW A (Construct & reimburse design)	AIP	2022	$	1,260,000	$	63,000	$	77,000	$ 1,400,000
Marina Municipal	Acquire 11.4 acres for RPZ	AIP	2023	$	561,600	$	28,080	$	34,320	$ 624,000
Marina Municipal	Extend RW & parallel TW west (design)	AIP	2023	$	351,000	$	17,550	$	21,450	$ 390,000

Marina Municipal	Extend RW and parallel TW west (construct)	AIP	2024	$	13,500,000	$	675,000	$	825,000	$	15,000,000
Marina Municipal	Extend Taxilane (Construct & Reimburse Design)	AIP	2025	$	1,755,000	$	87,750	$	107,250	$	1,950,000
Marina Municipal	GA Terminal (Construct & reimburse design)	AIP	2027	$	4,230,000	$	211,500	$	258,500	$	4,700,000
Marina Municipal	Apron Rehabilitation (concrete) Design only	AIP	2028	$	85,500	$	4,275	$	5,225	$	95,000
Marina Municipal	Apron rehabilitation (concrete) Construct	AIP	2029	$	630,000	$	31,500	$	38,500	$	700,000
Marina Municipal	Apron expansion (construct & reimburse design)	AIP	2030	$	2,340,000	$	117,000	$	143,000	$	2,600,000
Mariposa - Yosemite	Analysis RW Cracks	AIP	2022	$	18,000	$	900	$	1,100	$	20,000
Mariposa - Yosemite	Airport Perimeter Fencing with Card Access Gate	AIP	2023	$	358,200	$	17,910	$	21,890	$	398,000
Mariposa - Yosemite	Design: RW Crack Seal & Seal Coat Repair	AIP	2024	$	153,000	$	7,650	$	9,350	$	170,000
Mariposa - Yosemite	Self Serve Fueling System	AIP	2025	$	165,600	$	8,280	$	10,120	$	184,000
Mariposa - Yosemite	Construction: RW Crack Seal & Seal Coat	AIP	2027	$	315,000	$	15,750	$	19,250	$	350,000
Mariposa - Yosemite	Northwest Helicopter Parking with TaxiLane	AIP	2029	$	356,400	$	17,820	$	21,780	$	396,000
Mariposa - Yosemite	RW Signing, Obstruction Lighting, & Vault Modification	AIP	2030	$	150,000	$	7,500	$	9,167	$	166,667
McClellan-Palomar	Acquire Aircraft Rescue & Fire Fighting Vehicle	AIP	2022	$	1,080,000	$	$ -	$	120,000	$	1,200,000
McClellan-Palomar	Construct, Extend or Improve a RW Safety Area	AIP	2022	$	1,080,000	$	$ -	$	120,000	$	1,200,000
McClellan-Palomar	Construct, Extend or Improve a RW Safety Area	AIP	2023	$	1,260,000	$	$ -	$	140,000	$	1,400,000
McClellan-Palomar	Construct, Extend or Improve a RW Safety Area	AIP	2024	$	11,250,000	$	$ -	$	1,250,000	$	12,500,000
McClellan-Palomar	Aircraft Rescue & Fire Fighting Building	AIP	2025	$	45,000	$	$ -	$	5,000	$	50,000
McClellan-Palomar	Construct, Extend or Improve a RW Safety Area	AIP	2025	$	12,600,000	$	$ -	$	1,400,000	$	14,000,000
McClellan-Palomar	Construct Aircraft Rescue & Fire Fighting Building	AIP	2026	$	472,500	$	$ -	$	52,500	$	525,000
McClellan-Palomar	Conduct EA for Facility Improvements	AIP	2027	$	185,040	$	$ -	$	20,560	$	205,600
McClellan-Palomar	Rehabilitate TW Delta	AIP	2027	$	495,000	$	$ -	$	55,000	$	550,000
McClellan-Palomar	Segmented Circle, Lighting Vault and Windsock	AIP	2027	$	790,200	$	$ -	$	87,800	$	878,000
McClellan-Palomar	Improve Parking Area	AIP	2028	$	215,100	$	$ -	$	23,900	$	239,000
McClellan-Palomar	Removal of North Apron, TW N and Fuel Farm	AIP	2029	$	675,000	$	$ -	$	75,000	$	750,000
McClellan-Palomar	Passenger/Admin/Parking Facility Improvements	AIP	2030	$	2,250,000	$	$ -	$	250,000	$	2,500,000
Meadows Field	Airport Security Perimeter Enhancements Upgrade	AIP	2021	$	702,000	$	$ -	$	78,000	$	780,000
Meadows Field	TW G Rehab. and Extension - Design	AIP	2021	$	360,000	$	$ -	$	40,000	$	400,000
Meadows Field	TW G Extension - Construction	AIP	2022	$	2,664,000	$	$ -	$	296,000	$	2,960,000
Meadows Field	Airport Terminal Master Plan	AIP	2023	$	945,000	$	$ -	$	105,000	$	1,050,000
Meadows Field	Design New Domestic Terminal Baggage system	AIP	2023	$	567,000	$	$ -	$	63,000	$	630,000
Meadows Field	Design Pavement Rehabilitation RW 12R/30L	AIP	2024	$	495,000	$	$ -	$	55,000	$	550,000
Meadows Field	Construct RW 12R/30L Rehabilitation	AIP	2025	$	7,920,000	$	$ -	$	880,000	$	8,800,000
Meadows Field	Construct New Baggage System	AIP	2026	$	3,420,000	$	$ -	$	380,000	$	3,800,000
Meadows Field	TW A8 and Fuel Farm Access Rehabilitate	AIP	2026	$	1,080,000	$	$ -	$	120,000	$	1,200,000
Mefford Field	Rehab Main Aprn, Reloc. Seg Circle & Pri Wind Cone	AIP	2022	$	2,520,000	$	126,000	$	154,000	$	2,800,000
Mefford Field	Construct two helipads	AIP	2023	$	495,000	$	24,750	$	30,250	$	550,000
Mefford Field	Rehabilitate TWs, TW geometry mod. (Design)	AIP	2025	$	279,000	$	13,950	$	17,050	$	310,000
Mefford Field	Rehabilitate TWs, TW geometry mod. (Construct)	AIP	2026	$	2,610,000	$	130,500	$	159,500	$	2,900,000

Mefford Field	Rehab South end Taxilane and Area Paving (Design)	AIP	2027	$	178,200	$	8,910	$	10,890	$	198,000
Mefford Field	Rehab South end taxilane and area paving (Construct)	AIP	2028	$	1,575,000	$	78,750	$	96,250	$	1,750,000
Mefford Field	Fencing, gates, and access control	AIP	2029	$	1,080,000	$	54,000	$	66,000	$	1,200,000
Merced Regional - Macready Field	South GA Apron and Hangar Area Rehabilitation	AIP	2021	$	85,239	$	$ -	$	9,471	$	94,710
Merced Regional - Macready Field	TW A Rehabilitation - Phase 1 Environmental & Design	AIP	2021	$	206,527	$	$ -	$	22,947	$	229,474
Merced Regional - Macready Field	TW A Rehabilitation - Phase 2 Construction	AIP	2022	$	142,106	$	$ -	$	15,790	$	157,895
Merced Regional - Macready Field	TW A Rehabilitation - Phase 3 Construction	AIP	2023	$	142,106	$	$ -	$	15,790	$	157,895
Merced Regional - Macready Field	Rehab Closed Circuit TV Security System	AIP	2024	$	92,885	$	$ -	$	10,321	$	103,205
Merced Regional - Macready Field	Airport Layout Plan and Narrative Report Update	AIP	2025	$	297,900	$	$ -	$	33,100	$	331,000
Merced Regional - Macready Field	ARFF Support (Vehicle Replacement)	AIP	2026	$	378,000	$	$ -	$	42,000	$	420,000
Merced Regional - Macready Field	Overlay of GA parking area/new passgr apron/ramp/frt ramp	AIP	2027	$	1,291,770	$	$ -	$	143,530	$	1,435,300
Merced Regional - Macready Field	Apron lighting enhancements	AIP	2028	$	810,000	$	$ -	$	90,000	$	900,000
Merced Regional - Macready Field	ARFF Support	AIP	2029	$	23,625	$	$ -	$	2,625	$	26,250
Merced Regional - Macready Field	PMMP Update	AIP	2030	$	90,000	$	$ -	$	10,000	$	100,000
Mesa Del Rey	TW Reconstruction & Rehabilitation (Construction)	AIP	2022	$	801,000	$	40,050	$	48,950	$	890,000
Mesa Del Rey	ALUCP update	A&D	2023	$	-	$	138,600	$	15,400	$	154,000
Mesa Del Rey	Electrical Improvements (Re-package)	AIP	2023	$	328,500	$	16,425	$	20,075	$	365,000
Mesa Del Rey	Apron Rehabilitation (Design)	AIP	2024	$	112,500	$	5,625	$	6,875	$	125,000
Mesa Del Rey	Apron Rehabilitation (Construction)	AIP	2025	$	630,000	$	31,500	$	38,500	$	700,000
Mesa Del Rey	AWOS (Construction)	AIP	2025	$	135,000	$	6,750	$	8,250	$	150,000
Mesa Del Rey	Wildlife Hazardous Environmental Assessment	AIP	2026	$	108,000	$	5,400	$	6,600	$	120,000
Mesa Del Rey	Fuel Pump Reconstruction & Rehabilitation (Design)	AIP	2027	$	22,500	$	1,125	$	1,375	$	25,000
Mesa Del Rey	Fuel Pump Reconstruction & Rehabilitation (Const)	AIP	2028	$	180,000	$	9,000	$	11,000	$	200,000
Mesa Del Rey	Drainage Improvements with Envir. Assessment (Design)	AIP	2029	$	170,000	$	8,500	$	10,389	$	188,889
Mesa Del Rey	Drainage Improvements (Construction)	AIP	2030	$	500,000	$	25,000	$	30,556	$	555,556
Mesa Del Rey	Reconstruction of Entrance Gate (Construction)	A&D	2030	$	-	$	175,000	$	19,444	$	194,444
Modesto City - County - Harry Sham Field	Property Reimbursement	AIP	2021	$	315,000	$	15,750	$	19,250	$	350,000
Modesto City - County - Harry Sham Field	Design and Rehabilitate TW C	AIP	2022	$	225,000	$	11,250	$	13,750	$	250,000
Modesto City - County - Harry Sham Field	Reconstruct TW C	AIP	2023	$	1,485,000	$	74,250	$	90,750	$	1,650,000
Modesto City - County - Harry Sham Field	Design and Rehabilitate TW E	AIP	2024	$	225,000	$	11,250	$	13,750	$	250,000
Modesto City - County - Harry Sham Field	Reconstruction TW E	AIP	2025	$	1,395,000	$	69,750	$	85,250	$	1,550,000
Modesto City - County - Harry Sham Field	Design and Rehabilitate TW D	AIP	2026	$	135,000	$	6,750	$	8,250	$	150,000
Modesto City - County - Harry Sham Field	Reconstruct TW D	AIP	2027	$	531,000	$	26,550	$	32,450	$	590,000
Mojave Air And Space Port	Rehab RW 12-30 Ph 1: Pavement Improvements	AIP	2021	$	8,000,000	$	400,000	$	488,889	$	8,888,889
Mojave Air And Space Port	Rehab RW 12-30 Ph 2: Pvmt, Electrical & Surface Imp	AIP	2022	$	3,803,625	$	190,181	$	232,444	$	4,226,250
Mojave Air And Space Port	Rehabilitate TW A Phase 1: Lighting	AIP	2023	$	970,648	$	48,532	$	59,317	$	1,078,498
Mojave Air And Space Port	Construct TW D (Relocation)	AIP	2024	$	2,205,000	$	110,250	$	134,750	$	2,450,000
Mojave Air And Space Port	Rehabilitate TW F: Phase 1	AIP	2025	$	3,162,500	$	158,125	$	193,264	$	3,513,889
Mojave Air And Space Port	Expand RW 8-26 Ph 1: Acquire Land & Widen Exist. RW	AIP	2026	$	13,505,625	$	675,281	$	825,344	$	15,006,250

Montague-Yreka - Rohrer Field	Resurface RW,TWs and Ramps	A&D	2024	$ -	$ 499,500	$ 55,500	$ 555,000
Montague-Yreka - Rohrer Field	New Helipad	A&D	2025	$ -	$ 90,000	$ 10,000	$ 100,000
Montague-Yreka - Rohrer Field	Automated Weather Observing System (AWOS) New	A&D	2027	$ -	$ 72,000	$ 8,000	$ 80,000
Montague-Yreka - Rohrer Field	PAPI Lights Conversion to LED Lights	A&D	2029	$ -	$ 14,602	$ 1,622	$ 16,224
Montague-Yreka - Rohrer Field	Rohrer Field TW Resurface Project	A&D	2030	$ -	$ 458,339	$ 50,927	$ 509,266
Monterey Regional	10R-28L Pavement Rehabilitation Treatment	AIP	2021	$ 1,125,000	$ $ -	$ 125,000	$ 1,250,000
Monterey Regional	Commercial Apron Design	AIP	2021	$ 2,790,000	$ $ -	$ 310,000	$ 3,100,000
Monterey Regional	South Side Land Acquisition (4.4 Acres)	AIP	2021	$ 6,525,000	$ $ -	$ 725,000	$ 7,250,000
Monterey Regional	Commercial Apron Construction Phase 1	AIP	2022	$ 19,710,000	$ $ -	$ 2,190,000	$ 21,900,000
Monterey Regional	Demo Southside GA	AIP	2022	$ 1,260,000	$ $ -	$ 140,000	$ 1,400,000
Monterey Regional	Replacement ARFF Vehicle	AIP	2022	$ 720,000	$ $ -	$ 80,000	$ 800,000
Monterey Regional	ARFF Airfield Service Road	AIP	2023	$ 630,000	$ $ -	$ 70,000	$ 700,000
Monterey Regional	ARFF Construction	AIP	2023	$ 4,590,000	$ $ -	$ 510,000	$ 5,100,000
Monterey Regional	Terminal Building Design	AIP	2023	$ 4,140,000	$ $ -	$ 460,000	$ 4,600,000
Monterey Regional	Commercial Apron Construction Phase 2	AIP	2024	$ 19,710,000	$ $ -	$ 2,190,000	$ 21,900,000
Monterey Regional	Demo ARFF Southside	AIP	2024	$ 720,000	$ $ -	$ 80,000	$ 800,000
Monterey Regional	Terminal Building Construction	AIP	2025	$ 69,030,000	$ $ -	$ 7,670,000	$ 76,700,000
Monterey Regional	Relocated Parking and Roads	AIP	2026	$ 8,730,000	$ $ -	$ 970,000	$ 9,700,000
Monterey Regional	TW A Shift Construction	AIP	2027	$ 1,620,000	$ $ -	$ 180,000	$ 1,800,000
Monterey Regional	Demolish Old Terminal Building	AIP	2028	$ 4,140,000	$ $ -	$ 460,000	$ 4,600,000
Montgomery-Gibbs Executive	RW 10L/28R Grooving and Marking Design and Const	AIP	2022	$ 1,036,962	$ 51,848	$ 63,370	$ 1,152,180
Montgomery-Gibbs Executive	RW 10R/28L and TWs B/F Rehab	AIP	2023	$ 5,980,248	$ 299,012	$ 365,460	$ 6,644,720
Montgomery-Gibbs Executive	TW C Rehab, New Compass Calibration Pad	AIP	2023	$ 1,515,888	$ 75,794	$ 92,638	$ 1,684,320
Montgomery-Gibbs Executive	TWs H/A/J/B Rehab, RWs 28L and 28R Runup Apron	AIP	2024	$ 5,310,000	$ 265,500	$ 324,500	$ 5,900,000
Montgomery-Gibbs Executive	Hangar Area Pavement Rehab	AIP	2025	$ 2,610,000	$ 130,500	$ 159,500	$ 2,900,000
Montgomery-Gibbs Executive	TW K/Terminal Apron Rehab	AIP	2025	$ 2,976,768	$ 148,838	$ 181,914	$ 3,307,520
Montgomery-Gibbs Executive	Airport Service Roads Rehab	AIP	2026	$ 954,270	$ 47,714	$ 58,317	$ 1,060,300
Napa County	Airport Drainage Master Plan	AIP	2021	$ 157,500	$ 7,875	$ 9,625	$ 175,000
Napa County	Reconstruct TW K and RW 19R Holding Apron (Design)	AIP	2022	$ 491,400	$ 24,570	$ 30,030	$ 546,000
Napa County	Reconstruct TW K, RW 19R Holding Apron (Construction)	AIP	2023	$ 5,283,000	$ 264,150	$ 322,850	$ 5,870,000
Napa County	ALP Update and Narrative	AIP	2024	$ 315,000	$ 15,750	$ 19,250	$ 350,000
Napa County	Replace L-821 Relay Panel & Homerun Circuit (Design)	AIP	2024	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Napa County	RW 6-24 MIRL Replacement (Design)	AIP	2024	$ 346,500	$ 17,325	$ 21,175	$ 385,000
Napa County	RW 6-24 Shoulder Grading (Design)	AIP	2024	$ 67,500	$ 3,375	$ 4,125	$ 75,000
Napa County	L-821 Relay Panel and Homerun Circuit Replac. (Const)	AIP	2025	$ 414,000	$ 20,700	$ 25,300	$ 460,000
Napa County	RW 6-24 MIRL Replacement (Construction)	AIP	2025	$ 3,645,900	$ 182,295	$ 222,805	$ 4,051,000
Napa County	RW 6-24 Shoulder Grading (Construction)	AIP	2025	$ 585,000	$ 29,250	$ 35,750	$ 650,000
Napa County	Reconstruct TW C (Construction)	AIP	2026	$ 6,081,300	$ 304,065	$ 371,635	$ 6,757,000
Napa County	Reconstruct TW C (Design)	AIP	2026	$ 576,900	$ 28,845	$ 35,255	$ 641,000

Napa County	Rehabilitate RW 6-24(Design)	AIP	2026	$	810,000	$	40,500	$	49,500	$	900,000
Napa County	Rehabilitate RW 6-24, and Safety Area Grading (Con)	AIP	2026	$	10,350,000	$	517,500	$	632,500	$	11,500,000
Napa County	Replace & Reloc Airfield Elec Vault & Beacon (Des/Con)	AIP	2026	$	1,620,000	$	81,000	$	99,000	$	1,800,000
Napa County	TW J, J1, and J2 Seal Coat (Construction)	AIP	2026	$	435,600	$	21,780	$	26,620	$	484,000
Napa County	TW J, J1, and J2 Seal Coat (Design)	AIP	2026	$	61,200	$	3,060	$	3,740	$	68,000
Napa County	Envir. Tech Studies and EA RW 6 Safety Area Improve	AIP	2027	$	900,000	$	45,000	$	55,000	$	1,000,000
Napa County	Reconstruct TW H Sect 2 & Safety Area Grading Const	AIP	2027	$	2,510,100	$	125,505	$	153,395	$	2,789,000
Napa County	Reconstruct TW H Section 2 (Design)	AIP	2027	$	238,500	$	11,925	$	14,575	$	265,000
Napa County	Reconstruct TW H Section 3 and TW B (Construction)	AIP	2027	$	3,745,800	$	187,290	$	228,910	$	4,162,000
Napa County	Reconstruct TW H Section 3 and TW B (Design)	AIP	2027	$	355,500	$	17,775	$	21,725	$	395,000
Napa County	RW 1R-19L, 1L-19R Seal Coat & Rubber Removal (Con)	AIP	2028	$	1,130,400	$	56,520	$	69,080	$	1,256,000
Napa County	RW 1R-19L, 1L-19R Seal Coat & Rubber Removal (Des)	AIP	2028	$	114,300	$	5,715	$	6,985	$	127,000
Napa County	Rehabilitate TW E (Construction)	AIP	2029	$	2,357,100	$	117,855	$	144,045	$	2,619,000
Napa County	Rehabilitate TW E (Design)	AIP	2029	$	224,100	$	11,205	$	13,695	$	249,000
Napa County	TW J Extension & RW 1L Holding Apron (Construction)	AIP	2029	$	7,636,500	$	381,825	$	466,675	$	8,485,000
Napa County	TW J Extension and RW 1L Holding Apron (Design)	AIP	2029	$	688,500	$	34,425	$	42,075	$	765,000
Needles	2022-Safety Area Improvement Airfield Drainage Study	AIP	2022	$	54,000	$	2,700	$	3,300	$	60,000
Needles	2022-Safety Signs & Markings Update	A&D	2022	$	-	$	31,500	$	3,500	$	35,000
Needles	2016-ALUCP Update	A&D	2023	$	-	$	54,000	$	6,000	$	60,000
Needles	2023-Safety Area Improvements - Design	AIP	2023	$	82,800	$	4,140	$	5,060	$	92,000
Needles	2024-Safety Area Improvements- Construction	AIP	2024	$	585,000	$	29,250	$	35,750	$	650,000
Needles	2026-Narrative ALP Update	AIP	2026	$	171,000	$	8,550	$	10,450	$	190,000
Needles	2028-Airport Electrical Upgrades Ph I Design/Envir.	AIP	2028	$	225,000	$	11,250	$	13,750	$	250,000
Needles	2029-Airport Electrical Upgrades Phase II Construction	AIP	2029	$	1,350,000	$	67,500	$	82,500	$	1,500,000
Needles	2030-RW/TW Rehabilitation & Striping	AIP	2030	$	81,000	$	4,050	$	4,950	$	90,000
Nervino	Design - Reseal Joints in RW Pavements (75' x 4,652')	AIP	2021	$	25,740	$	1,287	$	1,573	$	28,600
Nervino	Construct - Reseal Joints in RW Pavements	AIP	2022	$	284,400	$	14,220	$	17,380	$	316,000
Nervino	Design - Reseal Joints in Pavements- TWs, Aprons & Taxi	AIP	2023	$	25,200	$	1,260	$	1,540	$	28,000
Nervino	Construct - Reseal Joints in Pavements- TWs, Aprons & T	AIP	2024	$	273,600	$	13,680	$	16,720	$	304,000
Nervino	Design/Construct: New Beacon Tower	AIP	2025	$	91,800	$	4,590	$	5,610	$	102,000
Nervino	Design/Construct: Snow Removal Equipment Building	AIP	2026	$	354,600	$	17,730	$	21,670	$	394,000
Nervino	Design/Construct -Replace 4-Unit Tee Hangar Building	AIP	2027	$	576,000	$	28,800	$	35,200	$	640,000
Nervino	Design-Two 5-unit Tee Hangars w/Paved Apron & Tws	AIP	2028	$	171,000	$	8,550	$	10,450	$	190,000
Nervino	Construct Two 5-unit Nested Tee Hangars	AIP	2029	$	1,089,900	$	54,495	$	66,605	$	1,211,000
Nervino	ALP Update Narrative and Plans	AIP	2030	$	144,000	$	7,200	$	8,800	$	160,000
Nervino	Pavement Maintenance Management Plan (PMMP)	AIP	2030	$	108,000	$	5,400	$	6,600	$	120,000
Nevada County	Construct: TW A Rehab, Phase 1	AIP	2022	$	817,200	$	40,860	$	49,940	$	908,000
Nevada County	Construct: Ramps 1, 2, and 5 Rehab Phase II	AIP	2023	$	1,130,400	$	56,520	$	69,080	$	1,256,000
Nevada County	Des: RW Pavement Preservation- Crack Seal, Seal Coat	AIP	2024	$	81,000	$	4,050	$	4,950	$	90,000

Nevada County	Design: AWOS Replacement	AIP	2024	$	27,000	$	1,350	$	1,650	$	30,000
Nevada County	Const.: RW Pavement Preservation - Crack Seal	AIP	2025	$	565,200	$	28,260	$	34,540	$	628,000
Nevada County	Construct: AWOS Replacement	AIP	2025	$	216,000	$	10,800	$	13,200	$	240,000
Nevada County	Design RWs 7 & 25 PAPI Install	AIP	2025	$	36,000	$	1,800	$	2,200	$	40,000
Nevada County	Design: Emergency Backup Generator-Airfield Lighting	AIP	2025	$	18,000	$	900	$	1,100	$	20,000
Nevada County	Design: RWs 7 & 25 REIL Install	AIP	2025	$	27,000	$	1,350	$	1,650	$	30,000
Nevada County	Con: Emergency Backup Generator for Airfield Lighting	AIP	2026	$	211,500	$	10,575	$	12,925	$	235,000
Nevada County	Construct: RWs 7 & 25 REIL Install	AIP	2026	$	171,000	$	8,550	$	10,450	$	190,000
Nevada County	Construct: RWs 7 & 25 PAPI Install	AIP	2026	$	299,700	$	14,985	$	18,315	$	333,000
Nevada County	Design: Ramps 3 and 4 Pavement Preservation	AIP	2026	$	90,000	$	4,500	$	5,500	$	100,000
Nevada County	Ramps 3 and 4 Repair (Construction) - Phase II	AIP	2027	$	218,700	$	10,935	$	13,365	$	243,000
Nevada County	4 - Service Road (Design)	AIP	2028	$	63,000	$	3,150	$	3,850	$	70,000
Nevada County	Airport Layout Plan Narrative with Updated Layout Plan	AIP	2029	$	144,000	$	7,200	$	8,800	$	160,000
Nevada County	Construct: Service Road Construction	AIP	2029	$	235,800	$	11,790	$	14,410	$	262,000
Nevada County	Pavement Maintenance Management Plan (PMMP)	AIP	2030	$	108,000	$	5,400	$	6,600	$	120,000
New Coalinga Municipal	Const Crack Sealing, RW 1-19 Rehabilitation & Fence	AIP	2022	$	454,500	$	22,725	$	27,775	$	505,000
New Coalinga Municipal	AWOS Repair	AIP	2023	$	27,000	$	1,350	$	1,650	$	30,000
New Coalinga Municipal	Airport Layout Plan Update with Narrative Report	AIP	2024	$	135,000	$	6,750	$	8,250	$	150,000
New Coalinga Municipal	Rehabilitate RW 12/30, TWs and apron	AIP	2025	$	540,000	$	27,000	$	33,000	$	600,000
New Coalinga Municipal	Airfield Signs and Airfield Paint Markings	AIP	2029	$	150,000	$	7,500	$	9,167	$	166,667
New Coalinga Municipal	Construct Airfield Signs and Airfield Paint Markings	AIP	2030	$	135,000	$	6,750	$	8,250	$	150,000
New Jerusalem	TW Rehab and Restriping	A&D	2023	$	-	$	315,000	$	35,000	$	350,000
Nut Tree	Northeast Hangar Apron & TXLN Recon Phase 1 - Const	AIP	2021	$	787,500	$	39,375	$	48,125	$	875,000
Nut Tree	RW/TW Lights, Apron Lighting, Beacon Elec Assessment	AIP	2022	$	45,000	$	2,250	$	2,750	$	50,000
Nut Tree	Taxilane & Hangar Taxilane Recon Phase Const	AIP	2022	$	1,852,200	$	92,610	$	113,190	$	2,058,000
Nut Tree	RW/TW Lights, Aprn Light, Beacon Replacement (Des)	AIP	2023	$	90,000	$	4,500	$	5,500	$	100,000
Nut Tree	RW/TW Lights, Apron Lighting & Beacon Replmnt - Const	AIP	2024	$	1,800,000	$	90,000	$	110,000	$	2,000,000
Nut Tree	PMMP Update	AIP	2025	$	67,500	$	3,375	$	4,125	$	75,000
Nut Tree	South Apron - Design	AIP	2026	$	180,000	$	9,000	$	11,000	$	200,000
Nut Tree	South Apron Expansion - Design	A&D	2027	$	-	$	62,100	$	6,900	$	69,000
Nut Tree	South Apron Expansion - Construction	AIP	2028	$	843,300	$	42,165	$	51,535	$	937,000
Nut Tree	RW and Parallel TW Extension - Phase I	AIP	2029	$	450,000	$	22,500	$	27,500	$	500,000
Nut Tree	RW and Parallel TW Extension - Phase II	AIP	2030	$	360,000	$	18,000	$	22,000	$	400,000
Oakdale Municipal	Pvmt Maintenance and Management Plan (PMMP)	AIP	2021	$	90,000	$	4,500	$	5,500	$	100,000
Oakdale Municipal	Pavement Preservation Construction, Phase II	AIP	2022	$	1,107,000	$	55,350	$	67,650	$	1,230,000
Oakdale Municipal	RSA and Drainage Improvements - EA or CatEx (TBD)	AIP	2023	$	247,500	$	12,375	$	15,125	$	275,000
Oakdale Municipal	Pavement Preservation Construction, Phase III	AIP	2024	$	848,700	$	42,435	$	51,865	$	943,000
Oakdale Municipal	Pavement Preservation Construction, Phase IV	AIP	2026	$	981,000	$	49,050	$	59,950	$	1,090,000
Oakdale Municipal	Pavement Preservation Construction, Phase V	AIP	2028	$	810,000	$	40,500	$	49,500	$	900,000

Oakdale Municipal	Pavement Preservation Construction, Phase VI	AIP	2030	$	1,080,000	$	54,000	$	66,000	$	1,200,000
Oceano County	Install New Electrical Vault & Assoc Elect. Design & Const	AIP	2022	$	263,520	$	13,176	$	16,104	$	292,800
Oceano County	Widen RW to 60 feet and Widen TW to 25 feet	AIP	2022	$	980,640	$	49,032	$	59,928	$	1,089,600
Oceano County	Install Aircraft Wash Rack - Designa and Construction	AIP	2023	$	198,720	$	9,936	$	12,144	$	220,800
Oceano County	Widen TW A & Miscellaneous Improvements	AIP	2023	$	1,014,840	$	50,742	$	62,018	$	1,127,600
Oceano County	Rehabilitate Apron Phase 1 (Design)	AIP	2024	$	120,510	$	6,026	$	7,365	$	133,900
Oceano County	Rehabilitate Apron - Phase 2 (Construction)	AIP	2025	$	436,950	$	21,848	$	26,703	$	485,500
Oceano County	Install Misc. NAVAIDs (Segmented Circle/Wind Cone)	AIP	2026	$	16,020	$	801	$	979	$	17,800
Oroville Municipal	Design/Const: Crack Seal RWs, TW, Apron & Taxilanes	AIP	2022	$	829,125	$	41,456	$	50,669	$	921,250
Oroville Municipal	Design: Develop New Tee Hangar Taxilane Site	AIP	2023	$	171,900	$	8,595	$	10,505	$	191,000
Oroville Municipal	Construct: Develop New Tee Hangar Taxilane Site	AIP	2024	$	905,040	$	45,252	$	55,308	$	1,005,600
Oroville Municipal	Design: Reconstruct and Realign T/W S and Apron	AIP	2024	$	152,100	$	7,605	$	9,295	$	169,000
Oroville Municipal	ALP Updated Narrative & Plans w/Aero Study	AIP	2025	$	225,000	$	11,250	$	13,750	$	250,000
Oroville Municipal	Construct: Reconstruct and Realign T/W S and Apron	AIP	2025	$	793,800	$	39,690	$	48,510	$	882,000
Oroville Municipal	Des/Con: New Above Ground Fuel Farm Facility South	AIP	2026	$	900,000	$	45,000	$	55,000	$	1,000,000
Oroville Municipal	Construct Two 14-unit Tee Hangar Buildings	AIP	2028	$	2,311,200	$	115,560	$	141,240	$	2,568,000
Oroville Municipal	Design for New Storage Hangar for FBO Fac.	AIP	2028	$	184,500	$	9,225	$	11,275	$	205,000
Oroville Municipal	Construct NE Storage Hangar for FBO Facility	AIP	2029	$	2,124,000	$	106,200	$	129,800	$	2,360,000
Oroville Municipal	Pavement Maintenance Management Plan (PMMP)	AIP	2030	$	108,000	$	5,400	$	6,600	$	120,000
Oxnard	Reconstruct Pavement RW 7-25	AIP	2021	$	13,230,000	$	661,500	$	808,500	$	14,700,000
Oxnard	Reconstruct Pavement TW F	AIP	2021	$	8,386,578	$	419,329	$	512,513	$	9,318,420
Oxnard	Reconstruct Pavement TWs A,B,C, D, E	AIP	2021	$	3,439,512	$	171,976	$	210,192	$	3,821,680
Oxnard	Design for Terminal (expanded) Ramp Reconstruction	AIP	2022	$	495,000	$	24,750	$	30,250	$	550,000
Oxnard	EA/Design for RW/TW Pavement Strengthening	AIP	2022	$	855,000	$	42,750	$	52,250	$	950,000
Oxnard	Reconstruct Terminal (expanded) Ramp	AIP	2023	$	4,950,000	$	247,500	$	302,500	$	5,500,000
Oxnard	RW & TW Pavement Strengthening Reconstruction	AIP	2024	$	9,900,000	$	495,000	$	605,000	$	11,000,000
Oxnard	ARFF Truck	AIP	2025	$	900,000	$	45,000	$	55,000	$	1,000,000
Oxnard	EA & Conceptual Design for Terminal Building	AIP	2025	$	450,000	$	22,500	$	27,500	$	500,000
Oxnard	Final Design for Terminal Building	AIP	2026	$	900,000	$	45,000	$	55,000	$	1,000,000
Oxnard	Des to Rehab. Central, West Hangar Areas & ARFF Aprn	AIP	2027	$	55,045	$	2,752	$	3,364	$	61,161
Oxnard	Des to Rehab. East Apron and Executive Hangar Area	AIP	2027	$	79,380	$	3,969	$	4,851	$	88,200
Oxnard	Design Rehab Perimeter & Terminal Loop Rds, ATCT	AIP	2028	$	72,143	$	3,607	$	4,409	$	80,159
Oxnard	Rehab. Central & West Hangar Areas & ARFF Apron	AIP	2029	$	550,448	$	27,522	$	33,638	$	611,609
Oxnard	Rehab. E Aprn, Exec Hangar Area & Port Transient Aprn	AIP	2029	$	793,800	$	39,690	$	48,510	$	882,000
Oxnard	Land Acquisition -RPZ Property Purchases	AIP	2030	$	7,690,500	$	384,525	$	469,975	$	8,545,000
Oxnard	Rehab Perim & Term Loop Rds, ATCT, Ops & Central Park	AIP	2030	$	721,436	$	36,072	$	44,088	$	801,596
Palo Alto	ALP Narrative w/ Aeronautical Survey & Drainage Eval	AIP	2021	$	585,000	$	29,250	$	35,750	$	650,000
Palo Alto	Sustainable Master Plan - AP-21000	AIP	2022	$	990,000	$	49,500	$	60,500	$	1,100,000
Palo Alto	Airfield Electrical Improvements (Design) AP-19001	AIP	2023	$	382,500	$	19,125	$	23,375	$	425,000

Palo Alto	AWOS III (Design) - AP-19000	AIP	2023	$	72,000	$	3,600	$	4,400	$	80,000
Palo Alto	EA for RW & TW Recon & Drainage Improvements	AIP	2023	$	360,000	$	18,000	$	22,000	$	400,000
Palo Alto	Reconstruction Access/Service Road (Construction)	AIP	2023	$	1,800,000	$	90,000	$	110,000	$	2,000,000
Palo Alto	Airfield Electrical Improvements (Construction)	AIP	2024	$	3,375,000	$	168,750	$	206,250	$	3,750,000
Palo Alto	AWOS III (Construction) - AP-19000	AIP	2024	$	283,500	$	14,175	$	17,325	$	315,000
Palo Alto	RW & TW Reconst & Drainage Improvements (Design)	AIP	2026	$	450,000	$	22,500	$	27,500	$	500,000
Palo Alto	RW & TW Reconst & Drainage Improvements (Const)	AIP	2027	$	3,600,000	$	180,000	$	220,000	$	4,000,000
Palo Alto	Land Use Compatibility Plan	AIP	2028	$	180,000	$	9,000	$	11,000	$	200,000
Paso Robles Municipal	Airfield Electrical Upgrades	AIP	2021	$	810,000	$	40,500	$	49,500	$	900,000
Paso Robles Municipal	Apron Lighting	AIP	2021	$	180,000	$	9,000	$	11,000	$	200,000
Paso Robles Municipal	Pavement Maintenance Management Plan (PMMP)	AIP	2021	$	28,800	$	1,440	$	1,760	$	32,000
Paso Robles Municipal	Geometry Upgrades TW D at RW 1-19 & Aprn Expansion	AIP	2023	$	6,300,000	$	315,000	$	385,000	$	7,000,000
Paso Robles Municipal	Geometry Upgrades TW F at RW 1 & holding bay	AIP	2025	$	4,950,000	$	247,500	$	302,500	$	5,500,000
Paso Robles Municipal	TW geometry upgrades: TW C and A at RW 1-19	AIP	2026	$	5,400,000	$	270,000	$	330,000	$	6,000,000
Paso Robles Municipal	Rehabilitate RW 13-31	AIP	2028	$	2,070,000	$	103,500	$	126,500	$	2,300,000
Paso Robles Municipal	Rehabilitate Parking Aprons	AIP	2030	$	576,000	$	28,800	$	35,200	$	640,000
Petaluma Municipal	Based Aircraft Apron Reconst. and Seal Coat (Const.)	AIP	2022	$	1,629,900	$	81,495	$	99,605	$	1,811,000
Petaluma Municipal	TW A Rehabilitation - Overlay (Design)	AIP	2023	$	110,700	$	5,535	$	6,765	$	123,000
Petaluma Municipal	TW A Rehabilitation - Overlay (Construction)	AIP	2025	$	916,200	$	45,810	$	55,990	$	1,018,000
Petaluma Municipal	North, South, and Executive Hangar Seal Coat (Design)	AIP	2026	$	45,000	$	2,250	$	2,750	$	50,000
Petaluma Municipal	RW 11-29 Seal Coat (Design)	AIP	2026	$	45,000	$	2,250	$	2,750	$	50,000
Petaluma Municipal	North, South, and Executive Hangar Seal Coat (Const)	AIP	2027	$	423,000	$	21,150	$	25,850	$	470,000
Petaluma Municipal	RW 11-29 Seal Coat (Construction)	AIP	2027	$	375,300	$	18,765	$	22,935	$	417,000
Petaluma Municipal	Apron C Reconstruction (Design)	AIP	2028	$	150,300	$	7,515	$	9,185	$	167,000
Petaluma Municipal	Apron C Reconstruction (Construction)	AIP	2029	$	1,441,800	$	72,090	$	88,110	$	1,602,000
Petaluma Municipal	South Hangar Area & Apron Taxilane Reconst. (Design)	AIP	2029	$	185,400	$	9,270	$	11,330	$	206,000
Petaluma Municipal	Apron B Reconstruction (Design)	AIP	2030	$	166,500	$	8,325	$	10,175	$	185,000
Petaluma Municipal	South Hangar Area & Apron Taxilane Reconst. (Const.)	AIP	2030	$	1,618,200	$	80,910	$	98,890	$	1,798,000
Pine Mountain Lake	AWOS Design	AIP	2021	$	45,000	$	2,250	$	2,750	$	50,000
Pine Mountain Lake	RW 09/27 Rehab Design	AIP	2021	$	315,000	$	15,750	$	19,250	$	350,000
Pine Mountain Lake	AWOS Construction	AIP	2022	$	180,000	$	9,000	$	11,000	$	200,000
Pine Mountain Lake	RW 09/27 Rehab Construction	AIP	2022	$	2,700,000	$	135,000	$	165,000	$	3,000,000
Pine Mountain Lake	TW A Rehab Design	AIP	2023	$	270,000	$	13,500	$	16,500	$	300,000
Pine Mountain Lake	TW A Rehab Construction	AIP	2024	$	2,700,000	$	135,000	$	165,000	$	3,000,000
Pine Mountain Lake	Parking Apron Rehab Design	AIP	2025	$	45,000	$	2,250	$	2,750	$	50,000
Pine Mountain Lake	Parking Apron Rehab Construction	AIP	2026	$	450,000	$	22,500	$	27,500	$	500,000
Pine Mountain Lake	Vehicle Access Roads and Drainage Design	AIP	2027	$	135,000	$	6,750	$	8,250	$	150,000
Pine Mountain Lake	Design of Rehab of AC Ramp & Helicopter Parking	AIP	2028	$	90,000	$	4,500	$	5,500	$	100,000
Pine Mountain Lake	Vehicle Access Roads and Drainage Construction	AIP	2028	$	900,000	$	45,000	$	55,000	$	1,000,000

Pine Mountain Lake	Rehabilitation of AC Ramp and Helicopter Parking	AIP	2030	$ 675,000	$ 33,750	$ 41,250	$ 750,000
Placerville	Airport Beacon Replacement (Design & Construct)	AIP	2021	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Placerville	Pavement Preservation and Remark RW 5-23	AIP	2022	$ 58,500	$ 2,925	$ 3,575	$ 65,000
Placerville	Pavement Preservation for TWs, Aprons and T	AIP	2022	$ 67,500	$ 3,375	$ 4,125	$ 75,000
Placerville	Pavement Preservation and Remark RW 5-23	AIP	2023	$ 531,000	$ 26,550	$ 32,450	$ 590,000
Placerville	Pavement Preservation for TWs, Aprons and T	AIP	2023	$ 855,000	$ 42,750	$ 52,250	$ 950,000
Placerville	Obstruction Removal (Construction) - on-site tree	AIP	2024	$ 315,000	$ 15,750	$ 19,250	$ 350,000
Placerville	AWOS (Design)	AIP	2025	$ 76,500	$ 3,825	$ 4,675	$ 85,000
Placerville	AWOS (Construction)	AIP	2026	$ 315,000	$ 15,750	$ 19,250	$ 350,000
Porterville Municipal	Rehabilitate parallel and connecting TWs	AIP	2022	$ 3,150,000	$ 157,500	$ 192,500	$ 3,500,000
Porterville Municipal	EA: Shift RW 12-30	AIP	2023	$ 405,000	$ 20,250	$ 24,750	$ 450,000
Porterville Municipal	Acquire 0.35 acres of Real Property	AIP	2025	$ 36,000	$ 1,800	$ 2,200	$ 40,000
Porterville Municipal	Relocate access roads & perimeter fence (design)	AIP	2025	$ 306,000	$ 15,300	$ 18,700	$ 340,000
Porterville Municipal	Relocate access roads & perimeter fence (construct)	AIP	2026	$ 5,130,000	$ 256,500	$ 313,500	$ 5,700,000
Porterville Municipal	RW & parallel TW relocate to north (design)	AIP	2027	$ 324,000	$ 16,200	$ 19,800	$ 360,000
Porterville Municipal	RW & parallel TW shift to the north (construct)	AIP	2028	$ 5,310,000	$ 265,500	$ 324,500	$ 5,900,000
Porterville Municipal	Taxilane rehabilitation	AIP	2030	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Poso-Kern County	RW Patch Repairs	A&D	2021	$ -	$ 18,000	$ 2,000	$ 20,000
Poso-Kern County	Crack fill, Slurry Seal & Restripe RW	A&D	2022	$ -	$ 135,000	$ 15,000	$ 150,000
Poso-Kern County	North Transient Parking Ramp Reconstruction	A&D	2023	$ -	$ 207,000	$ 23,000	$ 230,000
Ramona	Rehabilitate West Apron	AIP	2022	$ 909,000	$ 45,450	$ 55,550	$ 1,010,000
Ramona	Rock/Vegetation Removal within ROFA	AIP	2023	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Ramona	Rehabilitate RW 27	AIP	2025	$ 3,600,000	$ 180,000	$ 220,000	$ 4,000,000
Ramona	Rehabilitate TW Alpha	AIP	2026	$ 1,980,000	$ 99,000	$ 121,000	$ 2,200,000
Ravendale	Pavement Maintenance & Remarking; RW & TW	A&D	2022	$ -	$ 103,500	$ 11,500	$ 115,000
Red Bluff Municipal	TW Rehabilitation - Bid & Construction	AIP	2021	$ 366,300	$ 18,315	$ 22,385	$ 407,000
Red Bluff Municipal	Helicopter Parking Pads - Design Only	AIP	2022	$ 150,000	$ 7,500	$ 9,167	$ 166,667
Red Bluff Municipal	Main Apron Pavement Rehab - Bid & Construction	AIP	2022	$ 307,800	$ 15,390	$ 18,810	$ 342,000
Red Bluff Municipal	Apron Expansion - Construction	AIP	2023	$ 1,215,000	$ 60,750	$ 74,250	$ 1,350,000
Red Bluff Municipal	Security Upgrades; Fence, Surveillance - Construction	AIP	2024	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Red Bluff Municipal	Airport Layout Plan - Update	AIP	2025	$ 300,000	$ 15,000	$ 18,333	$ 333,333
Red Bluff Municipal	Update Pavement Management Plan	AIP	2025	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Red Bluff Municipal	RW 15-33 Extension - Environmental Documents	AIP	2026	$ 150,000	$ 7,500	$ 9,167	$ 166,667
Red Bluff Municipal	Rehabilitate Airfield Lighting System (Design)	AIP	2028	$ 75,000	$ 3,750	$ 4,583	$ 83,333
Red Bluff Municipal	RW 15-33 Extension - Design	AIP	2028	$ 1,500,000	$ 75,000	$ 91,667	$ 1,666,667
Red Bluff Municipal	Rehabilitate Airfield Lighting System (Bid & Const)	AIP	2029	$ 675,000	$ 33,750	$ 41,250	$ 750,000
Red Bluff Municipal	Rehabilitate RW 15/33 (Bid & Const)	AIP	2029	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Red Bluff Municipal	RW 15-33 Extension - Construction	AIP	2029	$ 1,350,000	$ 67,500	$ 82,500	$ 1,500,000
Red Bluff Municipal	Rehabilitate Apron (Design)	AIP	2030	$ 45,000	$ 2,250	$ 2,750	$ 50,000

Red Bluff Municipal	Rehabilitate TWs (Design)	AIP	2030	$	54,000	$	2,700	$	3,300	$	60,000
Redding Municipal	PDCR Study Runway 16-34, Runway 12, ALP Update	AIP	2021	$	436,163	$	$ -	$	48,463	$	484,625
Redding Municipal	Reconstruct Airport Loop Access Road - Phase 1	AIP	2021	$	1,220,400	$	$ -	$	135,600	$	1,356,000
Redding Municipal	Reconstruct Airport Loop Access Road - Phase 2	AIP	2021	$	3,299,400	$	$ -	$	366,600	$	3,666,000
Redding Municipal	Airfield Electrical System Assessment Study	AIP	2022	$	81,000	$	$ -	$	9,000	$	90,000
Redding Municipal	ALP Update/Narrative with APMS, WHA, and WHMP	AIP	2022	$	450,000	$	$ -	$	50,000	$	500,000
Redding Municipal	Pavement Preservation (Apron & Taxiways)	AIP	2022	$	900,000	$	$ -	$	100,000	$	1,000,000
Redding Municipal	Reconstruct Taxiway H Including Signage Replacement	AIP	2022	$	2,923,200	$	$ -	$	324,800	$	3,248,000
Redding Municipal	RW & TW Rehab, MAGVAR, RSA/Drainage - Construct	AIP	2022	$	13,063,500	$	$ -	$	1,451,500	$	14,515,000
Redding Municipal	RW & TW Rehab, MAGVAR, RSA/Drainage - Design Ph 2	AIP	2022	$	1,125,000	$	$ -	$	125,000	$	1,250,000
Redding Municipal	Service Road Improvements (Safety)	AIP	2022	$	54,000	$	$ -	$	6,000	$	60,000
Redding Municipal	Snow removal Equipment (Plow & Broom Attachments)	AIP	2022	$	45,000	$	$ -	$	5,000	$	50,000
Redding Municipal	All Weather Perimeter Road - RSAP Recommendation	AIP	2023	$	900,000	$	$ -	$	100,000	$	1,000,000
Redding Municipal	Construct Parallel Runway/Taxiway/ Electrical Vault	AIP	2023	$	3,870,000	$	$ -	$	430,000	$	4,300,000
Redding Municipal	Environmental Assessment - Runway 17-35 Extension	AIP	2023	$	360,000	$	$ -	$	40,000	$	400,000
Redding Municipal	Expand Solar Farm - VALE Grant	AIP	2023	$	1,350,000	$	$ -	$	150,000	$	1,500,000
Redding Municipal	RW 17-35 & Connector TWs Rehabilitation (Design)	AIP	2023	$	779,400	$	$ -	$	86,600	$	866,000
Redding Municipal	Security Fencing (Design)	AIP	2023	$	49,500	$	$ -	$	5,500	$	55,000
Redding Municipal	Eastside Apron Expansion (300'x450') (Design)	AIP	2024	$	148,500	$	$ -	$	16,500	$	165,000
Redding Municipal	Install MITL (Taxiway M, C & H) - Design Only	AIP	2024	$	60,750	$	$ -	$	6,750	$	67,500
Redding Municipal	Pavement Preservation (East Apron) Seal Coat (Design)	AIP	2024	$	16,200	$	$ -	$	1,800	$	18,000
Redding Municipal	Runway 17-35 and Connector Taxiways Rehabilitation	AIP	2024	$	6,660,000	$	$ -	$	740,000	$	7,400,000
Redding Municipal	Runway 17-35 Extension (Design)	AIP	2024	$	315,000	$	$ -	$	35,000	$	350,000
Redding Municipal	Security Fencing	AIP	2024	$	432,000	$	$ -	$	48,000	$	480,000
Redding Municipal	Terminal Apron Reconstruction (Design)	AIP	2024	$	855,000	$	$ -	$	95,000	$	950,000
Redding Municipal	Eastside Apron Expansion (300'x450')	AIP	2025	$	990,000	$	$ -	$	110,000	$	1,100,000
Redding Municipal	Install MITL (Taxiway M, C & H)	AIP	2025	$	405,000	$	$ -	$	45,000	$	450,000
Redding Municipal	Pavement Preservation (East Apron) - Seal Coat	AIP	2025	$	108,000	$	$ -	$	12,000	$	120,000
Redding Municipal	Runway 17-35 Extension - Construction	AIP	2025	$	2,700,000	$	$ -	$	300,000	$	3,000,000
Redding Municipal	Terminal Apron Reconstruction	AIP	2025	$	6,300,000	$	$ -	$	700,000	$	7,000,000
Redlands Municipal	Update Layout Plan with Narrative	AIP	2021	$	135,000	$	6,750	$	8,250	$	150,000
Redlands Municipal	Continue ALP Update with Narrative	AIP	2022	$	162,000	$	8,100	$	9,900	$	180,000
Redlands Municipal	Design security fence IAW WHP	AIP	2023	$	270,000	$	13,500	$	16,500	$	300,000
Redlands Municipal	Continue design parameter security fence	AIP	2024	$	135,000	$	6,750	$	8,250	$	150,000
Redlands Municipal	Construct REI Parameter Security Fence with WHP	AIP	2025	$	2,997,000	$	149,850	$	183,150	$	3,330,000
Redlands Municipal	Plan & Design East Ramp Pavement Rehab & Stripping	AIP	2026	$	135,000	$	6,750	$	8,250	$	150,000
Redlands Municipal	Rehab Pavement On East Ramp and Markings	AIP	2027	$	270,000	$	13,500	$	16,500	$	300,000
Redlands Municipal	Plan & Des W. Ramp Pavement Rehab & Fill Open Ditch	AIP	2028	$	135,000	$	6,750	$	8,250	$	150,000
Redlands Municipal	Rehab Pavement On West Ramp and Markings	AIP	2029	$	3,600,000	$	180,000	$	220,000	$	4,000,000

Redlands Municipal	Acquire Land For RPZ For RW 8/26	AIP	2030	$	5,400,000	$	270,000	$	330,000	$	6,000,000
Reedley Municipal	Apron Pavement Recon. (Tie-Down Apron) Ph. 1 Const	AIP	2021	$	562,500	$	28,125	$	34,375	$	625,000
Reedley Municipal	Apron Pavement Rehab. (Tie-Down Apron) Ph. 2 Const	AIP	2022	$	720,000	$	36,000	$	44,000	$	800,000
Reedley Municipal	Apron Pavement Recon. (Tie-Down Apron) Ph. 3 Const	AIP	2023	$	495,000	$	24,750	$	30,250	$	550,000
Reedley Municipal	Pvmt Maintenance & Management Program (PMMP)	AIP	2023	$	90,000	$	4,500	$	5,500	$	100,000
Reedley Municipal	ALP Narrative and Obstruction Survey	AIP	2024	$	180,000	$	9,000	$	11,000	$	200,000
Reedley Municipal	Apron Pvmt Reconst (Transient, Fuel & Hangar Aprons)	AIP	2025	$	207,000	$	10,350	$	12,650	$	230,000
Reedley Municipal	TW Pave. Pres. and Installation of REILs Design	AIP	2025	$	67,500	$	3,375	$	4,125	$	75,000
Reedley Municipal	TW Pave. Pres. and Installation of REILs Construct	AIP	2026	$	166,500	$	8,325	$	10,175	$	185,000
Reedley Municipal	Apron Pvmt Rehab (Transient Apron) Phase 1 Const	AIP	2027	$	1,080,000	$	54,000	$	66,000	$	1,200,000
Reedley Municipal	Apron Pavement Rehab (Fuel Apron) Phase 2 Const	AIP	2028	$	720,000	$	36,000	$	44,000	$	800,000
Reedley Municipal	RW Pavement Preservation - Design	AIP	2029	$	67,500	$	3,375	$	4,125	$	75,000
Reedley Municipal	Apron Pavement Rehab (Hangar Area) Phase 3 Const	AIP	2030	$	486,000	$	24,300	$	29,700	$	540,000
Reid Hillview	Prepare Des, Bid Docs & Perform Pavement Rehab	AIP	2022	$	1,800,000	$	90,000	$	110,000	$	2,000,000
Reid Hillview	Prepare Pavement Management System	AIP	2022	$	40,500	$	2,025	$	2,475	$	45,000
Reid Hillview	ALP Update with Narrative and AGIS	AIP	2023	$	225,000	$	11,250	$	13,750	$	250,000
Reid Hillview	Prepare Des, Bid Documents & Perform Perimeter Fence	AIP	2024	$	1,350,000	$	67,500	$	82,500	$	1,500,000
Reid Hillview	Prepare Design & Bid Documents for Shift of RWs & TWs	AIP	2025	$	225,000	$	11,250	$	13,750	$	250,000
Reid Hillview	Des & Bid Docs for Aircraft Shelter Area Pvmt Rehab	AIP	2026	$	99,000	$	4,950	$	6,050	$	110,000
Reid Hillview	Perform Shift of RWs and Const of West Side Parallel TW	AIP	2026	$	1,980,000	$	99,000	$	121,000	$	2,200,000
Reid Hillview	Construct Aircraft Shelter Area Pavement Rehabilitation	AIP	2027	$	1,080,000	$	54,000	$	66,000	$	1,200,000
Reid Hillview	Prepare Design & Bid Docs for Access Road Rehab	AIP	2030	$	126,000	$	6,300	$	7,700	$	140,000
Rio Vista Municipal	Construction Replace PAPI and REIL	AIP	2021	$	751,467	$	37,573	$	45,923	$	834,963
Rio Vista Municipal	Design - Reconstruction of RW 7-25	AIP	2022	$	409,050	$	20,453	$	24,998	$	454,500
Rio Vista Municipal	Design - Relocations of Drain Channel, Road & Fence	AIP	2022	$	126,000	$	6,300	$	7,700	$	140,000
Rio Vista Municipal	Design North Side Fencing Project	AIP	2022	$	49,500	$	2,475	$	3,025	$	55,000
Rio Vista Municipal	Environmental Assessment	AIP	2022	$	148,500	$	7,425	$	9,075	$	165,000
Rio Vista Municipal	Install new N side & Replace NW Perimeter Fencing	AIP	2022	$	373,500	$	18,675	$	22,825	$	415,000
Rio Vista Municipal	Land Acquisition - Future Hangars	AIP	2022	$	495,000	$	24,750	$	30,250	$	550,000
Rio Vista Municipal	Relocate City Drainage Channel	AIP	2022	$	675,900	$	33,795	$	41,305	$	751,000
Rio Vista Municipal	Construction Ph I - RW 7-25 reconstruction	AIP	2023	$	2,130,300	$	106,515	$	130,185	$	2,367,000
Rio Vista Municipal	Design - Taxilanes and Service Roads	AIP	2023	$	117,000	$	5,850	$	7,150	$	130,000
Rio Vista Municipal	Relocate Hangar Access Road	AIP	2023	$	358,200	$	17,910	$	21,890	$	398,000
Rio Vista Municipal	Relocate South East Fence	AIP	2023	$	167,400	$	8,370	$	10,230	$	186,000
Rio Vista Municipal	Construct Taxilane, Grade & Drain for 2 Tee Hangars	AIP	2024	$	500,400	$	25,020	$	30,580	$	556,000
Rio Vista Municipal	Construction Ph II Reconstruction of RW 7-25	AIP	2024	$	1,065,150	$	53,258	$	65,093	$	1,183,500
Rio Vista Municipal	Construction Ph III Reconstruction of RW 7-25	AIP	2025	$	1,065,150	$	53,258	$	65,093	$	1,183,500
Rio Vista Municipal	Design: Generator, Repave Parking Lot, Jet A Fuel	AIP	2025	$	67,500	$	3,375	$	4,125	$	75,000
Rio Vista Municipal	Install Emergency Generator	AIP	2026	$	64,800	$	3,240	$	3,960	$	72,000

Rio Vista Municipal	Repave Automobile Parking Lot	AIP	2026	$	229,500	$	11,475	$	14,025	$	255,000
Rio Vista Municipal	RW 15-33 Reconstruction Design	AIP	2026	$	409,050	$	20,453	$	24,998	$	454,500
Rio Vista Municipal	Design: Tee Hangars, Corporate Hangars, Helipad	AIP	2027	$	292,500	$	14,625	$	17,875	$	325,000
Rio Vista Municipal	Install Jet A Fuel System	AIP	2027	$	161,100	$	8,055	$	9,845	$	179,000
Rio Vista Municipal	Construct Row of Tee Hangars	AIP	2028	$	1,874,700	$	93,735	$	114,565	$	2,083,000
Rio Vista Municipal	Install Corporate Hangars near Bldg and West Apron	AIP	2029	$	1,376,100	$	68,805	$	84,095	$	1,529,000
Rio Vista Municipal	Relocate Helipad and Helicopter Parking Area	AIP	2030	$	54,000	$	2,700	$	3,300	$	60,000
Riverside Municipal	TW A Rehab Design include NEPA and Pavement Study	AIP	2021	$	134,871	$	6,744	$	8,242	$	149,857
Riverside Municipal	TW A Rehabilitation Construction	AIP	2022	$	450,000	$	22,500	$	27,500	$	500,000
Riverside Municipal	Service Road	AIP	2025	$	810,000	$	40,500	$	49,500	$	900,000
Riverside Municipal	RW 9/27 Slurry Coat	AIP	2027	$	540,000	$	27,000	$	33,000	$	600,000
Rogers Field	Design - Reseal Joints in RW Pavement (100' x 5,019')	AIP	2021	$	25,740	$	1,287	$	1,573	$	28,600
Rogers Field	Construct - Reseal Joints in RW Pavement	AIP	2022	$	846,900	$	42,345	$	51,755	$	941,000
Rogers Field	Design - Reseal Joints in TW and Taxilane Pavement	AIP	2023	$	27,900	$	1,395	$	1,705	$	31,000
Rogers Field	Construct - Reseal Joints in TW and Taxilane Pavement	AIP	2024	$	275,400	$	13,770	$	16,830	$	306,000
Rogers Field	Design - Extend TW A (50' x 440'), Relocate Threshold R	AIP	2025	$	198,000	$	9,900	$	12,100	$	220,000
Rogers Field	Construct: Extend TW A, Relocate Threshold RW 16	AIP	2026	$	1,298,700	$	64,935	$	79,365	$	1,443,000
Rogers Field	Des Devel E Hangar Area incld. Access Rd & T Hangars	AIP	2027	$	423,000	$	21,150	$	25,850	$	470,000
Rogers Field	Con: East Hangar Area include Access RD & T Hangars	AIP	2028	$	3,536,100	$	176,805	$	216,095	$	3,929,000
Rogers Field	Design/Construct: Snow Removal Equip Building	AIP	2029	$	426,600	$	21,330	$	26,070	$	474,000
Rogers Field	ALP Update Narrative and Plans	AIP	2030	$	144,000	$	7,200	$	8,800	$	160,000
Rogers Field	Design: Tee Hangar Site Development- Phase 2	AIP	2030	$	311,400	$	15,570	$	19,030	$	346,000
Rogers Field	Pavement Maintenance Management Plan (PMMP)	AIP	2030	$	108,000	$	5,400	$	6,600	$	120,000
Round Valley	RW 10-28 Pavement Rehabilitation Construction	AIP	2021	$	457,650	$	22,883	$	27,968	$	508,500
Round Valley	Security Fence	A&D	2022	$	-	$	90,000	$	10,000	$	100,000
Sacramento Executive	New Connector TW at RW 20, Threshold	AIP	2023	$	3,150,000	$	157,500	$	192,500	$	3,500,000
Sacramento Executive	Overlay Executive Roadways	LFP	2023	$	-	$	$ -	$	900,000	$	900,000
Sacramento Executive	Rehabilitate RW 2/20, and RSA Improvements	AIP	2023	$	8,865,000	$	443,250	$	541,750	$	9,850,000
Sacramento Executive	Overlay Executive Parking lots	LFP	2024	$	-	$	$ -	$	500,000	$	500,000
Sacramento Executive	Rehabilitate RW 12/30	AIP	2024	$	1,890,000	$	94,500	$	115,500	$	2,100,000
Sacramento Executive	Rehabilitate TW Foxtrot	AIP	2024	$	495,000	$	24,750	$	30,250	$	550,000
Sacramento Executive	Rehabilitation of TWs M, N and W	AIP	2024	$	1,485,000	$	74,250	$	90,750	$	1,650,000
Sacramento Executive	Rehabilitation TWs E & H, including TW Realignment	AIP	2025	$	1,485,000	$	74,250	$	90,750	$	1,650,000
Sacramento Executive	Rehabilitate TWs C & D, Including TW Realignment	AIP	2026	$	1,485,000	$	74,250	$	90,750	$	1,650,000
Sacramento Executive	Rehab North T-Hangar Area, Taxilanes & Apron Pvmt.	AIP	2027	$	1,395,000	$	69,750	$	85,250	$	1,550,000
Sacramento Executive	Rehabilitate South T-Hangar TWs	AIP	2028	$	180,000	$	9,000	$	11,000	$	200,000
Sacramento International	East Vault Bus Lot Expansion	LFP	2022	$	-	$	$ -	$	3,210,000	$	3,210,000
Sacramento International	Elkhorn Boulevard Extensions	LFP	2022	$	-	$	$ -	$	26,000,000	$	26,000,000
Sacramento International	Paving Economy Lot Rows 42A-42M	LFP	2022	$	-	$	$ -	$	2,250,000	$	2,250,000

Sacramento International	RON Apron Construction	AIP	2022	$ 14,940,000	$ $ -	$ 1,660,000	$ 16,600,000
Sacramento International	Shuttle Buses (multiple years)	LFP	2022	$ -	$ $ -	$ 8,700,000	$ 8,700,000
Sacramento International	I-5 Overpass Roadway Rehabilitation	LFP	2023	$ -	$ $ -	$ 1,000,000	$ 1,000,000
Sacramento International	Rehabilitation of Air Cargo Apron	AIP	2023	$ 10,800,000	$ $ -	$ 1,200,000	$ 12,000,000
Sacramento International	Economy Lot Expansion	LFP	2024	$ -	$ $ -	$ 20,000,000	$ 20,000,000
Sacramento International	Shuttle Bus Replacement to Electric, Infrastructure	LFP	2024	$ -	$ $ -	$ 2,810,000	$ 2,810,000
Sacramento International	Terminal B upper Roadway Saw and Reseal	LFP	2024	$ -	$ $ -	$ 225,000	$ 225,000
Sacramento International	Automated People Mover (APM) additional Vehicles	LFP	2025	$ -	$ $ -	$ 11,000,000	$ 11,000,000
Sacramento International	Overlay Roads from I-5 interchange to Terminal A/B	LFP	2025	$ -	$ $ -	$ 1,000,000	$ 1,000,000
Sacramento International	Rehab South Portion of TW A and Connecting TWs	AIP	2025	$ 20,700,000	$ $ -	$ 2,300,000	$ 23,000,000
Sacramento International	Reconstruct/Realign TW A System (A11 and A5)	AIP	2026	$ 27,900,000	$ $ -	$ 3,100,000	$ 31,000,000
Sacramento International	West Airfield Apron Construction	AIP	2028	$ 9,675,000	$ $ -	$ 1,075,000	$ 10,750,000
Sacramento Mather	Install New RW Lighting System	AIP	2023	$ 1,620,000	$ 81,000	$ 99,000	$ 1,800,000
Sacramento Mather	Rehabilitate (Overlay) RW 4L/22R	AIP	2023	$ 12,150,000	$ 607,500	$ 742,500	$ 13,500,000
Sacramento Mather	RW 4L/22R RW Safety Area Grading	AIP	2023	$ 1,350,000	$ 67,500	$ 82,500	$ 1,500,000
Sacramento Mather	RW 4L/22R Extension	AIP	2023	$ 9,000,000	$ 450,000	$ 550,000	$ 10,000,000
Sacramento Mather	Rehab Asphalt/Concrete Sections 4R/22L Phase 1	AIP	2024	$ 18,000,000	$ 900,000	$ 1,100,000	$ 20,000,000
Sacramento Mather	Rehab Asphalt/Concrete Sections Rnwy 4R/22L PH2	AIP	2025	$ 8,550,000	$ 427,500	$ 522,500	$ 9,500,000
Sacramento Mather	Remove Excess Markings and Pavement	AIP	2025	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Sacramento Mather	Rehabilitate General Aviation Apron	AIP	2026	$ 3,150,000	$ 157,500	$ 192,500	$ 3,500,000
Sacramento Mather	Rehabilitate TW D and D1	AIP	2026	$ 882,000	$ 44,100	$ 53,900	$ 980,000
Salinas Municipal	Airport Master Plan Update	AIP	2021	$ 540,000	$ 27,000	$ 33,000	$ 600,000
Salinas Municipal	Airport Pavement Management System (APMS)	AIP	2021	$ 96,750	$ 4,838	$ 5,913	$ 107,500
Salinas Municipal	ALUCP	A&D	2021	$ -	$ 157,500	$ 17,500	$ 175,000
Salinas Municipal	Design Taxilane Pavement Rehabilitation	AIP	2022	$ 247,500	$ 12,375	$ 15,125	$ 275,000
Salinas Municipal	Construct Taxilane Pavement Rehabilitation, Phase I	AIP	2023	$ 905,850	$ 45,293	$ 55,358	$ 1,006,500
Salinas Municipal	Construct Taxilane Pavement Rehabilitation, Phase II	AIP	2024	$ 1,040,400	$ 52,020	$ 63,580	$ 1,156,000
Salinas Municipal	Design Airfield Signage and RW Lighting Upgrades	AIP	2025	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Salinas Municipal	Design Perimeter Road Pavement Rehabilitation	AIP	2025	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Salinas Municipal	Const - Airfield Signage and RW Lighting Upgrades	AIP	2026	$ 675,000	$ 33,750	$ 41,250	$ 750,000
Salinas Municipal	Construct Perimeter Road Pavement Rehab, Phase I	AIP	2026	$ 451,548	$ 22,577	$ 27,595	$ 501,720
Salinas Municipal	Construct Perimeter Road Pavement Rehab, Phase II	AIP	2027	$ 270,198	$ 13,510	$ 16,512	$ 300,220
Salinas Municipal	NEPA - RW RSA Enhancements Safety Environmental	AIP	2027	$ 270,000	$ 13,500	$ 16,500	$ 300,000
Salinas Municipal	Design - Enhance RW Safety (RW 13-31 RSA Standards)	AIP	2028	$ 279,000	$ 13,950	$ 17,050	$ 310,000
Salinas Municipal	Construction - Enhance RW Safety (RW 13-31)	AIP	2029	$ 5,134,500	$ 256,725	$ 313,775	$ 5,705,000
Salinas Municipal	Design - Enhance Rw 8-26 RSA Shift RW 8-26	AIP	2030	$ 967,500	$ 48,375	$ 59,125	$ 1,075,000
Salinas Municipal	NEPA - East Side TW System, Access, and Hangars	AIP	2030	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Samoa Field	T-hangar improvements	A&D	2021	$ -	$ 180,000	$ 20,000	$ 200,000
Samoa Field	Resurfacing	A&D	2022	$ -	$ 42,300	$ 4,700	$ 47,000

Samoa Field	Design Ten T Hangars	A&D	2023	$ -	$ 270,000	$ 30,000	$ 300,000
Samoa Field	Construct 10 T Hangars	A&D	2024	$ -	$ 2,700,000	$ 300,000	$ 3,000,000
Samoa Field	Removal/Pruning Willow Stand	A&D	2026	$ -	$ 37,800	$ 4,200	$ 42,000
Samoa Field	Install RW Lights	A&D	2027	$ -	$ 495,000	$ 55,000	$ 550,000
Samoa Field	Construct Security Fencing	A&D	2028	$ -	$ 139,500	$ 15,500	$ 155,000
San Carlos	Pavement Maintenance & Management Plan	AIP	2021	$ 90,000	$ 4,500	$ 5,500	$ 100,000
San Carlos	Crack Seal, Seal Coat & Restripe Transient Parking Ramp	AIP	2022	$ 511,200	$ 25,560	$ 31,240	$ 568,000
San Carlos	Rehabilitate RW 12/30, Phase II - Construction	AIP	2022	$ 832,500	$ 41,625	$ 50,875	$ 925,000
San Carlos	TWs Reconfiguration & Electrical Upgrades (Design)	AIP	2022	$ 162,000	$ 8,100	$ 9,900	$ 180,000
San Carlos	Levee Assessment	AIP	2023	$ 40,500	$ 2,025	$ 2,475	$ 45,000
San Carlos	TW Reconfiguration & Electrical Upgrades (Const)	AIP	2023	$ 1,335,600	$ 66,780	$ 81,620	$ 1,484,000
San Carlos	Crack Seal, Seal Coat & Restripe Parking Ramps (Design)	AIP	2024	$ 121,500	$ 6,075	$ 7,425	$ 135,000
San Carlos	Crack Seal, Seal Coat & Restripe Parking Ramps (Const)	AIP	2025	$ 855,000	$ 42,750	$ 52,250	$ 950,000
San Carlos	Terminal Building (Design)	AIP	2026	$ 450,000	$ 22,500	$ 27,500	$ 500,000
San Diego International	Construct Terminal Apron	AIP	2021	$ 30,680,000	$ $ -	$ 49,120,000	$ 79,800,000
San Diego International	Residential Sound Attenuation	AIP	2021	$ 11,627,848	$ $ -	$ 2,906,962	$ 14,534,810
San Diego International	VALE - GSE EV Charging Terminal 2	AIP	2021	$ 825,000	$ $ -	$ 275,000	$ 1,100,000
San Diego International	Construct TW ""A""	AIP	2022	$ 34,146,631	$ $ -	$ 11,382,211	$ 45,528,842
San Diego International	Residential Sound Attenuation	AIP	2022	$ 11,901,330	$ $ -	$ 2,975,333	$ 14,876,663
San Diego International	VALE - Install PCAir and 400Hz at 19 Gates	AIP	2022	$ 7,575,000	$ $ -	$ 2,525,000	$ 10,100,000
San Diego International	Construct Remain Overnight (RON) Parking	AIP	2023	$ 13,499,831	$ $ -	$ 4,499,944	$ 17,999,775
San Diego International	Rehabilitate TW ""B""	AIP	2023	$ 35,734,847	$ $ -	$ 11,911,615	$ 47,646,462
San Diego International	Residential Sound Attenuation	AIP	2023	$ 11,627,848	$ $ -	$ 2,906,962	$ 14,534,810
San Diego International	VALE - GSE EV Charging 19 Gates	AIP	2023	$ 641,250	$ $ -	$ 213,750	$ 855,000
San Diego International	Rehabilitate ARFF Station	AIP	2024	$ 7,500,000	$ $ -	$ 2,500,000	$ 10,000,000
San Diego International	Residential Sound Attenuation	AIP	2024	$ 11,901,330	$ $ -	$ 2,975,333	$ 14,876,663
San Diego International	ZEV - Acquire RCC Buses Phase 1	AIP	2024	$ 3,750,000	$ $ -	$ 1,250,000	$ 5,000,000
San Diego International	Construct Terminal Apron Phase 2	AIP	2025	$ 35,734,847	$ $ -	$ 11,911,616	$ 47,646,463
San Diego International	Residential Sound Attenuation	AIP	2025	$ 11,901,330	$ $ -	$ 2,975,333	$ 14,876,663
San Diego International	VALE - GSE EV Charging 11 Gates	AIP	2025	$ 371,250	$ $ -	$ 123,750	$ 495,000
San Diego International	ZEV - Acquire RCC Buses Phase 2	AIP	2025	$ 3,750,000	$ $ -	$ 1,250,000	$ 5,000,000
San Diego International	Construct Northside Apron Improvements	AIP	2026	$ 26,043,750	$ $ -	$ 8,681,250	$ 34,725,000
San Diego International	Part 150 Noise Exposure Map Update	AIP	2026	$ 375,000	$ $ -	$ 125,000	$ 500,000
San Diego International	Residential Sound Attenuation	AIP	2026	$ 11,901,330	$ $ -	$ 2,975,333	$ 14,876,663
San Diego International	VALE - PCAir and 400HZ 11 Gates	AIP	2030	$ 4,500,000	$ $ -	$ 1,500,000	$ 6,000,000
San Francisco International	RW 10L-28R Rehabilitation	AIP	2021	$ 123,300,000	$ $ -	$ 13,700,000	$ 137,000,000
San Francisco International	TW A & B Reconstruction	AIP	2021	$ 36,000,000	$ $ -	$ 4,000,000	$ 40,000,000
San Francisco International	TW F and N Reconstruction	AIP	2021	$ 450,000	$ $ -	$ 50,000	$ 500,000
San Francisco International	TW L Reconstruction	AIP	2021	$ 450,000	$ $ -	$ 50,000	$ 500,000

San Francisco International	TW Z Reconstruction Phase I	AIP	2021	$	450,000	$	$ -	$	50,000	$	500,000
San Francisco International	TW D and T Realignment	AIP	2022	$	34,200,000	$	$ -	$	3,800,000	$	38,000,000
San Francisco International	TW C Reconstruction Phase I	AIP	2023	$	2,018,406	$	$ -	$	224,267	$	2,242,673
San Francisco International	TW C Reconstruction Phase II	AIP	2023	$	450,000	$	$ -	$	50,000	$	500,000
San Francisco International	TW E & J Realignment	AIP	2023	$	450,000	$	$ -	$	50,000	$	500,000
San Francisco International	TW Z Reconstruction Phase II	AIP	2023	$	450,000	$	$ -	$	50,000	$	500,000
San Gabriel Valley (El Monte)	Replace Perimeter Fencing- [RSAT]	AIP	2022	$	225,000	$	11,250	$	13,750	$	250,000
San Gabriel Valley (El Monte)	Pvmt Repairs & Maintenance - Crack Sealing/Patching	AIP	2023	$	45,000	$	2,250	$	2,750	$	50,000
San Gabriel Valley (El Monte)	RW & TW Reconstruction - [Design]	AIP	2024	$	540,000	$	27,000	$	33,000	$	600,000
San Gabriel Valley (El Monte)	Airport Land Use Compatibility Plan [ALUCP]	A&D	2026	$	-	$	270,000	$	30,000	$	300,000
San Gabriel Valley (El Monte)	RW & TW Reconstruction - [Construction]	AIP	2027	$	7,200,000	$	360,000	$	440,000	$	8,000,000
San Luis Obispo County Regional	Acquire Aircraft Rescue and Fire Fighting Vehicle	AIP	2021	$	1,080,000	$	$ -	$	120,000	$	1,200,000
San Luis Obispo County Regional	Master Plan	AIP	2021	$	360,000	$	$ -	$	40,000	$	400,000
San Luis Obispo County Regional	Rehabilitate RW 11-29 Phase 2 (Construction)	AIP	2021	$	12,016,625	$	$ -	$	1,335,181	$	13,351,805
San Luis Obispo County Regional	Rehabilitate Apron	AIP	2022	$	859,410	$	$ -	$	95,490	$	954,900
San Luis Obispo County Regional	Rehabilitate RW Electrical Vault	AIP	2022	$	1,080,000	$	$ -	$	120,000	$	1,200,000
San Luis Obispo County Regional	Conduct/Update Miscellaneous Study (Conduct Drainage Study)	AIP	2023	$	281,700	$	$ -	$	31,300	$	313,000
San Luis Obispo County Regional	Reconstruct TWs A (West) & L; Construct Site N Connector	AIP	2024	$	3,530,610	$	$ -	$	392,290	$	3,922,900
San Luis Obispo County Regional	Reconstruct TWs A, E, And C (South)	AIP	2024	$	4,514,040	$	$ -	$	501,560	$	5,015,600
San Luis Obispo County Regional	Reconstruct TWs A & H	AIP	2025	$	3,453,480	$	$ -	$	383,720	$	3,837,200
San Luis Obispo County Regional	Reconstruct TW a (East, & C (north), RW 11 bypass TW	AIP	2026	$	5,136,840	$	$ -	$	570,760	$	5,707,600
San Martin	Design Parking Ramp Rehabilitation	AIP	2021	$	135,000	$	6,750	$	8,250	$	150,000
San Martin	Prepare Pavement Management System	AIP	2021	$	36,000	$	1,800	$	2,200	$	40,000
San Martin	ALP update with Narrative & AGIS	AIP	2022	$	225,000	$	11,250	$	13,750	$	250,000
San Martin	Construction of Perimeter Fencing	AIP	2022	$	360,000	$	18,000	$	22,000	$	400,000
San Martin	Perform Parking Ramp Rehabilitation	AIP	2022	$	675,000	$	33,750	$	41,250	$	750,000
San Martin	Prepare Design & bid Docs for Const. of Access Rd	AIP	2022	$	63,000	$	3,150	$	3,850	$	70,000
San Martin	Const. Access Rd Between Transient Apron & Hanger	AIP	2023	$	585,000	$	29,250	$	35,750	$	650,000
San Martin	Install backup Generator for RW Lighting & Fire Protect.	AIP	2023	$	99,000	$	4,950	$	6,050	$	110,000
San Martin	Prep Des & Bid Documents for Const. of Security Fence	AIP	2024	$	99,000	$	4,950	$	6,050	$	110,000
San Martin	AWOS	AIP	2025	$	270,000	$	13,500	$	16,500	$	300,000
San Martin	Construct Security Fencing	AIP	2025	$	1,800,000	$	90,000	$	110,000	$	2,000,000
San Martin	Envir. Assessment for Property Acquisition to Protect Approach	AIP	2029	$	90,000	$	4,500	$	5,500	$	100,000
San Martin	Prepare Design & Bid Documents for RW Extension	AIP	2030	$	315,000	$	15,750	$	19,250	$	350,000
San Martin	Property Acquisition for Safety Zones/Encroachment	AIP	2030	$	2,700,000	$	135,000	$	165,000	$	3,000,000
Santa Barbara Municipal	Marking, Signage, and Lighting Plan Update	AIP	2022	$	360,000	$	$ -	$	40,000	$	400,000
Santa Barbara Municipal	Master Plan Update	AIP	2022	$	243,000	$	$ -	$	27,000	$	270,000
Santa Barbara Municipal	Northeast Pavement Rehabilitation	AIP	2022	$	747,869	$	$ -	$	83,097	$	830,965
Santa Barbara Municipal	TW H Environmental Assessment	AIP	2022	$	135,000	$	$ -	$	15,000	$	150,000

Santa Barbara Municipal	Marking, Signage & Lighting Plan	AIP	2023	$ 4,943,700	$ -	$ 549,300	$ 5,493,000
Santa Barbara Municipal	TW H Extension	AIP	2024	$ 3,432,600	$ -	$ 381,400	$ 3,814,000
Santa Barbara Municipal	TW H Reimbursable Agt.	AIP	2024	$ 270,000	$ -	$ 30,000	$ 300,000
Santa Barbara Municipal	South Terminal Apron	AIP	2025	$ 3,078,000	$ -	$ 342,000	$ 3,420,000
Santa Barbara Municipal	TW H Extension	AIP	2026	$ 11,642,400	$ -	$ 1,293,600	$ 12,936,000
Santa Maria Public	Rehab. TW A, A6-A8, S & T, U, V, and W	AIP	2021	$ 6,750,000	$ -	$ 750,000	$ 7,500,000
Santa Maria Public	Rehabilitate RW 12-30	AIP	2022	$ 6,120,000	$ -	$ 680,000	$ 6,800,000
Santa Maria Public	Safety Improvements: Guidance Sign Upgrades	AIP	2023	$ 315,000	$ -	$ 35,000	$ 350,000
Santa Maria Public	Safety Improvements: TW Safety Area Grading	AIP	2023	$ 1,395,000	$ -	$ 155,000	$ 1,550,000
Santa Maria Public	Rehab. TW A from A2 to A6, including TW connectors	AIP	2024	$ 6,660,000	$ -	$ 740,000	$ 7,400,000
Santa Maria Public	Rehabilitate terminal apron, Ph 3	AIP	2025	$ 3,780,000	$ -	$ 420,000	$ 4,200,000
Santa Maria Public	Environmental Assessment (EA) to Extend TW B	AIP	2026	$ 495,000	$ -	$ 55,000	$ 550,000
Santa Maria Public	Rehabilitate TWs E and H	AIP	2027	$ 3,780,000	$ -	$ 420,000	$ 4,200,000
Santa Maria Public	Extend TW B south from TW E to TW B7	AIP	2028	$ 3,780,000	$ -	$ 420,000	$ 4,200,000
Santa Maria Public	Rehabilitate Main Hangar Apron (Design)	AIP	2029	$ 315,000	$ -	$ 35,000	$ 350,000
Santa Maria Public	Rehabilitate Main Hangar Apron (Construction)	AIP	2030	$ 4,815,000	$ -	$ 535,000	$ 5,350,000
Santa Ynez	Mid-field Security Enhancements, Apron Reconst. (Con)	AIP	2021	$ 1,620,000	$ 81,000	$ 99,000	$ 1,800,000
Santa Ynez	Pavement Rehabilitation, RW, Aprons and Taxilanes	AIP	2023	$ 2,790,000	$ 139,500	$ 170,500	$ 3,100,000
Santa Ynez	Pole-mounted Apron Lighting	AIP	2026	$ 252,000	$ 12,600	$ 15,400	$ 280,000
Santa Ynez	Fuel Facility Upgrades	AIP	2027	$ 1,980,000	$ 99,000	$ 121,000	$ 2,200,000
Santa Ynez	Airport Perimeter Security Upgrades	AIP	2029	$ 495,000	$ 24,750	$ 30,250	$ 550,000
Santa Ynez	Rehabilitate Airfield Pavements, Various Locations	AIP	2030	$ 675,000	$ 33,750	$ 41,250	$ 750,000
Scott Valley - Bud Davis Field	ALP and Master Plan Update with Aeronautical Survey	A&D	2022	$ -	$ 315,000	$ 35,000	$ 350,000
Scott Valley - Bud Davis Field	PMMP Update	A&D	2024	$ -	$ 90,000	$ 10,000	$ 100,000
Sequoia Field	RW 13-31 & Exits A, C, & E Rehabilitation (Design)	AIP	2022	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Sequoia Field	RW 13-31 & Exits A, C, & E Rehabilitation (Construction)	AIP	2023	$ 315,000	$ 15,750	$ 19,250	$ 350,000
Sequoia Field	Parallel TW Rehabilitation (Design)	AIP	2024	$ 18,000	$ 900	$ 1,100	$ 20,000
Sequoia Field	Parallel TW Rehabilitation (Construction)	AIP	2025	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Sequoia Field	Apron & Taxilane Rehabilitation (Design)	AIP	2026	$ 36,000	$ 1,800	$ 2,200	$ 40,000
Sequoia Field	Apron & Taxilane Rehabilitation (Construction)	AIP	2027	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Sequoia Field	12000 Gal. AVGAS Fuel Island (Design)	AIP	2028	$ 27,000	$ 1,350	$ 1,650	$ 30,000
Sequoia Field	12000 Gal. AVGAS Fuel Island (Construction)	AIP	2029	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Sequoia Field	16 Unit Nested T-Hangar Building (Design)	AIP	2030	$ 81,000	$ 4,050	$ 4,950	$ 90,000
Shafter - Minter Field	Study for Airfield Pvmt Management System (APMS)	AIP	2021	$ 63,000	$ 3,150	$ 3,850	$ 70,000
Shafter - Minter Field	Des (Reimb.) & Const of Apron Pavement Rehab	AIP	2022	$ 337,500	$ 16,875	$ 20,625	$ 375,000
Shafter - Minter Field	Design (Reimbursement) and Construction of TWs Rehab	AIP	2022	$ 783,000	$ 39,150	$ 47,850	$ 870,000
Shafter - Minter Field	Construction of Aircraft Parking Reconstruction Ph I	AIP	2023	$ 1,332,000	$ 66,600	$ 81,400	$ 1,480,000
Shafter - Minter Field	Construction of Aircraft Parking Reconstruction Ph II	AIP	2024	$ 1,372,500	$ 68,625	$ 83,875	$ 1,525,000
Shafter - Minter Field	Construction of Central Apron Pavement Rehab.	AIP	2029	$ 1,215,000	$ 60,750	$ 74,250	$ 1,350,000

Shafter - Minter Field	Environmental Assessment and RW 12-30 Extension	AIP	2030	$	1,170,000	$	58,500	$	71,500	$	1,300,000
Shelter Cove	Improve Drainage Planning South and Central Areas	A&D	2021	$	-	$	225,000	$	25,000	$	250,000
Shelter Cove	Improve Drainage Construction South Area	A&D	2022	$	-	$	202,500	$	22,500	$	225,000
Shelter Cove	Hangers Feasibility Study	A&D	2023	$	-	$	36,000	$	4,000	$	40,000
Shelter Cove	Improve Drainage Construction Central Area	A&D	2023	$	-	$	192,713	$	21,413	$	214,125
Shelter Cove	Tiedown Area Paving Planning South and North	A&D	2023	$	-	$	36,000	$	4,000	$	40,000
Shelter Cove	Pilots Lounge	A&D	2024	$	-	$	72,000	$	8,000	$	80,000
Shelter Cove	South Tiedown Area Paving Construction	AIP	2024	$	576,000	$	28,800	$	35,200	$	640,000
Shelter Cove	Outside Public Restroom	A&D	2025	$	-	$	63,000	$	7,000	$	70,000
Shelter Cove	North Tiedown Area Paving Construction	AIP	2026	$	288,000	$	14,400	$	17,600	$	320,000
Shelter Cove	TW Realignment Planning	A&D	2027	$	-	$	225,000	$	25,000	$	250,000
Shelter Cove	TW Realignment Construction	AIP	2028	$	855,000	$	42,750	$	52,250	$	950,000
Shelter Cove	10 Space Pilot's Parking Lot Planning and Design	A&D	2029	$	-	$	27,000	$	3,000	$	30,000
Shelter Cove	10 Space Pilot's Parking Lot Construction	A&D	2030	$	-	$	90,000	$	10,000	$	100,000
Shoshone	Replace RW Lighting Control System	A&D	2021	$	-	$	31,500	$	3,500	$	35,000
Shoshone	Replace Segmented Circle	A&D	2022	$	-	$	29,700	$	3,300	$	33,000
Shoshone	Reconstruct RW 15-33	A&D	2028	$	-	$	675,000	$	75,000	$	750,000
Siskiyou County	ALP Master Plan Update with Aeronautical Survey	A&D	2022	$	-	$	315,000	$	35,000	$	350,000
Siskiyou County	PMMP Update	A&D	2024	$	-	$	90,000	$	10,000	$	100,000
Siskiyou County	Pavement Improvements (Phase 1 - Design)	A&D	2026	$	-	$	135,000	$	15,000	$	150,000
Southard Field	Segmented Circle Repair	A&D	2021	$	-	$	27,000	$	3,000	$	30,000
Southard Field	Pvmt Maintenance & Remarking RW, TW & Tiedown	A&D	2022	$	-	$	135,000	$	15,000	$	150,000
Spaulding	Pant Maintenance & Remarking RW, TW & Tiedown	A&D	2022	$	-	$	108,000	$	12,000	$	120,000
Spaulding	Des & Relocate Beacon & Reconst. Segmented Circle	A&D	2023	$	-	$	90,000	$	10,000	$	100,000
Susanville Municipal	TW Rehabilitation Phase I, Bid Alt I - Construction	AIP	2021	$	891,000	$	44,550	$	54,450	$	990,000
Susanville Municipal	TW Rehabilitation, Phase I - Construction	AIP	2021	$	666,000	$	33,300	$	40,700	$	740,000
Susanville Municipal	Perimeter Fence - Design	AIP	2022	$	108,000	$	5,400	$	6,600	$	120,000
Susanville Municipal	TW Rehabilitation, Phase II - Construction	AIP	2022	$	234,900	$	11,745	$	14,355	$	261,000
Susanville Municipal	Pavement Maintenance Management Plan	AIP	2023	$	135,000	$	6,750	$	8,250	$	150,000
Susanville Municipal	Perimeter Fence - Construction	AIP	2023	$	382,500	$	19,125	$	23,375	$	425,000
Susanville Municipal	Apron Reconstruction, Phase II - Construction	AIP	2024	$	1,012,500	$	50,625	$	61,875	$	1,125,000
Susanville Municipal	RW Sealcoat - Design	AIP	2025	$	67,500	$	3,375	$	4,125	$	75,000
Susanville Municipal	RW Sealcoat - Construction	AIP	2026	$	225,000	$	11,250	$	13,750	$	250,000
Taft	Airport Relocation Study	AIP	2021	$	180,000	$	9,000	$	11,000	$	200,000
Taft	Rehabilitate Rny, Txy and Parking Ramp	A&D	2021	$	-	$	225,000	$	25,000	$	250,000
Taft	Conduct Master Plan on Proposed New Site	AIP	2022	$	180,000	$	9,000	$	11,000	$	200,000
Taft	EA for New Location	AIP	2023	$	180,000	$	9,000	$	11,000	$	200,000
Taft	Design New Location	AIP	2024	$	472,500	$	23,625	$	28,875	$	525,000
Tehachapi Municipal	Airport Land Use Compatibility Plan	A&D	2021	$	-	$	162,000	$	18,000	$	180,000

Tehachapi Municipal	Rehabilitate south parallel and connecting TWs	AIP	2021	$ 4,320,000	$ 216,000	$ 264,000	$ 4,800,000
Tehachapi Municipal	Rehabilitate RW 11-29	AIP	2022	$ 1,710,000	$ 85,500	$ 104,500	$ 1,900,000
Tehachapi Municipal	Rehabilitate southwest hangar taxilane	AIP	2023	$ 765,000	$ 38,250	$ 46,750	$ 850,000
Tehachapi Municipal	Remove and replace fuel facility	AIP	2024	$ 810,000	$ 40,500	$ 49,500	$ 900,000
Tehachapi Municipal	Land Acquisition. Acquire 0.3 Acres	AIP	2025	$ 243,000	$ 12,150	$ 14,850	$ 270,000
Tehachapi Municipal	Environmental Assessment (EA): North side parallel TW	AIP	2026	$ 270,000	$ 13,500	$ 16,500	$ 300,000
Tehachapi Municipal	North-Side Parallel TW, Phase 1	AIP	2028	$ 1,890,000	$ 94,500	$ 115,500	$ 2,100,000
Tehachapi Municipal	Rehabilitate aprons	AIP	2029	$ 2,520,000	$ 126,000	$ 154,000	$ 2,800,000
Tehachapi Municipal	Rehabilitate mid-field taxilanes	AIP	2030	$ 1,170,000	$ 58,500	$ 71,500	$ 1,300,000
Tracy Municipal	Construct Helicopter Parking Area	AIP	2022	$ 843,750	$ 42,188	$ 51,563	$ 937,500
Tracy Municipal	Perimeter Fencing (800 LF)	AIP	2022	$ 102,870	$ 5,144	$ 6,287	$ 114,300
Tracy Municipal	Medium Intensity TW Edge Lights TWs A, B, D, and E	AIP	2023	$ 1,260,000	$ 63,000	$ 77,000	$ 1,400,000
Tracy Municipal	Fuel Island and Fuel Farm Expansion	AIP	2024	$ 900,000	$ 45,000	$ 55,000	$ 1,000,000
Tracy Municipal	Engineering Design - Taxilanes and Access Road	AIP	2025	$ 252,000	$ 12,600	$ 15,400	$ 280,000
Tracy Municipal	Construct: Tee Hangar Taxilanes	AIP	2026	$ 596,700	$ 29,835	$ 36,465	$ 663,000
Tracy Municipal	Construct:Corporate Hangar Taxilanes and Access Rd	AIP	2027	$ 1,101,150	$ 55,058	$ 67,293	$ 1,223,500
Tracy Municipal	ALP Update	AIP	2030	$ 144,000	$ 7,200	$ 8,800	$ 160,000
Tracy Municipal	Pavement Maintenance Management Plan (PMMP)	AIP	2030	$ 108,000	$ 5,400	$ 6,600	$ 120,000
Truckee-Tahoe	Design: Reconstruct Existing RW 2-20, including RW	AIP	2021	$ 369,450	$ 18,473	$ 22,578	$ 410,500
Truckee-Tahoe	Construct: Reconstruct Existing RW 2-20	AIP	2023	$ 4,605,300	$ 230,265	$ 281,435	$ 5,117,000
Truckee-Tahoe	Design/Const: Replace VASI w/ New 4-box PAPI RW 20	AIP	2024	$ 93,600	$ 4,680	$ 5,720	$ 104,000
Truckee-Tahoe	Design/Const.: Relocate TW G & Extend Associated	AIP	2025	$ 5,347,800	$ 267,390	$ 326,810	$ 5,942,000
Truckee-Tahoe	Design/Construct: RW 11-29 (East) - 100' x 2,200' - Cra	AIP	2026	$ 323,100	$ 16,155	$ 19,745	$ 359,000
Truckee-Tahoe	Design/Construct: Reconstruct Apron A2	AIP	2027	$ 2,073,600	$ 103,680	$ 126,720	$ 2,304,000
Truckee-Tahoe	Design/Construct: Reconstruct Apron A1	AIP	2028	$ 2,211,840	$ 110,592	$ 135,168	$ 2,457,600
Truckee-Tahoe	Airport Layout Plan Narrative with Updated Layout Pl	AIP	2029	$ 225,000	$ 11,250	$ 13,750	$ 250,000
Truckee-Tahoe	Design/Construct New Apron F4	AIP	2029	$ 2,508,300	$ 125,415	$ 153,285	$ 2,787,000
Truckee-Tahoe	Design/Construct: Const. New Aircraft Control Tower	AIP	2030	$ 9,315,000	$ 465,750	$ 569,250	$ 10,350,000
Truckee-Tahoe	Pavement Maintenance Management Plan (PMMP)	AIP	2030	$ 108,000	$ 5,400	$ 6,600	$ 120,000
Tulelake	Design/Const: Const of 8-foot Habitat/Security Fence	AIP	2022	$ 810,000	$ 40,500	$ 49,500	$ 900,000
Tulelake	Pavement Maintenance Management Plan	AIP	2022	$ 81,000	$ 4,050	$ 4,950	$ 90,000
Tulelake	Des: New AWOS, Seg. Circle & Lighted Wind Cone	AIP	2023	$ 50,400	$ 2,520	$ 3,080	$ 56,000
Tulelake	Construct: New AWOS A-V	AIP	2024	$ 271,800	$ 13,590	$ 16,610	$ 302,000
Tulelake	Construct: Segmented Circle & Lighted Wind Cone	AIP	2024	$ 198,900	$ 9,945	$ 12,155	$ 221,000
Tulelake	Design: Extend TW A to Full Length of RW 11-29	AIP	2025	$ 193,500	$ 9,675	$ 11,825	$ 215,000
Tulelake	Construct: Extend TW A to Full Length of RW 11-29	AIP	2026	$ 2,034,900	$ 101,745	$ 124,355	$ 2,261,000
Tulelake	Des/Const: Const New Tee Hangar Site Include Taxilane	AIP	2027	$ 1,296,000	$ 64,800	$ 79,200	$ 1,440,000
Tulelake	Design/Construct: 10-Unit Tee Hangar Building	AIP	2028	$ 891,000	$ 44,550	$ 54,450	$ 990,000
Tulelake	ALP Update Narrative and Plans	AIP	2030	$ 144,000	$ 7,200	$ 8,800	$ 160,000

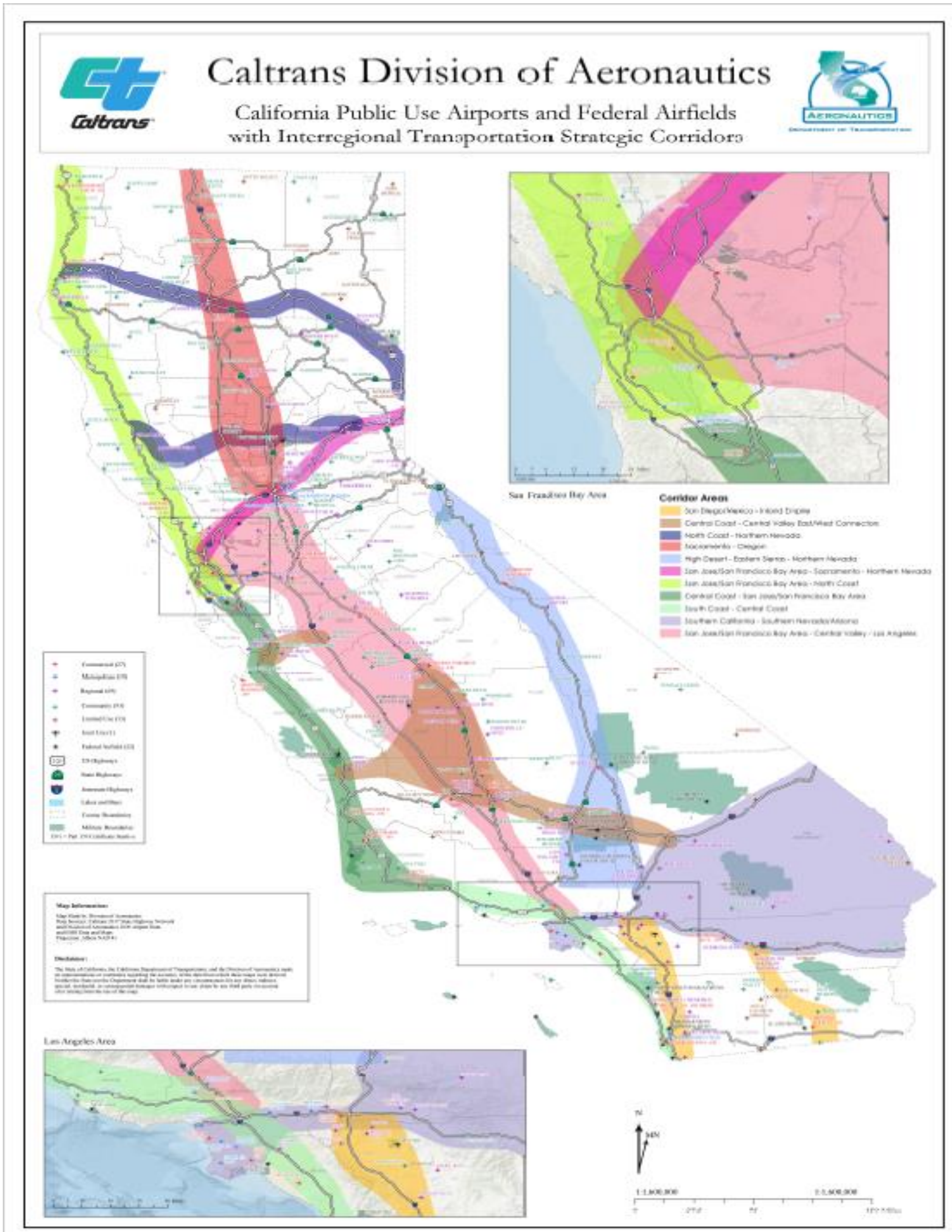
Turlock Municipal	Apron A1, Wind Indicator & Segmented Circle - Design	AIP	2022	$	172,500	$	8,625	$	10,542	$	191,667
Turlock Municipal	Update Master Plan	AIP	2022	$	180,000	$	9,000	$	11,000	$	200,000
Turlock Municipal	Widen RW, RSA & Infrastructure Improvements	AIP	2022	$	2,777,249	$	138,862	$	169,721	$	3,085,832
Turlock Municipal	Apron A1; Wind Indicator & Segmented Circle Const	AIP	2023	$	672,750	$	33,638	$	41,113	$	747,500
Turlock Municipal	Extend Parallel Taxi A;3 new RW/TW - Design	AIP	2024	$	163,013	$	8,151	$	9,962	$	181,125
Turlock Municipal	Extend Parallel TW A; Const 3 new RY/TW connectors	AIP	2025	$	776,250	$	38,813	$	47,438	$	862,500
Twentynine Palms	Safety Area Improvements Airfield Drainage Study	AIP	2022	$	54,000	$	2,700	$	3,300	$	60,000
Twentynine Palms	Safety Area Improvements - Design	AIP	2023	$	82,800	$	4,140	$	5,060	$	92,000
Twentynine Palms	Safety Area Improvements - Construction	AIP	2024	$	585,000	$	29,250	$	35,750	$	650,000
Twentynine Palms	ALUCP Update	A&D	2025	$	-	$	54,000	$	6,000	$	60,000
Twentynine Palms	Narrative ALP Update	AIP	2026	$	171,000	$	8,550	$	10,450	$	190,000
Twentynine Palms	Safety Signs & Markings Update	A&D	2027	$	-	$	31,500	$	3,500	$	35,000
Twentynine Palms	RW Rehabilitation & Striping	AIP	2030	$	90,000	$	4,500	$	5,500	$	100,000
Ukiah Municipal	Install RW 15 PAPI & REILs on both ends of R/W 15-33	AIP	2022	$	585,000	$	29,250	$	35,750	$	650,000
Ukiah Municipal	R/W 15-33 Install LED MIRL & Threshold Lights (Cnst Ph 2)	AIP	2022	$	2,335,730	$	116,786	$	142,739	$	2,595,255
Ukiah Municipal	New TW A4 - Design	AIP	2024	$	69,201	$	3,460	$	4,229	$	76,890
Ukiah Municipal	Pvmt Rehab of T/W A, A3, A5 - Design	AIP	2024	$	112,500	$	5,625	$	6,875	$	125,000
Ukiah Municipal	New TW A4 - Construction	AIP	2026	$	654,570	$	32,729	$	40,002	$	727,300
Ukiah Municipal	Pvmt Rehab of T/W A, A3, A5 - Construction	AIP	2026	$	1,699,314	$	84,966	$	103,847	$	1,888,127
University	Design/Construct- Rotating Beacon & Beacon Tower	AIP	2021	$	219,150	$	10,958	$	13,393	$	243,500
University	Pavement Maintenance Management Plan (PMMP)	AIP	2021	$	97,200	$	4,860	$	5,940	$	108,000
University	Reimbursable Agreement RW 35 VASI/PAPI	AIP	2021	$	137,803	$	6,890	$	8,421	$	153,114
University	Rehab & Widen RW 17-35, RSA Improvement, Lighting	AIP	2022	$	4,656,600	$	232,830	$	284,570	$	5,174,000
University	Rehab TW A, Cross TWs, Dia TW, New TW Connector Des.	AIP	2024	$	306,619	$	15,331	$	18,738	$	340,688
University	Rehab TW A, Cross TWs, Dia TW, New TW Connector Con.	AIP	2025	$	1,777,500	$	88,875	$	108,625	$	1,975,000
University	Rehab W. Apron & Fueling Apron, New Aprn Flood Light (Design)	AIP	2027	$	496,490	$	24,824	$	30,341	$	551,655
University	Rehab W. Apron & Fueling Apron, New Apron Flood Light (Const)	AIP	2028	$	2,878,200	$	143,910	$	175,890	$	3,198,000
University	ALP Update Narrative and Plans	AIP	2029	$	144,000	$	7,200	$	8,800	$	160,000
Van Nuys	RW 16L/34R Reconstr & RW 16R/34L Slurry-Restriping	AIP	2021	$	16,657,731	$	832,887	$	1,017,972	$	18,508,590
Van Nuys	Reconstruct Taxilane A4	AIP	2022	$	12,150,000	$	607,500	$	742,500	$	13,500,000
Van Nuys	Reconstruct TW H	AIP	2022	$	1,080,000	$	54,000	$	66,000	$	1,200,000
Van Nuys	Reconstruct VSR (TW A4 to Tunnel)	AIP	2022	$	1,440,000	$	72,000	$	88,000	$	1,600,000
Van Nuys	Reconstruct Taxilane B1	AIP	2023	$	9,450,000	$	472,500	$	577,500	$	10,500,000
Van Nuys	Reconstruct VSR (Tunnel West - East)	AIP	2024	$	3,600,000	$	180,000	$	220,000	$	4,000,000
Van Nuys	Rehabilitate TWs P, Q, R & Run-up Area	AIP	2024	$	5,040,000	$	252,000	$	308,000	$	5,600,000
Van Nuys	Reconstruct TWs E, F (East segment) & Txln B3	AIP	2025	$	5,670,000	$	283,500	$	346,500	$	6,300,000
Van Nuys	Reconstruct VSR (TW B1 to Tunnel)	AIP	2025	$	3,600,000	$	180,000	$	220,000	$	4,000,000
Van Nuys	Reconstr TW C, Rehab TW D, F (west & center segments)	AIP	2026	$	5,400,000	$	270,000	$	330,000	$	6,000,000
Van Nuys	Reconstruct VSR (TW A2 to TW B1)	AIP	2026	$	2,250,000	$	112,500	$	137,500	$	2,500,000

Visalia Municipal	Airport Layout Plan Update	AIP	2021	$	144,000	$	7,200	$	8,800	$	160,000
Visalia Municipal	PMMP	AIP	2022	$	135,000	$	6,750	$	8,250	$	150,000
Visalia Municipal	Equipment- FOD Sweeper	AIP	2023	$	135,000	$	6,750	$	8,250	$	150,000
Visalia Municipal	Reconstruct TWs A & B and Tiedown Apron	AIP	2024	$	298,800	$	14,940	$	18,260	$	332,000
Visalia Municipal	Reconstruct TWs A & B and Tiedown Apron	AIP	2025	$	2,380,500	$	119,025	$	145,475	$	2,645,000
Visalia Municipal	Design - Reconstruct Hangar lane H1 & H2	AIP	2026	$	144,000	$	7,200	$	8,800	$	160,000
Visalia Municipal	Reconstruct Hangar Rows H1 & H2	AIP	2027	$	1,178,100	$	58,905	$	71,995	$	1,309,000
Visalia Municipal	Design- Remove and Replace AC on West Cargo Aprn	AIP	2028	$	195,300	$	9,765	$	11,935	$	217,000
Visalia Municipal	Replace AC West Cargo Apron & Reseal Apron A1	AIP	2029	$	1,485,000	$	74,250	$	90,750	$	1,650,000
Ward Field	Perimeter Fencing	A&D	2022	$	-	$	67,500	$	7,500	$	75,000
Ward Field	RW Rehabilitation - Phase 1 (Design)	A&D	2024	$	-	$	67,500	$	7,500	$	75,000
Ward Field	RW Rehabilitation - Phase 2 (Construction)	A&D	2026	$	-	$	315,000	$	35,000	$	350,000
Ward Field	Obstruction Removal - Phase 1 (Design)	A&D	2028	$	-	$	45,000	$	5,000	$	50,000
Ward Field	Obstruction Removal - Phase 2 (Construction)	A&D	2030	$	-	$	315,000	$	35,000	$	350,000
Watsonville Municipal	Engineering Design & Permitting - Rehabilitate Apron A7	AIP	2023	$	423,000	$	21,150	$	25,850	$	470,000
Watsonville Municipal	Construct - Rehab Apron A7 & Rehabilitate Drainage	AIP	2025	$	4,097,700	$	204,885	$	250,415	$	4,553,000
Watsonville Municipal	EA- RW 2 Complex Extension	AIP	2026	$	540,000	$	27,000	$	33,000	$	600,000
Watsonville Municipal	Eng. Design RW 2 Complex Extension/ Reconst. RW 2-20	AIP	2028	$	882,000	$	44,100	$	53,900	$	980,000
Watsonville Municipal	RW 2 Complex Extension, Reconstruct RW 2-20 (Const)	AIP	2029	$	9,262,170	$	463,109	$	566,022	$	10,291,300
Watsonville Municipal	Airport Layout Plan Narrative with Updated Layout	AIP	2030	$	144,000	$	7,200	$	8,800	$	160,000
Watsonville Municipal	Pavement Maintenance Management Plan (PMMP)	AIP	2030	$	90,000	$	4,500	$	5,500	$	100,000
Weed	ALP Update (Pen and Ink)	A&D	2021	$	-	$	4,500	$	500	$	5,000
Weed	TW West Rehabilitation (Phase 1 - Design)	A&D	2021	$	-	$	135,000	$	15,000	$	150,000
Weed	TW/Apron Rehabilitation (Phase 1 - Design)	A&D	2021	$	-	$	333,000	$	37,000	$	370,000
Weed	ALP and Master Plan Update with Aeronautical Survey	A&D	2022	$	-	$	315,000	$	35,000	$	350,000
Weed	TW West Rehabilitation (Phase Construction)	A&D	2022	$	-	$	1,161,000	$	129,000	$	1,290,000
Weed	TW/Apron Rehabilitation (Phase Construction)	A&D	2023	$	-	$	3,339,000	$	371,000	$	3,710,000
Weed	PMMP Update	A&D	2024	$	-	$	90,000	$	10,000	$	100,000
Weed	Airfield Electrical (Phase 1 - Design)	A&D	2025	$	-	$	67,500	$	7,500	$	75,000
Weed	Airfield Electrical (Phase Construction)	LFP	2026	$	-	$	$ -	$	500,000	$	500,000
Westover Field Amador County	Upgrade MIRL/MITL with LED lighting	AIP	2021	$	135,000	$	6,750	$	8,250	$	150,000
Westover Field Amador County	Wildlife Mitigation Fence (Design Only)	AIP	2022	$	157,500	$	7,875	$	9,625	$	175,000
Westover Field Amador County	RW and TW Pavement Rehabilitation (Design)	AIP	2023	$	135,000	$	6,750	$	8,250	$	150,000
Westover Field Amador County	Wildlife Mitigation Fence (Construction)	AIP	2024	$	1,440,000	$	72,000	$	88,000	$	1,600,000
Westover Field Amador County	RW Pavement Rehabilitation (Construction)	AIP	2025	$	382,500	$	19,125	$	23,375	$	425,000
Westover Field Amador County	Rehab TW A - (16,000 SY)	AIP	2026	$	337,500	$	16,875	$	20,625	$	375,000
Westover Field Amador County	Airfield Drainage Study	AIP	2027	$	112,500	$	5,625	$	6,875	$	125,000
Westover Field Amador County	Construct Public Restrooms (Construction)	A&D	2027	$	-	$	54,000	$	6,000	$	60,000
Westover Field Amador County	EA for Drainage Improvements	AIP	2028	$	202,500	$	10,125	$	12,375	$	225,000

Westover Field Amador County	Airport Drainage and Retention Pond (Design)	AIP	2029	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Westover Field Amador County	Airport Drainage & Retention Pond (Construction)	AIP	2030	$ 540,000	$ 27,000	$ 33,000	$ 600,000
Westover Field Amador County	Construct Thirty (30) Hangars (Design Only)	A&D	2030	$ -	$ 900,000	$ 100,000	$ 1,000,000
Westover Field Amador County	East/West and north/south txwys, Access Rd & Security lights	AIP	2030	$ 72,000	$ 3,600	$ 4,400	$ 80,000
Westover Field Amador County	East/West and north/south txwys, Access Rd & Security lights	AIP	2030	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Westover Field Amador County	Expand Apron and Security Lighting (Construction)	AIP	2030	$ 157,500	$ 7,875	$ 9,625	$ 175,000
Westover Field Amador County	Expand Apron and Security Lighting (Design)	AIP	2030	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Westover Field Amador County	Hangar #1 Reconstruction/Replacement	A&D	2030	$ -	$ 67,500	$ 7,500	$ 75,000
Westover Field Amador County	Hangar One Reconstruction (Bid/Award & Const.)	A&D	2030	$ -	$ 450,000	$ 50,000	$ 500,000
Westover Field Amador County	Land Acquisition	AIP	2030	$ 900,000	$ 45,000	$ 55,000	$ 1,000,000
Westover Field Amador County	Master Plan Update with ALUCP update	A&D	2030	$ -	$ 90,000	$ 10,000	$ 100,000
Westover Field Amador County	Pavement Overlay-Hangar Area (Construction)	AIP	2030	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Westover Field Amador County	Pavement Overlay-Hangar Area (Design)	AIP	2030	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Westover Field Amador County	Reconstruct Terminal Building (Design)	A&D	2030	$ -	$ 67,500	$ 7,500	$ 75,000
Westover Field Amador County	Reconstruction Terminal Building (Construction)	A&D	2030	$ -	$ 270,000	$ 30,000	$ 300,000
Westover Field Amador County	Update AWOS III	AIP	2030	$ 135,000	$ 6,750	$ 8,250	$ 150,000
Westover Field Amador County	Water System/Fire Hydrant Extension (Construction)	A&D	2030	$ -	$ 270,000	$ 30,000	$ 300,000
Westover Field Amador County	Water System/Fire Hydrant Extension (Design)	A&D	2030	$ -	$ 36,000	$ 4,000	$ 40,000
Whiteman	Conduct Obstruction Survey	AIP	2021	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Whiteman	Master Plan Update	AIP	2021	$ 1,350,000	$ 67,500	$ 82,500	$ 1,500,000
Whiteman	Pvmt. Repairs & Maintenance - Crack Sealing/Patching	AIP	2023	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Whiteman	Reconfigure Entrance Road & Construct RW 30 Hold	AIP	2024	$ 360,000	$ 18,000	$ 22,000	$ 400,000
Whiteman	Enhance Blast Protection & Stripe Vehicle Zipper Lane	AIP	2025	$ 450,000	$ 22,500	$ 27,500	$ 500,000
Whiteman	Relocate RW Thresholds and Approach Markings [MP]	AIP	2025	$ 720,000	$ 36,000	$ 44,000	$ 800,000
Whiteman	Pvmt Repairs & Maintenance - Crack Sealing/Patching	AIP	2026	$ 45,000	$ 2,250	$ 2,750	$ 50,000
Whiteman	Reconfigure Entrance Road & Construct RW 30 Hold	AIP	2026	$ 2,880,000	$ 144,000	$ 176,000	$ 3,200,000
Whiteman	Airport Land Use Compatibility Plan (ALUCP)	A&D	2027	$ -	$ 270,000	$ 30,000	$ 300,000
Whiteman	Survey Underground Utilities - Develop Utility Map	AIP	2027	$ 432,000	$ 24,000	$ 24,000	$ 480,000
Whiteman	Exit TWs (MP)	AIP	2028	$ 687,600	$ 30,000	$ 46,400	$ 764,000
Whiteman	Acquire 10.8 Acres in Avigation Easements	AIP	2029	$ 364,500	$ 18,225	$ 22,275	$ 405,000
Whiteman	Construct Non-Airworthy Aircraft Parking Area	AIP	2029	$ 529,720	$ 13,243	$ 14,637	$ 557,600
Willits Municipal	North Apron Area Reconstruction - Design	AIP	2021	$ 54,000	$ 2,700	$ 3,300	$ 60,000
Willits Municipal	South Apron Area Seal Coat - Design	AIP	2021	$ 54,000	$ 2,700	$ 3,300	$ 60,000
Willits Municipal	Envir. Assessment for Removal of Tree Obstructions	AIP	2022	$ 180,000	$ 9,000	$ 11,000	$ 200,000
Willits Municipal	North Apron Area Reconstruction - Construction	AIP	2022	$ 387,000	$ 19,350	$ 23,650	$ 430,000
Willits Municipal	South Apron Area Seal Coat - Construction	AIP	2022	$ 72,000	$ 3,600	$ 4,400	$ 80,000
Willits Municipal	Removal of Tree Obstructions	AIP	2023	$ 67,500	$ 3,375	$ 4,125	$ 75,000
Willits Municipal	Segmented Circle Rehabilitation - Design	AIP	2023	$ 40,500	$ 2,025	$ 2,475	$ 45,000
Willits Municipal	Segmented Circle Rehabilitation - Construction	AIP	2024	$ 99,000	$ 4,950	$ 6,050	$ 110,000

Willits Municipal	Removal of Tree Obstructions	AIP	2025	$	67,500	$	3,375	$	4,125	$	75,000
Willits Municipal	Removal of Tree Obstruction	AIP	2026	$	67,500	$	3,375	$	4,125	$	75,000
Willits Municipal	Removal of Tree Obstruction	AIP	2027	$	67,500	$	3,375	$	4,125	$	75,000
Willits Municipal	Removal of Tree Obstructions	AIP	2028	$	67,500	$	3,375	$	4,125	$	75,000
Willows - Glenn County	Apron Rehabilitation Project, Construction Phase	AIP	2021	$	1,533,645	$	76,682	$	93,723	$	1,704,050
Willows - Glenn County	Pavement Condition Study	AIP	2022	$	45,000	$	2,250	$	2,750	$	50,000
Woodlake	RW Reconstruction	AIP	2022	$	1,250,660	$	62,533	$	76,429	$	1,389,622
Woodlake	Parallel TW Reconstruction	AIP	2023	$	478,224	$	23,911	$	29,225	$	531,360
Woodlake	Apron Reconstruction	AIP	2024	$	1,627,313	$	81,366	$	99,447	$	1,808,125
Woodlake	Airport Lighting with Signs, Reflectors, Wind Cone	AIP	2025	$	450,000	$	22,500	$	27,500	$	500,000
Woodlake	Perimeter fencing	AIP	2026	$	183,600	$	9,180	$	11,220	$	204,000
Woodlake	T-Hangars (8 Units)	AIP	2026	$	225,000	$	11,250	$	13,750	$	250,000
Woodlake	Obstruction Removal and Lighting	AIP	2027	$	72,000	$	3,600	$	4,400	$	80,000
Woodlake	T-Hangars (6 Units)	AIP	2027	$	168,300	$	8,415	$	10,285	$	187,000
Yolo County-Davis Woodland Winters	Runup Apron - Ph 1 (RW 16) & Ph 2 (RW 34) - Const.	AIP	2022	$	1,350,000	$	67,500	$	82,500	$	1,500,000
Yolo County-Davis Woodland Winters	RW 16-34 Rehabilitation - Design	AIP	2023	$	153,000	$	7,650	$	9,350	$	170,000
Yolo County-Davis Woodland Winters	RW 16-34 Rehabilitation - Construction	AIP	2024	$	1,265,400	$	63,270	$	77,330	$	1,406,000
Yolo County-Davis Woodland Winters	TW A & B Rehab & TW Safety Area Grading - Design	AIP	2024	$	140,760	$	7,038	$	8,602	$	156,400
Yolo County-Davis Woodland Winters	TW A & B Rehab and TW Safety Area Grading - Const.	AIP	2025	$	990,000	$	49,500	$	60,500	$	1,100,000
Yuba County	Electrical Assessment	AIP	2022	$	67,500	$	3,375	$	4,125	$	75,000
Yuba County	Wildlife Hazard Site Visit & Mitigation - Design	AIP	2022	$	90,000	$	4,500	$	5,500	$	100,000
Yuba County	Electrical Improvements - Design	AIP	2023	$	112,500	$	5,625	$	6,875	$	125,000
Yuba County	RW 14-32 Rehabilitation - Design	AIP	2023	$	135,000	$	6,750	$	8,250	$	150,000
Yuba County	Wildlife Hazard Mitigation - Construction	AIP	2023	$	648,000	$	32,400	$	39,600	$	720,000
Yuba County	Electrical Improvements - Construction	AIP	2024	$	1,350,000	$	67,500	$	82,500	$	1,500,000
Yuba County	RW 14-32 Rehabilitation - Construction	AIP	2024	$	4,050,000	$	202,500	$	247,500	$	4,500,000
Yuba County	TWs A & B Rehabilitation - Design	AIP	2025	$	135,000	$	6,750	$	8,250	$	150,000
Yuba County	New Hangar Area TW and TW A/A4 - Design	AIP	2026	$	180,000	$	9,000	$	11,000	$	200,000
Yuba County	TWs A & B Rehabilitation - Construction	AIP	2026	$	684,000	$	34,200	$	41,800	$	760,000
Yuba County	Demolition of Existing TW A4 - Construction	AIP	2027	$	90,000	$	4,500	$	5,500	$	100,000
Yuba County	New Hangar Area TW and TW A/A4 - Construction	AIP	2027	$	1,161,000	$	58,050	$	70,950	$	1,290,000
Yuba County	Environmental & Permits for Drainage Improvements	AIP	2028	$	117,000	$	5,850	$	7,150	$	130,000
Yuba County	Environmental for Land Acquisition	AIP	2029	$	72,000	$	3,600	$	4,400	$	80,000
Yuba County	Drainage Improvements - Design	AIP	2030	$	270,000	$	13,500	$	16,500	$	300,000
			Total	$	3,153,940,787	$	95,683,481	$	1,422,793,731	$	4,672,417,998

APPENDIX B: INTERREGIONAL TRANSPORTATION STRATEGIC PLAN CORRIDORS



APPENDIX C: FACT3 FROM FAA

Appendix C. This excerpt from FACT3 covers time periods in the progression of NextGen airspace efficiencies that have improved capacity at several airports. And it confirms that major airports like SFO will remain constrained according to FACT3 projections due to demand and local limitations.

	FACT1			FACT2			FACT3		
Airport	2004	2013	2020	2007	2015	2025	2011	2020	2030
ABQ		●	●						
ATL	●	◑	●			●	●	●	●
BDL			●						
BHM			●						
BOS			◑			◑			
BUR		●	●						
BWI		◑	◑						
CLT		◑	◑		◑	◑			●
CVG		◑	◑						
DCA			◑						
DEN			◑						
DFW			◑						
DTW			◑						
EWR	●	●	●	●	●	●	●	●	●
FLL		●	◑	●	◑	●			◑
HOU		●	●		◑	◑			
IAD			◑			◑			
IAH		◑	◑		◑	◑			●
ISP			●						
JFK		●	◑		◑	●	●	●	●
LAS		◑	●		◑	●			●
LAX		◑	◑			◑			
LGA	●	●	●	●	●	●	●	●	●
LGB		●	●		●	●			
MDW		◑	●		◑	●			
MEM			◑						
MIA			◑						
MSP		◑	◑			◑			
OAK		●	●		●	●			
ONT			●						
ORD	●	●	◑	●	◑	◑			◑
PBI		●	◑		◑	◑			
PHL	●	●	◑		●	●	●	●	◑
PHX		◑	◑			●			●
PVD			●		◑	◑			
SAN						●			
SAT		●	●		◑	◑			
SEA			◑			◑			
SFO						●		◑	●
SLC			◑						
SNA		●	●		●	●			
STL		◑	◑						
TUS		●	●		◑	◑			

Comparative Summary Results Across all Three FACT Reports

Legend:

◑ Constrained in reference case, but unconstrained if planned improvements are implemented

● Constrained even after all planned improvements are implemented; additional capacity enhancement is needed; or constrained in base year.

No symbol indicates not capacity constrained

Note: *This table lists only the airports that were identified as capacity-constrained in one of the FACT reports. Other airports that were analyzed in the FACT reports, but not identified as capacity-constrained, are not included.*

APPENDIX D: MOBILITY AND ACCESS FUNDING PROGRAMS

The Regional Transportation Improvement Program Funds.

The State Transportation Improvement Program (STIP) is five-year plan that includes two parts: the Interregional Transportation Improvement Program (ITIP), which is allocated 25 percent of the STIP funds to invest in the interregional transportation system by Caltrans, and the Regional Transportation Improvement Program (RTIP), which is allocated 75 percent of the STIP funds to address regional and interregional transportation issues that are controlled by the individual MPOs and RTPAs. Goods movement and interregional connectivity are the high-value applications for receiving RTIP funds. RTIP funds can be used for intermodal facilities and to match federal transportation grants (Caltrans 2015).

Recent guidance to RTPAs and MPOs encourages close coordination between local planning agencies and ALUCs. This closer coordination could yield tangible results for airports that include air cargo facilities and depend on local roadways for efficient operation. Closer coordination may allow transportation planning agencies to better link airport facilities to regional and interregional roads.

State Highway Operation and Protection Program

The State Highway Operation and Protection Program provides funding for projects regarding safety, preservation of existing facilities, and various types of operational improvements for the State Highway System. The SHOPP is a four-year program that is updated every two years.

Local Sales Tax Measure and other Funds

Local sales tax measures and other locally generated transportation funds provide a significant source of revenue that could be eligible for use on interregional projects. Counties can adopt a sales tax increase for transportation projects.

Federal Funding Opportunities

The FAA will not provide AIP funds for airport operators to develop certain air cargo buildings or improvements to highway systems beyond the airport property line. However, the portion of highways and transit systems that occur within the airport property line are eligible for grants under the AIP.

The FAA encourages airport sponsors and State and local officials to consider passenger convenience, airport ground access, and access to airport facilities in their Master Plans (FAA 2020).

Other Funding Sources

Funding for capital projects inside the interregional corridors comes from a variety of sources; however, the sum of all funding falls short of the need. It is projected that the State could face a $1 trillion infrastructure funding gap by 2050 (Hewes, 2018). California Senate Bill 1, *The Road Repair and Accountability Act* (SB 1), ratified in 2017, generates additional transportation funding through levies on fuel. SB 1 is expected to provide $54 billion dollars between 2017 and 2027 to address some of the State's transportation funding shortfall (Rebuilding CA, 2017). However, government investment is not enough to meet all demand.

Third-party development, which would occur outside Federal or State budgets, may address some of the shortfall. Projects involving third parties, usually referred to as Public-Private Partnerships or P3s, can provide funds to develop and operate infrastructure that is generally considered to be the domain of the government. Recently, cargo handling companies are now either leasing or financing the development of air cargo facilities on and near airports to make better use of space and manage physical and human resources more effectively. This concept also lends itself to a common-use pricing structure in which an airport receives revenues on processed cargo rather than a square footage basis. In some instances, operators of logistics facilities are developing warehouses and infrastructure on property that is owned by and leased from the airport operator.

APPENDIX E: SYNOPSIS OF CALTRANS VULNERABILITY ASSESSMENTS OF 2019

The assessments done for the Transportation Planning area of Caltrans are largely based on global climate data compiled by the Intergovernmental Panel on Climate Change (IPCC) and California research institutions like the Scripps Institution of Oceanography. The primary focus of the assessments is risk to the State Highway System (SHS) from events tied to natural responses from increasing GHG emissions. As needed, the Aeronautics Division has added concerns for aviation among summaries of key findings in each District's "summary report."
https://dot.ca.gov/programs/transportation-planning/2019-climate-change-vulnerability-assessments

Table E-1: Synopsis of Caltrans Vulnerability Assessments of 2019

District	District Characteristics	Key Assets	Concerns / Findings
1	D-1 covers 500 square miles, most of which is rural (and— when beyond the coast—part of the Pacific Northwest rainforest) in Del Norte, Humboldt, Lake, and Mendocino Counties. D-1 headquarters are in Eureka.	There are no interstate highways in D-1, so the major State roads are principal arterials—US 101, US 199, and the principal arterial corridor of SR 20, 29, and 53 in Lake County. The SR 1 corridor is the primary north south route in the coastal parts of the district. SR 101 and 299 also are part of the Strategic Highway Network (STRAHNET), which serves military bases.	SLR and coastal erosion will be primary impacts. The report suggests that Caltrans should work with FHWA and other agencies to update design standards for adaptability.
2	D-2 covers Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama and Trinity Counties. It is largely rural and headquartered in Redding.	I-5 is the District lifeline route for local and statewide connections. In addition, I-5 is noted in the CFMP as having the highest truck volumes in the District. Freight in D-2 supports logging, manufacturing, and agriculture.	Hot, dry summers and cold, wet winters add to soil erosion, pavement distress and wildfires. Airport condition obviates support to mitigate impacts for other modes.
3	D-3 includes Sacramento, El Dorado, Placer, Yuba, Sutter, Yolo, Glenn, Colusa, Butte, Sierra, and Nevada Counties. The area is geographically diverse from Sacramento to farmland to a portion of the Lake Tahoe Basin. Marysville is D-3's Headquarters.	SR-99 is the "Farm to Market" corridor as it connects Bakersfield to Sacramento. SR's 70 and 149 are "focus routes," for goods movement. The primary east-west routes are US 50, I-80, and SR 20. I-80 is part of a national freight corridor coordination effort due to its high truck volumes and difficult winter driving conditions. D-3 includes the Port of West Sacramento, which specializes in agricultural and construction cargo.	SLR from the Bay Area can threaten Sacramento airports via low elevations and proximity to two rivers.
4	Headquartered in Oakland, D-4 covers nine counties with San Francisco, Oakland, San Jose, and Santa Rosa. District 4 is also a major freight hub with modal connectivity that can be particularly vulnerable to disruptions caused by extreme weather events.	Between January and May of 2017, D-4 experienced weather-related damages in 110 locations, largely from heavy precipitation and strong coastal storms. Caltrans expects events of this scale to increase in frequency, due to climate change.	With considerable study of the San Francisco Bay for the effects of climate change on sea levels, concern for air and marine ports is paramount.
5	D-5 is headquartered in San Luis Obispo and is responsible for Santa Barbara, San Luis Obispo, Monterey, San Benito, and Santa Cruz Counties. The district is largely rural, with the northern and southern portions on a rural-urban interface for a region known as the Central Coast.	SR 1 runs along the coast for the length of the District and passes through coastal communities, rugged cliffs, dunes, wetlands, estuaries, and beaches. US 101 and I-5 are primary north-south corridors. East-west routes, including SR 152, 46 and 133 connect the coast to the Central Valley. Urbanization of the Central Coast is occurring primarily along major highway corridors.	All concerns are seen on the Central Coast: July 2017 had a record-breaking streak of 100+ temperature readings; debris flows from heavy rain; 2018 wildfires burned over 6,100 acres; by the end of the century, sea levels will likely rise by from 0.7 to 9.9 feet.
6	D-6 is headquartered in Fresno and serves Fresno, Madera, Tulare, and Kings Counties, and most of Kern County. District 6 is responsible for 476 miles of freeway and 1,554 miles of rural and urban highway. It maintains the largest portion of lane miles (with a	D-6 covers 476 miles of freeway and 1,554 miles of rural and urban highway. It maintains the largest portion of lane miles (with a combined length of 5,810) in the State Highway System. I-5 and SR99 run the length of D-6 and carry a significant amount of truck traffic that is vital to the agricultural	Amid drought, subsidence has damaged roads and irrigation canals; heavy rain and snow in the winter of 2016-17 saturated soils and caused movement under the Highway 120 road bed, resulting in a large fissure in the highway over 100 feet long; rising temperatures and forest decay contribute to

	combined length of 5,810) in the State Highway System. Thirty-three state highways are wholly or partially located within the district.	base of the region. A series of east-west highways (SR 140, SR 152, SR 180, SR 198, and SR 46) connect to I-5 and SR 99 as a grid system for the valley's farming communities.	wildfires—especially in remote areas, emphasizing aviation support to assist fire response.
7	D-7 is a socially and geographically diverse area covering Los Angeles and Ventura Counties, which have populations of 10.1 million and 850,000 people respectively. District HQs are in downtown L.A.	The area's topological diversity includes mountain ranges, coastal plains and beaches, lakes, deserts, and large urban areas. The District also includes two Channel Islands: San Clemente and Santa Catalina.	D-7's focus on infrastructure can help aviation's interests in mobility and access: Raising roadways, increasing drainage, and installing pumping systems to prevent SLR inundation; or realigning and siting new roadways to avoid storm surge, and coastal erosion. Airports from LAX or OXR inland to ONT could benefit.
8	D-8 consists of San Bernardino and Riverside Counties which features deserts, mountainous terrain, forests, agriculture, as well as urban and rural built environments' HQs are in the city of San Bernardino.	Many of the District's major state highways are severely congested during peak periods due to the high number of commuters. I-10 is heavily used for long distance recreational and goods movement to Arizona and beyond—as is I-15 15 to Nevada and beyond. I-215 is another major goods/commuter route. Other major corridors exist on highways 91, 210, 58 and I-40. Heavy congestion is expected to increase due to population and employment growth.	For moving freight and people, CASP makes the point for reviewing under-used airports; issues in D-8 make the point for supporting interregional corridors for intermodal advantages.
9	D-9 covers Mono and Inyo counties, plus the eastern portion of Kern county. The district is primarily rural, and most of its land is under the jurisdiction of governmental agencies and tribal nations. Population estimates range from 50 people in unincorporated rural areas to over 28,000 in incorporated city areas. District HQs are in Bishop.	State Routes (SR) 14 and 58, and US Route (US) 395, are its major transportation corridors, and the focus of many of the District's mobility and access improvement efforts. This corridor also provides a primary route to Southern California and the District's tourist areas. In Kern County, SR 58 is the major east-west corridor, and it links Bakersfield and D-6 with Nevada by connecting to SR 14 and then to US 395.	D-9 furthers the case for aviation support and utilization via on-going support of key corridors. Factors for roads and airports that challenge resiliency include wide swings in temperatures from cold high elevations to hot deserts below sea level. Weather that downslopes from the Sierra Nevada mountains adds to precipitation that adds to flooding and mudslides.
10	D-10 encompasses eight counties: Alpine, Amador, Calaveras, Mariposa, Merced, San Joaquin, Stanislaus, and Tuolumne. The District is very diverse with three urban counties in the San Joaquin Valley (San Joaquin, Stanislaus, and Merced), and five rural counties in the Central Sierra Nevada (Amador, Calaveras, Tuolumne, Mariposa, and Alpine). The cities of Stockton (HQs), Modesto, and Merced are the three largest cities with a combined population of approximately 1.5 million.	Because the District borders the San Francisco East Bay area, many parts of the SHS in the District face increasing levels of congestion due to heavy commuter traffic. D-10 maintains 854 bridges and 3,547 lane-miles. The District also includes 19 airports, the Port of Stockton, and numerous transit rail authorities.	D-10 has its share of climate issues like other Districts. But the District report has noteworthy SLR comments for an inland area with several airports: "There are 254 miles of roadway between Stockton and Sacramento that sit below the three-foot-high tide line. According to Climate Central research, roughly 55,000 Stockton residents live in properties at elevations lower than the historical tide and storm records for the San Francisco Bay. Other than airports: of the at-risk communities in Stockton and Sacramento, 60% are low income and ethnic minorities."
11	D-11 (headquartered in San Diego) consists of two very different counties: urbanized San Diego County and rural Imperial County. From the District's System Management Plan, District 11 is "one of the most geographically and culturally diverse areas in the country with a wide range of climates and terrain—from the temperate coastal region to chilly mountain peaks and blazing desert sands."	Key highway routes in the District are well-known: I-5 from the Mexico border north along the coast; I-8 to Arizona and beyond, and I-15 through San Diego's "North County" region. (The District report—in its summary—does not report in detail on connecting State routes.)	San Diego sea levels are projected from 1.1 to 7 feet above current levels; maximum10.2'. Inland, and for other areas, District strategy is focused on maintenance to mitigate flooding, erosion and extreme heat.
12	D-12, headquartered in Santa Ana, is Orange County. The countywide population was 3.2 million people in 2016. Orange County is also home to 11 major universities and 10 private	District 12 maintains the most complete High Occupancy Vehicle (HOV) network in California, owing to congestion generated by both tourism and local commerce. And routes in "OC" make connections:	Not surprisingly, The District report provides emphasis on pavement: "Many of Caltrans' assets, including tunnels, bridges, and culverts, will likely be in place for 50 years or longer. Asphalt pavement is replaced more frequently—approximately every 20-40 years depending on the

	colleges/universities, two major military installations and numerous tourist attractions.	I-5 connects Orange County with Los Angeles and San Diego Counties. SR 1 accesses beaches and coastal cities. SR 57 and SR 55 form a major north-south spine, linking nine east-west freeways from SR 73 in Orange County to I-210) east of Los Angeles. I-405) begins at the I-5 interchange in Irvine and runs northwest, parallel to the ocean until it terminates and connects back to I-5 in the San Fernando Valley of L.A. SR 74 offers interregional access between Orange County and Riverside County. SR 91 is a major east-west freeway in the county linking Riverside and San Bernardino Counties to Orange and L.A. Counties. SR 73 connects the I-5 corridor in San Juan Capistrano to the I-405 corridor in Costa Mesa. The southernmost 12 miles of the highway operate as the San Joaquin Hills Transportation Corridor toll road.	pavement's purpose." Pavement is the major cost issue for airports, and it is stressed are more than highways, creating maintenance cycles that are less than 10 years.

APPENDIX F: SUMMARY OF KEY OBJECTIVES, OPPORTUNITIES AND RECOMMENDATIONS

Chapter 1 – Introduction and Policy/Regulatory Frameworks

The objectives, opportunities and recommendations in CASP 2020 and not exclusive to aviation. The CASP respects the intentions that are articulated in CTP 2050 goals:

- Provide a vision for the statewide transportation system through the development of goals, objectives, and measurable performance objectives
- Outlines specific, actionable recommendations to achieve the objectives of the CTP 2050 Policy Element

Chapter 2 – Economics and Funding

Create a Specific Role for Designated Airport Funding Specialists

The Division should identify designated staff to explore opportunities with other transportation agencies and related funding sources. While dedicated staff execute traditional funding programs and contribute to CIP development, their efforts could be expanded or supplemented to:

- explore how projects completed by other states and agencies accessed new or different funding sources
- reach out to other transportation agencies to explore new ways to coordinate projects so that they may qualify for other funding sources
- provide outreach to GA airport operators and their communities to alert them of alternative funding sources
- collaborate with FAA to coordinate the Division's CIP with FAA's AIP programming

Incorporate Aviation Planning and Funding into Land Use Compatibility Planning Efforts

The preparation of ALUCPs provides airport operators, their communities, and Division staff with unique opportunities to discuss long-range visions for both the airport and their communities. These efforts could be bolstered during ALUCP preparation to consider the links between community and airport development goals and the funding opportunities that could be available to support both, such as the use of underutilized airports to support aviation-compatible community development projects defined by statute.

Provide Training Opportunities for General Aviation and Non-NPIAS Airport Operators

Dedicated staff members could assist GA and non-NPIAS airports to identify applicable funding sources for appropriate aviation facility and community development projects. Staff can also serve as a liaison to facilitate project identification and inclusion in the CIP or NPIAS, to help explain review criteria comprised of several components ranging from development needs to proximity with nearby airports. (FAA Order 5090.5)

Develop and Aviation Development and Funding Toolkit

Division staff and outreach professionals can provide leadership through the development of an Aviation Development and Funding Toolkit for airport operators and communities. The toolkit could include such information as:

- summaries of available funding sources, their applicability to specific projects, and match requirements
- examples of alternative funding partnerships and funding opportunities (see Section 4), and
- tools for communicating the importance and benefits of airports to their communities and aviation development needs to elected officials, community planners, and other stakeholders.

Chapter 3 – Infrastructure and Safety

Identify new policies that link to CTP issues, objectives and goals:

- Consider the predictable effects of global climate change as important safety issues that warrant infrastructure improvement at the local level with systemwide planning considerations
- Encourage collaboration among airports to identify resiliency solutions. For example, California's GA airports could benefit from measures deployed at commercial service airports to address sea-level rise
- Promote further collaboration among State agencies that have traditionally not been consulted during transportation planning and programming decisions. Where applicable, agencies may include those in natural resources, the Governor's Office of Emergency Services, flood control, etc.

Chapter 4 – Future Trends and Needs

Additional Applications for the Use of Geospatial Data

For airports without adequate resources to utilize GIS capabilities, Caltrans and Division staff may have an opportunity to assist GA airports by providing funding or expertise to create Airport Data Information Portal accounts with FAA and enter Airport GIS data into the system. As discussed in Land Use and Sustainability (Chapter 6), the Division has the means for promoting compatible land use near airports. These efforts could be further strengthened by providing a library that provides links to current ALP data, including data available from ADIP, heliport, and ALUC plans so that it could be accessible to local agencies, developers, and other stakeholders. The system would allow interested parties to review local land use maps and GIS data so that land use compatibility can be considered during project planning, design, and permitting processes.

Transportation Network Companies, Ridesharing, Transit

Challenges:

- Increased value and reallocation of curb space

- Increased congestion on terminal roadways and curbside areas (Smith 2018); and
- Reduced use of public transportation and multi-passenger shuttle services by air travelers

The use of app-based technologies by TNCs to promote shared vehicle use makes transportation opportunities affordable for those who do not own vehicles, thereby promoting transportation equity and social sustainability goals. The use of personal vehicles to generate income also promotes social equity by creating jobs. However, these new technologies do not reduce the number of vehicles on California's congested roadways or reduce airport terminal congestion. Preliminary studies also suggest that the availability of TNCs has resulted in decreased transit use. Long-time van services have all but disappeared from airports. Complete responses as either actions or recommended best practices may best be considered by way of experience over time.

The Division could work with transit agencies and airport operators to promote ridesharing and transit opportunities to airports to help reduce congestion near terminal areas.

Unmanned Aircraft Systems / Urban Air Mobility

(Includes applicable notes from Chapter 6, Land Use and Sustainability)

UAS rules and regulations from FAA remain subject to further development as the technology evolves and matures. Specific measures for airports and local agencies will continue to evolve while fully integrating UAS into the NAS. At the State level, the Division performs the following:

- Coordinates UAS use on current Caltrans projects
- Works with the California Film Commission to provide permits for the use of UAS during filmmaking and to enable drone use over California highways.

UAS operations can also pose security challenges by passing into regulated airspace, passing over-populated areas, colliding with necessary infrastructure, or posing privacy concerns. Some jurisdictions have enacted "No Drone Zones" through land use and zoning regulations.

The Division may wish to consider expanding its consideration of aviation and land use compatibility to address inadvertent effects of increased UAS use.

Despite the strides made by aircraft manufactures to develop viable aircraft, UAM challenges remain unabated as neither the physical infrastructure (e.g., takeoff and landing facilities, power facilities, etc.) nor the regulatory and policy framework have been developed to address UAM operation in urban areas. As this technology is developed, Caltrans will be called upon to issue permits for the operation of new facilities (heliports and vertiports) and consider the potential effects of such operations on land use and those living and working near such facilities. A regulatory framework must be established for issuing permits for new vertiports. Current UAM models proposed would be implemented to serve urban populations. As proposed by one industry proponent, aircraft would fly above existing urban roads and highways to transport passengers to and from downtown areas.

The Division has long promoted land use compatibility near airports, but emerging technologies could challenge current strategies, which seek to separate aircraft and people. On the other hand, the introduction of new technologies presents the Division with an opportunity to be a leader in the development of a new policy framework to guide UAM and be a leader in the implementation of new technologies.

Policy Recommendation: Promote the implementation of new technologies that can safely reduce or replace transportation related emissions.

Commercial Space Industry

As the commercial space industry continues to grow in California, Caltrans will need to evaluate the effects of commercial space flight at FAA-licensed, non-Federal launch sites and their potential effect on compatible land use for those living and working nearby. Specific policy concerns may include, but are not limited to, noise effects associated with launch activities and the use and storage of fuel and other hazardous materials used in launch activities. It may also be worthy to consider policy that responds to competition elsewhere. FAA has licensed space ports in Texas, Florida, Alaska, Virginia, Oklahoma, Colorado and New Mexico. Hawaii and Georgia are also establishing spaceports.

Use of Airport Property for Non-Aeronautical Activity

Revenue generation will remain important to California airports, as insufficient revenues can lead to deferred maintenance, operational restrictions, or even closure. The presence of available land can provide new opportunities and revenue streams, especially for underutilized airports located outside of urban areas, such as job creation/employment opportunities for nearby residents that do not require daily commutes. However, some land use changes on or adjacent to an airport can result in hazards to ongoing aircraft operations and long-term airport viability when they lead to incompatible land uses, encroachment, and the loss of aeronautical revenue. Airport operators must consider the types of proposed development, review proposed design plans carefully to ensure that they are consistent with ongoing aircraft operations, and consider the potential cumulative or synergistic effects of proposed develop on long-term airport development.

RTPAs in the San Francisco Bay area have explored regional solutions to alleviate congestion at SFO. These collaborative efforts should extend to other areas of California, especially Southern California and the Central Valley. Regionalism should be explored to address and avoid both airspace and surface traffic congestion associated with passenger travel and air cargo.

Chapter 5 – Mobility and Access

Opportunities

Although transportation planning agencies may have divergent goals associated with transportation planning and investments, the State has worked to provide a focused vision for its statewide transportation system—regardless of mode or funding source — through ongoing legislation, executive orders, and programs that contribute to the aggressive reductions in transportation-related GHG emissions. Constructive measures include:

- SB 375, which identifies the direct link between land use and transportation to reduce GHG emissions.
- SB 391, which requires Caltrans to update the CTP every five years while showing how the State will achieve the statewide GHG reduction goals.

SB 391 is revolutionary because it requires Caltrans to focus the transportation goals and investments associated with all transportation modes (transit, rail, aviation, highways and maritime) through the lens of a single statewide transportation plan that addresses and marks progress toward the single goal of GHG reduction. While the various Divisions within Caltrans will continue to adhere to federal agency planning and funding regulations and guidance, they will do so more cohesively and consistently as a result of:

- CTP development
- The increased focus of regional transportation planning and sustainable community strategies that link transportation and housing through SB 375
- The ongoing efforts of MPOs and RTPAs that consider aviation within their regional plans.

Chapter 6 – Land Use and Sustainability

Land Use

Research conducted by the Airport Cooperative Research Program (ACRP) and Mineta Transportation Institute (MTI) has identified several gaps in knowledge or understanding that continue to challenge compatible land use efforts and implementation:

- Local communities may not understand the value of their airports and the role airports play in supporting the local and regional economies, promoting local businesses, law enforcement, and emergency services.
- Local government/planning agency staff may not understand airport operations, associated regulations and guidance, or the issues and concerns associated with aviation and land use.
- Airport operators/managers may not coordinate or communicate effectively with local planning agencies, or they may not be knowledgeable or involved in decision-making regarding proposed land use changes in the airport vicinity.
- Little coordination occurs among airport operators, agency planners, and stakeholders in the community.

Amid these issues, new technologies may cause the Division to reconsider or revise its planning guidance. Although the Division already embarks upon educational efforts through the publication of its Handbook and assistance to agencies, ongoing outreach to local agencies does not occur frequently; the Handbook is updated at approximately 10-year intervals, and ALUCPs must be prepared to address a 20-year timeframe.

The Division is well-qualified to provide ongoing outreach and education to local agencies and communities. Staff members may serve as subject-matter experts and prepare data that can be distributed through existing channels of communication such as the Division's website and newsletters.

Policy Recommendations:

Enhance education and outreach to promote greater understanding by local decision makers of the relationship of aviation preservation and growth to future land use project proposals by:

- Promoting greater understanding of an airport's current value and planned growth
- Promoting better coordination between airport sponsors and managers with elected officials and local planning agency staff on airport compatible land use
- Several lower-cost opportunities and approaches are available to the Division to initiate ongoing education and outreach to local airport managers, local agency staff, and communities including:
- Designate a current Division staff member to serve as a Land Use Education Coordinator responsible for the development and distribution of education and outreach materials as necessary
- Provide educational materials describing the value and economic impact of California airports for presentation to communities, chambers of commerce, and the development community
- Prepare a "tool kit" for distribution and use by airport managers, ALUCs, local planning agencies, and developers regarding airport operations, land use compatibility goals, and processes and make the materials available on the Division's webpage
- Prepare online training modules for ALUC staff and local planning agencies that can be made available on the Division's webpage
- Develop a curriculum that could be incorporated throughout the University of California Extension program and presented to the development community/chambers of commerce, etc.

Integrate Airports, ALUCPs, and Compatible Land Goals into Regional Planning Efforts

SB 375 boldly linked land use and transportation to promote GHG reduction (CA Senate-2008). As noted previously, the 2017 CTC guidance to MPOs and RTPAs encourages regional transportation agencies to consider airports and ALUCPs during RTP development.

Policy Recommendations:

- Provide leadership, liaison, and information sharing to better integrate airports and ALUCPs with regional planning programs and efforts:

- Providing liaison with RTPA leadership to share information about airports and ALUCPs that can be considered during RTPA preparation
- Encouraging ALUCs to include RTPA representatives in ALUC preparation (i.e., technical advisory committees, etc.)
- Providing education and outreach for the consideration of regional transportation planning efforts during ALUCP preparation and updates

Incorporate Smart Growth Principles in ALUC Planning Efforts

While not all smart growth principles are consistent with airport land use compatibility goals, some are applicable:

- Encouraging community and stakeholder collaboration in the development process
- Making development decisions predictable, fair, and cost effective
- Strengthening aid and directing development toward existing communities

Address New and Emerging Technologies

Challenges

California has been cited as an early adapter of these technologies. Since some commercial applications of UAS (package delivery) and UAM will fly over metropolitan areas, traditional approaches that rely on the separation of people and aircraft operations may not be possible.

The Division will need to identify new metrics to evaluate the potential noise safety and airspace effects associated with these technologies and how land use policies can be used to avoid or mitigate these effects. Considerable education and outreach will be required to help ALUCs incorporate these technologies into ALUCPs and consistency evaluation processes within the statutory limits governing ALUC authority.

Opportunities

The Division and other functional units within Caltrans have a unique opportunity to lead policy development on these emerging technologies. Current UAM proposals would not be consistent with the Division's existing compatible land use guidance, which seeks to "limit the number of people, both in the air and on the ground, from potentially hazardous conditions." Potential opportunities include providing:

- Leadership in UAS/UAM implementation and a position of prominence in the evaluation of potential effects on airports and their nearby communities
- Policy leadership to avoid and mitigate potential effects
- Inter-agency leadership in planning for the integration of UAS/UAM technology in California's multimodal transportation system
- Transportation planning leadership through education and outreach to ALUCs, airport managers, and planning agencies to help them prepare for and implement UAS/UAM technologies as technology and implementation progresses

Policy Recommendations:

- Monitor and participate in industry research associated with UAM technology, such as NASA's ongoing Advanced Air Mobility National Campaign.
- Monitor changes in FAA regulations and guidance pertaining to UAS/UAM.
- Work with the San Francisco Bay Area MTC and Los Angeles County Metropolitan Transportation Authority as UAS/UAM projects are proposed for early adaptation in these regions.
- Work with other functional units within Caltrans to identify UAM considerations and prepare outreach and educational materials regarding UAM integration into the statewide transportation system.
- Prepare education and outreach materials for ALUCs and local agencies regarding UAS/UAM and its implementation in land use compatibility planning

Sustainability

Address and Adapt to Climate Change

Challenges

- Climate change is ongoing, and it will lead to increased stress on aviation infrastructure
- Climate-related events are not always predictable and can disrupt aircraft operations/result in system-wide delays
- Air quality impacts are an on-going concern to address in efforts balanced between State legislation and global standards used to guide engine manufacturers, aircraft operators and fuel producers.

Opportunities

- Use available data from federal and State agencies that can be used to identify, plan, and prepare for climate change risks to California's aviation infrastructure
- Build upon climate change adaptation guidance prepared by other Caltrans offices and units to create aviation-specific guidance that can be included in the Division's Consultant guidelines
- Prepare educational information and training material for airport operators to prepare for climate adaptation, extreme weather events, and operational disruptions
- Integrate activities associated with climate change and adaptation into airport-related projects that seek Division funding
- Identify, track, and prioritize need throughout the aviation system so that the greatest needs can be considered when allocating limited grant funds

Policy Recommendations:

Provide leadership through coordination and collaboration with other functional units/modes within Caltrans and RTPAs to identify climate-related effects that could affect aviation and the transportation system.

Establish Division activities that can advance the CTP 2050 airport strategy to require ZEV infrastructure to be included in ALUCPs

Provide leadership and outreach to airport operators and management to identify climate risks, identify mitigation and adaption measures, and prepare for climate related events and operational interruptions.
Identify, track, and prioritize climate-related risks and vulnerability throughout the aviation system so that the greatest needs can be considered when allocating the limited funds.