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Consultants to Airport Management

Draft Report

Mather Airport Master Plan

Prepared for

Sacramento County
Department of Airports
Sacramento, California

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Revised May 2013 by the Sacramento County Department of Airports

December 2003

The revised Master Plan is presented in two draft forms, one with changes from the 2004 draft annotated and the other “clean” with all changes incorporated. The same revised information is presented in both versions. The annotated version includes the historic version of the Plan, with deleted items stricken through and new text in bold and italic font. The second version shows the Plan in its revised final draft form. Again, the Plan presented is the same in both documents; the annotated version is presented for complete transparency, so the reader can clearly see all of the changes made to the Plan. This is the annotated version of the Plan.

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Chapter 1

INTRODUCTION

(Reader's Note: This is an annotated version of the 2013 Draft Mather Master Plan Update. Changes to the previous document are show: deleted text is stricken through and new text is both bold and italicized.)

The County of Sacramento (the County) is preparing for the challenges and opportunities associated with ~~growth~~ ***changes*** in aviation activity. Accordingly, the County has initiated a Master Plan ***(Plan)*** for Mather Airport (MHR, Mather, or Airport) to identify the facilities necessary to meet near- and long-term aviation demand. This report presents the Master Plan, which was prepared with funding assistance from the Federal Aviation Administration (FAA), and is intended to provide the Sacramento County Board of Supervisors with information vital to facilitating the future role of Mather.

AIRPORT SETTING

As presented on Figure 1-1, Mather is located approximately 12 miles east of downtown Sacramento in ~~the City of Rancho Cordova~~ ***unincorporated Sacramento County***. The Airport occupies approximately ~~2,875~~ ***2,253*** acres of land and is surrounded by a mix of residential commercial, industrial, and open land uses.

2013 UPDATE: The boundary of the Airport was examined and refined as part of the property transfer between the Air Force and the County. The updated figure of 2,253 acres is largely a result of shifting ownership of the environmental preserve, located to the south of the Airport, to another County department.

History

Mather was established in 1918 as a military base and pilot training school. The base was closed after World War I, but reactivated in 1941 as a training field. In 1958, the Strategic Air Command B-52 wing was assigned to the base. In the 1970s, Mather provided inter-service and international undergraduate navigator training. Base expansion and improvement continued throughout the 1980s, but ceased when the decision to close Mather was announced by the Department of Defense in 1988. In 1993, the Air Force issued a Record of Decision for disposal of the base and aviation facilities were transitioned ***via lease*** to Sacramento County on March 28, 1995. Mather was officially reopened as a civilian airport on May 5, 1995.

2013 UPDATE: The Airport property was formally transferred to the County of Sacramento, in September 2012, from the United States government through the Secretary of the Air Force. The transfer occurred under and pursuant to the powers and authority contained in the Defense Authorization Amendments and Base Closure and Realignment Act of 1988.

Current Role

Following Mather's re-opening in May 1995, the majority of all-cargo carriers operating at Sacramento International Airport (International) relocated to Mather because of (1) limited apron space at International, (2) the need to develop independent sort facilities ***as required by each cargo carrier's business methods***, and (3) Mather's location relative to growing markets along the ~~Interstate~~ ***Highway*** 50 corridor. ~~Airborne Express*, and~~ United Parcel Service (UPS) currently operates at Mather.

In addition to air cargo service, Mather also accommodates regional general aviation demand, including corporate general aviation, recreational general aviation, and air taxis. Mather's based general aviation aircraft are primarily used for corporate, government, and recreational purposes. ~~Trajen Flight Support~~ ***Atlantic Aviation*** and Mather Aviation provide services to general aviation users.

For purposes of this Plan, aircraft operations are classified into the following categories:

- ***Air Carrier: These operations include scheduled flights, charter flights, diverted flights, and ferry operations (empty flights). The FAA defines an air carrier aircraft, as one capable of carrying more than 60 passengers, even if the aircraft is conducting air freight operations.***

- ***Air Taxi and Commuter: These operations consist of unscheduled operations of "for hire" air taxis and the scheduled operations of commuter airlines, including regional affiliate airlines operating aircraft with less than 60 seats.***

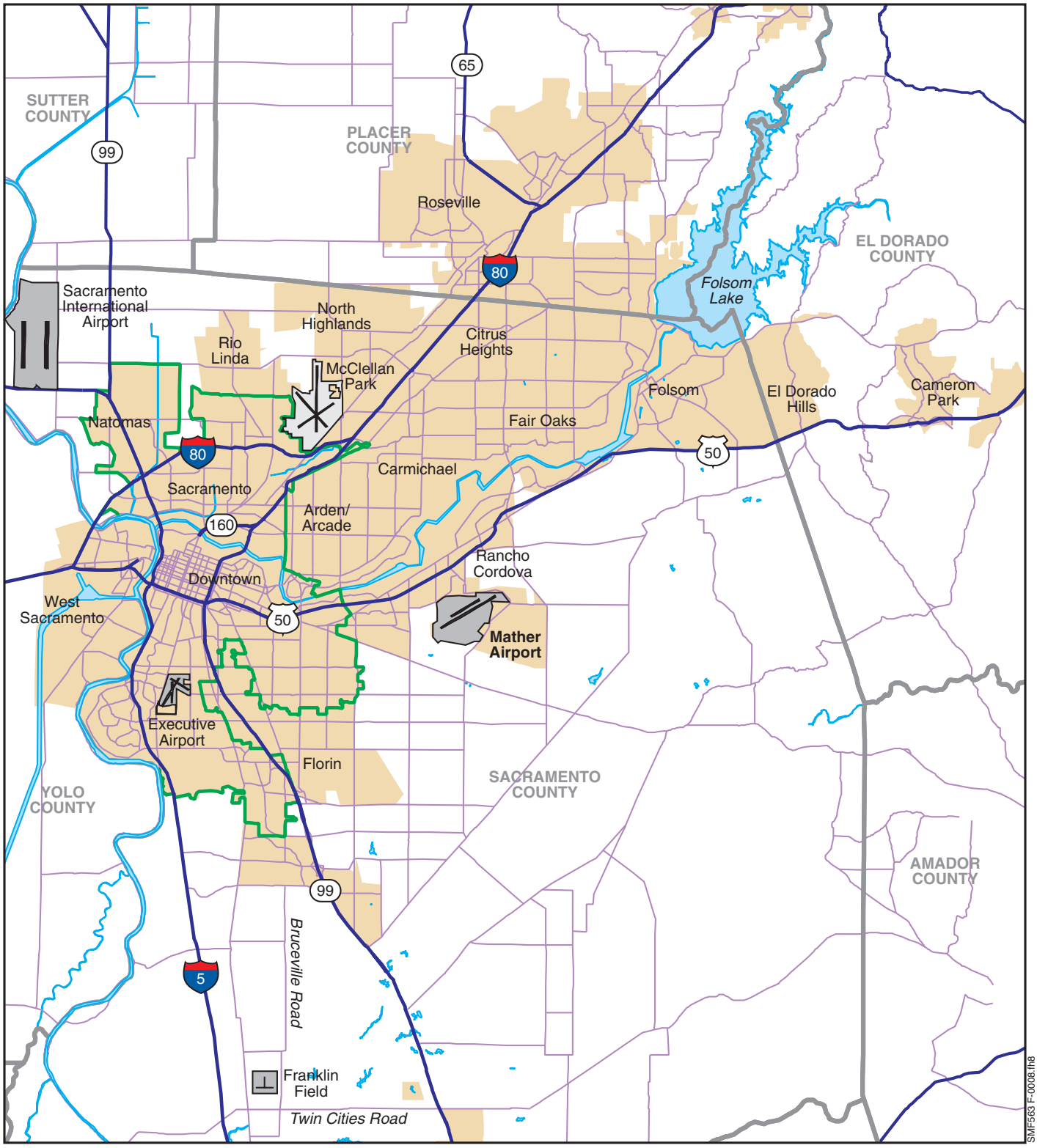
- ***General Aviation: These operations include all civil aircraft operations not classified as air carrier or air taxi and commuter operations.***

- ***Military: Military aircraft operations.***

~~Intel Corporation currently contracts with Executive Jet Management (EJM)~~ ***Aerodynamics Incorporated (ADI) contracts with a local corporate employer*** to provide regularly scheduled air taxi service (~~Intel~~ employees only) from Mather to San Jose International Airport and Hillsboro, Oregon. Additional tenants include the Sacramento County Sheriff Air Operation Bureau, ~~Union Flights~~, ***Embry-Riddle***

~~*Airborne Express was acquired by DHL Worldwide Express in 2004.~~

Aeronautical University, Ameriflight LLC, Redding Aero Enterprises, and the California Department of Justice. The California Department of Education and the Army National Guard own property within the Airport boundary. The California Department of Forestry (CDF) used Mather as its northern California maintenance base from 1995 to 2002, but relocated to McClellan Park in June 2002.



LEGEND

- Sacramento County Airport System airports
- Urbanized areas
- Water/river
- County boundary
- City boundary
- Interstate/Highway

N

2.5 0 2.5 5

Graphic Scale in Miles

Figure 1-1

REGIONAL LOCATION

Mather AIrport Master Plan

December 2003

LEIGH FISHER ASSOCIATES

2013 UPDATE: The air cargo industry has significantly changed since this plan was originally drafted. Currently, there are only two integrated air cargo carriers operating in the Sacramento region; United Parcel Service (UPS) at Mather and Federal Express (Fed-Ex) at Sacramento International Airport.

Master Plan Background

The County of Sacramento owns and operates Sacramento International Airport, Mather Airport, Executive Airport*, and Franklin Field (collectively, the County Airport System).** The locations of these airports are shown on Figure 1-1. To foster the successful evolution of the Airport System, the County initiated an Airport System Policy Plan in 2001 to identify the specific aviation market segments to be served at each airport, and implement policy defining the mission and role of each airport.

Airport System Policy Plan

Information and stakeholder (e.g., tenants, users, community) input gathered for the System Policy Plan indicated that International should continue to provide scheduled passenger service; and both Executive and Franklin Field should continue in their roles as general aviation airports. However, determining the future role of Mather required additional analyses based on the following: (1) the Airport does not have the full range of facilities to accommodate existing and future users; (2) environmental constraints could limit operations or preclude necessary development; and (3) necessary facilities and markets served are not compatible with community expectations.

From the community's perspective, aircraft activity associated with the ultimate disposition of Runway 4L-22R was of particular concern. Some of Mather's all-cargo airlines expressed the need for a ~~backup~~ runway for use when ~~primary~~ Runway 4R-22L is not available (e.g., closed for runway ***maintenance***, reconstruction or because of an aircraft incident). Consequently, several ~~backup runway~~ alternatives ***for Runway 22R-4L*** were evaluated in terms of operational capability, as well as economic and environmental impacts.

To address these issues, the following potential roles for Mather were evaluated:

- **Role #1—Primarily Accommodate Air Cargo**. In this role, Mather would serve as the County's primary air cargo airport, accommodating air cargo and some general aviation demand; and potentially serve as a regional air cargo hub if market conditions warrant such development. Although this

*Executive Airport is owned by the City of Sacramento and leased to the County to operate and maintain.

**McClellan Park, also a County-owned airport, is operated by a third-party operator and is not considered part of the Airport System.

role is associated with positive regional economic benefits, the provision of facilities necessary to accommodate such demand could cause adverse environmental impacts.

- **Role #2—Primarily Accommodate General Aviation**. In this role, Mather would serve as a second general aviation reliever to International, primarily accommodating general aviation and some air cargo demand. While this role has relatively insignificant development costs, it could result in some air cargo carriers relocating to International or "leaking" to airports outside the Sacramento area.

County Board of Supervisors' Direction

Findings regarding alternative Mather roles were presented to the Sacramento County Board of Supervisors on October 16, 2001. The following summarizes the key information presented:

- Either potential Mather role is feasible, but economic and environmental tradeoffs are associated with both.
- Potential environmental impacts associated with alternative development concepts (in addition to aircraft noise) required detailed review.
- The cost and sources of funds to construct necessary facilities and mitigate environmental impacts are primary issues.
- Numerous additional variables could affect the successful development of the Airport in either role.

Based on the above, the Board of Supervisors unanimously agreed to (1) continue to develop Mather as an air cargo airport within the limits established by previously approved land use decisions/policies; and (2) analyze the market potential, feasibility, costs, and impacts associated with the development of Mather as an air cargo airport or regional sort hub in a detailed master plan study.

2013 UPDATE: Given the changes in the economy, air cargo industry and actual inquires received since this Plan was initially developed, a third role is now being recommended for the Airport, consistent with prior Board of Supervisor directions and concerns listed above.

- ***Role #3—Accommodate Air Cargo and General Aviation. In this role, Mather would serve as the County's primary air cargo airport while also accommodating general aviation demand. This balanced role reflects current***

economic and market conditions. This role has moderate development costs which will result in positive regional economic benefits.

This third role has a reduced focus on air cargo and an increased general aviation component, as reflected in the updated forecast presented in Chapter 3.

MASTER PLAN GOALS AND OBJECTIVES

This Master Plan is intended to assist the County in preparing for the challenges and opportunities associated with: (1) ~~growth~~ ***changes*** in aviation activity, (2) trends and factors affecting the air cargo market, (3) community desires for economic generation, and (4) potential benefits to and effects on the community. In support of these goals, the following Master Plan-specific objectives were established:

- Assess the market—identify trends in air cargo and general aviation. Inventory existing conditions, and project trends and future needs.
- Identify issues and opportunities.
- Coordinate analyses, findings, and recommendations with users and tenants, and involve the public.
- Provide flexible recommendations—recommend facilities, phasing, and a financial plan that allows the Airport to accommodate users under alternative roles.

PUBLIC OUTREACH

The County has a long history of effective public outreach programs, and is aware of the different "publics" interested in or affected by the Master Plan results. Accordingly, an extensive public outreach program was established for the Master Plan to facilitate decision-making and information sharing.

Mather Master Plan Working Group

The Mather Master Plan Working Group (MMPWG) was established to obtain key input during the course of developing the Master Plan and to foster decision-making. Specifically, the MMPWG consists of representatives from the following: (1) Airport users and tenants, including representatives of air cargo carriers, freight forwarders, and general aviation operators; (2) federal, State, and County agencies specializing in aviation, planning, environmental planning, and public works; (3) residents, special interest groups, and local business members (representing both users of the Airport and groups that could be affected by Airport development); and

(4) professional planning representatives from various public agencies. The MMPWG met on the following occasions during preparation of the Master Plan to review and provide input on technical analyses and study findings:

- ***Working Group Meeting #1—Project Initiation, April 5, 2002***. To review and provide input on project objectives, inventory data, planning constraints, and forecasts of aviation demand.

- ***Working Group Meeting #2—Airfield Alternatives, May 30, 2002.*** To review and provide input on airfield alternatives.

- ***Working Group Meeting #3—Landside Alternatives, March 27, 2003.*** To review and provide input on landside, access, and circulation alternatives.

Public Information Workshops

Three public information workshops were held during preparation of the Master Plan to allow the public to review and comment on study findings. Workshops coincided with development and selection of airfield and landside alternatives. Workshops were organized as drop-in sessions where participants attended at their convenience. Information stations were set up for individual topics and a technical presentation was given at a scheduled time. Participants were offered the opportunity to provide both written and oral comments.

County Board of Supervisors' Workshops

The following three information workshops were held with the Sacramento County Board of Supervisors during development of the Master Plan:

- ***Workshop #1—Airfield Alternatives,*** August 7, 2002

- ***Workshop #2—Landside Alternatives,*** June 10, 2003

- ***Workshop #3—Recommended Airport Development Concept,*** August 20, 2003

Each workshop included a technical presentation summarizing study findings, and interactions between Supervisors, Airport staff, and members of the consultant team. Similar to public information workshops, the public was provided an opportunity to comment.

A final session ~~will be~~ ***was*** held with the Board in December 2003 to secure approval of the Draft Mather Airport Master Plan.

2013 UPDATE: On December 9, 2003, the Board was presented the Draft Final Master Plan with the staff recommendation to transmit the Draft Final Master Plan to the Department of Environmental Review and Assessment (DERA) with the direction to undertake environmental review pursuant to the requirements of the California Environmental Quality Act (CEQA). The Board approved this recommendation on February 17, 2004 after briefings were presented to the following jurisdictions:

- ***Folsom City Council on January 13, 2004***
- ***El Dorado County Board of Supervisors January 27, 2004***
- ***Rancho Cordova City Council on February 2, 3004***

Per the direction of the Board, a Draft Environmental Impact Report (DEIR) was prepared and circulated in July 2012. Comments received on the DEIR necessitated the need to update the Master Plan forecast, project description and associated environmental review. The updates to this Master Plan address current conditions and respond to comments received during the DEIR process. These changes and updated documents were presented to the Board on May 21st, 2013. In April and May 2013, Representatives of the Cities of Folsom and Rancho Cordova as well as El Dorado County were briefed on the updated plan. Subsequent to the Board update, DERA will issue a new Notice to Preparation (NOP) and a new DEIR will be prepared and circulated.

DOCUMENT ORGANIZATION

The remainder of this Master Plan is organized as follows:

- Chapter 2: Existing Conditions
- Chapter 3: Historical and Forecast Aviation Demand
- Chapter 4: Airport Requirements
- Chapter 5: Airfield Alternatives
- Chapter 6: Landside, Access, and Circulation Alternatives
- Chapter 7: Recommended Development Concept
- Chapter 8: Financial Plan

Appendices providing detailed technical data and information on key analyses are provided at the end of this document.

MASTER PLAN UPDATES

Recommendations contained in this Master Plan are based on the best information and market data available during the course of the study. The Master Plan should be updated, as necessary, to respond to changes in market conditions and aviation demand. A Master Plan Update and/or revalidation should be considered no later than 2010.

2013 UPDATE: Elements of this plan were revised in 2013. Typically Master Plans are updated every five to ten years.

Chapter 2

EXISTING CONDITIONS

This chapter presents information on pertinent existing conditions at Mather Airport as of ~~March 2002~~ ***May 2013***.*

REGIONAL SETTING

As illustrated on Figure 1-1 in Chapter 1, Mather is located approximately 12 miles east of downtown Sacramento in ~~Rancho Cordova~~ ***unincorporated Sacramento County, adjacent to the City of Rancho Cordova***. Rancho Cordova has an estimated population of ~~55,000~~ ***64,776 according to the U.S. Census for 2010***, and estimated employment over ~~90,000~~ ***56,000 (2007), according to Applied Geographic Solutions***.

Vicinity and Surrounding Area

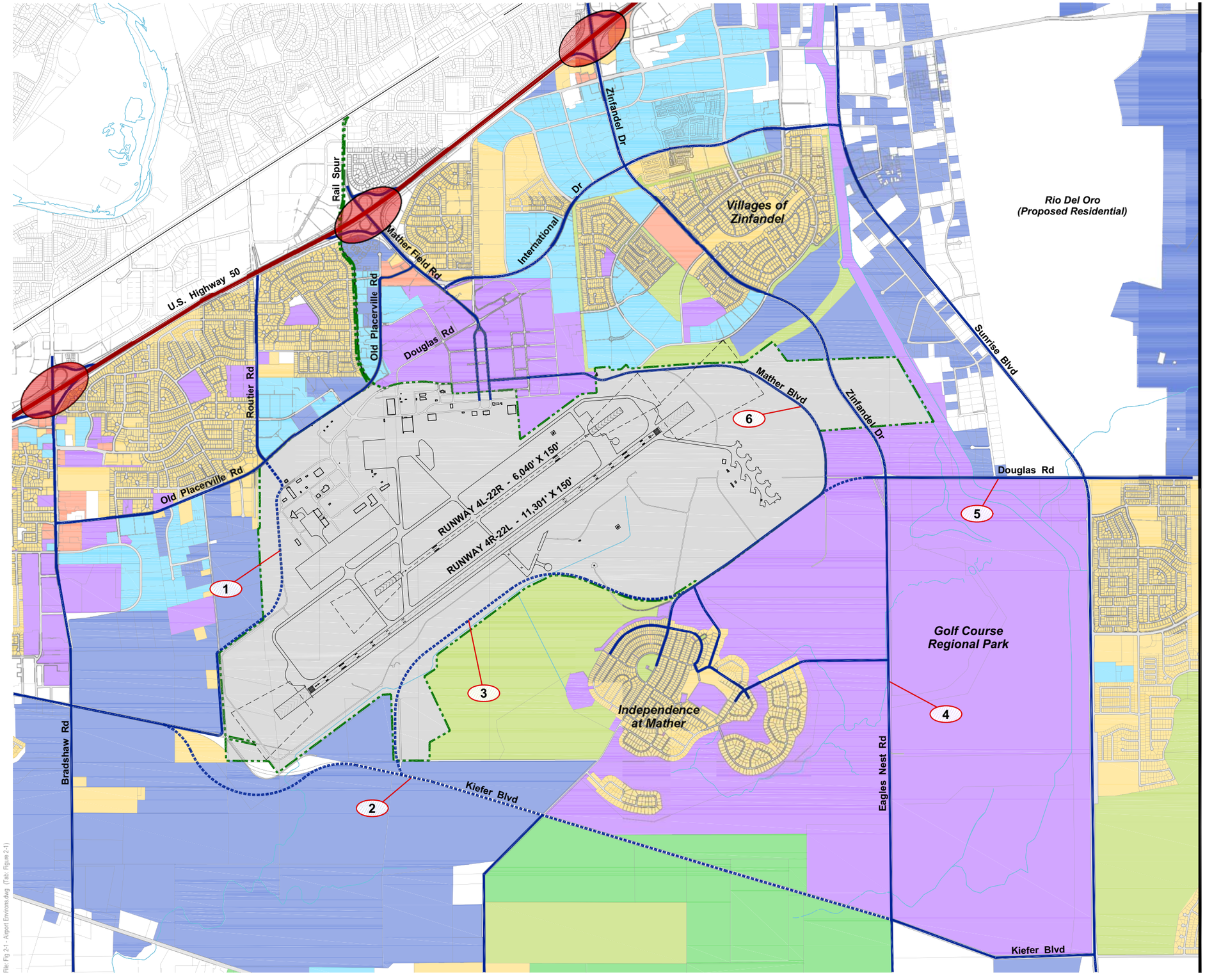
The area surrounding and most directly affected by the presence and operation of Mather is referred to as the Mather Airport environs. The environs are generally bounded on the north by U.S Highway 50, on the east by Sunrise Boulevard, on the south by Kiefer Boulevard, and on the west by Bradshaw Road (see Figure 2-1). U.S. Highway 50 provides access between Rancho Cordova and downtown Sacramento, where it converges with Interstate 5, Interstate 80, and Highway 99.

Land Uses and Development Patterns

Mather is surrounded by a mix of residential, commercial, industrial, and open land uses. Generalized land uses depicted on Figure 2-1 are based on existing land use patterns and 2005 planned land uses. The Mather Specific Plan, adopted in 1999, implements previous planning efforts in the environs by identifying a land use framework with specific requirements for private and public development; the location, intensity, and character of land uses; circulation patterns; and necessary infrastructure.

A substantial amount of new housing ***has been constructed or*** is anticipated within the eastern portion of Rancho Cordova, southern portions of Sacramento County, and in western El Dorado County. Over 25,000 new homes ***have been built,*** are under construction, approved, or in the approval stage in the eastern Rancho Cordova and several thousand more in the southeastern portion of Sacramento County. El Dorado

*Updated in October 2003 to reflect tenant ***changes and updated again in 2013 to reflect current conditions***.



LEGEND

- Airport Boundary
- Highway / Interstate
- Airport Access Routes
- Regional Access Point

Generalized Land Uses

- Airport
- Residential
- Commercial
- Office
- Industrial
- Public
- Agricultural
- Open space

Transportation / Roadway Improvement & Time Frame:

1. Routier Rd. Extension, TBD
2. Kiefer Blvd. Completion, 2025
3. Mather Blvd./Douglas Rd. Realignment, TBD
4. Eagles Nest Rd. Widening (4 Lanes), 2018
5. Douglas Rd. Widening (4 Lanes), TBD
6. Mather Boulevard Abandonment, TBD

NOTES

- Golf course/regional park east of Airport is a 500-acre economic conveyance.
- Land Use information not obtained for areas north of U.S. Highway 50.

N

0 250' 500'

GRAPHIC SCALE IN FEET

SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 2-1

AIRPORT ENVIRONS

Mather Airport Master Plan
May 2013

File: Fig 2-1 - Airport Environs.dwg (Tab: Figure 2-1)

County has approved over 14,000 homes ***with***in ***their*** Specific Plan areas. ***The City of Folsom is perusing development South of Highway 50.***

Independence at Mather, a 1,200-unit residential neighborhood, is located immediately south of the Airport. Stone Creek (previously called Villages of Zinfandel), a planned residential community, is located immediately northeast of the Airport. Villages of Zinfandel, approved by the County Board of Supervisors in 1998, includes 1,800 residential units, 1.5 million square feet of light industrial or high-technology space, 1.2 million square feet of office space, and 250,000 square feet of retail space. Construction of residential units began in late 2001. Construction on the first phase of commercial development began in 2002.

~~Two~~ ***Several*** additional planned residential communities ~~Sunrise Douglas and Rio del Oro,~~ are in ~~planned~~ ***the planning stage or under development*** east, ***southeast and south*** of Mather ~~(see Figure 2-1). Combined, these planned communities include approximately 24,000 residential units.~~

Approximately 700 acres immediately adjacent to and south of the ~~airfield~~ ***airport*** are designated as a special "Airport Industrial Subarea," which can be leased to private or public interests. The eastern 500 acres are considered economic development conveyance, and were identified as a potential location for a variety of uses.

Meteorological Conditions

Sacramento's climate is generally characterized as Mediterranean with an average annual precipitation of 17 inches. The rainy season is November through March when about 75% of the annual precipitation occurs. Mild thunderstorms occur mainly in the spring. Average temperatures range from 60°F to 95°F in the summer; and 37°F to 53°F in the winter. Heavy fogs occur in the winter, and may last for several days. Light and moderate fogs are more frequent, and usually occur in the early morning hours. Prevailing winds at Mather are from the southwest at an average speed of 8.6 miles per hour.

Cloud ceiling and visibility determine whether aircraft flights are governed by visual flight rules (VFR) or instrument flight rules (IFR).* The basic difference between VFR and IFR is that a pilot uses visual reference to navigate an aircraft under VFR and aircraft instruments to navigate under IFR. When the cloud ceiling is less than 1,000 feet or visibility is less than 3 miles, pilots are required to fly according to IFR.** VFR weather conditions at Mather occur 92.4% of the year; IFR conditions occur 7.6% of the year. A more detailed weather analysis, including

*Definitions are contained in ***Federal Aviation Regulations (***FAR***)*** Part 91, *General Operating and Flight Rules*.

**Except under Special VFR, as defined in FAR Part 91.

monthly and hourly percent occurrence of VFR and IFR conditions, is presented in Appendix A.

Annual wind data at the Airport are summarized in Table 2-1.

Table 2-1

ANNUAL WIND DATA
Mather Airport

Weather *(b)*	Wind direction *(a)* West	East	Total
VFR	98.1%	1.9%	100%
IFR	98.7	1.3	100

(a) Assuming west flow is the preferred direction of traffic and a maximum tailwind component of 5 knots.

(b) VFR (visual flight rule) conditions are in effect when the cloud ceiling is at least 1,000 feet above the Airport elevation and visibility is at least 3 miles. IFR (instrument flight rule) conditions are in effect when the cloud ceiling or visibility minimums falls below VFR minimums.

Source: Leigh Fisher Associates, February 2002, based on an analysis of Hourly Surface Airways Observation data obtained from the National Oceanic and Atmospheric Administration for a 10-year period beginning January 1, 1983, and ending December 31, 1992.

According to prevailing wind patterns, Mather operates in a west flow, i.e., arrivals and departures on Runways 22R and 22L, more than 98% of the time under both VFR and IFR conditions.

2013 UPDATE: The meteorological data from the initial report continues to be valid.

AIRPORT SITE

Mather occupies approximately ~~2,875~~ ***2,253*** acres at an elevation of ~~96~~ ***98.5*** feet above mean sea level (MSL). The site includes two parallel runways, 55 acres of cargo ramp space, 73 acres of general aviation aircraft parking ramp, ~~290,000~~ ***251,345***

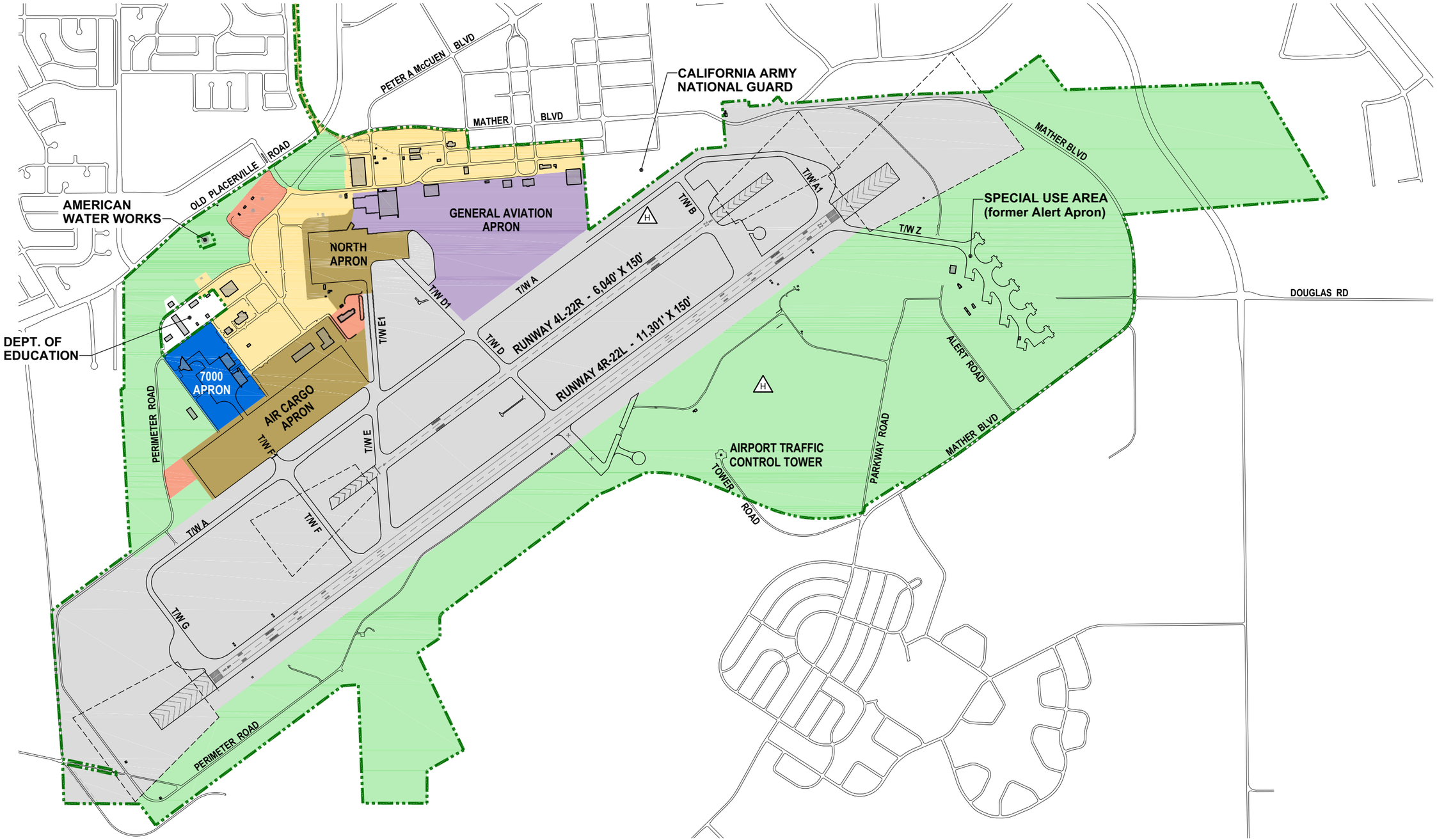
square feet of aircraft storage and maintenance hangars, and about ~~198,000~~ ***49,000*** square feet of office space. The majority of these facilities were constructed when the site was an active Air Force base.

Figure 2-2 illustrates land uses within the Airport boundary and identifies key airfield facilities. As shown, development is concentrated on the north side of the Airport. General aviation and air cargo land uses are divided by a triangular airfield ***turf*** area formed by Taxiways A, E1, and D1. ~~Air cargo uses are bisected by aviation support and nonaviation land uses~~. The ~~Open space~~ ***area immediately*** south of Runway 4R-22L ~~accounts for approximately half of the total Airport property (1,440 acres)~~ ***is essentially un-developed and affords opportunity for development of airport dependent, aviation related and compatible non-aviation development. This area amounts to approximately 555 acres, or about 25 percent of the airport property.***

Figures 2-3 and 2-4 illustrate the general layout and location of buildings, roadways, public parking areas, and aprons on the east and west sides of the Airport, respectively.

Table 2-2 presents an inventory of existing buildings at the Airport, including general use, lessee, and size. All buildings were previous military installations except buildings 4580, 7080, and 7085, which were constructed after 1996. Three buildings are adjacent to the Special Use Area (former Alert Apron) on the east side of the Airport. Two of these buildings, 8150 and 8195, are scheduled for demolition. The third structure, occupied by the Sacramento County Sheriff's Department (Building 8158) is approximately 1,900 square feet. The Sacramento County Airport System uses approximately 33,600 square feet of building space for various uses including offices, storage, and equipment maintenance shops.

2013 UPDATE: Over 31 former military structures have been demolished since the original Master Plan study. The remaining structures were designed for specific military purposes which vary greatly from today's general aviation, business and cargo needs. There is a significant effort and cost associated with retrofitting these former military structures. In order for a perspective tenant or the County to re—purpose the former military buildings, asbestos and lead paint needs to be removed and abated, upgrades are required to meet current County building codes and interior renovations are vital to conform to the tenant(s) needs. Additionally, the facilities will also require appropriate parking facilities and essential infrastructure and utility upgrades.



LEGEND

- Air Cargo (95 acres ±)
- General Aviation (95 acres ±)
- Non-Aviation (120 acres ±)
- Aviation Support (15 acres ±)
- Airfield (905 acres ±)
- Open Space (100 acres ±)
- Other Use (25 acres ±)
- Helipad
- Runway Protection Zone (RPZ)
- Airport Boundary (2,265 acres)

N

0 700' 1,400'

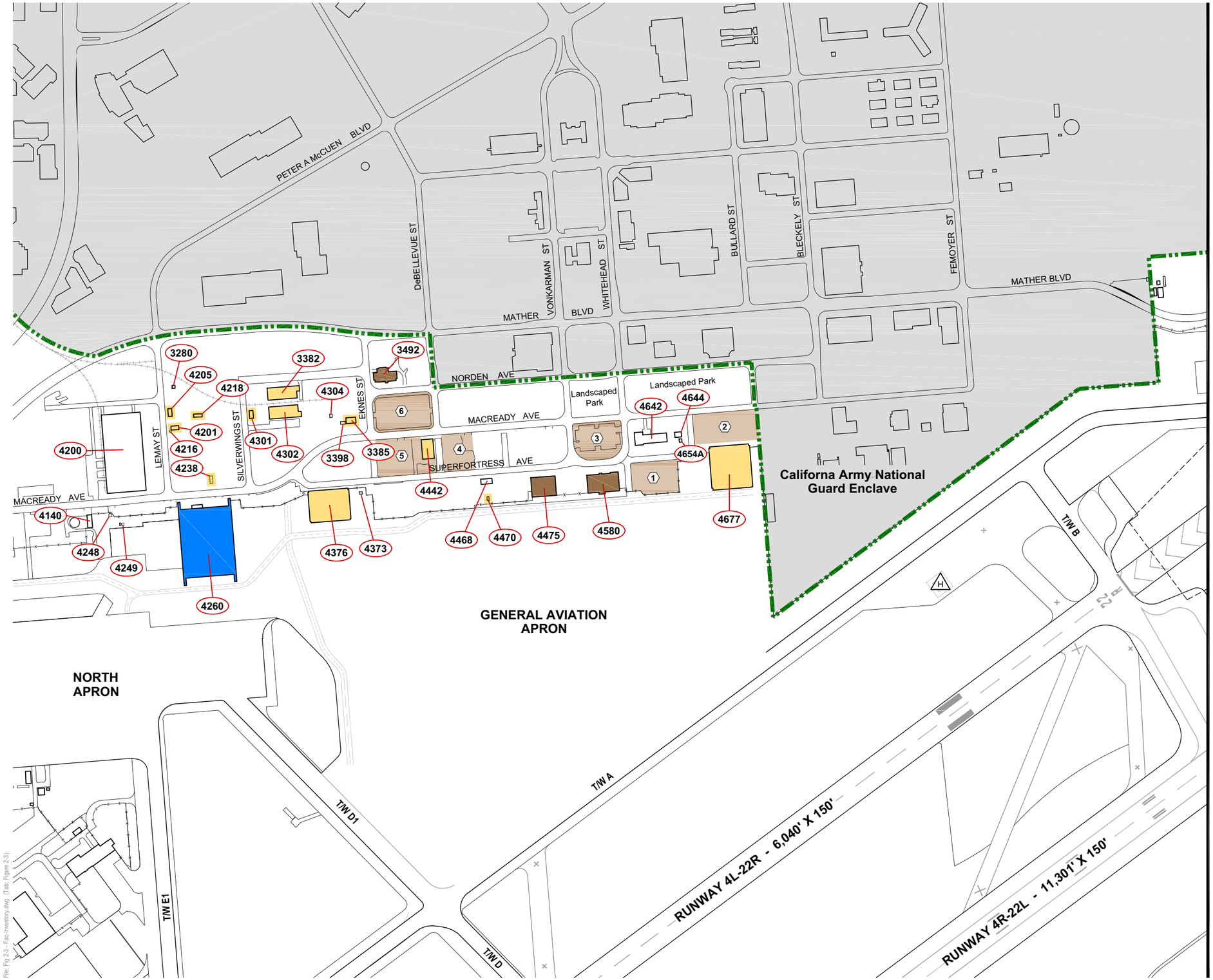
GRAPHIC SCALE IN FEET

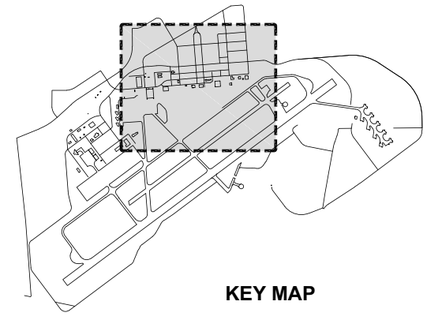
Figure 2-2

EXISTING AIRPORT LAND USES AND AIRFIELD FACILITIES

Mather Airport Master Plan
April 2013

File: Fig 2-2 - Land-Use-Exist.dwg (Tab: Figure 2-2)





KEY MAP

LEGEND

- Aircraft Storage/Maintenance Hangars
- Buildings/Hangars to be Removed
- Recently Constructed or Renovated
- Public Parking Areas
- Airport Boundary
- 4642 Building Number
- (1) Vehicle Parking Lot Number

NOTES

- Building numbers correspond to Table 2-2.
- Vehicle parking lot numbers correspond to Table 2-5.

N

0 250' 500'

GRAPHIC SCALE IN FEET

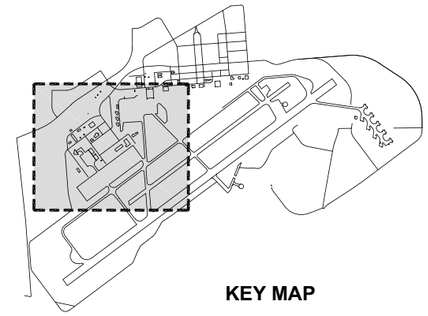
SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 2-3

BUILDING AND FACILITY INVENTORY (EAST SIDE)

Mather Airport Master Plan
May 2013

File: Fig 2-3 - Fac-Inventory.dwg (Tab: Figure 2-3)



KEY MAP

LEGEND

- Aircraft Storage/Maintenance Hangars
- Buildings/Hangars to be Removed
- Recently Constructed or Renovated
- Airport Boundary
- 4642 Building Number

NOTES

Building numbers correspond to Table 2-2.

N

0 250' 500'

GRAPHIC SCALE IN FEET

SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 2-4

BUILDING AND FACILITY INVENTORY (WEST SIDE)

Mather Airport Master Plan
May 2013

File: Fig 2-3 - Fac-Inventory.dwg (Tab: Figure 2-4)

Airfield Facilities

Since the majority of Mather's facilities were constructed ~~to~~ ***for*** military ~~criteria~~ ***needs*** during the 1950s, the County implemented a number of improvements to enhance safety and meet FAA design standards, including rehabilitation of ~~taxiway~~ ***runway*** and apron pavements, and construction of new taxiways to enhance operational efficiency. Mather~~'s airfield facilities~~ meet***s*** FAA Airport Reference Code (ARC)* D-V criteria and can accommodate aircraft with wingspans of up to ~~214~~ ***213*** feet and approach speeds of up to 165 knots~~. Mather meets the ARC criteria for all aircraft currently using the Airport.~~

Information regarding Mather's airfield facilities is summarized in the following sections.

Runways

As shown on Figure 2-2, the airfield includes two parallel northeast-southwest runways separated by 1,000 feet (centerline to centerline). ~~Primary~~ Runway 4R-22L is 11,301 feet long and 150 feet wide (with 75-foot-wide shoulders). Runway 4L-22R is 6,040 feet long and 150 feet wide. The distance separating the parallel runways is insufficient to allow simultaneous operations during Instrument Flight Rules (IFR) conditions ***under current standards***. Table 2-3 provides additional runway data.

*The FAA uses a two-component coding system called Airport Reference Code to classify airfield facilities according to the operational and physical characteristics of the aircraft intended to use them. The first component ~~of the ARC,~~ depicted by a letter, is the aircraft approach category and relates to approach speed; the second component, depicted by a Roman numeral, is the aircraft design group and relates to wingspan.

Table 2-2

EXISTING BUILDING INVENTORY
Mather Airport

Building number	Address	General use	Lessee	Size (sq ft)
3382	10386 Aircorp Way	Warehouse-no occupancy permit	None-scheduled for demolition	11,335
~~3385~~	~~10405 Aircorp Way~~	~~Hazardous waste central storage~~	~~Used by AFBCA Scheduled for demolition~~	~~1,650~~
~~3398~~	~~Silverwings Street~~	~~Covered awning~~	~~Sub Sea Systems~~	~~915~~
3492 *(a)*	10425 Norden Avenue	Office space	~~BERC, Sacramento County~~ ***Available for lease***	7,110
4005 4020	Neely Way	Fuel farm-880,000 gallon tank 440,000 gallon tank	~~Trajen Flight Support~~ ***Atlantic Aviation***	1,955
~~4130~~	~~Macready Avenue~~	~~Jet engine test cell~~	~~None-scheduled for demolition~~	~~870~~
4140	Macready Avenue	Deluge water storage tank	Used by SCAS	n.a.
4145	10312 Macready Avenue	Deluge pump station	Used by SCAS	1,560
4147	Macready Avenue	Shop	Available for lease	240
~~4150~~	~~10300 Macready Avenue~~	~~Warehouse/sort facility~~	~~Available for lease~~ ~~Nonleasable~~	~~17,610~~ ~~12,185~~
4200	3678 Lemay Street	Warehouse/office	~~Available for lease~~ ***CEAR***	80,820
~~4201~~	~~3671 Lemay Street~~	~~Storage~~	~~Sacramento Mineral Society~~	~~820~~
4205	3663 Lemay Street	Club house	~~Sacramento Mineral Society~~ ***CEAR***	880
4215	3708 Lemay Street	Shed	None-scheduled for demolition	2,150
~~4217~~	~~3683 Lemay Street~~	~~Shed~~	~~None-scheduled for demolition~~	~~825~~
~~4218~~	~~3679 Lemay Street~~	~~Shed~~	~~None-scheduled for demolition~~	~~820~~
~~4225~~	~~3708 Silverwings Street~~	~~Storage~~	~~None-scheduled for demolition~~	~~815~~
~~4236~~	~~Lemay Street~~	~~Shed~~	~~None-scheduled for demolition~~	~~530~~
~~4238~~	~~Lemay Street~~	~~Covered storage~~	~~None-scheduled for demolition~~	~~530~~
~~4248~~	~~Macready Avenue~~	~~Water heater~~	~~None-scheduled for demolition~~	~~375~~
4249	Macready Avenue	Compressed air plant	None-scheduled for demolition	105
~~4250~~	~~Macready Avenue~~	~~Wash rack (nonoperational)~~	~~USAF~~	~~24,030~~
4260	10360 Macready Avenue	Main aircraft maintenance hangar	Mather Aviation	98,830
4301	Silverwings Street	Storage	None-scheduled for demolition	800
4302	3683 Silverwings Street	Shop	None-scheduled for demolition	10,965
~~4304~~	~~Eknes Street~~	~~Storage~~	~~Used by AFBCA Scheduled for demolition~~	~~220~~
4373	Superfortress Avenue		~~Trajen Flight Support~~ ***Atlantic Aviation***	195
4376	10400 Superfortress Avenue	Hazardous material storage	~~Trajen Flight Support~~ ***Atlantic Aviation***	36,000
4442	3730 DeBellevue Street	Warehouse	~~SCGS~~ ***California Capital Air Show***	6,000
~~4445~~	~~10457 Superfortress Avenue~~	~~Office~~	~~None-scheduled for demolition~~	~~11,905~~
~~4468~~	~~10470 Superfortress Avenue~~	~~Office~~	~~None-no occupancy permit~~	~~1,400~~
~~4470~~	~~Superfortress Avenue~~	~~Storage/trash bin~~	~~Intel scheduled for demolition~~	~~125~~
~~4473~~	~~10480 Superfortress Avenue~~	~~Shop~~	~~None-scheduled for demolition~~	~~25,435~~
4475 *(a)*	10488 Superfortress Avenue	Office	~~Intel~~ ***ADI Shuttle***	12,500

Table 2-2 *(page 2 of 3)*
EXISTING BUILDING INVENTORY
Mather Airport

Building #	Address	General use	Lessee	Size (sq ft)
4580 *(a)*	10510 Superfortress Avenue	General aviation terminal/offices	~~Trajen Flight Support~~ Atlantic Aviation Hertz Rent a Car ***National Guard Bureau*** ~~Bailey Law Firm~~ American Academy of Aeronautics	12,670
4642	3745 Whitehead Street	Offices/Airport administration	SCAS Embry Riddle California Capital Air Show	7,150
~~4644~~	~~Buffington Street~~	~~Storage~~	~~None~~	~~800~~
~~4654A~~	~~Buffington Street~~	~~Storage~~	~~None~~	~~235~~
4677	10556 Superfortress Avenue	Offices/hangar	~~Trajen Freight Support~~ ***Atlantic Aviation***	48,000
~~7000~~	~~10234 Spaatz Way~~	~~Warehouse~~	~~Safe Store~~	~~49,830~~
7001	10157 Missile Way	Equipment maintenance shop	SCAS	4,900
7005	10080 Missile Way	Aircraft maintenance hangar	~~Trajen Flight Support~~ ***Atlantic Aviation***	17,000
7007	Skymaster Way	Generator		175
7008	Missile Way	Storage		1,685
7009	10203 Missile Way	Warehouse/office/shop	~~Placer Fire Equipment~~ ***Elks Lodge*** ***CEAR***	33,035
~~7010~~	~~10056 Missile Way~~	~~Office/aircraft maintenance hangar~~	~~Sheriff's Air Operations~~	~~17,395~~
~~7013 *(a)*~~	~~3735 Neely Way~~	~~Office~~	~~U.S. Forest Service~~	~~11,900~~
~~7014 *(a)*~~	~~3741 Neely Way~~	~~Office~~	~~Available for lease~~	~~19,315~~
7015	3846 Bazley Way	Aircraft maintenance hangar	~~None~~ ***Sherriff's Air Operations***	26,615
7016	10228 Missile Way	Fire foam storage shed	~~Sacramento Metro Fire~~	305
~~7020~~	~~3841 Bazley Way~~	~~Warehouse~~	~~None~~	~~23,835~~
7022	3819 Bazley Way	Shop	~~None~~ ***SCAS***	7,495
7024	10201 Skymaster Way	Shop	None	20,815
~~7025~~	~~Neely Way~~	~~Offices~~	~~None-no occupancy permit~~	~~12,340~~
~~7027~~	~~Missile Way~~	~~Covered patio~~	~~None~~	~~n.a.~~
7028	Bazley Way	Storage	~~None~~ ***Classic Marine***	1,530
~~7030~~	~~3819 Neely Way~~	~~Office~~	~~None-scheduled for demolition~~	~~20,160~~
7032	Missile Way	Generator		295
7033	10035 Missile Way	Shop	~~Sub Sea Systems~~	12,040
~~7035~~	~~10034 Missile Way~~	~~Aircraft maintenance hangar~~	~~None-scheduled for demolition~~	~~21,585~~
7040	3868 Bazley Way	Aircraft maintenance hangar	~~Union Flights~~	24,900
~~7041~~	~~10028 Missile Way~~	~~Paint booth~~	~~Sub Sea Systems~~	~~1,500~~
~~7043~~	~~Bazley Way~~	~~Storage-no occupancy permit~~	~~None~~	~~1,040~~
~~7045~~	~~10215 Truemper Way~~	~~Shop/warehouse~~	~~None-no occupancy permit~~	~~31,675~~
~~7055~~	~~3835 Neely Way~~	~~Office~~	~~None-scheduled for demolition~~	~~21,720~~
7063	10295 Truemper Way	Modular office	United Parcel Service	720

Table 2-2 *(page 3 of 3)*
EXISTING BUILDING INVENTORY
Mather Airport

Building #	Address	General use	Lessee	Size (sq ft)
7065	10295 Truemper Way	Office	United Parcel Service	1,025
7066	10295 Truemper Way	Storage	United Parcel Service	190
7068	Bazley Way	Storage	~~None~~ *CDF*	105
7070	Truemper Way	Shop	~~Used by SCGS~~ *SCAS*	1,075
7075	10321 Truemper Way	Fire station	24-hour ARFF and airfield maintenance	19,275
7080 *(a)*	10300 Truemper Way	Air cargo building/office/sorting	DHL Worldwide Express	38,000
7085 *(a)*	10260 Truemper Way	Air cargo building/office/sorting	Menlo Air Cargo	33,800
8150 *(b)*	Former Alert Apron	Office	None-scheduled for demolition	20,480
8158 *(b)*	Former Alert Apron		Sheriff's EVOC	1,900
8195 *(b)*	Former Alert Apron	Storage	None-scheduled for demolition	190

AFBCA = Air Force Base Conversion Agency
ARFF = Aircraft rescue and fire fighting
BERC = Business Environmental Resource Center
EVOC = Emergency vehicle operation course
SCAS = Sacramento County Airport System
SCGS = Sacramento County General Services
USAF = United States Air Force

(a) Visual inspection indicates recent construction or renovation.
(b) Located adjacent to Special Use Area (see Figure 2-2).

Source: Kennedy/Jenks Consultants, March 2002, updated May 2013, Sacramento County Airport System.

Table 2-3

RUNWAY DATA
Mather Airport

	Runway 4R-22L		Runway 4L-22R	
	4R	22L	4L	22R
Runway length (ft)	11,301	11,301	6,040	6,040
Runway width (ft)	150	150	150	150
Overrun Length (ft)	1,000	1,000	800	1,000
Runway threshold elevation (feet above MSL)	75	96	78	92
Pavement type	AC/PCC	AC/PCC	AC	AC
Pavement strength (lbs)				
~~Single wheel~~	~~80,000/60,000~~	~~80,000/60,000~~	~~60,000~~	~~60,000~~
~~Dual wheel~~	~~210,000/110,000~~	~~210,000/110,000~~	~~110,000~~	~~110,000~~
~~Dual tandem wheel~~	~~365,000/150,000~~	~~365,000/150,000~~	~~150,000~~	~~150,000~~
Single wheel (S)	***80,000***	***80,000***	***50,000***	***50,000***
Dual wheel (D)	***200,000***	***200,000***	***110,000***	***110,000***
Dual tandem (2D)	***770,000***	***770,000***	***175,000***	***175,000***
Dual-dual tandem (DDT)	***900,000***	***900,000***	***--***	***--***
Runway lighting	HIRL	HIRL	MIRL	MIRL
Runway marking	***Non***Precision	Precision	Nonprecision	Nonprecision
Approach lighting	--	MALSR	--	--
Approach aids	VOR,VASI	Cat I ILS, VASI, VOR	--	--
Approach slope	34:1	50:1	20:1	20:1

AC = Asphalt concrete
Cat I ILS = Category I instrument landing system
FAR = Federal Aviation Regulations
HIRL = High intensity runway lights
MALSR = Medium intensity approach light system with runway alignment indicator lights
MIRL = Medium intensity runway lights
MSL = Mean sea level
PCC = Portland cement concrete
VASI = Visual approach slope indicator
VOR = Very-high frequency omnidirectional range station

Sources: Kennedy/Jenks Consultants, March 2002.
Sacramento County Airport System, *Mather Airport Layout Plan*, October 2000.

Taxiways

As shown on Figure 2-2, taxiways connect the runways and aircraft parking areas. Most taxiways are 75 feet wide, which is the ARC dimensional standard for Airplane Design Group V. Taxiway A, north of Runway 4L-22R, is the Airport's only full-length parallel taxiway. Additional taxiways connect both runways to Taxiway A and the aircraft parking aprons. The use of Taxiways D and D1, which connect Taxiway A to Runway 4L-22R and the General Aviation Apron, is restricted to aircraft with maximum gross weights of 17,000 pounds or less.~~*~~ Additional taxiway data are provided in Table 2-4.

Table 2-4

TAXIWAY DATA
Mather Airport

Taxiway	Location/Purpose	Width (feet)	Type of construction	Condition
A	Full-length parallel taxiway north of Runway 4L 22R	75	PCC	Very good
B	Connects Runway 22R and 22L thresholds with Taxiway A	100	AC/PCC	Very good *(b)*
D *(a)*	Midfield runway exit taxiway	75	PCC/AC overlay	Poor
D1 ~~*(a)*~~ ***(b)***	Connects Taxiway A to North and General Aviation aprons	150	PCC/AC overlay	Poor
E	Connects Runway 4L threshold to Taxiway A and Runway 4R	75	PCC/AC	~~Very~~ good
E1	Connects Taxiway A to North and Air Cargo aprons	~~150~~ ***75***	PCC~~/AC overlay~~	~~Good~~ ***Fair***
F	Runway 22L exit taxiway	75	PCC	Very good
F1	Connects Taxiway F with Air Cargo Apron	75	PCC	Very good
G	Connects Runway 4R threshold to Taxiway A	75	PCC	Very good

AC = Asphalt concrete
PCC = Portland cement concrete

(a) Restricted to aircraft with maximum gross weights of ~~17,000~~ ***50,000*** pounds or less. ~~At the time of this report, (~~Taxiway D is scheduled for improvements. As part of the rehabilitation project, the County is considering construction of a 4-inch structural overlay on approximately 1,600 feet of pavement from Taxiway A to the intersection with Runway 4R-22L***)***
Except for a 400-foot portion immediately north of Runway 4L-22R, which is in poor condition.

(b) Restricted to aircraft with maximum gross weights of 17,000 pounds or less.

Sources: Kennedy/Jenks Consultants based on *Mather Airport Layout Plan*, March 2002.
Shutt Moen Associates, *Mather Airport Airfield Pavement Evaluation*, September 1999.
Sacramento County Airport System staff, April 2013.

~~*Construction scheduled for 2004 will increase strength to 50,000 lbs.~~

Helipads

Mather has ~~three~~ *two* ~~450-square-yard~~ helipads. The north helipad is located south of the California Army National Guard (CANG) enclave between Taxiway A and Runway 4L-22R. ~~The west helipad is located on the north side of the 7000 Apron.~~ The south helipad is located approximately 1,000 feet northwest of the Airport traffic control tower (ATCT).

Service Roads

Service roads facilitate the movement of aircraft support and Airport vehicles inside the airfield. As shown on Figure 2-2, Mather has a ~~vast~~ network of service roads that provide ground access to most areas. Perimeter Road is the major service road providing access to the airfield, runways and taxiways. ~~The south side of~~ ***South of Taxiway A, the*** Perimeter Road appears to be in poor condition ~~and would not support the load of fuel trucks~~, but the remainder of the road is in fair condition.

Vault Road is a narrow road in poor condition providing access to ILS instrumentation, airfield lighting vault, and weather station. Alert Road provides access to the Special Use Area and is in fair condition. Parkway Road connects Vault Road and Alert Road with Tower Road and is in good condition. Tower Road leads to the ATCT and is in good condition. A dirt/gravel road along the Airport perimeter fence is primarily used for periodic inspection of the fence and gates within the vicinity.

AVIGATION

Avigation refers to facilities and operating procedures related to the navigation of aircraft. Procedures and conditions pertinent to aircraft operations at Mather are discussed in the following sections.

Imaginary Surfaces and Obstructions

The airspace and land in the Airport environs consist of imaginary or obstacle limitation surfaces described below.

Approach Surfaces. Approach surfaces are sloped trapezoidal areas centered about the extended runway centerline. Penetration of an approach surface by a manmade object, object of natural growth, or terrain is considered an obstruction to air navigation unless allowed under specific conditions described in Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*. Approach surfaces

vary depending on the types of navigational aids that are available at an airport. The approach surface slope for each runway end at Mather is listed in Table 2-3. According to Mather's existing ALP, no obstructions of FAR Part 77 surfaces exist. ***Additionally, the January 2013 airport inspection performed by the California Department of Transportation Division of Aeronautics did not note any obstructions.***

Runway Protection Zones. A runway protection zone (RPZ) is a trapezoidal area centered about the extended runway centerline that enhances protection of people and property on the ground. RPZ dimensions vary with the type of aircraft and approach visibility minimums associated with that runway end. As shown on Figure 2-2, all land underlying the existing RPZs, except for approximately 8 acres of open space beneath the approach to Runway 22L, is within the Airport boundary.

Safety ~~and Approach-Departure~~ Zones. The ***1997*** Mather Airport Comprehensive Land Use Plan (CLUP) designates safety zones ***(Clear, Approach and Departure, and Overflight)*** to restrict incompatible land uses around the Airport. ~~Safety~~ ***Clear*** zones have the same dimensions as RPZs. ~~Approach and departure~~ ***Safety*** zones begin at the outer end of the ~~safety~~ ***Clear*** zones, and extend outward to a distance determined by the intersection between the approach surface and a horizontal surface located 150 feet above the established airport elevation. Existing land uses in the Airport environs are compatible with existing ***CLUP*** safety ~~and approach-departure~~ zones.

Air Traffic Control

The Mather Airport traffic control tower (ATCT) is approximately 1,800 feet south-east of Runway 4R-22L. The ATCT includes office space for personnel, equipment storage, and maintenance rooms. The ATCT is operational 24 hours a day, ***Monday through Friday, and from 0500-2100 on weekends*** ~~7 days a week~~. In 2000, the County reactivated the ATCT as an FAA contract tower. Under this agreement, the FAA funds operation of the ATCT for 16 hours during the day, and the County funds operation for the remaining hours. Air traffic control radar services are not provided at the Mather ATCT, ***but are available from Northern California Terminal Radar Approach Control Facility (TRACON)***.

The Mather ATCT is responsible for controlling air traffic within Mather's Class D airspace, which extends for a 5 mile radius around Mather and from the surface up to 2,600 feet above MSL. Pilots must establish and maintain two-way communications with the Mather ATCT prior to entering Mather's Class D airspace. Within Class D airspace, no separation services are provided to aircraft operating under VFR. In mid-2002, radar approach and departure control and other air traffic control services at Mather were integrated into the Northern California TRACON.

Navigation and Landing Aids

Existing navigation and landing aids and approaches at Mather are described below. Additional navigational aids associated with each runway are listed in Table 2-3

Precision Instrument Approach. A precision instrument approach is a standard procedure that provides the pilot with an electronic glide slope and glide path. At Mather, a Category I instrument landing system (ILS) provides a precision instrument approach to Runway 22L to a decision height (DH)* not lower than 200 feet and a visibility not less than 2,400 feet. ~~The installation of a runway visual range (RVR) reporting system and distance measuring equipment (DME) anticipated in 2003 may reduce visibility minimums to 1,800 feet. The RVR is pending FAA approval.~~

Nonprecision Approach. A nonprecision approach procedure is a standard procedure in which no electronic glide slope is provided. At Mather, position guidance for nonprecision instrument approaches to Runways 22L and 4R is provided by a very high frequency omnidirectional range (VOR) and DME located 12.8 nautical miles southwest of the approach end of Runway 4R.

2013 UPDATE: Area Navigation (RNAV) Global Positioning System (GPS) approaches are now in place on Runways 4R and 22L. These procedures overlay the flight paths of existing procedures, but allow the use of satellite based RNAV navigational system rather than ground based radio navigation signals.

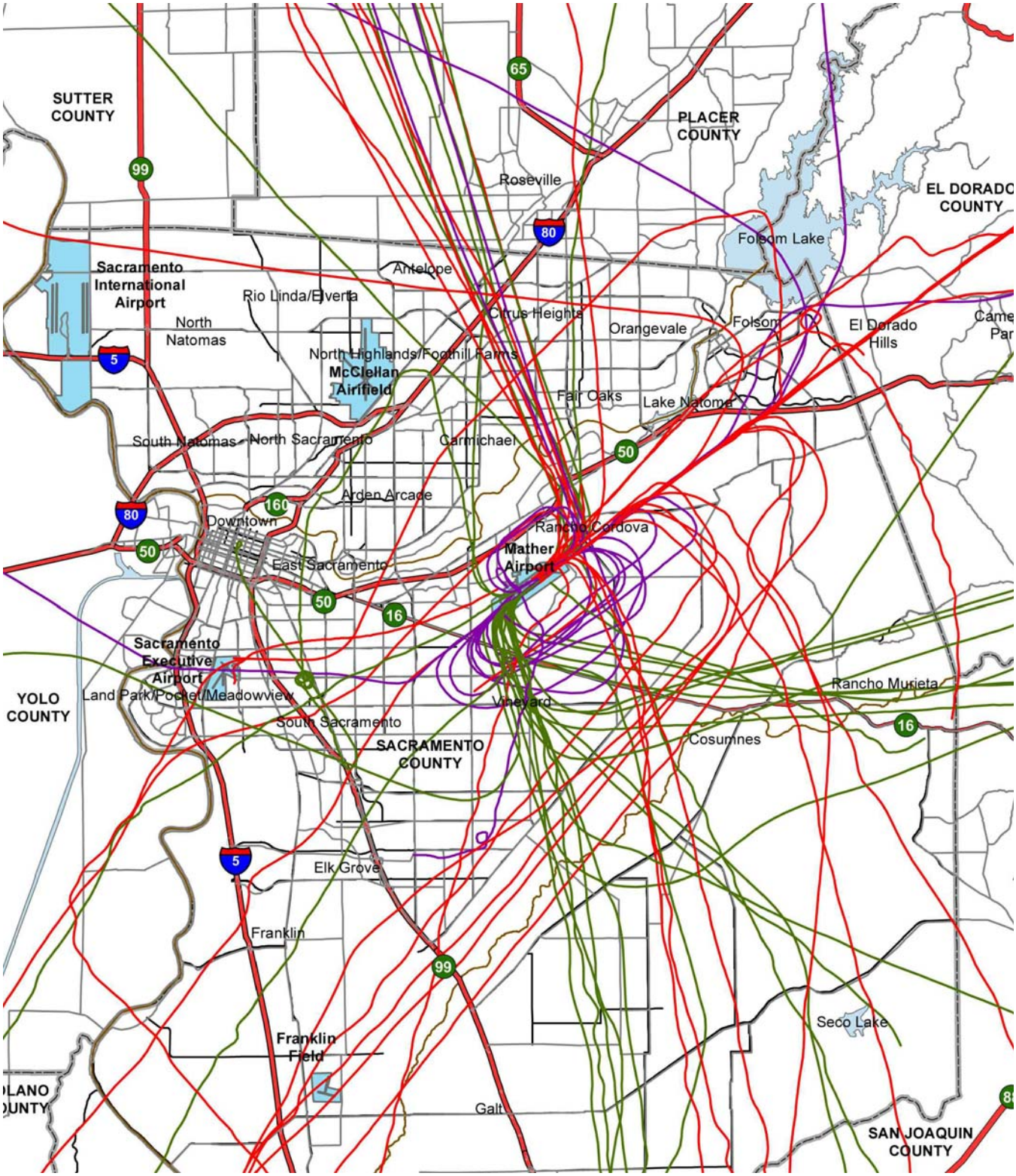
Approach Lighting System. Approach lighting systems assist pilots in transitioning from instrument to visual conditions on the final approach to a runway. Runway 22L is equipped with a medium intensity approach lighting system with runway alignment indicator lights (MALSR). Runways 22R, 4R, and 4L currently do not have approach lighting systems.

Visual Approach Slope Indicator. A visual approach slope indicator (VASI) provides, through a system of lights, the proper approach slope to a runway, similar to the glide slope of an ILS. VASI systems are intended for day and night use under visual flight conditions. Runways 4R and 22L are equipped with four-light VASIs (VASI-V4L).

Existing Aircraft Operations

Approximately ~~98%~~ ***88%*** of all aircraft operations at Mather occur on Runways 22R and 22L (west flow) and approximately ~~2%~~ ***12%*** occur on Runways 4L and 4R (east

*DH is the lowest height above the runway end at which a pilot must decide whether to continue the approach or execute a missed approach.



LEGEND

Mather Flight Track Type

- Arrival Track
- Departure Track
- Touch and Go Track

N

0 2.5 5

GRAPHIC SCALE IN MILES

Figure 2-5

MATHER AIRPORT RADAR FLIGHT TRACK DATA DECEMBER 20, 2012

Mather Airport Master Plan
May 2013

File: Fig 2-5 - Flight-Tracks.dwg (Tab: Figure 2-5)

flow). The vast majority of aircraft operations occur on the longer Runway 4R-22L, with Runway 4L-22R primarily accommodating general aviation, ***including*** touch-and-go training activity.

During visual meteorological conditions (VMC), aircraft operating under VFR operate on a right traffic pattern for Runway 22R and a left traffic pattern for Runway 4L (vice versa for Runway 4R-22L). The pattern altitude is 1,000 feet ***AGL*** for piston aircraft and 1,800 feet ***AGL*** for turbojet aircraft.

Figure 2-5 shows actual radar flight tracks for one day of operations at Mather. As shown, the majority of arrivals are straight-in to Runway 22L. Most large aircraft converge with the straight-in route approximately 8***-20*** miles east of the Airport. Smaller, general aviation aircraft operate shorter final approaches. The majority of departures turn north or south after departing on Runway 22L.

Noise Abatement Procedures

The following nighttime noise abatement procedures are currently in place at Mather.

- Runway 22 Departures—Northbound ***jet*** departures turn left heading 090, and proceed on course after reaching 6,000 feet MSL. All others ***jet*** departures turn left heading 090, and proceed on course after reaching 4,000 feet MSL.
- Runway 4 Departures—All ***jet*** departures turn right heading 100 until reaching 4,000 feet MSL~~. Northbound departures then turn right and~~ ***then*** proceed on course~~; all other departures should proceed direct on course~~.
- Arrivals from the North and East—Vectors to intercept the approach east of CAMRR (20 nm from the runway end) at or above ~~6,500~~ ***6,100*** feet MSL.
- Arrivals from the Southwest through the Southeast—Vectors to intercept the approach east of LDOOR (15 nm from the runway end) at or above ~~5,000~~ ***4,900*** feet MSL.
- Aircraft entering a downwind south of Mather must turn final prior to 10 miles. If unable, aircraft will be vectored to intercept final approach east of LDOOR at or above ~~5,000~~ ***4,900*** feet MSL.

In addition, the County has entered into Memorandums of Understanding (MOUs) with Travis and Beale air force bases to ~~regulate~~ ***provide aircrew recommended operating procedures to*** military aircraft flight training activity for noise abatement ~~purpouses~~ ***purposes***.

2013 UPDATE: Altitudes are revised due to FAA changes to the CAMRR and LDOOR waypoints on the MHR ILS RWY 22L instrument approach procedure, and clarifying language added to arrival and jet departure procedures. (The instrument approach procedure contains reference points for navigational use known as

waypoints. CAMRR waypoint is located nearly 22 miles from MHR in El Dorado County. LDOOR waypoint is located nearly 17 miles from MHR in El Dorado County.)

GROUND TRANSPORTATION

Ground transportation infrastructure at Mather and in its environs is described in the following paragraphs.

Access Roadways

U.S. Highway 50, located approximately one mile north of Mather, provides regional access from the east and west and connects areas north and south of the Airport along Interstate 5, Interstate 80, and Highway 99. As shown on Figure 1-1, these roads intersect west of the Airport in downtown Sacramento.

The three primary Airport access roads are shown on Figure 2-1 and are described below.

Mather Field Road. Mather Field Road is a four-lane divided roadway intersecting U.S. Highway 50 north of the Airport. At Lower Placerville Road, the northbound and southbound lanes diverge forming a couplet of two-lane, one-way streets providing access/egress to the general aviation facilities on the north end of the Airport. Air cargo facilities can also be accessed via the Mather Field Road entrance, although more direct access is provided at Macready Avenue and Old Placerville Road to the west.

Macready Avenue. Macready Avenue intersects Old Placerville Road west of Mather Field Road providing the most direct access/egress to the air cargo facilities. Old Placerville Road runs east-west along the northwestern boarder of the Airport intersecting Bradshaw Road, which provides access to U.S. Highway 50 and locations south of the Airport.

Douglas Road. Douglas Road is a two-lane roadway providing local access/ egress to locations east of the Airport. Sunrise Boulevard and Zinfandel Drive intersect Douglas providing local access from areas north and south of the Airport.

Circulation Roadways

The general aviation facilities at the Airport and corresponding roadways are depicted on Figure 2-3. Circulation within this area is provided primarily along Macready and Superfortress avenues. The surface condition of these roadways is considered fair to good~~; however, the section of Macready Avenue between Eknes~~

~~and Von Karman streets is in poor condition.~~ ***A section of Macready Avenue between Eknes and Von Karman streets was reconstructed in 2008.***

The air cargo facilities and corresponding roadways are depicted on Figure 2-~~4~~. Access to this area from the Airport entrance at Macready Avenue is provided along Neely Way, which is considered to be in good condition. Circulation within this area is along a series of small local streets that connect Neely and Bazley ways and provide access to the cargo buildings. Large trucks have difficulty maneuvering on some of these streets and at times may disrupt traffic movement in adjacent lanes.

2013 UPDATE: Current operations, by large vehicles, lead to congested conditions given the current roadway configuration. With the exception of portions of Macready Avenue, which has been reconstructed, the circulation roadways were constructed using military standards. While the roadway pavement condition are considered fair to good, the functionality of the roadways is lacking for existing usage the disparity between military standards used to design and build the roads and today's actual use results in less desirable operating conditions.

Transit Facilities

Sacramento Regional Transit operates ~~75~~ ***67*** bus routes and ~~two~~ ***three*** light-rail lines within Sacramento County. Currently, the ***closest*** light-rail ***station is*** ~~system terminates at~~ the Mather Field Station, a transit center located at Mather Field Road and Folsom Boulevard in Rancho Cordova, ***approximately 1.8 miles from the airport Administration Office.*** Six bus routes serve the Rancho Cordova community, feeding into the Mather Field Station, and light-rail trains operate from 4:30 a.m. to ~~1:00~~ ***12:30*** a.m. with 15-minute headways (30 minute headways in the evenings). The light-rail corridor ~~is currently being~~ ***has been*** extended east ***from the Mather Field Station and to*** ~~and will include additional~~ stations at Zinfandel Drive, the Cordova Town Center, Sunrise Boulevard, Hazel Avenue, and the City of Folsom.

Automobile Parking Facilities

As shown on Figure 2-3, seven public parking areas are designated for visitors and general aviation users along Macready and Superfortress avenues. Table 2-5 lists the location, size, and number of spaces in each lot. Lot 4 contains a building planned for demolition, which would provide approximately 20,000 square feet for additional parking spaces. Lot 5 ***and 9*** is a designated truck parking lot and has no assigned parking spaces.

Table 2-5

PUBLIC PARKING AREAS
Mather Airport

Lot	Location	Lot size (sq ft)	Spaces
1	Superfortress Ave. and Whitehead St.	45,000	79
2	Between Superfortress Ave., Buffington St., and Macready Ave.	48,000	68
3	Between Superfortress Ave., Von Karman St., Whitehead St., and Macready Ave.	28,000	63
4	Between Superfortress Ave., DeBellevue Ave. and Macready Ave.	38,000	88
5	Between Superfortress Ave., Eknes St., DeBellevue Ave. and Macready Ave.	20,000	n.a.
6	Between Macready Ave., Norden Ave., DeBellevue Ave., and Eknes St.	48,000	122
7	Between Macready Ave. and Superfortress Ave.	14,000	24
8	***10300 Truemper Way***	***8,200***	***35***
9	***10300 Truemper Way***	***7,300***	***na***
	Total	241,000	444

Note: Lot numbers corresponds to Figure 2-3.

n.a. = not applicable.

Source: Kennedy/Jenks Consultants, March 2002.
Sacramento County Airport System, May 2012

Additional parking areas for air cargo employees and tenants are located throughout the air cargo and nonaviation areas on the west side of the Airport.

AIR CARGO FACILITIES

As illustrated on Figure 2-2, the air cargo area occupies approximately 100 acres northwest of the airfield. The area includes cargo sort and warehouse facilities, and apron space leased to cargo airlines. Air cargo facilities are described below.

Cargo Storage and Sort Facilities

Mather includes a total of ~~89,400~~ ***71,800*** square feet of freight warehouse space. DHL Worldwide Express ***(conducting ground transportation operations)*** occupies Building 7080 and uses the 38,000 square feet of that building for office space and sorting facilities. United Parcel Service (UPS) operates from temporary trailers and 2,000-square-foot buildings adjacent to the North Apron. ~~Menlo Air Cargo (formerly~~

~~Emery Worldwide)~~ ***UPS Supply Chain Solutions*** occupies Building 7085, a 33,800-square-foot facility adjacent to the Air Cargo Apron constructed in 1999.

Aircraft Parking Apron

Figure 2-2 shows the location and layout of the aircraft parking aprons on the north side of the runways and the Special Use Area formerly called the Alert Apron.

Approximately 55 acres of aircraft parking apron are ***currently*** designated for air cargo use. The ~~Air~~ ***West*** Cargo Apron encompasses ~~36~~ ***43*** acres north of Taxiway A. Cargo operations are conducted on the eastern half of the apron. Airfield access to the Air Cargo Apron is provided via Taxiway F1 and Taxiway E1.

The North Apron encompasses ~~19~~ ***12*** acres north of the Air Cargo Apron and west of the General Aviation Apron. Air cargo aircraft access ***to*** the apron ~~via~~ ***is limited to*** Taxiway E1 because of weight restrictions on Taxiway D1. The eastern portion of the North Apron encompasses 9 acres adjacent to the General Aviation Apron and is not currently in use.

Table 2-6 summarizes aircraft parking apron data.

Table 2-6

AIRCRAFT PARKING APRONS
Mather Airport

Apron	Purpose	Size (acres)	Material	Condition
~~Air~~ ***West*** Cargo Apron	Air cargo operations	~~36.0~~ ***43.0***	PCC	~~East side-good~~ ~~West side-poor~~ ***Good***
North Apron	Air cargo operations	~~19.0~~ ***12.0***	PCC	~~West side-good~~ ~~East side-poor~~ ***Good***
Apron near Building 4250	Wash area only	0.5	PCC	Nonoperational
General Aviation Apron	GA aircraft operations	73.0	PCC & AC	~~Generally poor~~ ***Good to poor*** East side-excellent
7000 Apron	Not in use	4.5	PCC	~~East side-very poor~~ ~~West side-very good~~ ***Fair to poor***
Former Alert Apron	Not in use	8.8	PCC	Poor

AC = Asphalt concrete
PCC = Portland cement concrete

Sources: Kennedy/Jenks Consultants, March 2002.
Shutt Moen Associates, *Mather Airport Airfield Pavement Evaluation*, September 1999.
Sacramento County Airport System staff, April 2013.

GENERAL AVIATION FACILITIES

As shown on Figure 2-2, general aviation facilities are located north of Taxiway A and east of the air cargo area.

Aircraft Storage and Maintenance

Mather provides a total of ~~290,000~~ ***251,300*** square feet of indoor aircraft storage and maintenance space allocated among ~~seven~~ ***six*** conventional hangars and one corporate hangar. Figures 2-3 and 2-4 depict the locations of storage and maintenance hangars. Table 2-2 provides specific information on hangar location, use, and size. No T-hangars or shadeport facilities are ***currently*** located at Mather.

One corporate and two conventional hangars are located on the north side of the General Aviation Apron. Mather Aviation provides full-service aircraft maintenance and repair from the 48,000-square-foot facility (Building 4677) east of the terminal building and ***the*** 36,000-square-foot corporate hangar (Building 4376) ~~and 4677)~~ are used for aircraft storage and the 98,000-square-foot aircraft maintenance hangar (Building 4260), ~~both are primarily used for aircraft storage~~ ***is used for maintenance***.

~~Five~~ ***Three*** conventional hangars are located adjacent to the ***Northwest Ramp (***7000 Apron***)***. ~~Trajen Flight Support~~ ***Atlantic Aviation*** leases Building 7005 for office and aircraft storage, and the Sacramento County Sheriff's Air Operations Bureau leases Building ~~7010~~ ***7015*** for aircraft ***storage and*** maintenance. ~~The County is upgrading these buildings for future tenants. The remaining hangar, located on the west side of the 7000 Apron (Building 7035), is scheduled for demolition~~. ***Building 7040 is currently unoccupied.***

2013 UPDATE: The corporate and conventional hangars located along the general aviation apron were originally constructed for military uses. The conversion for today's general aviation uses is inadequate at best. Recent investigation indicates it is more economical and operationally more desirable, from both an airport and tenant's perspective, to construct new general aviation hangar facilities rather than renovate and reuse existing ones.

Aircraft Parking Apron

The general aviation area includes one ~~73~~ ***82***-acre apron used for itinerant and based general aviation aircraft operations and parking. The General Aviation Apron was configured by the Air Force for large military aircraft. Since the Airport opened in 1995, the County has been using the tiedown spaces left by the Air Force, which are two or three times larger than needed and very inefficient for general aviation operations. About 150 parking spaces are spread over the ~~73~~ ***82***-acre apron.

In 2002, the County constructed new tiedowns and taxilanes on the General Aviation Apron in accordance with FAA design criteria. The total area was reduced to about 25 acres, providing tiedowns for 65 based aircraft, including single- and multi-engine aircraft, and parking spaces for about 40 itinerant aircraft. The remainder of the apron is used for overflow parking.

Fixed Base Operator

~~Trajen Flight Support~~ ***Atlantic Aviation*** is Mather's sole fixed base operator (FBO). ~~Trajen~~ ***Atlantic*** operates from 6,800 square feet of leased space in the General Aviation Terminal on the north side of the General Aviation Apron and provides

aircraft fueling, ramp support, passenger terminal and lounge, aircraft sales/leasing/brokerage, courtesy transportation, and catering/flight kitchen.

~~Trajen~~ ***Atlantic*** is also under contract with the County to manage several Airport facilities, including the corporate hangar, General Aviation Apron, fuel farm, and hangars currently leased to the U.S. Department of Justice and Mather Aviation.

Mather Aviation, located in Building 4260, offers aircraft maintenance, aviation support, and avionics sales and services.

Terminal Building

The general aviation terminal building, constructed in 1996, comprises approximately 15,000 square feet at 10510 Superfortress Avenue. ~~Trajen Flight Support~~ ***Atlantic Aviation*** leases 6,800 square feet and is the primary tenant. Hertz Rent-a-Car and other commercial tenants lease approximately 4,000 square feet.

OTHER USES

Besides cargo and general aviation, the following additional facilities, and buildings are located at Mather.

Airport Administration and Support

The Airport Administration Building (Building 4642) is located in the general aviation area on Whitehead Street between Macready and Superfortress avenues.

~~The Business Environmental Resource Center (BERC), which is located at 10435 Norden Avenue (Building 3492), provides information and support to Airport tenants, including permit assistance and consulting services to Sacramento County businesses.~~

Aircraft Rescue and Fire Fighting

Mather has a 24-hour first-response aircraft rescue and fire fighting (ARFF) facility located south of the North Apron. The ARFF facility shares a 5-acre parcel with airfield maintenance. Jurisdictional responsibility for structural fires and medical emergencies rests with the Sacramento Metropolitan Fire District.

Fuel Storage

The original Air Force fuel farm currently supplies Jet A and AvGas, but is to be replaced with a new farm. Two fuel tanks are located at the fuel farm on Neely

Way. The capacities of the tanks are 10,000 and 20,000 barrels, respectively. ~~All fuel distribution lines to the tanks and the 10,000-barrel tank have been modified and are operational.~~ ***Only 200,000 gallons (4762 barrels) of Jet A are currently stored in the smaller tank. A 12,000 gallon (286 barrels) AvGas tank is also installed in this area.*** The 20,000-barrel tank has not been modified, but could be ***made*** operational ~~within 6 months,~~ if needed. The update would require the addition of fire protection, cleaning of the tank interior, and connections. The fuel farm is leased to ~~Trajen Flight Support~~ ***Atlantic Aviation***, which is the fuel supplier for the Airport.

2013 UPDATE: Construction began on a new fuel farm in early 2013, and is expected to be complete late 2013. The project will install two new 1190 barrel capacity jet fuel storage tanks and related fuel dispensing equipment, one existing tank with a 285 barrel capacity will be relocated. The existing AvGas tank will be relocated to the new fuel farm site. The new location is approximately 0.80 acres, located at the west end of the west cargo apron. The existing fuel farm will be demolished in the future.

Utilities

Electricity, telephone, gas, and sewer services are provided to Airport tenants.

2013 UPDATE: The existing utility infrastructure was installed by the Air Force in the 1950's and not designed for today's needs. Upgrades are expected to be needed as roadways and buildings are upgraded.

Mather has historically been served with groundwater supplied from onsite wells and treatment facilities. Electrical power is supplied to Mather from the Sacramento Municipal Utility District (SMUD) and West Coast Gas provides natural gas. Regional County Sanitation District (SRCSD) provides collection and treatment to waste water for the entire County. Local sewer service for the Mather Airport area is provided by the Sacramento Area Sewer District (SASD).

The proposed expansion of the landside development will result in an increased demand for utilities; this will be offset through developer fees associated with building permits and adherence to the Mather Field Public Facilities Financing Plan.

Industrial and Commercial Uses

Several ~~nonaviation~~ ***non-aviation*** businesses are based at Mather. ***CEAR (California Electronic Asset Recovery) is a recycling center for electronic recycling***

services, which operates from building 4200 and Classic Marine, one of Sacramento's oldest boating service and repair shops, leases building 7033. ~~The Sacramento Mineral Society leases a storage building and a clubhouse, which are located northwest of the terminal building. Sub Sea Systems operates a metal fabrication business and leases space for an office and a shop north of the Air Cargo Apron.~~

Military and Government Facilities

The California Army National Guard and the Sacramento County Department of Education facilities are located on the Airport, but are not part of Airport property.

The 65-acre Special Use Area located southeast of Runway 22L is currently used by the Sacramento County Sheriff's Department to conduct an emergency vehicle operation course. The Sheriff's Air Operations Bureau leases a hangar adjacent to the ***Northwest Ramp*** (7000 Apron) (Building ~~7010~~ ***7015***) for office and aircraft ***storage and*** maintenance space.

Security

A security fence is located along the perimeter of the runway and apron area~~. A private company provides general security services. Patrol services include general perimeter observations and certain building checks, but exclude the Airport ramp operations area.~~ Since September 11, 2001, a ramp access and control plan has been in place. A revision of the security procedures is issued approximately every 12 months, if deemed necessary. There is no federal requirement for an access control system at Mather.

The security of each gate and facility is assigned to a keeper, which is either a tenant or County representative. Tenants are responsible for the security of their facilities. Each facility is assigned a separate gate. ~~which is~~ ***Gates 412,13, 415, 419, 420, 701, 704, 705 and 806 are electrically operated gates, all other gates are*** operated manually. County personnel are tasked with securing all unlocked gates. Currently, an intercom and closed-circuit television system operated by ~~Trajen~~ ***Atlantic Aviation and Mather Aviation*** are used to control access to the General Aviation area.

ENVIRONMENTAL CONDITIONS

Known environmental constraints pertinent to Master Plan recommendations are summarized below.

Aircraft Noise Exposure

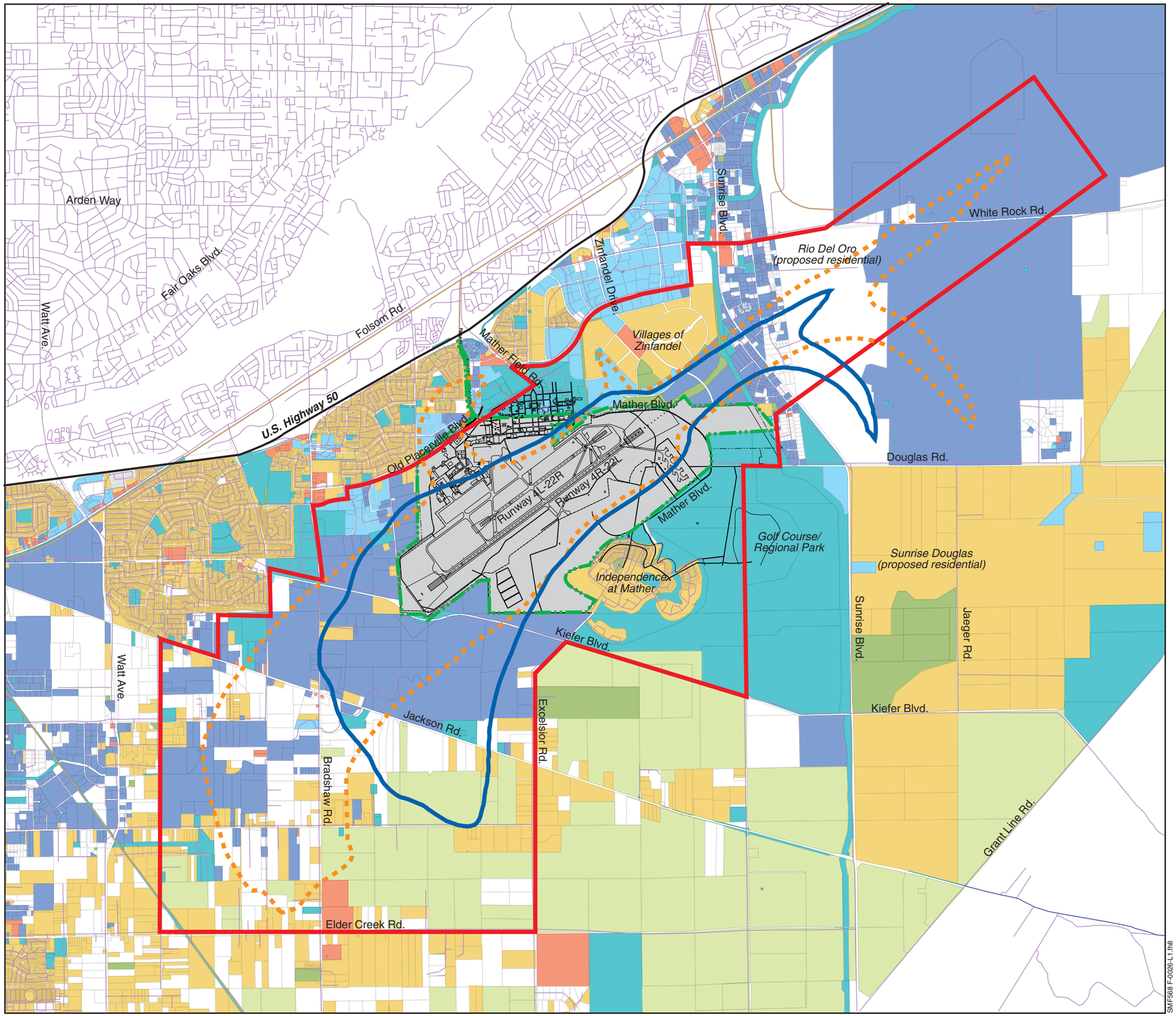
Figure 2-6 presents 2001 noise exposure patterns. Generally, the 2001 CNEL 60 (Community Noise Equivalent Level—expressed in decibels) and higher noise exposure contours are located within the boundaries of the Mather Airport Policy Area (MAPA), except for one area northeast of the Airport. The MAPA was approved by the Sacramento County Board of Supervisors in 1997 and established to (1) increase awareness in future residential communities of potential aircraft noise exposure; (2) limit the potential for conflict between existing communities; and (3) protect future Airport development and operational flexibility beyond that provided by the CLUP. MAPA guidelines prohibit new residential development within the CLUP CNEL 60 contour and require noise insulation, real estate disclosure statements, and avigation easements for residential development outside the CNEL 60 but within the MAPA.

2013 UPDATE: On April 19, 2006 the County Board of Supervisors adopted an Airport Planning Policy Area (APPA) for Mather as an interim effort to ensure airport land use compatibility during a period of rapid development that was outpacing the rate at which airport master plans, environmental documentation, and Airport Land Use Compatibility Plans could be updated. The MHRAPPA includes an area beyond the 60 Community Noise Exposure Level (CNEL) noise contour inside the County's jurisdiction, where residential development is allowed but requires incorporation of interior sound insulation, a requirement to provide disclosure to homebuyers, and the granting of an avigation easement to the County. The APPA conditions residential development beyond the 60CNEL noise contour, by requiring new residential uses within it to provide disclosue, interior sound insulation, and an avigtion easement to the County. The new DEIR will re-evaluate noise impacts and produce new noise contours for the Mather Airport.

Based on FAA criteria for noise exposure, Mather is compatible with surrounding land uses. However, changes in aircraft flight patterns or runway facilities may result in noise exposure in existing residential areas, or require changes to planned land uses. Effects of future noise exposure associated with Master Plan alternatives are addressed in Chapter 5.

Natural Environment

The Mather site includes numerous environmentally sensitive areas. The southern portion of the Airport includes ~~vast~~ grasslands, vernal pools, and seasonal wetlands that provide existing and potential habitat for a variety of species. Natural environmental constraints are depicted on Figure 2-7.



LEGEND

- CNEL 60 noise exposure area
- Mather CLUP CNEL 60 noise exposure area
- Mather Airport Policy Area
- Airport boundary

Generalized land uses (2005)

- Airport
- Residential
- Commercial
- Office
- Industrial
- Public
- Agricultural
- Open space

CLUP = Comprehensive Land Use Plan
CNEL = Community Noise Equivalent Level

Note: Land use information was not obtained for areas north of U.S. Highway 50.

Sources: Base map ~~L~~eigh Fisher Associates, June 2001, based on U.S. Department of Commerce, Bureau of the Census Tiger files.

Noise contours ~~L~~eigh Fisher Associates, May 2002.

Generalized land uses ~~E~~conomic & Planning Systems, Inc., based on data provided by Sacramento County, June 2001.

Mather CLUP noise exposure area ~~A~~irport Land Use Commission for Sacramento, Sutter, Yolo, and Yuba counties, May 1997.

Villages of Zinfandel land use ~~D~~raft Supplemental Environmental Impact Report, *Villages of Zinfandel*, Sacramento County, October 2001.

N

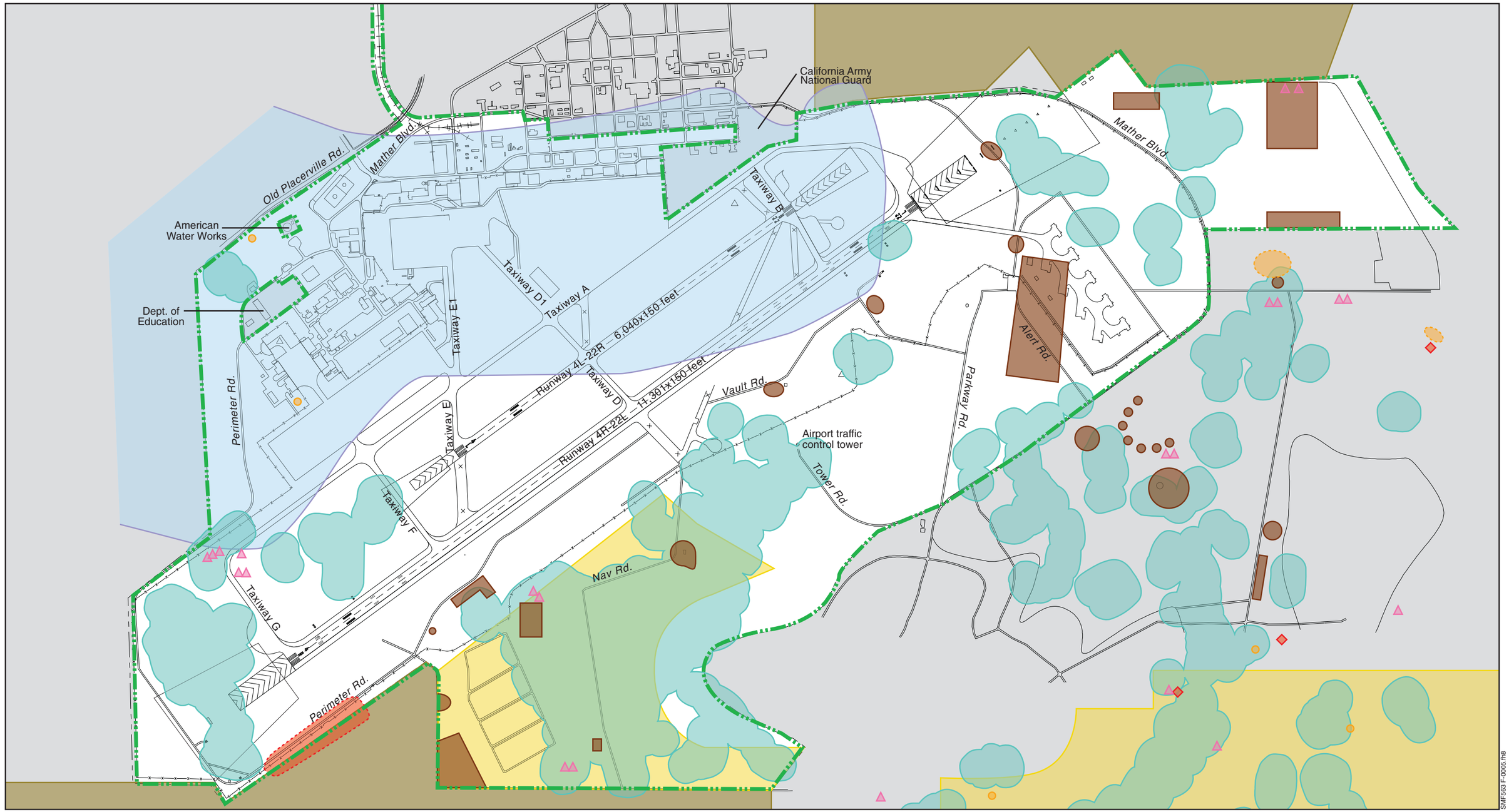
2,500 0 2,500 5,000

Graphic Scale in Feet

SMF568 F-0028-L1.fh8

Figure 2-6
ESTIMATED 2001 NOISE EXPOSURE
Mather Airport Master Plan
October 2003

LEIGH FISHER ASSOCIATES



LEGEND

- Installation Restoration Program (IRP) site
- Groundwater plume
- Mining area
- Vernal pool and 250 foot buffer
- Aggregate resources
- Airport boundary
- Endangered species (bird or mammal)
- Endangered species or potential habitat (reptile or amphibian)
- Endangered species (fish or other aquatic animal)

Sources: County of Sacramento, Draft SEIR, *Mather Field Specific Plan*, September 1996.
County of Sacramento, EIR, *Mather Field County-Operated Aviation Facility*, September 1994.
Jones and Stokes, *Biological Resources Occurring in the Mather Field Specific Plan and Mather Single Family Housing Area*, June 1997.

N

700 0 700 1,400

Graphic Scale in Feet

SMF563 F-0005.tif8

Figure 2-7
ENVIRONMENTAL AND GEOGRAPHIC CONSTRAINTS
Mather Airport Master Plan
December 2003

LEIGH FISHER ASSOCIATES

Biological Resources. Based on a review of previous reports, 14 special-status plant species and 52 special-status wildlife species were considered to have the potential to occur in the Airport vicinity.* "Special-status species" refers to species that are either listed or proposed for listing as threatened or endangered by the California or Federal Endangered Species Acts. Figure 2-7 illustrates the location of these special-status species and habitats.

Sensitive Habitats. Annual grassland habitat is found over most of the Airport's undeveloped areas. Grasslands are open, treeless landscapes consisting of annual grasses and broad-leafed herbaceous species.** The southern, undeveloped portion of the Airport consists of seasonal wetlands and vernal pools. ~~Previous inventories have shown that about 150 acres of wetlands exist within the Airport boundary, of which about one-third are vernal pools.***~~ The County of Sacramento ~~is conducting~~ ***has conducted*** a Natural Resources Assessment at Mather. The first phase of this study includes a wetlands delineation and assessment of vernal pools.

2013 UPDATE: Ownership of the environmental preserve, located to the south of the Airport, was transferred to another County department during the property transfer from the Air Force. Since this parcel is no longer part of the Airport, a large portion of the biological resource and sensitive habitats inventoried previously are no longer a part of the Airport.

Historic, Archaeological, and Cultural Resources

During preparation of the Mather Air Force Base Disposal and Reuse Draft EIS, the Air Force consulted with the California State Historic Preservation Officer (SHPO). The SHPO concluded that (1) Mather did not contain historic properties; (2) disposal and reuse would not affect cultural resources; and (3) no structures or resources were considered for listing on the National Register of Historic Places. However, the Sacramento County Historical Society has indicated that Mather is a locally

*Draft Supplemental Environmental Impact Report (SEIR), *Mather Field Specific Plan*, County of Sacramento Department of Environmental Review and Assessment (DERA), September 1996 and U.S. Fish and Wildlife Service, *List of Federal Endangered and Threatened Species that May Be Affected by Projects within the Carmichael 7 ½ Minute Quad*, March 25, 2002.

**Final Environmental Impact Report, *Mather Field County-Operated Aviation Facility*, County of Sacramento DERA, September 1994.

***Draft SEIR, *Mather Field Specific Plan*, September 1996 and Final EIR, *Mather Field County-Operated Aviation Facility*, September 1994.

important historic resource, as many buildings exist from the pre-World War II era.****

Hydrology and Drainage

Mather is located within the Morrison Creek Stream Group watershed—a system of creeks that drains into Beach-Stone Lake and the Sacramento River. The City of Sacramento and the U.S. Army Corps of Engineers have concluded that the watershed provides flood protection from 40-year and 100-year events.

Natural surface storm water runoff (from the northeast to the southwest) has been partially altered by the airfield and buildings.* The current drainage system consists of storm sewers, culverts, and channels that discharge into Morrison Creek.

Hazardous Materials

Because Mather was operated as a federal military installation, the U.S. Environmental Protection Agency (EPA), Department of Defense (DOD), U.S. Air Force (USAF), and the California EPA, Department of Toxic Substance Control (DTSC) oversee hazardous substances investigations and remediation. The DOD also oversees its own program, Installation Restoration Program (IRP), which identifies, characterizes, and remediates contamination at military facilities.

Since 1982, the DOD has identified approximately 68 contaminated sites on the Airport as a result of aircraft fueling and maintenance activity, fire protection training, corrosion control, past disposal activities, and landfilling. Main contaminants include solvents, petroleum products, and various solid wastes. In addition, pesticides, herbicides, asbestos, polychlorinated biphenyls (PCBs), radon, ordinance, metals (including lead), low-level radioactive waste, landfill gases, and medical waste, which were used, stored, or generated as part of base operations have been identified as potential sources of contamination. Although significant remediation has occurred to date, substantial work remains to be completed.

2013 UPDATE: Since the original Basewide Environmental Baseline Survey (EBS) for the former Mather AFB, dated December 1993, much progress has been made toward cleaning up environmental contamination and improving the environmental condition of the property. Investigations were completed at all areas of known or suspected contamination, and decisions made to take all actions necessary to protect human health and the environment. All remedial actions were put in place,

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****Draft SEIR, *Mather Field Specific Plan*, September 1996.

*Draft SEIR, *Mather Field Specific Plan*, September 1996 and Final EIR, *Mather Field County-Operated Aviation Facility,* September 1994.

and many sites were closed out (remedial actions are complete) after having met cleanup requirements.

Aggregate Resources

High quality aggregate (sand and gravel) resources exist on-Airport, and in the immediate vicinity. The aggregates are used to make Portland cement concrete, ***asphaltic concrete, and road base*** ~~material used extensively in construction~~. It is estimated that approximately 40 million tons of aggregates (a 5- to 8-year supply for the Sacramento area) could be extracted from the area south of the airfield (see Figure 2-7). It should be noted that this area also coincides with the location of seasonal wetlands and vernal pools.

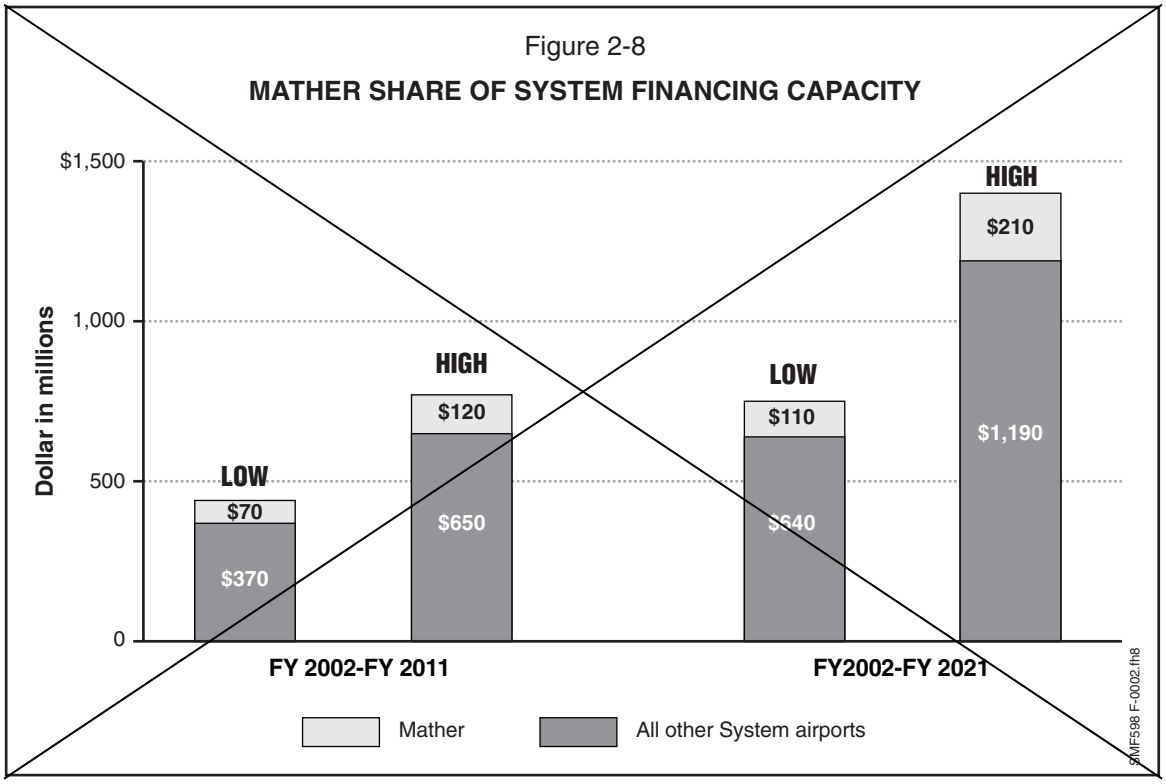
FINANCING CAPACITY

A ***general*** financing capacity analysis, which provides an estimate of the County's ~~capacity~~ ***approach*** to finance capital improvements, was undertaken ~~to indicate the range of funding likely to be available for Master Plan recommendations, and~~ ***to*** serve as a "reasonableness check" on proposed investments. ~~The analysis, approach, and assumptions used to determine the County's financing capacity are provided in Appendix B.~~

~~As presented on Figure 2-8, it is estimated that about 15% of the County's Airport System financing capacity may be available for improvements at Mather in the future. Consequently, it was calculated that between $70 million and $120 million would be available for improvements at Mather in the near term (10 years), and that between $110 million and $210 million would be available for improvements in the longer term (20 years).~~

Figure 2-8

MATHER SHARE OF SYSTEM FINANCING CAPACITY



~~Conditions that could result in an increased amount of future funding for improvements at Mather include: (1) high-priority capacity projects that would result in increased FAA discretionary funding; (2) a higher landing fee at Mather to support capital investment; and/or (3) a dedicated cargo facility charge to support capital investments.~~

2013 UPDATE: The County Airport System does not allocate funding to each Airport; instead projects from all four airports are incorporated into the five year Capital Improvement Program (CIP). The CIP is renewed and updated each year, with each project competing against the others based on its own merit and available funding. In the proposed 2013 CIP, Mather projects account for 33% of the proposed projects, but this portion will vary by year.

Chapter 3*

HISTORICAL AND FORECAST AVIATION DEMAND

2013 UPDATE: When the Mather Airport Master Plan DEIR was completed and circulated for public review and comment in September 2012, comments were received concerning the validity of the airport activity forecast baseline year (2007) relative to industry and airport activity trends that have occurred since the DEIR was initiated. Consideration of these concerns led to the determination that a completely new airport activity forecast, with a baseline year of 2012 and a planning horizon year of 2035 should be prepared.

Given the complete update of the forecast baseline and planning horizon years, the entire Chapter 3 has been updated. This updated forecast base case considers the organic growth of activity at the Airport, as described in the forecast narrative; numerous factors were reviewed and considered in its preparation, including national and regional economic and aviation industry trends.

In addition to the forecast base case, an alternative forecast scenario was included based on the reintroduction of a second integrated air cargo carrier to Mather. The forecast for this scenario was built on an underlying assumption that the most likely case for a second carrier coming to Mather would be for integrated cargo activity occurring at Sacramento International Airport (International) to shift to Mather (under this scenario, all cargo carried by commercial passenger service flights, "belly cargo," would remain at International.). Inclusion of this scenario was based on several considerations: recent changes in the air cargo industry and the relative attractiveness of Mather over International for such operations based on planned improvements, available development area, lack of operational and environmental constraints, and costs. While this is deemed the most likely scenario, the independent reintroduction of a different integrated air cargo carrier to Mather is also possible, and this scenario facilitates the impacts of a second scheduled integrated air cargo carrier at Mather to be assessed, regardless of reason for locating to Mather.

There is currently no known intent by any International tenant(s) or any additional integrated air cargo carrier(s) to locate to Mather. Therefore the forecast base case is given primary consideration. However, given Mather's greater capability to accommodate demand for aircraft apron and landside facility development relative to that of International, it is reasonable and in the public interest to fully disclose and assess the impact of a scenario in which a second carrier chooses to operate from Mather during the planning horizon.

~~*Prepared Spring 2002~~. ***Prepared in May 2013***

INTRODUCTION AND SUMMARY

This working paper presents forecasts of aviation activity in support of the Master Plan Update (MPU) for Mather Airport (the Airport or MHR). The forecasts presented in this memorandum are "unconstrained" and, therefore, do not include specific assumptions about physical, regulatory, environmental or other impediments to aviation activity growth. The baseline unconstrained forecasts are the "preferred" forecasts recommended for Federal Aviation Administration (FAA) approval. Forecasts of aviation activity are presented for air cargo, based aircraft, and aircraft operations, including, all-cargo airlines, general aviation, and military operations. Using calendar year 2012 as the base year, annual forecasts were prepared for four future demand years—2018, 2023, 2028, and 2035. Additionally, to meet FAA requirements, demand for the years 2017, 2022 and 2027 are identified for comparison purposes with the FAA's Terminal Area Forecasts (TAF) using the preferred forecasts presented in Section 6. An alternative forecast scenario was also prepared and is summarized in Appendix A.

FORECAST PROCESS AND APPROACH

The MHR Master Plan Update forecasts were prepared using a collaborative process which included: (1) a review of previous forecasts prepared for the Airport, including the Mather Airport Master Plan forecasts prepared in 2004 and updated in 2008 and the FAA 2012 TAF for the Airport; (2) the collection and analysis of data related to the key issues and trends affecting future cargo demand at Mather and in the Sacramento Region*; (3) the development of statistical models to identify historical causal factors related to air cargo activity; (4) a review of the FAA 2012 TAF for forecasts of total regional general aviation demand in the Sacramento Region; and (5) coordination with representatives of the Sacramento County Airport System (SCAS) and the FAA.

The approach used in developing forecasts for MHR included consideration of the Airport service region and the role of the Airport in providing commercial cargo service and recent trends in based aircraft demand and corporate and general aviation activity at the Airport. In particular:

- The air cargo forecasts were developed based on a review of the recent trends and an evaluation of key components of air cargo activity (i.e., enplaned and deplaned cargo (freight and mail) for cargo integrators and their regional feeders).

- Forecasts of based aircraft were developed from a review of historical trends in total based aircraft at MHR and in the Sacramento Region, the number and types of based aircraft (corporate jet, multi-engine turboprop, and single engine aircraft), input from SCAS on the demand for corporate and general aviation facilities, and the FAA 2012 TAF of based aircraft demand at MHR and other airports in the Sacramento Region.

- The aircraft operations forecasts were derived from the forecasts of cargo activity and based aircraft for the Airport. Forecasts of aircraft operations were developed by (1) disaggregating the total demand into the components (i.e., cargo integrators and their regional feeders as well as local and itinerant general aviation operations) and (2) making assumptions about the average aircraft size of cargo aircraft in terms of cargo per operation

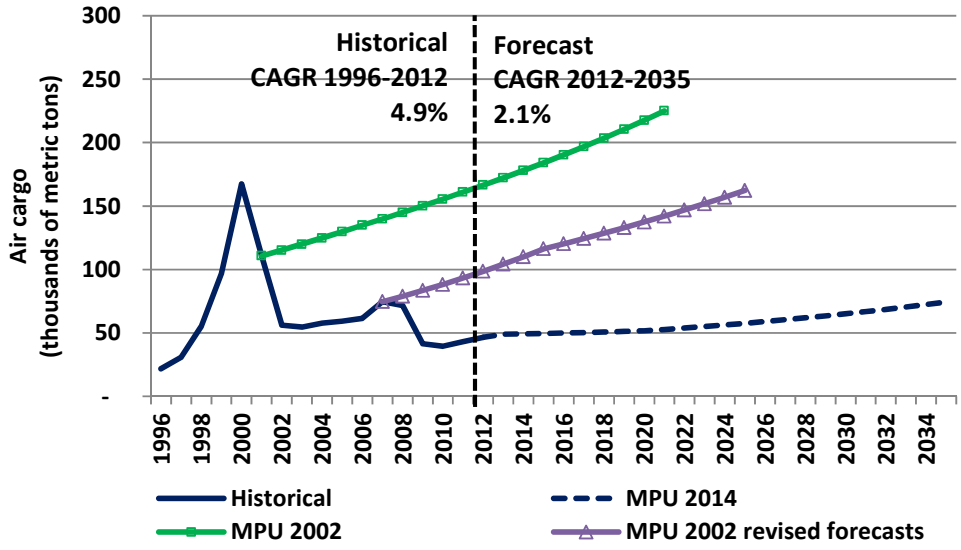
* The Sacramento Region, also referred to as the Airport service region in this report, includes a primary and secondary area. The primary area consists of 7 counties, including El Dorado, Placer, Sacramento, San Joaquin, Sutter, Yolo, and Yuba. The secondary area consists of 11 counties, including Amador, Butte, Calaveras, Colusa, Glenn, Napa, Nevada, Shasta, Solano, Stanislaus, and Tehama.

and the utilization of based aircraft in terms of general aviation operations per based aircraft for future years. In addition, the future aircraft fleet plans of the cargo airlines serving MHR and aircraft trends in the general aviation industry were also considered based on available information.

AIR CARGO

Figure 1-1 presents historical air cargo (in metric tons) for 1996 through 2012 and forecasts for 2013 through 2035. (The FAA does not prepare cargo forecasts for individual airports as part of the TAF.) Since 1996, the cargo industry nationwide and at MHR has experienced significant changes related to: (1) air cargo security regulations by the FAA and Transportation Security Administration (TSA); (2) consolidation in the air cargo industry; (3) an increasing trend in the volume of cargo transported by truck; (4) the national and global economic recessions; (5) use of all-cargo carriers by the U.S. Postal Service to transport mail; and (6) increased use of mail substitutes (e.g., email). Total cargo (enplaned and deplaned air freight and mail) is forecast to increase an average of 2.1% per year at the Airport as shown on Figure 1-1.

Figure 3-1
HISTORICAL AND FORECAST AIR CARGO
Mather Airport



Note: The forecasts presented in this figure were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

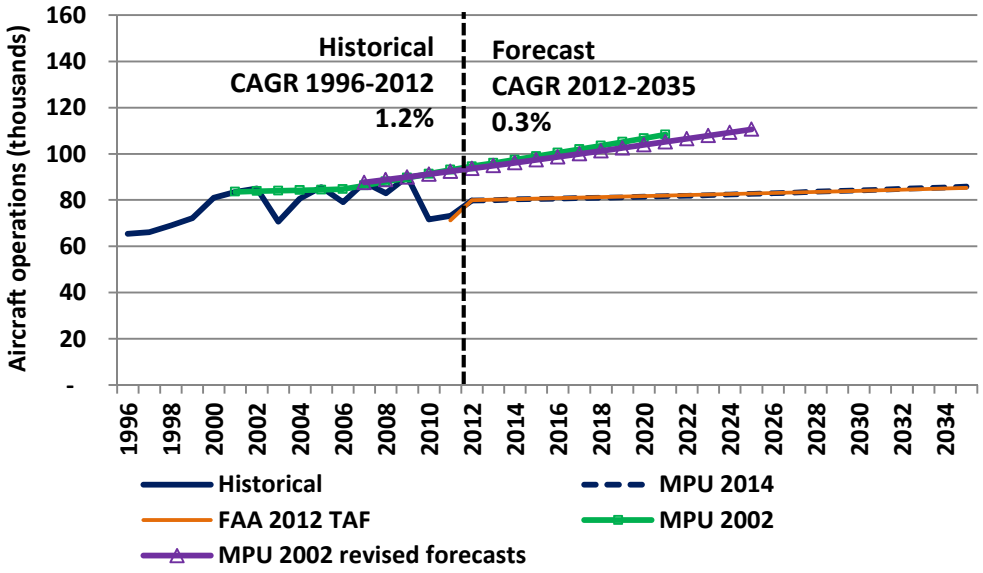
CAGR = Compound annual growth rate
Includes enplaned and deplaned air freight and mail.
The sharp decrease in cargo in 2001 reflects the transfer of the USPS air mail contract. Mather was officially reopened as a civilian airport on May 5, 1995.

Sources: Historical: Sacramento County Airport System records.
MPU 2014 Forecast: LeighFisher, March 2013.

AIRCRAFT OPERATIONS

Figure 1-2 presents historical total aircraft operations for 1996 through 2012 and forecasts for 2013 through 2035, compared with the FAA 2012 TAF for the Airport. (Total aircraft operations include air carrier, air taxi and commuter, general aviation, and military takeoffs and landings.) The aircraft operations forecasts are based on 2012 data and are within 0.2% of the FAA 2012 TAF in 2017 and 2022. The forecast average growth rate in total aircraft operations of 0.32% per year between 2012 and 2035 is higher than the rate forecast by the FAA in its 2012 TAF for the Airport—an average of 0.28% per year from FFY 2011 to FFY 2035. A detailed comparison of the MPU aircraft operations forecasts and the FAA 2012 TAF is presented in Section 6.

Figure 3-2
HISTORICAL AND FORECAST TOTAL AIRCRAFT OPERATIONS
Mather Airport



Note: The forecasts presented in this figure were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

CAGR = Compound annual growth rate

Sources: Historical: Sacramento County Airport System records.
Data for 1996 and 1997 are estimated.
MPU 2014 Forecast: LeighFisher, March 2013.
FAA 2012 TAF: U.S. Department of Transportation, Federal Aviation Administration, www.faa.gov.

ECONOMIC BASIS FOR AVIATION DEMAND

The economy of the Sacramento Region is an important determinant of long-term cargo demand at the Airport. Generally, regions with large populations, high levels of employment, and high average per capita incomes will generate strong demand for airline services. The demographics and economy of the region—as measured by changes in population, employment, and per capita income—as well as the cost of transport (e.g., oil prices)—are typically the most important factors affecting aviation demand.

The following sections present a discussion of the economic basis for aviation demand at the Airport—the historical population, nonagricultural employment, per capita income and comparative unemployment rates of the Sacramento Region. Also provided is a summary of the economic outlook for world regions, the United States, California, and the Sacramento Region.

AIRPORT SERVICE REGION

For the purposes of this study, the region served by the Airport includes a primary and secondary area. The primary area of the Airport service region, both in terms of population and geography, includes 7 counties with a population of 3.1 million in 2011, as shown in Table 2-1 and on Figure 2-1. Because economic growth and activity within the primary area stimulate a significant portion of cargo demand at the Airport, statistics for these 7 counties were used to evaluate aviation activity trends at the Airport.

SOCIOECONOMIC TRENDS

Tables 2-2, 2-3, and 2-4 present comparative trends in population, nonagricultural employment, and per capita personal income in Airport Service Region, the State of California, and the United States in 1990, 2000, and from 2005 through 2011. Projections are also presented for 2018, 2023, 2028, and 2035.

Population

Historically, population in the Airport Service Region and the State increased faster than in the nation. From 1990 to 2011, population in the Airport Service Region increased an average of 1.6% per year, while population in the State and the nation increased an average of 1.1% per year, as shown in Table 2-2. Population growth in the Airport Service Region is projected to increase an average of 1.1% per year between 2011 and 2035, with stronger growth forecast in the primary area (an average increase of 1.3% per year) than in the secondary area (an average increase of 0.9% per year) during this period.

Employment

From 1990 to 2011, nonagricultural employment in the Airport Service Region increased an average of 1.2% per year, faster than for the State and nation (an average of 1.1% and 1.0% per year, respectively), as shown in Table 2-3. Between 2007 and 2011, nonagricultural employment in the Airport Service Region decreased in each year, reflecting the effects of the 2008-2009 economic recession, financial credit crisis, and a slow economic recovery. Nonagricultural employment trends in the State and nation were similar to that for the Airport Service Region, although employment growth returned in 2011. Nonagricultural employment in the Airport Service Region is projected to increase an average of 1.3% per year between 2011 and 2035, with stronger growth forecast in the primary area (an average increase of 1.4% per year) than in the secondary area (an average increase of 0.9% per year) during this period.

Table 3-1
AIRPORT SERVICE REGION POPULATION

County	2011 Population	2011 Percent of total
Primary area		
Sacramento	1,436,105	29.9%
San Joaquin	696,214	14.5
Placer	357,138	7.4
Yolo	202,054	4.2
El Dorado	180,938	3.8
Sutter	94,919	2.0
Yuba	72,578	1.5
Subtotal	3,039,946	63.3%
Secondary area		
Stanislaus	518,522	10.8%
Solano	416,471	8.7
Butte	220,266	4.6
Shasta	177,774	3.7
Napa	138,088	2.9
Nevada	98,612	2.1
Tehama	63,601	1.3
Calaveras	45,052	0.9
Amador	37,953	0.8
Glenn	28,128	0.6
Colusa	21,549	0.4
Subtotal	1,766,016	36.7%
Estimated airport service region	4,805,962	100.0%

Source: U.S. Department of Commerce, Bureau of the Census, www.census.gov, accessed July 2012.

Income

From 1990 to 2011, per capita personal income in the Airport Service Region increased an average of 0.9% per year, faster than that for the State (an average of 0.8% per year) but slower than the nation (an average of 1.1% per year), as shown in Table 2-4. Since 2000, the growth in per capita income has slowed. In 2011, per capita income in the Airport Service Region was $29,298 (in 2000 dollars), less than that for the State ($33,414) and the nation ($31,816). Per capita personal income in the Sacramento Region is projected to increase an average of 1.4% per year between 2011 and 2035.

Figure 3-3
AIRPORT SERVICE REGION

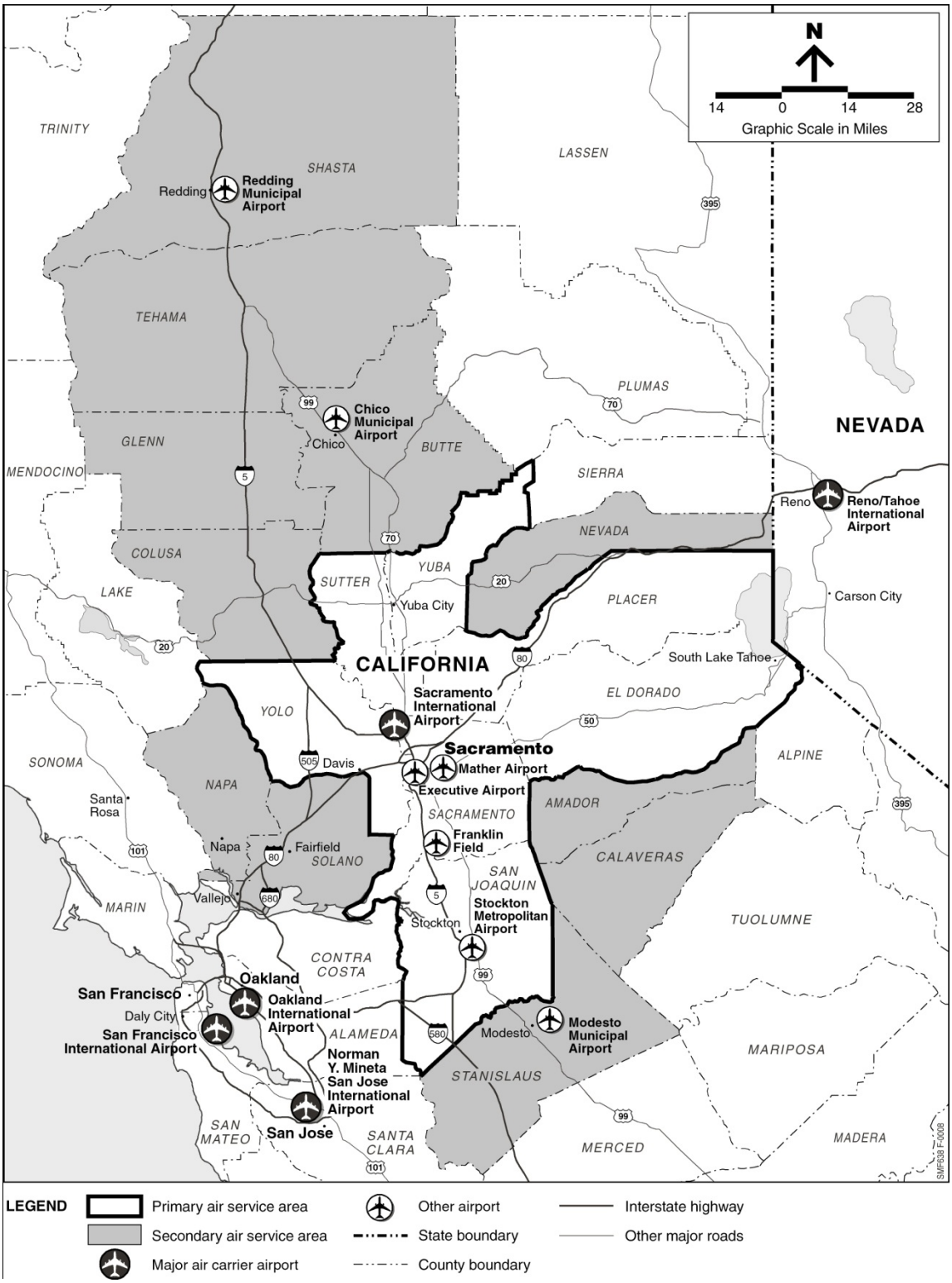


Table 3-2
HISTORICAL AND PROJECTED POPULATION
In thousands

	Airport service region				
	Primary area	Secondary area	Total	State of California	United States
Historical					
1990	2,084	1,381	3,466	29,760	248,718
2000	2,515	1,608	4,124	33,988	281,422
2005	2,847	1,718	4,565	35,828	295,517
2006	2,881	1,730	4,611	36,021	298,380
2007	2,914	1,736	4,651	36,250	301,231
2008	2,946	1,743	4,689	36,604	304,094
2009	2,976	1,749	4,725	36,961	306,772
2010	3,009	1,759	4,769	37,349	308,746
2011	3,040	1,766	4,806	37,692	311,592
2012	n.a.	n.a.	n.a.	38,041	313,914
Projected					
2018	3,342	1,882	5,223	40,395	333,632
2023	3,564	1,967	5,532	42,398	349,968
2028	3,788	2,054	5,842	44,407	366,348
2035	4,101	2,174	6,274	47,200	389,119
	Percent increase (decrease)				
2005-2006	1.2%	0.7%	1.0%	0.5%	1.0%
2006-2007	1.1	0.4	0.9	0.6	1.0
2007-2008	1.1	0.4	0.8	1.0	1.0
2008-2009	1.0	0.4	0.8	1.0	0.9
2009-2010	1.1	0.6	0.9	1.1	0.8
2010-2011	1.0	0.4	0.8	0.9	0.7
	Compound average annual percent increase (decrease)				
Historical					
1990-2000	1.9%	1.5%	1.8%	1.3%	1.3%
2000-2011	1.7	0.9	1.4	0.9	0.9
1990-2011	1.8	1.2	1.6	1.1	1.1
Projected					
2011-2018	1.4	0.9	1.2	1.0	1.0
2018-2023	1.3	0.9	1.2	1.0	1.0
2023-2028	1.2	0.9	1.1	0.9	0.9
2028-2035	1.0	0.7	0.9	0.8	0.8
2011-2035	1.3	0.9	1.1	0.9	0.9

Note: The primary area consists of 7 counties, including El Dorado, Placer, Sacramento, San Joaquin, Sutter, Yolo, and Yuba.
The secondary area consists of 11 counties, including Amador, Butte, Calaveras, Colusa, Glenn, Napa, Nevada, Shasta, Solano, Stanislaus, and Tehama.

Sources: Historical: U.S. Department of Commerce, Bureau of the Census, www.census.gov, accessed November 2012. Population data are reported for April 1 Census counts and July 1 estimates for intercensal years.
Projected: Primary area— Sacramento Area Council of Governments, *The Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS),* adopted April 19, 2012. Secondary area, State, and United States—Woods & Poole, Economic and Demographic Projections, 2012.

Table 3-3

HISTORICAL AND PROJECTED NONAGRICULTURAL EMPLOYMENT

In thousands

	Airport service region				
	Primary area	Secondary area	Total	State of California	United States
Historical					
1990	802	420	1,222	12,500	109,487
2000	1,020	519	1,539	14,489	131,785
2005	1,126	565	1,691	14,802	133,703
2006	1,149	573	1,722	15,065	136,086
2007	1,156	573	1,730	15,185	137,598
2008	1,128	562	1,690	14,995	136,790
2009	1,063	531	1,595	14,092	130,807
2010	1,034	523	1,557	13,937	129,874
2011	1,024	519	1,544	14,061	131,359
2012	n.a.	n.a.	n.a.	14,309	133,738
Projected					
2018	1,110	550	1,659	15,295	143,031
2023	1,201	578	1,779	16,362	152,930
2028	1,298	607	1,905	17,495	163,515
2035	1,445	650	2,095	19,201	179,575
	Percent increase (decrease)				
2005-2006	2.1%	1.4%	1.8%	1.8%	1.8%
2006-2007	0.6	0.1	0.4	0.8	1.1
2007-2008	(2.4)	(2.0)	(2.3)	(1.2)	(0.6)
2008-2009	(5.7)	(5.4)	(5.6)	(6.0)	(4.4)
2009-2010	(2.7)	(1.5)	(2.3)	(1.1)	(0.7)
2010-2011	(1.0)	(0.7)	(0.9)	0.9	1.1
	Compound average annual percent increase (decrease)				
Historical					
1990-2000	2.4%	2.1%	2.3%	1.5%	1.9%
2000-2011	0.0	0.0	0.0	(0.3)	(0.0)
1990-2011	1.2	1.0	1.1	0.6	0.9
Projected					
2011-2018	1.2	0.8	1.0	1.2	1.2
2018-2023	1.6	1.0	1.4	1.4	1.3
2023-2028	1.6	1.0	1.4	1.3	1.3
2028-2035	1.4	0.8	1.2	1.2	1.2
2011-2035	1.4	0.9	1.3	1.3	1.3

Note: The primary area consists of 7 counties, including El Dorado, Placer, Sacramento, San Joaquin, Sutter, Yolo, and Yuba.
The secondary area consists of 11 counties, including Amador, Butte, Calaveras, Colusa, Glenn, Napa, Nevada, Shasta, Solano, Stanislaus, and Tehama.

Sources: Historical: California and US: U.S. Department of Labor, Bureau of Labor Statistics, accessed February 2013.
Airport Service Region: State of California Employment Development Department
Projected: Primary area—Sacramento Area Council of Governments, *The Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS),* adopted April 19, 2012. Secondary area, State, and United States—Woods & Poole, Economic and Demographic Projections, 2012.

Table 3-4

HISTORICAL AND PROJECTED PER CAPITA PERSONAL INCOME

	Airport service region				
	Primary area	Secondary area	Total	State of California	United States
Historical					
1990	24,784	23,097	24,116	28,169	25,499
2000	29,292	26,676	28,272	33,404	30,319
2005	30,215	28,111	29,423	34,150	31,259
2006	30,833	28,778	30,062	35,463	32,223
2007	31,248	29,447	30,576	35,887	32,810
2008	30,738	28,853	30,037	35,194	32,750
2009	29,524	27,892	28,920	32,936	31,012
2010	29,550	28,169	29,040	33,083	31,423
2011	29,794	28,448	29,298	33,414	31,816
Projected					
2018	32,041	30,730	31,564	36,347	34,525
2023	34,425	32,904	33,876	39,089	37,239
2028	37,255	35,473	36,617	42,328	40,458
2035	41,923	39,689	41,131	47,640	45,778
	Percent increase (decrease)				
2005-2006	2.0	2.4	2.2	3.8	3.1
2006-2007	1.3	2.3	1.7	1.2	1.8
2007-2008	(1.6)	(2.0)	(1.8)	(1.9)	(0.2)
2008-2009	(4.0)	(3.3)	(3.7)	(6.4)	(5.3)
2009-2010	0.1	1.0	0.4	0.4	1.3
2010-2011	0.8	1.0	0.9	1.0	1.2
	Compound average annual percent increase (decrease)				
Historical					
1990-2000	1.7	1.5	1.6	1.7	1.7
2000-2011	0.1	0.5	0.3	(0.1)	0.4
1990-2011	0.9	1.0	0.9	0.8	1.1
Projected					
2011-2018	1.0	1.1	1.1	1.2	1.2
2018-2023	1.4	1.4	1.4	1.5	1.5
2023-2028	1.6	1.5	1.6	1.6	1.7
2028-2035	1.5	1.4	1.5	1.5	1.6
2011-2035	1.4	1.4	1.4	1.5	1.5

Note: Data are presented in 2000 dollars.
The primary area consists of 7 counties, including El Dorado, Placer, Sacramento, San Joaquin, Sutter, Yolo, and Yuba.
The secondary area consists of 11 counties, including Amador, Butte, Calaveras, Colusa, Glenn, Napa, Nevada, Shasta, Solano, Stanislaus, and Tehama.

Sources: Historical: U.S. Department of Commerce, Bureau of the Economic Analysis, Regional Accounts Data, www.bea.gov, accessed February 2013. Expressed in 2000 dollars using the consumer price index.
Projected: Woods & Poole, Economic and Demographic Projections, 2012.

Unemployment Rates

In addition to the employment trends discussed earlier, the unemployment rate is also indicative of general economic conditions. Table 2-5 shows comparative annual unemployment rates in the Airport Service Region, the State, and the nation as a whole for 2000 through 2011. Unemployment rates in the primary area of the Airport Service Region and the State have exceeded the trends in the nation since 2000.

Table 3-5
COMPARATIVE UNEMPLOYMENT RATES

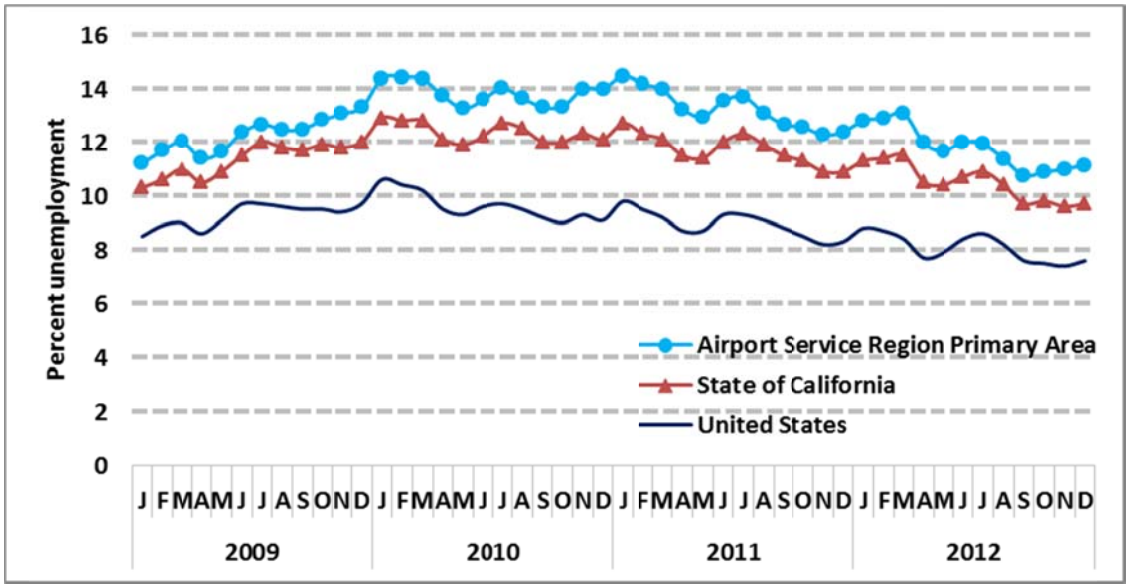
	Airport Service Region primary area	State of California	United States
2000	5.1%	4.9%	4.0%
2001	5.4	5.4	4.7
2002	6.5	6.7	5.8
2003	6.8	6.8	6.0
2004	6.4	6.2	5.5
2005	5.8	5.4	5.1
2006	5.4	4.9	4.6
2007	6.1	5.4	4.6
2008	8.0	7.2	5.8
2009	12.3	11.3	9.3
2010	13.8	12.4	9.6
2011	13.3	11.7	8.9
2012	11.8	10.5	8.1

Note: Unemployment rates are for calendar years and not seasonally adjusted and represent annual averages.

Source: U.S. Department of Labor, Bureau of Labor Statistics, www.bls.gov, accessed February 2013.

Since the beginning of the recession in December 2007, monthly unemployment rates in the Airport Service Region, the State of California, and the United States have increased, as shown on Figure 2-2. In December 2012, the unemployment rate (unadjusted) for the primary area of the Airport Service Region was 11.1%, higher than that for the State (9.7%) and the nation (7.6%).

Figure 3-4
MONTHLY UNEMPLOYMENT RATES



Note: Unemployment rates not seasonally adjusted.

Source: U.S. Department of Labor, Bureau of Labor Statistics, www.bls.gov, accessed February 2013.

Nonagricultural Employment by Industry Sector

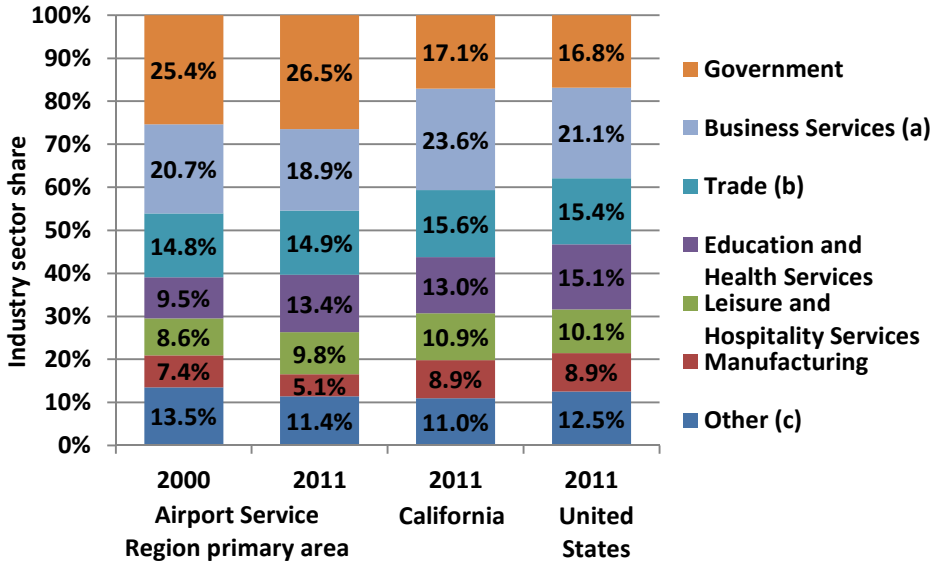
Figure 2-3 shows a comparative distribution of nonagricultural employment by industry sector for the Airport Service Region primary area in 2000 and in 2011, and for the State and the nation in 2011.

- ***Government***. Employment by federal, state and local government agencies* accounted for the largest share of nonagricultural employment and increased an average of 0.4% per year between 2000 and 2011. The share of government employment in the Sacramento primary area increased from 25.4% in 2000 to 26.5% in 2011.

*As reported by the U.S. Department of Labor, Bureau of Labor Statistics, government employment includes only civilian employees.

Figure 3-5

COMPARATIVE DISTRIBUTION OF NONAGRICULTURAL EMPLOYMENT



Note: The primary area consists of 7 counties, including El Dorado, Placer, Sacramento, San Joaquin, Sutter, Yolo, and Yuba.

(a) Includes professional and business services, finance and information.

(b) Includes wholesale and retail trade.

(c) Includes mining, finance, insurance, real estate, construction, transportation and public utilities.

Source: U.S. Department of Labor, Bureau of Labor Statistics, www.bls.gov, accessed November 2012.

- ***Business Services***. Business services in the Sacramento Region accounted for the second largest share of nonagricultural employment, with 20.7% in 2000 and 18.9% in 2011. From 2000 to 2011, the Sacramento primary area's employment in business services decreased an average of 0.8% per year, largely as the result of job losses in information services.*

- ***Trade.*** Trade is comprised of wholesale and retail trade. From 2000 to 2011, the Sacramento primary area's employment in trade increased an average of 0.1% per year, reflecting growth in wholesale trade. The share of trade employment in the Sacramento primary area increased slightly from 14.8% in 2000 to 14.9% in 2011.

- ***Education and Health Services.*** Employment in education and health services in the Sacramento primary area increased an average of 3.2% per year between 2000 and 2011 and was the fastest growing industry sector. The share of education and health services

*Information services includes traditional, Internet, and software publishing; the motion picture and sound recording industries; the broadcasting industries; the telecommunications industries; Web search portals, data processing industries; and the information services industries.

employment in the Sacramento primary area increased from 9.5% in 2000 to 13.4% in 2011.

- ***Leisure and Hospitality Services.*** The Sacramento primary area's employment in leisure and hospitality services increased an average of 1.2% per year between 2000 and 2011. The share of leisure and hospitality services in the Sacramento primary area increased from 8.6% in 2000 to 9.8% in 2011.

- ***Manufacturing.*** Manufacturing employment in the Sacramento primary area decreased an average of 3.3% per year between 2000 and 2011 and experienced the largest employment losses of any industry sector. The manufacturing sectors in California and the nation also experienced job losses between 2000 and 2011, decreasing an average of 3.6% and 3.4% per year, respectively, during that period. The share of manufacturing employment in the Sacramento primary area decreased from 7.4% in 2000 to 5.1% in 2011.

- ***Other Activities.*** Other employment in the Sacramento primary area decreased an average of 1.5% per year between 2000 and 2011, largely as the result of job losses in construction. The share of other employment in the Sacramento primary area decreased from 13.5% in 2000 to 11.4% in 2011.

Sacramento Industry Clusters

Sacramento's economy is driven by companies that export goods and services nationally and globally, bringing in new investment and jobs that support economic growth as well as aviation services. Companies that make up industry clusters, also referred to as the "traded sector", tend to *cluster* because they draw competitive advantage from their proximity to competitors, to a skilled workforce, to specialized suppliers, and to a shared base of sophisticated knowledge about their industry.

As shown on Table 2-6, the Center for Strategic Economic Research (CSER) identified 6 industry clusters as part of the Next Economy Capital Region Prosperity Plan*. The Clean Energy Technology cluster was added based on previous research specific to the Sacramento Region. The CSER projects the Life Sciences and Health Services cluster to experience the strongest growth through 2020, followed by Education and Knowledge Creation and Knowledge-Intensive Business and Financial Services clusters.

Sacramento Exports

Foreign trade is important in establishing links to the global economy. In 2011, the Sacramento economy created $6.1 billion in export activity, as shown on Figure 2-4. Computer and electronic product manufacturing and crop production together accounted for 66.5% of export value in the 7-county Sacramento primary area. In 2011, the Sacramento primary area accounted for nearly 4.0% of total exports in the State.

*Next Economy Capital Region Prosperity Plan is assembled by the Capital Region of California (including El Dorado, Placer, Sacramento Sutter, Yolo and Yuba counties) as a competitive and strategic economic development plan for the region.

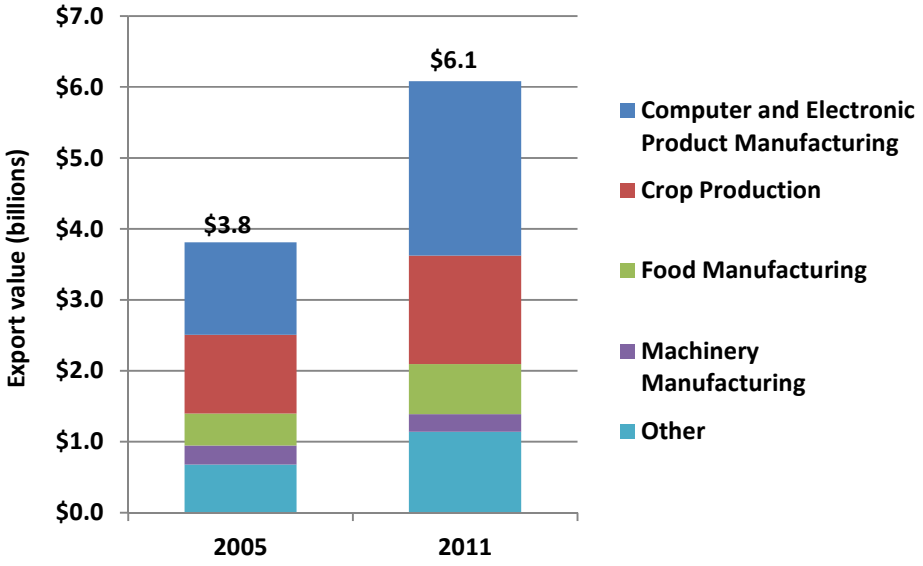
Table 3-6
SACRAMENTO INDUSTRY CLUSTERS

Industry cluster	2010 Employment	2010 Output (millions)	Projected percent increase (decrease) 2010-2020 Employment	Projected percent increase (decrease) 2010-2020 Output
Agriculture and Food	37,442	3,455	1.4%	24.3%
Advanced Manufacturing	11,409	1,740	(3.1)	30.4
Information and Communications Technology	30,906	9,693	3.2	35.9
Life Sciences and Health Services	98,646	8,643	25.1	28.1
Clean Energy Technology	3,015	846	*(a)*	*(a)*
Education and Knowledge Creation	16,618	115	14.5	20.8
Knowledge-Intensive Business and Financial Services	69,893	18,277	12.1	36.4

(a) Clean Energy Technology was selected based on previous research specific to the Sacramento Region. Comparable data are not available to prepare projected growth rates.

Source: Center for Strategic Economic Research, *Next Economy Capital Region Prosperity Plan,* Research Report, March 2012, www.strategiceconomicresearch.org, accessed July 2012. Based on data from CA Employment Development Department, U.S. Bureau of Economic Analysis, IMPLAN, and Moody's Analytics.

Figure 3-6
VALUE OF SACRAMENTO REGION EXPORTS



Note: Data are for the Sacramento 7-county primary area consisting of El Dorado, Placer, Sacramento, San Joaquin, Sutter, Yolo, and Yuba counties.

Source: U.S. Department of Commerce, International Trade Administration, www.trade.gov, accessed November 2012.

Major Employers

Table 2-7 lists the major employers in the Sacramento Region in 2011. The State of California was the largest employer in the Sacramento Region in 2011, reflecting its role as the State capital. Health care and education services together accounted for nearly half (12 of the 25) of major companies reflecting the importance of these sectors to the economy of the Sacramento Region.

Table 3-7
MAJOR EMPLOYERS IN THE SACRAMENTO REGION

Employer	Industry	County	Number of employees
State of California	Government	Various	74,727
University of California Davis	Education	Yolo	11,704
Sacramento County	Government	Sacramento	11,300
Kaiser Permanente	Health care	Various	9,589
Sutter Health	Health care	Various	9,372
UC Davis Health System	Health care	Sacramento	8,580
Mercy/Catholic Healthcare West	Health care	Sacramento	6,942
Intel Corp.	Semiconductor chips	Sacramento	6,515
Raley's Family of Fine Stores	Retail Grocery Chain	Various	6,195
Elk Grove Unified School District	Education	Sacramento	5,619
San Juan Unified School District	Education	Sacramento	4,600
Sacramento Unified School District	Education	Sacramento	4,500
City of Sacramento	Government	Sacramento	4,000
Hewlett-Packard Co.	Computer hardware manufacturer	Placer	3,500
Los Rios Community College District	Education	Sacramento	3,153
Wells Fargo & Co	Financial Services	Various	2,936
Sacramento Veterans Affairs Medical Center	Health care	Sacramento	2,785
Health Net of California	Health care	Sacramento	2,544
Placer County	Government	Placer	2,400
California State University Sacramento	Education	Sacramento	2,342
Thunder Valley Casino Resort	Casino resort	Placer	2,025
Union Pacific Railroad Co. Inc.	Transportation and goods movement	Placer	2,000
Northstar-At-Tahoe Resort	Ski resort	Placer	1,950
Sacramento Municipal Utility District	Electric Company	Sacramento	1,859
U.S. Postal Service	Mail Delivery	Yolo	1,794

Source: Sacramento Business Journal, Book of Lists, Volume 28, No. 43, Published December 23, 2011.

ECONOMIC OUTLOOK

The economic outlook for the United States, the State of California, and the Sacramento Region forms a basis for anticipated growth in aviation activity at the Airport. Economic activity in the Sacramento Region and the State is directly linked to the production of goods and services in the world and the rest of the United States. Both the movement of cargo and corporate and general aviation services at the Airport depend on the economic linkages between and among the regional, State, national, and global economies.

Global Economy

Globalization of the world economy has created linkages between national economies that relate to trade and aviation activity. The Sacramento Region and the State have strong linkages to the global economy through a number of industry sectors. The economic growth of these world regions, in terms of Gross Domestic Product (GDP), is related to the growth in aviation activity. Projections of GDP for the world regions are shown in Table 2-8.

U.S. Economy

The U.S. economy continues to recover from the financial crisis and global recession, although the pace of the recovery remains slow. The consensus among economists is that downturns following financial crises tend to be more prolonged than other downturns. In addition, such recessions raise the level and duration of unemployment, reduce the number of hours that employees work, and dampen investment. Continued high unemployment, lower disposable incomes, and reduced spending by businesses and consumers, particularly in the near-term, has the potential to dampen growth in the U.S. economy and the demand for cargo and aviation services nationally and at MHR.

The Congressional Budget Office (CBO) expects that U.S. economic growth, as measured by U.S. GDP in constant dollars, will increase 1.4% in 2013 and 3.4% in 2014 reflecting a gradual improvement in underlying economic factors and the tightening of federal fiscal policy that is scheduled to occur in 2013.* The CBO projects that the unemployment rate will decrease to 5.5% by the end of 2018 and to 5.2% in 2023; inflation is projected to remain at 2.0% through 2023.

*Congressional Budget Office, *Budget and Economic Outlook: Fiscal Years 2013 to 2023*, February 2013.

Table 3-8
HISTORICAL AND PROJECTED GDP GROWTH BY WORLD REGION

World region	Compound average annual percent increase (decrease) in GDP (in constant U.S. dollars)		
	Historical		Projected
	1990-2010	2000-2012	2010-2030
Asia	n.a.	4.3%	4.5%
Canada	1.9%	2.0	2.3
Europe *(a)*	(1.2) *(b)*	1.1	1.5
Latin America/Mexico	3.6	3.0	4.0
Middle East/Africa	n.a.	2.0	2.3
United States	3.4	1.6	2.5
World	1.8	2.5	3.2

n.a. = not available

(a) Data are for the Euro area.
(b) Percent change between 1991 and 2000.

Sources: Historical: International Monetary Fund, *World Economic Outlook* database, www.imf.org, accessed March 2013 and U.S. Department of Commerce, Bureau of Economic Analysis, www.bea.gov, accessed July 2012.
Projected: Global Insight as reported in U.S. Department of Transportation, Federal Aviation Administration, *FAA Aerospace Forecasts, Fiscal Years 2013-2033,* March 2013.

California Economy

California has experienced an uneven economic recovery, with some sectors of the economy such as high technology and exports reporting growth which is offset by a weak real estate market and continued volatility in equity markets. Near-term economic projections prepared by the University of California at Los Angeles (UCLA) Anderson Forecast* are for:

- Continued slow steady gains in employment through 2013, with expected growth of 1.6%, 2.2% and 2.3% in 2013, 2014 and 2015, respectively.

- Steady job growth in California that will bring the state's unemployment rate in line with the national average by the end of 2014. The unemployment rate will average 9.6% in 2013 and decrease to 8.4% in 2014 and 7.2% in 2015.

- As the world economy and U.S. investment improves, California is expected to account for a disproportionate share of the improvement. Real personal income is forecast to increase 1.4% in 2013, followed by 3.6% in 2014 and 3.3% in 2015.

*UCLA Anderson Forecast, *March 2013 Economic Outlook*, March 13, 2013, www.uclaforecast.com.

Sacramento Economy

The Center for Continuing Study of the California Economy (CCSCE) develops growth projections for the Sacramento Council of Governments (SACOG) 6-county region* and expects that growth in the SACOG region will begin to outpace the nation in job growth again in the coming decades.

- The SACOG region employment is projected to increase an average of 1.1% per year through 2035, compared with an average increase of 0.6% per year for the nation and 0.7% per year for the State.

- A number of factors are expected to restrain job growth in the SACOG region through 2020, including slower national and State growth rates, in part due to reduced immigration rates in the short-term, slow recovery expected in the housing market, State budget challenges that may continue to affect job and income levels in State government, and aging and eventual retirement of the baby boomers which may affect both employment and housing demand.

Despite slower growth in the short-term, the CCSCE expects continued economic growth in the SACOG region in the long-term, with the region expected to capture an increasing share of California jobs, particularly from 2020 to 2035.

- Government sector jobs will be a source of growth, particularly after 2020.

- The professional and business services sector—which serves state government and includes the fast-growing computer, architectural and engineering, scientific and Research and Development laboratory services industries—is also expected to resume growth in the future.

- Although construction job levels will likely impair growth in the short term, they are expected to rise in response to long-term population growth and a housing rebound.

Risks to the Economic Outlook

While the near-term outlook is improving and the mid- to long-term outlook is favorable, there are risks that expectations for growth may not be achieved. Key risks include:

- Inflation risks still persist due to the sizable amount of liquidity that the Federal Reserve Bank has injected into the banking system, which could eventually trigger upward pressures on prices. Also, increases in oil prices and rapid expansion of U.S. industrial capacity could trigger upward pressure on inflation.

- U.S. consumers may not be able to generate much spending growth due to persistent unemployment, reduced wealth and home values, and the various reasons described above.

- Increases in fuel prices related to rising global demand and political instability in oil producing countries in the Middle East and North Africa present a risk to continued economic recovery and growth.

*The SACOG Region includes El Dorado, Placer, Sacramento, Sutter, Yolo and Yuba counties.

- A significant worsening of the banking and fiscal problems in Europe could lead to further turmoil in international financial markets that could affect U.S. financial markets—reducing wealth, severely constraining the availability of credit, reducing hiring, and causing higher unemployment.

- In the long term, the principal risks to U.S. economic performance are the sizable external and fiscal deficits. The continuing deficits in the U.S. balance of payments could result in greater volatility in the currency markets, which would then translate into higher interest rates and, potentially, slower economic growth. These risks could be compounded if the fiscal deficit is not reduced in the near-term, thereby leading to increased financing requirements and subsequent increases in interest rates. Increased interest rates could lead to lower levels of investment and, consequently, slower productivity growth.

Economic Basis for Forecast Aviation Demand

The economic outlook for world regions, the United States, the State of California, and the Sacramento Region form a basis for anticipated growth in aviation demand at the Airport. Employment and income projections for the Sacramento Region and the State of California are for gradual but continued economic growth, particularly in biotechnology and pharmaceuticals, health care services, education, leisure and hospitality services. Factors expected to contribute to economic growth in the Sacramento Region and associated increases in aviation demand include: (1) the diversity in the economic base, which lessens its vulnerability to weaknesses in particular industry sectors, (2) growth in the existing and emerging Sacramento industry sectors described earlier, (3) an educated labor force able to support the development of knowledge-based and service industries, and (4) continued reinvestment to support the development of tourism, conventions, and other businesses. This outlook is reflected in the aviation demand forecasts presented in Section 5, “Aviation Demand Forecasts.”

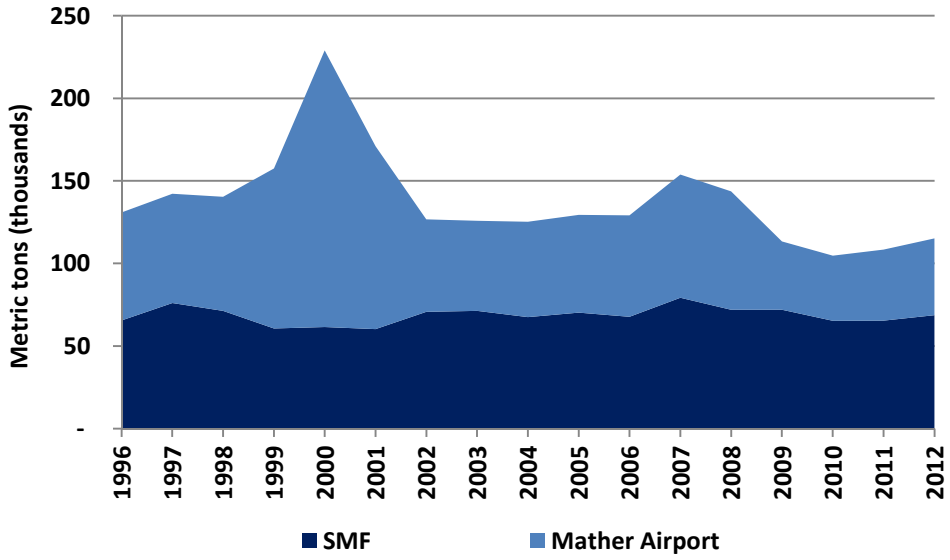
HISTORICAL AIR CARGO

A review of air cargo activity at the Airport provided the foundation for the air cargo forecasts and included an analysis of: (1) overall trends in air cargo, regional and national; (2) all-cargo airline market shares; and (3) monthly activity for air cargo and all-cargo airline landings.

REGIONAL AND NATIONAL AIR CARGO TRENDS

In recent years, the cargo industry has been adversely affected by increased fuel prices, the world economic recession, and competition from other transportation modes. Between 1996 and 2012, total air cargo (freight and mail) in the Sacramento Region increased an average of 4.9% per year, compared with an average increase of 0.3% per year in the nation as a whole during this period, as shown in Table 3-1 and Figure 3-1. Since 2000, MHR has accounted for a decreasing share of regional air cargo, decreasing from 73.2% in 2000 to 40.4% in 2012.

Figure 3-7
REGIONAL AIR CARGO TRENDS
Mather Airport and Sacramento International Airport



Note: Sum of enplaned and deplaned freight and mail in metric tons.
Data for 1996 and 1997 are estimated.
The sharp decrease in MHR cargo in 2001 reflects the transfer of the USPS air mail contract.
Mather was officially reopened as a civilian airport on May 5, 1995.

Source: Sacramento County Airport System records.

Table 3-9

REGIONAL AND NATIONAL AIR CARGO TRENDS

Mather Airport, Sacramento International Airport, and United States

In metric tons

	Sacramento County Airport System				
	Mather Airport				
Year	MHR	Percent of region	SMF Airport	Total region	United States
1996	21,568	24.8%	65,440	87,008	n.a.
1997	30,784	28.8%	76,064	106,848	27,879,877
1998	55,177	43.6%	71,235	126,411	29,452,405
1999	96,804	61.5%	60,655	157,459	29,969,594
2000	167,528	73.2%	61,483	229,011	30,790,710
2001	110,715	64.8%	60,210	170,925	27,293,150
2002	56,069	44.2%	70,657	126,727	28,133,844
2003	54,545	43.4%	71,245	125,790	28,351,042
2004	57,750	46.1%	67,466	125,217	29,894,104
2005	59,136	45.7%	70,224	129,360	30,095,576
2006	61,403	47.6%	67,688	129,091	30,419,297
2007	74,646	48.5%	79,196	153,843	29,296,597
2008	71,636	49.9%	71,950	143,586	26,772,937
2009	41,339	36.5%	71,968	113,307	24,220,966
2010	39,406	37.6%	65,302	104,708	27,316,021
2011	43,054	39.7%	65,340	108,394	26,930,602
2012	46,567	40.4%	68,626	115,193	26,416,000 *(a)*
	Percent increase (decrease)				
2007-2008	(4.0)		(9.1)	(6.7)	(8.6)
2008-2009	(42.3)		0.0	(21.1)	(9.5)
2009-2010	(4.7)		(9.3)	(7.6)	12.8
2010-2011	9.3		0.1	3.5	(1.4)
2011-2012	8.2		5.0	6.3	(1.9)
	Compound annual percent increase (decrease)				
1996-2003	14.2		1.2	5.4	0.3
2003-2007	8.2		2.7	5.2	0.8
2007-2010	(19.2)		(6.2)	(12.0)	(2.3)
2010-2012	8.7		2.5	4.9	(1.7)
1996-2012	4.9		0.3	1.8	(0.4)

Notes: Data include enplaned and deplaned air freight and mail. Data for 1996 and 1997 are estimated.

(a) Estimated based on data for January through October 2012.

Sources: SCAS (1999 – 2003): PB Aviation, Sacramento Airport Master Plan, Appendix A, updated forecast, April 15, 2005. SCAS (2004-2012): Mather Airport records.
United States: Airports Council International, North America Rankings and Worldwide Traffic Report and Bureau of Transportation Statistics, www.bts.gov, for years noted.

EIGHTH BUSIEST CALIFORNIA CARGO AIRPORT

According to Airport Council International data (ACI), Mather Airport ranked eighth in terms of cargo transported in California in 2011, as shown in Table 3-2. The traditional gateways (Los Angeles LAX, Oakland and San Francisco) will continue to accommodate very large volumes of cargo due to the large number of widebody international passenger flights and the associated cargo capacity in aircraft belly compartments. However, second tier cargo gateways, such as Mather, could attract new volumes of international cargo activity. In 2011, the top 10 California airport's cargo decreased 3.4%, while MHR increased 9.3%.

Table 3-10
COMPARATIVE AIRPORT DATA (TOP 10 CALIFORNIA RANKINGS)
Total Enplaned and Deplaned Cargo

World rank	Airport	City	2011 Tons	Percent change from 2010
13	LAX	Los Angeles	1,681,611	(3.8%)
43	OAK	Oakland	483,375	(5.4)
55	SFO	San Francisco	382,019	(10.5)
56	ONT	Ontario	378,728	6.4
132	SAN	San Diego	118,681	2.9
187	SMF	Sacramento	65,279	(2.6)
224	BUR	Burbank	46,293	4.9
233	**MHR**	**Mather**	**40,976**	**9.3**
241	SJC	San Jose	39,613	(11.5)
291	LGB	Long Beach	25,610	(2.5)

Source: Airports Council International, *World Airport Traffic Report* for 2010 and 2011.

HISTORICAL AIR CARGO

The Airport is served by two all-cargo airlines—United Parcel Service and Air Cargo, Inc. Federal Express and Westair Industries operate at Sacramento International Airport. As shown in Table 3-3 and Figure 3-2, historical trends in air cargo at the Airport have varied significantly since 1999. From 1999 to 2003, total cargo decreased an average of 13.4% per year, largely as a result of the cessation of mail transported through the Airport. From 2003 to 2007, total cargo increased an average of 8.2% per year, faster than growth at SMF (2.7% per year) and the United States (0.8% per year) during this period. The decrease in cargo at the Airport between 2007 and 2010, an average decrease of 19.2% per year, reflects the loss of service by DHL (provided by Airborne Express) in 2009. Since 2010, cargo at the Airport has increased to 46,567 metric tons in 2012.

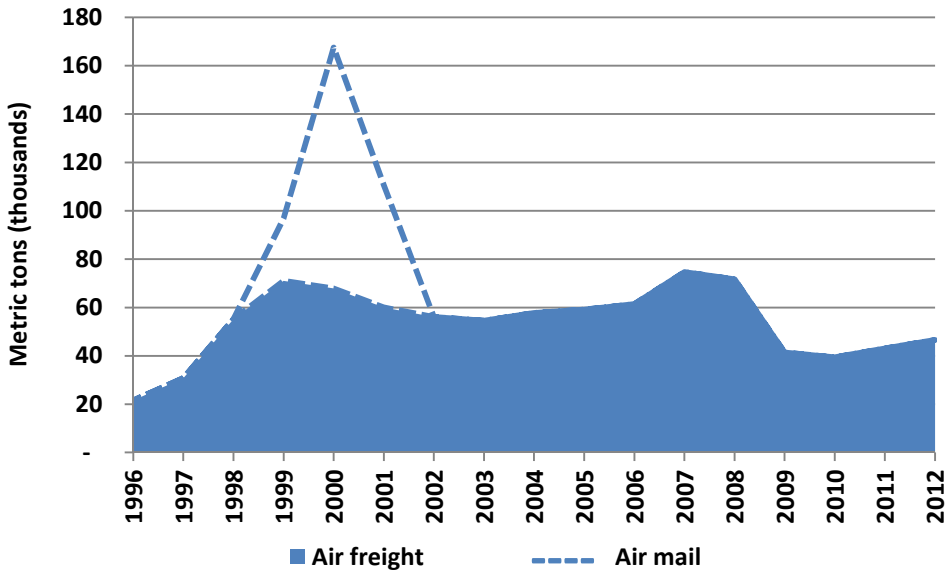
Table 3-11
HISTORICAL AIR CARGO
Mather Airport
In metric tons

Year	Air mail	Air freight	Total air cargo	Percent change
1999	25,789	71,015	96,804	--%
2000	99,658	67,870	167,528	73.1
2001	50,701	60,014	110,715	(33.9)
2002	--	56,069	56,069	(49.4)
2003	--	54,545	54,545	(2.7)
2004	--	57,750	57,750	5.9
2005	--	59,136	59,136	2.4
2006	--	61,403	61,403	3.8
2007	--	74,646	74,646	21.6
2008	--	71,636	71,636	(4.0)
2009	--	41,339	41,339	(42.3)
2010	--	39,406	39,406	(4.7)
2011	--	43,054	43,054	9.3
2012	--	46,567	46,567	8.2
	Compound annual percent increase (decrease)			
1999-2003	--	(6.4%)	(13.4%)	
2003-2007	--	8.2	(7.6%)	
2007-2010	--	(19.2%)	(19.2%)	
2010-2012	--	8.7	8.7	
1999-2012	--	(3.2)	(5.5)	

Note: Data include enplaned and deplaned air freight and mail.

Source: Sacramento County Airport System records.

Figure 3-8
HISTORICAL AIR CARGO
Mather Airport



Note: Sum of enplaned and deplaned freight and mail in metric tons.

Source: Sacramento County Airport System records.

AIR CARRIER MARKET SHARES OF FREIGHT

The market shares for the cargo airlines serving the Airport are shown in Table 3-4. In 2012, United Parcel Service had the largest market share of air freight (95.6%) at the Airport, followed by Air Cargo (2.0%), Redding AERO (2.0%), and Ameriflight (0.4%).

MONTHLY AIR CARGO

Table 3-5 presents monthly air cargo data for the Airport for January 2008 through January 2013. The monthly data show the seasonal variation in air cargo activity, with peak levels occurring typically in December and the lowest monthly activity occurring from January through February.

MONTHLY ALL-CARGO AIRLINE AIRCRAFT LANDINGS

Table 3-6 presents monthly all-cargo airline aircraft landings data for the Airport for January 2008 through January 2013.

Table 3-12
AIRLINE SHARES OF AIR FREIGHT
Mather Airport
In metric tons

Airline	2008	2009	2010	2011	2012
Cargo airlines					
United Parcel Service	40,284	38,315	37,479	40,937	44,515
Air Cargo	582	--	810	971	942
Airborne Express	29,661	2,030	--	47	--
Federal Express	--	--	3	--	--
Subtotal cargo airlines	70,527	40,346	38,293	41,956	45,457
Other airlines					
Redding AERO	331	690	926	832	939
Ameriflight	594	303	187	205	171
Martinaire Partners	185	--	--	--	--
Pacific Coast Jet Charter	--	--	--	62	--
Subtotal other airlines	1,109	994	1,113	1,099	1,111
Total air freight	71,636	41,339	39,406	43,054	46,567
	Percent of total				
Cargo airlines					
United Parcel Service	56.2%	92.7%	95.1%	95.1%	95.6%
Air Cargo	0.8	--	2.1	2.3	2.0
Airborne Express	41.4	4.9	--	0.1	--
Federal Express	--	--	0.0	--	--
Subtotal cargo airlines	98.5%	97.6%	97.2%	97.4%	97.6%
Other airlines					
Redding AERO	0.5%	1.7%	2.4%	1.9%	2.0%
Ameriflight	0.8	0.7	0.5	0.5	0.4
Martinaire Partners	0.3	--	--	--	--
Pacific Coast Jet Charter	--	--	--	0.1	--
Subtotal other airlines	1.5%	2.4%	2.8%	2.6%	2.4%
Total air freight	100.0%	100.0%	100.0%	100.0%	100.0%

Note: Data include enplaned and deplaned air freight. Does not include air mail.

Source: Sacramento County Airport System records.

Table 3-13
HISTORICAL AIR CARGO BY MONTH
Mather Airport
In metric tons

Year	Month												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
2008	6,579	5,896	6,032	6,728	6,656	6,254	6,678	6,240	5,742	6,120	4,368	4,344	71,636
2009	3,052	3,088	3,412	3,516	3,448	3,531	3,723	3,238	3,542	3,642	3,016	4,131	41,339
2010	3,040	2,860	3,306	3,336	3,320	3,324	3,185	3,164	3,433	3,290	2,920	4,230	39,406
2011	2,442	2,754	3,425	3,057	3,026	3,347	3,814	4,169	4,145	3,837	3,807	5,231	43,054
2012	3,323	3,448	3,952	3,438	4,092	3,942	3,775	4,223	3,660	4,248	4,021	4,446	46,567
2013	3,826												
	Year-over-year percent increase (decrease)												
2008-2009	(53.6%)	(47.6%)	(43.4%)	(47.7%)	(48.2%)	(43.5%)	(44.3%)	(48.1%)	(38.3%)	(40.5%)	(31.0%)	(4.9%)	(42.3%)
2009-2010	(0.4)	(7.4)	(3.1)	(5.1)	(3.7)	(5.9)	(14.5)	(2.3)	(3.1)	(9.7)	(3.2)	2.4	(4.7)
2010-2011	(19.7)	(3.7)	3.6	(8.4)	(8.8)	0.7	19.8	31.8	20.8	16.6	30.4	23.7	9.3
2011-2012	36.1	25.2	15.4	12.5	35.2	17.8	(1.0)	1.3	(11.7)	10.7	5.6	(15.0)	8.2
2012-2013	15.1												
	Percent of total												
2008	9.2%	8.2%	8.4%	9.4%	9.3%	8.7%	9.3%	8.7%	8.0%	8.5%	6.1%	6.1%	100.0%
2009	7.4	7.5	8.3	8.5	8.3	8.5	9.0	7.8	8.6	8.8	7.3	10.0	100.0
2010	7.7	7.3	8.4	8.5	8.4	8.4	8.1	8.0	8.7	8.3	7.4	10.7	100.0
2011	5.7	6.4	8.0	7.1	7.0	7.8	8.9	9.7	9.6	8.9	8.8	12.2	100.0
2012	7.1	7.4	8.5	7.4	8.8	8.5	8.1	9.1	7.9	9.1	8.6	9.5	100.0
5-year average (2008-2012)	7.6%	7.5%	8.3%	8.3%	8.5%	8.4%	8.7%	8.7%	8.5%	8.7%	7.5%	9.2%	100.0%

Note: Data include enplaned and deplaned air freight and mail.

Source: Sacramento County Airport System records.

Table 3-14

HISTORICAL ALL-CARGO AIRLINE LANDINGS BY MONTH

Mather Airport

Year	Month												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
2008	132	228	211	245	239	125	241	238	222	254	203	219	2,557
2009	128	126	134	138	127	133	140	120	123	127	108	164	1,568
2010	77	94	104	114	96	103	101	104	106	106	99	180	1,284
2011	88	100	118	110	102	111	99	114	109	104	107	173	1,335
2012	94	108	112	100	118	111	102	121	103	120	123	171	1,383
2013	115												
	Year-over-year percent increase (decrease)												
2008-2009	(3.0%)	(44.7%)	(36.5%)	(43.7%)	(46.9%)	6.4%	(41.9%)	(49.6%)	(44.6%)	(50.0%)	(46.8%)	(25.1%)	(38.7%)
2009-2010	(39.8)	(25.4)	(22.4)	(17.4)	(24.4)	(22.6)	(27.9)	(13.3)	(13.8)	(16.5)	(8.3)	9.8	(18.1)
2010-2011	14.3	6.4	13.5	(3.5)	6.3	7.8	(2.0)	9.6	2.8	(1.9)	8.1	(3.9)	4.0
2011-2012	6.8	8.0	(5.1)	(9.1)	15.7	0.0	3.0	6.1	(5.5)	15.4	15.0	(1.2)	3.6
2012-2013	22.3												
	Percent of total												
2008	5.2%	8.9%	8.3%	9.6%	9.3%	4.9%	9.4%	9.3%	8.7%	9.9%	7.9%	8.6%	100.0%
2009	8.2	8.0	8.5	8.8	8.1	8.5	8.9	7.7	7.8	8.1	6.9	10.5	100.0
2010	6.0	7.3	8.1	8.9	7.5	8.0	7.9	8.1	8.3	8.3	7.7	14.0	100.0
2011	6.6	7.5	8.8	8.2	7.6	8.3	7.4	8.5	8.2	7.8	8.0	13.0	100.0
2012	6.8	7.8	8.1	7.2	8.5	8.0	7.4	8.7	7.4	8.7	8.9	12.4	100.0
5-year average (2008-2012)	6.4%	8.1%	8.4%	8.7%	8.4%	7.2%	8.4%	8.6%	8.2%	8.7%	7.9%	11.2%	100.0%

Source: Sacramento County Airport System records.

HISTORICAL AIRCRAFT OPERATIONS

This section summarizes historical total aircraft operations at the Airport from 1990 through 2012. Aircraft operations include the total number of departures and arrivals by air carrier, air taxi and commuter, general aviation, and military aircraft. An aircraft operation is defined as either a takeoff or a landing at the Airport. Table 4-1 and Figure 4-1 present a summary of total aircraft operations at MHR by type.

AIR CARRIER

Air carrier operations are those performed in revenue service by the all-cargo airlines serving the Airport. Included are scheduled flights, charter flights, diverted flights, and ferry operations (empty flights). The FAA defines an air carrier aircraft, for traffic counting purposes, as capable of carrying more than 60 passengers and provides a list of model types that are counted as air carrier operations (Appendix 3 in Order JO 7210.3W), even if the aircraft is conducting air freight operations.* As shown in Table 4-1, the number of air carrier aircraft operations has varied considerably since 2000, largely as a result of changes in all-cargo airline service. In 2012, a total of 4,669 air carrier aircraft operations were performed at the Airport, less than the 17-year average of 5,300 operations. According to SCAS records, all-cargo airlines accounted for approximately 60% of air carrier operations in 2012. Air carrier size aircraft that perform all-cargo operations at the airport include aircraft models such as the Airbus 300-600 and the Boeing 757 and 767 aircraft.

AIR TAXI AND COMMUTER

Air taxi and commuter operations consist of unscheduled operations of "for hire" air taxis and the scheduled operations of commuter airlines, including regional affiliate airlines operating aircraft with less than 60 seats. The FAA defines air taxi and commuter operations as those performed by aircraft other than those listed in Appendix 3 noted above and which use three-letter company designators. Fractional ownership and management companies and corporate flight departments that use a three-letter company designator are included in air taxi operations.

Air taxi and commuter operations at Mather are performed by cargo regional feeders, corporate flight departments, and fractional ownership and management companies, as described below.

- The operations of cargo regional feeders (affiliates of the cargo integrators) at the Airport accounted for 25% of air taxi and commuter aircraft operations in 2012, according to SCAS records. Commuter or regional aircraft that perform all-cargo operations at the airport include small turboprop aircraft such as the Beechcraft 99 and Shorts 360 aircraft.

- In addition to the operations of cargo affiliates, corporate aviation also accounts for a large share of air taxi and commuter operations. Corporate aviation at the Airport includes an Intel Corporation flight department with 2 of its Embraer 145 regional jets based at MHR and corporate operations at the two fixed base operators (FBOs) located at the Airport—Atlantic Aviation and Mather Aviation.

- Fractional ownership and management companies accounted for a large share of air taxi and commuter aircraft operations in 2012. Fractional ownership companies sell a fraction of specific aircraft and allow the purchaser to choose arrival and departure points and times for each trip. Fractional owner travel costs are typically higher than flying

*U.S. Department of Transportation, Federal Aviation Administration, Order JO 7210.3W, February 11, 2010, http://www.faa.gov/air_traffic/publications.

commercial carriers but lower than purchasing, staffing and maintenance of a similar private jet. A number of fractional ownership companies operated at the Airport in 2012—CitationShares, Flight Options, and Netjets—using business jets such as the Cessna Citation Excel (560XL), the Dassault Falcon 2000, and the Raytheon Hawker 800 aircraft.

As shown in Table 4-1, air taxi and commuter aircraft operations increased an average 1.1% per year between 1996 and 2007. Since 2007, air taxi and commuter have increased an average of 1.4% per year to 12,493 in 2012, higher than the 17-year average of 11,900 operations.

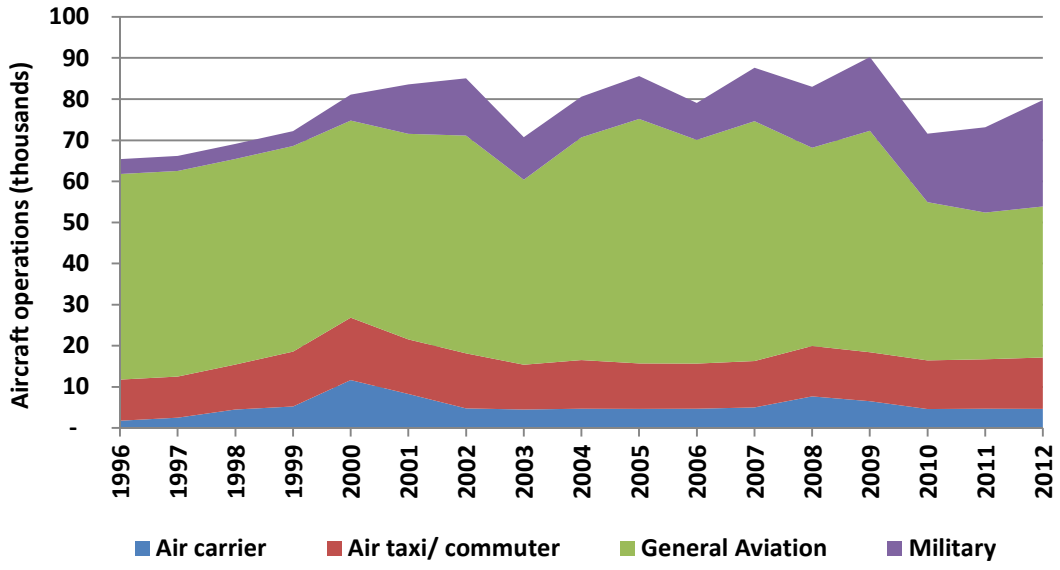
GENERAL AVIATION

General aviation operations include all civil aircraft operations not classified as air carrier or air taxi and commuter operations. As shown in Table 4-1, general aviation aircraft operations decreased an average of 1.9% per year between 1996 and 2012 to 36,732 in 2012, less than the 17-year average of 49,100 operations.

MILITARY

Military aircraft operations at the Airport have averaged approximately 11,500 operations per year from 1996 through 2012. In 2012, military operations totaled 25,874, more than the 17-year average. Historically, military operations have varied with geopolitical trends.

Figure 3-9
HISTORICAL AIRCRAFT OPERATIONS
Mather Airport



Note: Sum of takeoffs and landings.
Mather was officially reopened as a civilian airport on May 5, 1995.

Source: U.S. Department of Transportation, Air Traffic Activity System (ATADS), www.faa.gov, accessed February 2013.

Table 3-15
HISTORICAL AIRCRAFT OPERATIONS
Mather Airport

	Commercial flights						
	Air carrier *(a)*	Air taxi/ commuter *(b)*	Subtotal	General aviation	Military	Total	Percent increase (decrease)
1996	1,761	10,000	11,761	50,000	3,650	65,411	--%
1997	2,514	10,000	12,514	50,000	3,650	66,164	1.2
1998	4,506	10,922	15,428	50,000	3,652	69,080	4.4
1999	5,246	13,326	18,572	50,000	3,650	72,222	4.5
2000	11,666	15,149	26,815	47,940	6,316	81,071	12.3
2001	8,270	13,257	21,527	50,010	12,030	83,567	3.1
2002	4,764	13,404	18,168	52,957	13,904	85,029	1.7
2003	4,490	10,910	15,400	44,968	10,341	70,709	(16.8)
2004	4,692	11,817	16,509	54,191	9,885	80,585	14.0
2005	4,648	11,064	15,712	59,437	10,435	85,584	6.2
2006	4,706	10,941	15,647	54,405	8,994	79,046	(7.6)
2007	4,998	11,272	16,270	58,331	13,016	87,617	10.8
2008	7,688	12,254	19,942	48,229	14,831	83,002	(5.3)
2009	6,535	11,889	18,424	53,875	17,905	90,204	8.7
2010	4,597	11,855	16,452	38,486	16,642	71,580	(20.6)
2011	4,685	12,046	16,731	35,673	20,717	73,121	2.2
2012	4,669	12,493	17,162	36,732	25,874	79,768	9.1
	Compound annual percent increase (decrease)						
1996-2007	9.9%	1.1%	3.0%	1.4%	12.3%	2.7%	
2007-2012	(0.1)	2.2	1.6	(6.3)	19.3	0.2	
1996-2012	6.3	1.4	2.4	(1.9)	13.0	1.2	

Note: Sum of takeoffs and landings.
Data for 1996 through 1999 are estimated.
Mather was officially reopened as a civilian airport on May 5, 1995.

(a) Includes all-cargo and other carrier operations.
(b) Includes scheduled and for-hire service passenger service on aircraft with less than 60 seats.

Source: U.S. Department of Transportation, Air Traffic Activity System (ATADS), www.faa.gov, accessed February 2013.

MONTHLY AIRCRAFT OPERATIONS

Table 4-2 presents monthly total aircraft operations data for the Airport for January 2008 through January 2013. The monthly data show the seasonal variation in total aircraft operations, with September, October and December each accounting for approximately 9% of annual operations in 2012.

Table 3-16

HISTORICAL COMMERCIAL AIRCRAFT OPERATIONS BY MONTH

Mather Airport

Year	Month												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
2008	1,322	1,310	1,336	1,392	1,265	1,189	2,100	1,945	1,966	2,172	1,718	2,227	19,942
2009	1,703	1,539	1,589	1,705	1,455	1,540	1,591	1,494	1,425	1,545	1,290	1,548	18,424
2010	1,405	1,265	1,469	1,395	1,293	1,381	1,283	1,349	1,316	1,367	1,222	1,707	16,452
2011	1,374	1,223	1,613	1,426	1,420	1,350	1,222	1,501	1,355	1,374	1,374	1,499	16,731
2012	1,340	1,408	1,512	1,440	1,415	1,380	1,220	1,495	1,573	1,532	1,310	1,537	17,162
2013	1,106												
	Year-over-year percent increase (decrease)												
2008-2009	28.8%	17.5%	18.9%	22.5%	15.0%	29.5%	(24.2%)	(23.2%)	(27.5%)	(28.9%)	(24.9%)	(30.5%)	(7.6%)
2009-2010	(17.5)	(17.8)	(7.6)	(18.2)	(11.1)	(10.3)	(19.4)	(9.7)	(7.6)	(11.5)	(5.3)	10.3	(10.7)
2010-2011	(2.2)	(3.3)	9.8	2.2	9.8	(2.2)	(4.8)	11.3	3.0	0.5	12.4	(12.2)	1.7
2011-2012	(2.5)	15.1	(6.3)	1.0	(0.4)	2.2	(0.2)	(0.4)	16.1	11.5	(4.7)	2.5	2.6
2012-2013	(17.5)												
	Percent of total												
2008	6.6%	6.6%	6.7%	7.0%	6.3%	6.0%	10.5%	9.8%	9.9%	10.9%	8.6%	11.2%	100.0%
2009	9.2	8.4	8.6	9.3	7.9	8.4	8.6	8.1	7.7	8.4	7.0	8.4	100.0
2010	8.5	7.7	8.9	8.5	7.9	8.4	7.8	8.2	8.0	8.3	7.4	10.4	100.0
2011	8.2	7.3	9.6	8.5	8.5	8.1	7.3	9.0	8.1	8.2	8.2	9.0	100.0
2012	7.8	8.2	8.8	8.4	8.2	8.0	7.1	8.7	9.2	8.9	7.6	9.0	100.0
5-year average (2008-2012)	8.1%	7.6%	8.5%	8.3%	7.7%	7.7%	8.4%	8.8%	8.6%	9.0%	7.8%	9.6%	100.0%

Note: Data include air carrier and air taxi/commuter aircraft operations.

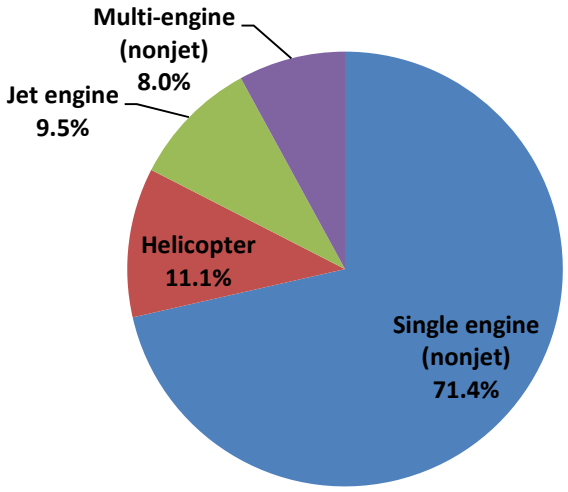
Source: U.S. Department of Transportation, Air Traffic Activity System (ATADS), www.faa.gov, accessed February 2013.

BASED AIRCRAFT

This section summarizes based aircraft at the Airport in 2012 by category and by type of based aircraft owner. In addition, a summary of the utilization of based aircraft, in terms of the number of based aircraft per capita and general aviation operations per based aircraft, is presented for the Airport and selected airports in the Sacramento Region using the FAA 2012 TAF for each airport.

Table 5-1 and Figure 5-1 present a summary of based aircraft in 2012 at MHR by aircraft category and type of based aircraft owner. In 2012, a total of 63 aircraft were based at the Airport, according to an SCAS inventory of based aircraft conducted by SCAS staff. Single-engine aircraft accounted for the largest share of total based aircraft at the Airport In 2012, with 71.4%, followed by helicopters (11.1%), jet engine aircraft (9.5%), and multi-engine aircraft (8.0%). Of the 63 aircraft based at the Airport, 44 aircraft are used for corporate aviation; the remaining 19 aircraft are used for cargo and government operations.

Figure 3-10
PERCENT OF BASED AIRCRAFT BY TYPE IN 2012
Mather Airport



Source: Sacramento County Airport System, March 2013.

It is important to note that SCAS' count of 63 based aircraft at Mather differs from the 26 based aircraft reported in the FAA 2012 TAF. The SCAS inventory is based on a physical count of aircraft at Mather conducted by the Airport manager and other SCAS staff and is believed to represent a current and accurate count of MHR based aircraft.

As shown in Table 5-2, there were 0.29 based aircraft per 1,000 people in Sacramento County, less than the average for the primary area (0.44) and the Airport service region as a whole (0.63). In 2012, an average of 423 general aviation operations per based aircraft were performed at the airports in Sacramento County, compared with 446 for the primary area and 392 for the Airport service region.

Table 3-17
BASED AIRCRAFT IN 2012
Mather Airport

Aircraft type	Corporate aviation			Cargo	Government		Total	Percent of total
	Atlantic Aviation *(a)*	GMJ Air Shuttle, LLC	Mather Aviation *(a)*	DHL	Sacramento County Sheriff's Department	U.S. Department of Justice		
Single engine (nonjet)								
Reciprocating	28	--	7	--	3	6	44	69.8%
Turboprop	1	--	-	--	--	--	1	1.6
Single-engine subtotal	29	--	7	--	3	6	45	71.4%
Multi-engine (nonjet)	3			1		1	5	8.0
Jet engine								
Twin-engine	3	2	--	--	--	--	5	7.9%
Three engine	-	--	--	1	--	--	1	1.6
Jet engine subtotal	3	2	--	1	--	--	6	9.5%
Helicopter	--	--	--	--	5	2	7	11.1
Other	--	--	--	--	--	--	--	0.0%
Total Airport	35	2	7	2	8	9	63	100.0%

(a) Fixed base operator at the Airport.

Source: Sacramento County Airport System, March 2013.

Table 3-18

BASED AIRCRAFT UTILIZATION IN 2012

Selected Sacramento Region Airports

County	Population	Percent of total	Based aircraft	Percent of total	Based aircraft per 1,000 people	General aviation operations	GA operations per based aircraft	Number of airports
Primary area								
Sacramento	1,436,105	29.9%	416	13.7%	0.29	175,899	423	5
San Joaquin	696,214	14.5	215	7.1	0.31	107,987	502	2
Placer	357,138	7.4	203	6.7	0.57	67,000	330	1
Yolo	202,054	4.2	76	2.5	0.38	60,000	789	1
El Dorado	180,938	3.8	302	9.9	1.67	143,624	476	4
Sutter	94,919	2.0	67	2.2	0.71	7,900	118	1
Yuba	72,578	1.5	60	2.0	0.83	35,000	583	1
Subtotal	3,039,946	63.3%	1,339	44.0%	0.44	597,410	446	15
Secondary area								
Stanislaus	518,522	10.8%	305	10.0%	0.59	53,482	175	3
Solano	416,471	8.7	210	6.9	0.50	135,000	643	2
Butte	220,266	4.6	131	4.3	0.59	65,899	503	2
Shasta	177,774	3.7	320	10.5	1.80	103,405	323	3
Napa	138,088	2.9	213	7.0	1.54	41,174	193	1
Nevada	98,612	2.1	131	4.3	1.33	26,750	204	1
Tehama	63,601	1.3	141	4.6	2.22	33,668	239	2
Calaveras	45,052	0.9	52	1.7	1.15	32,000	615	1
Amador	37,953	0.8	85	2.8	2.24	24,800	292	1
Glenn	28,128	0.6	77	2.5	2.74	49,500	643	2
Colusa	21,549	0.4	38	1.2	1.76	27,900	734	1
Subtotal	1,766,016	36.7%	1,703	56.0%	0.96	593,578	349	19
Airport service region	4,805,962	100.0%	3,042	100.0%	0.63	1,190,988	392	34

Note: Includes airports with FAA 2012 TAFs.

Sources: U.S. Department of Commerce, Bureau of the Census, www.census.gov, accessed July 2012. U.S. Department of Transportation, Federal Aviation Administration, Terminal Area Forecasts, Fiscal Years 2013-2040, www.faa.gov.

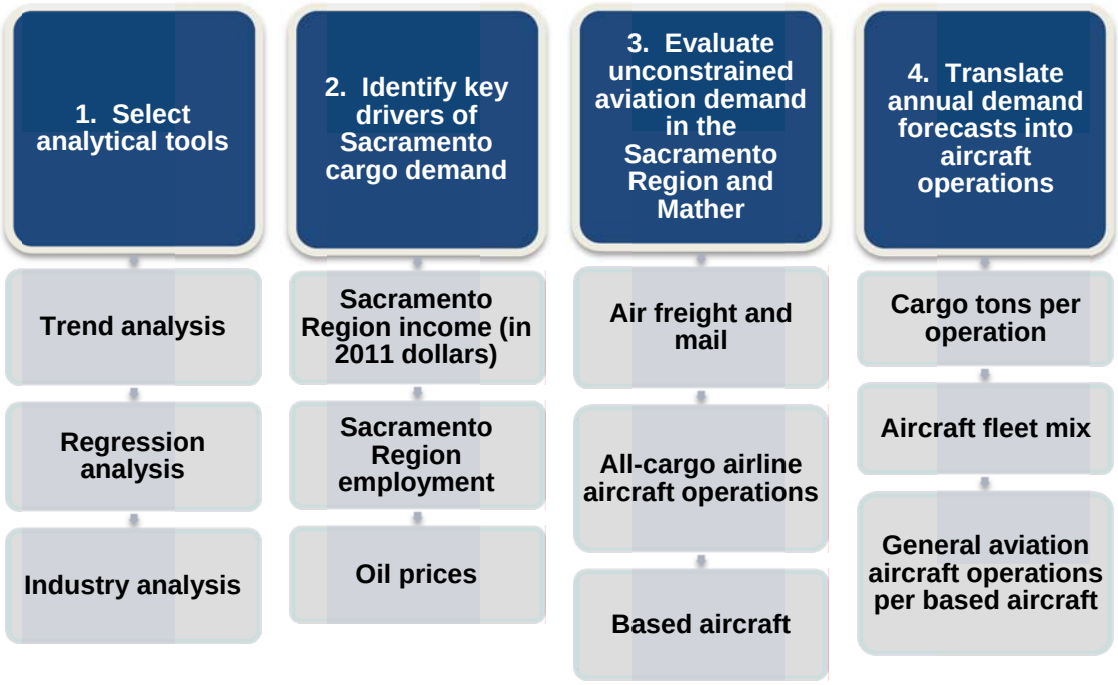
AVIATION DEMAND FORECASTS

This section summarizes the forecasts of air cargo, all-cargo airline aircraft operations, and total aircraft operations for MHR, including the forecast approach, methodology, and assumptions. As noted earlier, the baseline forecasts presented in this report are "unconstrained" and, therefore, do not include specific assumptions about physical, regulatory, environmental or other impediments to aviation activity growth. Forecasts of aviation activity are presented for air cargo, all-cargo airline aircraft operations, and aircraft operations, including air carrier, air taxi and commuter, general aviation including based aircraft, and military operations. Using calendar year 2012 as the base year, annual forecasts were prepared for three future demand years—2018, 2023, and 2035.

FORECAST APPROACH AND METHODOLOGY

As shown in Figure 6-1, the forecast approach incorporated a multi-tiered approach to evaluate cargo and general aviation activity at MHR. It was recognized that no one approach would provide input on all of the key factors that affect aviation demand in the Sacramento Region. For example, an econometric analysis would provide input on the relationships between historical cargo trends and regional economic conditions but little to no input on such factors as (1) the role of all-cargo airline hubs and network in service decisions, (2) recent trends in the cargo industry that have affected the consolidation and movement of air freight, and (3) the capacity and effect of all-cargo airline aircraft fleets on cargo activity. Input from these factors is important to the development of reliable forecasts that can serve as the basis for planning efforts at the Airport.

Figure 3-11
UNCONSTRAINED FORECAST APPROACH
Sacramento Region and Mather Airport



AIR CARGO

The key elements considered in the preparation of cargo forecasts for the Airport included (1) historical cargo trends in the Sacramento Region, including SMF and Mather Airport, (2) shares of all-cargo airline activity, and (3) the key factors affecting future cargo activity such as national and global economic conditions, oil price volatility, and airline industry trends.

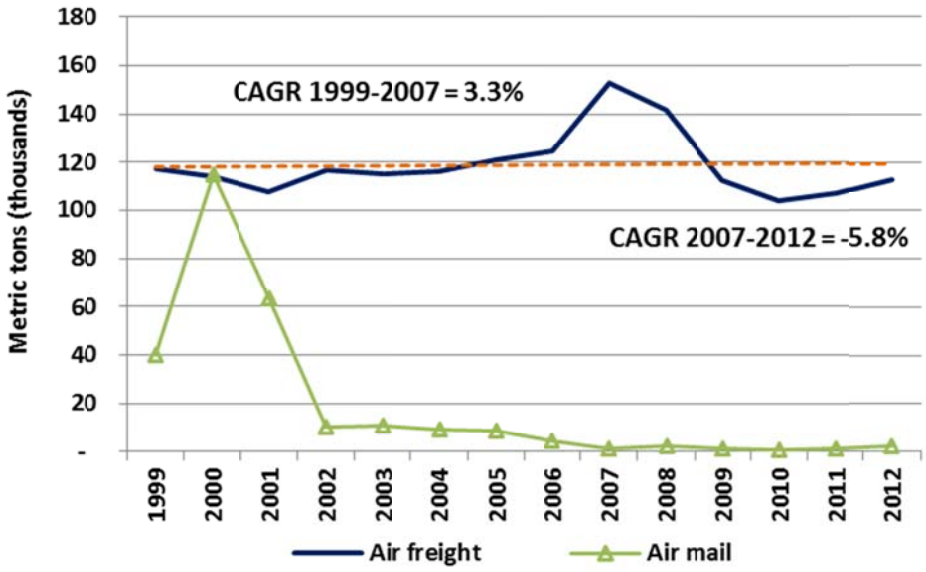
Forecast Approach and Methodology

The methodology for preparing cargo forecasts incorporated a multi-tiered approach to evaluate cargo activity in the Sacramento Region and at Mather.

Historical Trend Analysis

As shown on Figure 6-2, total air freight in the Sacramento Region increased an average of 3.3% between 1999 and 2007, followed by an average decrease of 5.8% per year between 2007 and 2012, reflecting the effects of the 2008-2009 economic recession, fuel price volatility, and consolidation in the air cargo industry. The trends in regional air mail reflect changes in U.S. postal contracts which have resulted in significantly reduced air mail tonnage since 2002.

Figure 3-12
HISTORICAL TREND ANALYSIS – REGIONAL AIR CARGO
Mather Airport and Sacramento International Airport



Notes: CAGR = Compound annual growth rate
Includes enplaned and deplaned freight and mail.

Source: Sacramento County Airport System records.

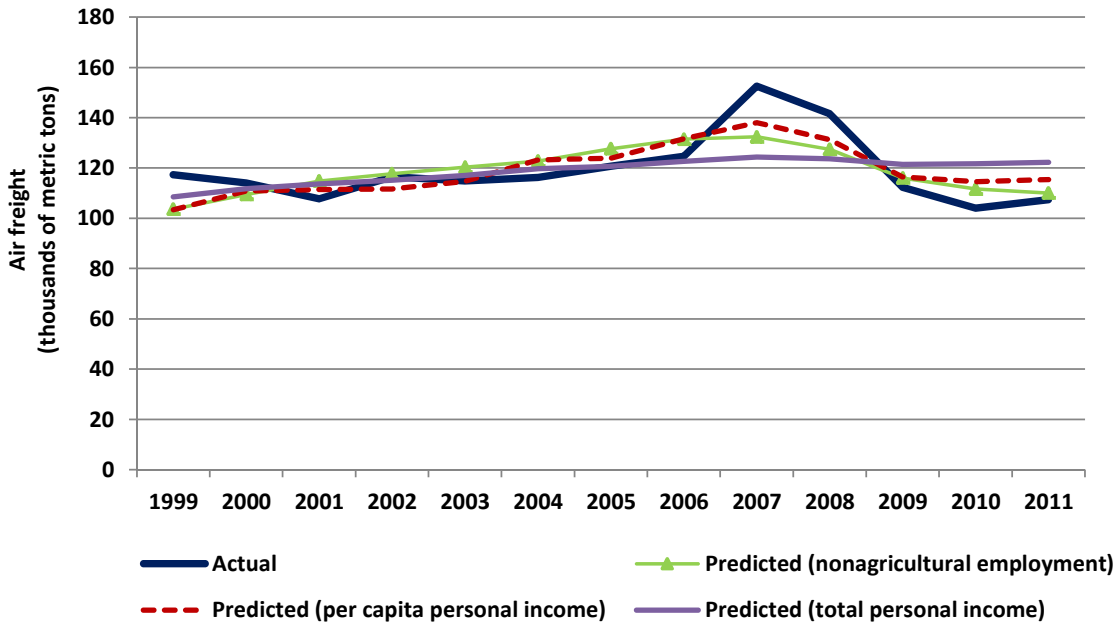
Regression Analysis

To prepare air cargo forecasts for the Sacramento Region and Mather, regression analyses of total air freight in the Sacramento Region were conducted. Separate regression analyses of air mail were not prepared because of the small volume of mail relative to freight and the volatility in air mail volume historically.

The trend in air freight can be explained by a regression analysis relating cargo trends to economic and airline industry metrics. Typically, an air cargo regression model includes an economic variable (e.g., total personal income, per capita income, or GDP—all expressed in constant dollars) and a cost variable (e.g., price of oil, jet fuel—also expressed in constant dollars). It is important to note that, unlike an analysis of passenger demand at an airport, cost variables specific to MHR cargo activity are not available. The primary objective is to represent the two key variables that affect air cargo demand, i.e., economic activity driving the demand for air cargo services and how much it costs to transport cargo. Other variables may be important as well, depending on the traffic market characteristics.

As shown in Figure 6-3, the historical trend in air freight relates strongly to regional economic activity. Regression models which included economic variables such as total income, per capita personal income, or employment in the Sacramento Region explained approximately 50% of the historical variation in air freight. In contrast, regression models which included only cost of travel variables such as West Texas Intermediate (WTI) oil prices explained a small share of the historical variation in air freight.

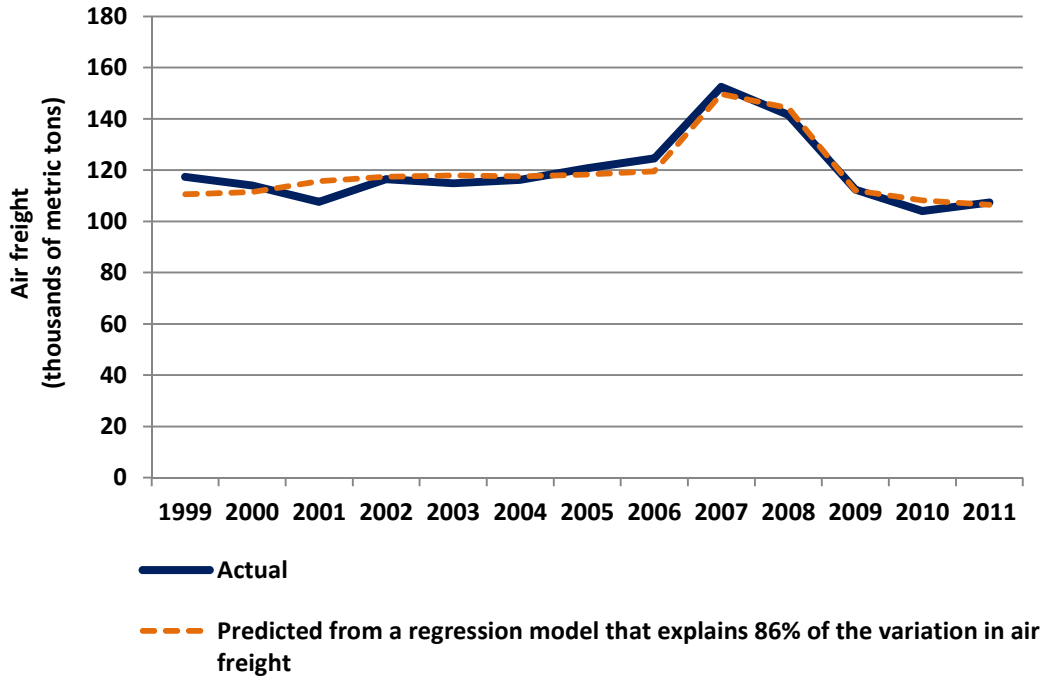
Figure 3-13
ECONOMIC VARIABLES
HISTORICAL AND PREDICTED AIR FREIGHT
Sacramento Region



Sources: Actual—Sacramento County Airport System records.
Predicted—LeighFisher, March 2013.

A representative regression model which includes an economic variable and a cost variable is shown on Figure 6-4. The historical trend in air freight at MHR relates strongly to the predicted values from a regression model which includes nonagricultural employment in 18-county Sacramento Region and West Texas Intermediate (WTI) oil prices, in 2011 dollars. In addition, a dummy variable* for 2007 and 2008 was used to reflect the large changes in air freight during that period related to the cessation of domestic air cargo service by DHL, not only in the Sacramento Region but throughout the United States as well. The forecasts of air freight in the Sacramento Region were based on projections of nonagricultural employment in the Sacramento Region, presented in Table 3-1, and projections of oil prices based on the Department of Energy national forecasts.**

Figure 3-14
REPRESENTATIVE MODEL
HISTORICAL AND PREDICTED AIR FREIGHT
Mather Airport and Sacramento International Airport



Sources: Actual—Sacramento County Airport System records.
Predicted—LeighFisher, March 2013.

*A dummy variable has a value of 0 or 1 to indicate the absence or presence of an event that may shift the outcome but is not explained by the independent variables. For example, the terrorist events of 2001 changed the structure of the aviation industry and are oftentimes represented by a dummy variable in econometric analyses.

**U.S. Department of Energy, Energy Information Administration, *Annual Energy Outlook 2012*, June 2012, www.doe.gov.

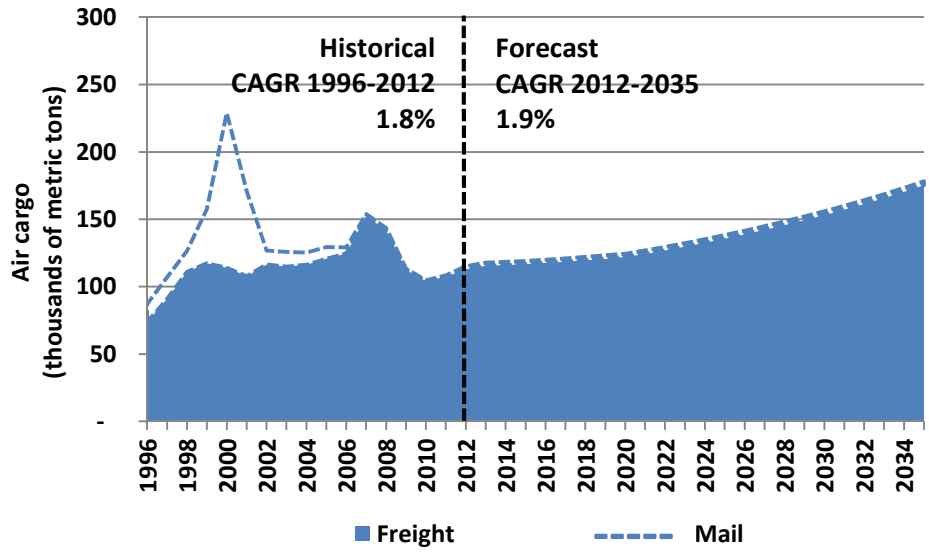
Industry Analysis

Industry trends, both past and present, were important in considering the reasonableness of the forecasts generated by the statistical analysis and evaluating the capacity of the airline industry to support the forecast air freight demand. In recent years, the cargo industry has been adversely affected by increased fuel prices, the world economic recession, and competition from other transportation modes. Although these factors have already had an impact on the cargo industry, the potential for continued adjustments is not reflected in the statistical analysis.

Sacramento Region Air Cargo Forecasts

As shown on Figure 6-5 and in Table 6-1, total air cargo in the Sacramento Region is forecast to increase from 115,193 metric tons in 2012 to 178,180 metric tons in 2035, an average rate of 1.9% per year, compared with an average increase of 2.2% per year in U.S. domestic air cargo during this period forecast by Boeing Corporation.

Figure 3-15
HISTORICAL AND FORECAST AIR CARGO—SACRAMENTO REGION



Note: The forecasts presented in this figure were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

CAGR = Compound annual growth rate
Includes enplaned and deplaned air cargo.
The sharp decrease in cargo in 2001 reflects the transfer of the USPS air mail contract. Mather was officially reopened as a civilian airport on May 5, 1995.

Sources: Historical: Sacramento County Airport System records.
Forecast: LeighFisher, March 2013.

Table 3-19

HISTORICAL AND FORECAST AIR CARGO—SACRAMENTO REGION

Master Plan Update

Mather Airport

In metric tons

The forecasts presented in this table were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

Calendar year	Sacramento Region				United States
	Mather Airport	Mather share	SMF	Total	
Historical					
2000	167,528	73.2%	61,483	229,011	30,790,710
2007	74,646	48.5	79,196	153,843	29,296,597
2008	71,636	49.9	71,950	143,586	26,772,937
2009	41,339	36.5	71,968	113,307	24,220,966
2010	39,406	37.6	65,302	104,708	27,316,021
2011	43,054	39.7	65,340	108,394	26,930,602
2012	46,567	40.4	68,626	115,193	26,416,000
Forecast					
2018	50,760	41.6%	71,300	122,060	30,100,400
2023	55,010	41.6	77,230	132,240	33,560,370
2035	74,380	41.7	103,800	178,180	43,575,010
	Compound annual percent increase (decrease)				
2000-2007	(10.9%)		3.7%	(5.5%)	(0.7%)
2007-2012	(9.0)		(2.8)	(5.6)	(2.0)
2000-2012	(10.1)		0.9	(5.6)	(1.3)
2012-2018	1.4		0.6	1.0	2.2
2018-2023	1.6		1.6	1.6	2.2
2023-2035	2.5		2.5	2.5	2.2
2012-2035	2.1		1.8	1.9	2.2

Note: Includes enplaned and deplaned air cargo and mail for passenger and all-cargo airlines.

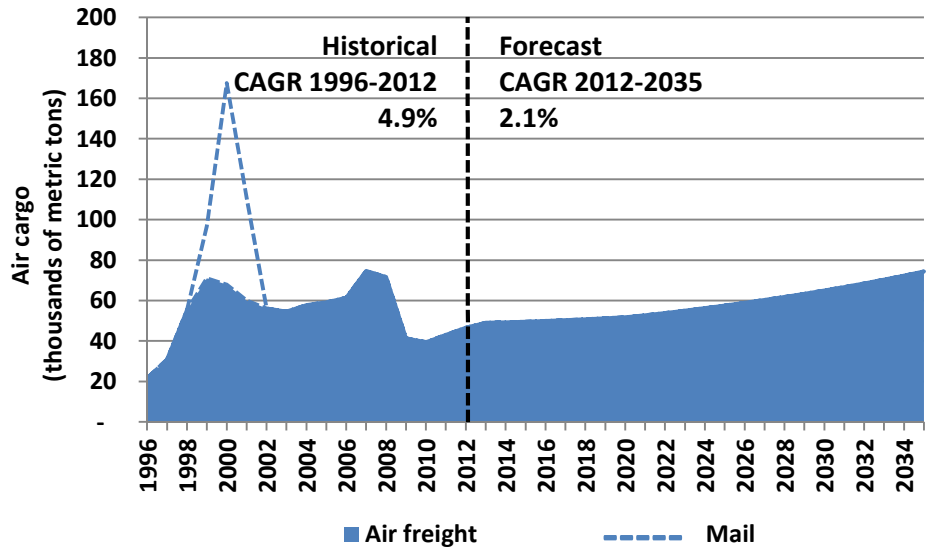
(a) Estimated based on data for January through October 2012.

Sources: Historical--SCAS, 1999 - 2003: PB Aviation, Sacramento Airport Master Plan, Appendix A, updated forecast, April 15, 2005. SCAS, 2004-2009: Sacramento County Airport System records. United States: Airports Council International, North America Rankings and Worldwide Traffic Report, for years noted. Forecast--Mather and SMF: LeighFisher, March 2013. United States: Boeing World Cargo Forecast, 2012-2013, www.boeing.com. Forecasts are for U.S. domestic cargo.

Mather Air Cargo Forecasts

As shown on Figure 6-6 and in Table 6-2, total air cargo at the Airport is forecast to increase from 46,567 metric tons in 2012 to 74,380 metric tons in 2035, an average growth rate of 2.1% per year. In 2012, air freight accounted for all air cargo at the Airport.*

Figure 3-16
HISTORICAL AND FORECAST AIR CARGO
Mather Airport



Note: The forecasts presented in this figure were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

CAGR = Compound annual growth rate
Includes enplaned and deplaned air cargo.
The sharp decrease in cargo in 2001 reflects the transfer of the USPS air mail contract. Mather was officially reopened as a civilian airport on May 5, 1995.

Sources: Historical: Sacramento County Airport System records.
Forecast: LeighFisher, March 2013.

*According to SCAS records, air mail for the Sacramento Region was carried on passenger airlines and FedEx, which does not report freight and mail separately at SMF; in 2012, no air mail was handled at Mather. However, the United States Postal Service contract with FedEx expires in September 2013 and will be subject to a competitive bid process.

Table 3-20
AIR CARGO FORECASTS – BASELINE
Master Plan Update
Mather Airport

The forecasts presented in this table were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

	Historical			Forecast		
	2010	2011	2012	2018	2023	2035
Air freight (in metric tons)						
Cargo integrators	38,293	41,956	45,457	49,550	53,700	72,610
Cargo regional feeders	1,113	1,099	1,111	1,210	1,310	1,770
Air freight total	39,406	43,054	46,567	50,760	55,010	74,380
Air freight (in metric tons)						
Enplaned	18,231	19,604	20,701	22,565	24,460	33,070
Deplaned	21,175	23,450	25,866	28,195	30,550	41,310
Air freight total	39,406	43,054	46,567	50,760	55,010	74,380
Percent of total						
Enplaned	46.3%	45.5%	44.5%	44.5%	44.5%	44.5%
Deplaned	53.7%	54.5%	55.5%	55.5%	55.5%	55.5%
All-cargo airline aircraft operations						
Cargo integrators	2,568	2,670	2,766	2,840	2,930	3,510
Cargo regional feeders	5,568	3,138	3,106	3,290	3,470	4,420
Total operations	8,136	5,808	5,872	6,130	6,400	7,930
Air freight per operation (in metric tons)						
Cargo integrators	14.9	15.7	16.4	17.4	18.3	20.7
Cargo regional feeders	0.2	0.4	0.4	0.4	0.4	0.4
Total	4.8	7.4	7.9	8.3	8.6	9.4

	Compound average annual percent increase				
	2010-2011	2011-2012	2012-2018	2018-2023	2023-2035
Air freight					
Cargo integrators	9.6%	8.3%	1.4%	1.6%	2.5%
Cargo regional feeders	(1.3)	1.1	1.4	1.6	2.5
Air freight total	9.3%	8.2%	1.4%	1.6%	2.5%
Enplaned	7.5%	5.6%	1.4%	1.6%	2.5%
Deplaned	10.7%	10.3%	1.4%	1.6%	2.5%
All-cargo airline aircraft operations					
Cargo integrators	4.0%	3.6%	0.4%	0.6%	1.5%
Cargo regional feeders	(43.6)	(1.0)	1.0	1.1	2.0
Total	(28.6%)	1.1%	0.7%	0.9%	1.8%
Air freight per operation					
Cargo integrators	5.4%	4.6%	1.0%	1.0%	1.0%
Cargo regional feeders	75.1	2.1	0.5	0.5	0.5
Total	53.1%	7.0%	0.7%	0.7%	0.7%

Note: According to SCAS records, air mail for the Sacramento Region was carried on passenger airlines and FedEx, which does not report freight and mail separately at SMF; in 2012, no air mail was handled at Mather.

Sources: Historical: Sacramento County Airport System records. Forecast: LeighFisher, March 2013.

BASED AIRCRAFT

As shown in Table 6-3, the total number of based aircraft at the Airport is forecast to increase an average of 0.6% per year between 2012 and 2035, reflecting the projected growth in the population and economy of the Sacramento Region as well as the offsetting effect of increases in future fuel prices which is likely to limit based aircraft demand. Single engine aircraft are forecast to decrease an average of 0.2% per year between 2012 and 2035, equal to the FAA's forecast growth rate for single engine aircraft in the nation as a whole. Multi-engine (non-jet) aircraft are forecast to increase an average of 2.0% per year between 2012 and 2035. Jet aircraft are forecast to experience the strongest growth through 2035—an average increase of 3.5% per year—reflecting the role of the Airport as a center for corporate aviation. Helicopters are forecast to increase an average of 0.5% per year between 2012 and 2035.

Table 6-4 presents a summary of the FAA 2012 TAF for each county in the Airport service region in terms of the growth in based aircraft, general aviation operations, and general aviation operations per based aircraft. The FAA forecasts an increase of 0.6% per year in the number of based aircraft in the Airport service region and a 0.2% increase in the number of general aviation operations in the Sacramento Region. As a result, the number of general aviation operations per based aircraft is forecast to decrease an average of 0.4% per year between 2012 and 2035.

AIRCRAFT OPERATIONS

This section summarizes the forecasts of total aircraft operations, including all-cargo airline (cargo integrators and regional feeders), air taxi and commuter, general aviation, and military operations.

Forecast Approach and Methodology

The forecasts of total aircraft operations are derived from the forecasts of cargo demand described previously and an evaluation of general aviation and military operations. In particular:

- The forecasts of all-cargo airline aircraft departures are based on the air cargo forecasts and assumptions regarding average cargo tonnage per operation and type of all-cargo service (integrated carrier or regional feeder).

- The forecasts of general aviation aircraft operations are based on historical trends, the number of aircraft based at the Airport, the average daily utilization of those aircraft, assumptions regarding aircraft utilization in the future, and industry forecasts of general aviation activity such as those prepared by the FAA.

- The forecasts of military aircraft operations are based on data for the base year of the forecasts and carried forward through the forecast period. Military operations typically increase and decrease with geopolitical trends and therefore this activity may vary in a given year.

Table 3-21
BASED AIRCRAFT FORECASTS – BASELINE
Master Plan Update
Mather Airport

The forecasts presented in this table were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

Aircraft type	Historical 2012	Forecast 2018	Forecast 2023	Forecast 2035
Single engine (nonjet)				
Reciprocating	44	43	43	42
Turboprop	1	1	1	1
Single-engine subtotal	45	44	44	43
Multi-engine (nonjet)	5	6	6	8
Jet engine				
Twin-engine	5	6	7	11
Three engine	1	1	1	2
Jet engine subtotal	6	7	9	13
Helicopter	7	7	7	8
Other	--	--	--	--
Total Airport	63	65	66	72
General aviation aircraft operations				
Itinerant	29,324	29,950	30,470	31,780
Local	7,408	7,560	7,700	8,030
General aviation total	36,732	37,380	38,040	39,810
General aviation aircraft operations per based aircraft	583	578	573	553

	Compound annual growth rate 2012-2018	2018-2023	2023-2035
Based aircraft	0.4%	0.5%	0.7%
General aviation aircraft operations	0.3	0.4	0.4
General aviation aircraft operations per based aircraft	(0.2)	(0.2)	(0.3)

Sources: Historical: Sacramento County Airport System records. Forecast: LeighFisher, March 2013.

Table 3-22

COMPARATIVE FORECASTS OF GENERAL AVIATION DEMAND

Selected Sacramento Region Airports

	Based aircraft			General aviation aircraft operations			GA operations per based aircraft		
County	2012	2035	CAGR 2012-2035	2012	2035	CAGR 2012-2035	2012	2035	CAGR 2012-2035
Primary area									
Sacramento	416	475	0.6%	175,899	174,572	0.0%	423	378	(0.6%)
San Joaquin	215	305	1.5	107,987	121,465	0.5	502	398	(1.0)
Placer	203	203	0.0	67,000	67,670	0.0	330	333	0.0
Yolo	76	76	0.0	60,000	60,000	0.0	789	789	0.0
El Dorado	302	275	(0.4)	143,624	150,666	0.2	476	548	0.6
Sutter	67	67	0.0	7,900	7,900	0.0	118	118	0.0
Yuba	60	60	0.0	35,000	35,000	0.0	583	583	0.0
Subtotal	1,339	1,461	0.4%	597,410	617,273	0.1%	446	423	(0.2%)
Secondary area									
Stanislaus	305	428	1.5%	53,482	52,039	(0.1%)	175	122	(1.6%)
Solano	210	210	0.0	135,000	135,000	0.0	643	643	0.0
Butte	131	174	1.2	65,899	67,093	0.1	503	386	(1.1)
Shasta	320	447	1.5	103,405	132,980	1.1	323	297	(0.4)
Napa	213	242	0.6	41,174	39,441	(0.2)	193	163	(0.7)
Nevada	131	131	0.0	26,750	26,750	0.0	204	204	0.0
Tehama	141	141	0.0	33,668	33,668	0.0	239	239	0.0
Calaveras	52	52	0.0	32,000	32,000	0.0	615	615	0.0
Amador	85	85	0.0	24,800	24,800	0.0	292	292	0.0
Glenn	77	77	0.0	49,500	49,500	0.0	643	643	0.0
Colusa	38	38	0.0	27,900	27,900	0.0	734	734	0.0
Subtotal	1,703	2,025	0.8%	593,578	621,171	0.2%	349	307	(0.6%)
Airport service region	3,042	3,486	0.6%	1,190,988	1,238,444	0.2%	392	355	(0.4%)

Note: CAGR = Compound annual growth rate
Includes airports with FAA 2012 TAFs.

Sources: U.S. Department of Transportation, Federal Aviation Administration, Terminal Area Forecasts, Fiscal Years 2013-2040, www.faa.gov.

Forecast Assumptions

Table 6-5 presents the forecast assumptions for cargo airline aircraft operations, including assumptions for the average cargo tonnage per cargo airline operation.

All-Cargo Airline Aircraft Operations Forecasts

Cargo airline operations at Mather include the flight activity by airlines dedicated exclusively to the transportation of freight such as UPS and by commuter/regional size aircraft. Air carrier size aircraft that perform all-cargo operations at the airport include widebody (e.g., Airbus A-300-600 and B-767) and narrowbody (e.g., Boeing 757) aircraft. Commuter or regional aircraft that perform all-cargo operations at the airport include small piston and turboprop aircraft. In 2012, there were 5,872 cargo airline operations performed at the Airport, including air carrier (2,766) and air taxi (3,106) operations, as shown in Table 6-5.

The forecast of all-cargo operations was developed by first estimating the share of future cargo tonnage expected to be carried by air carrier and commuter aircraft. The cargo tonnage expected to be carried by all-cargo carriers was then divided by an estimated cargo tons per departure ratio to yield total air carrier cargo operations. For example, all-cargo aircraft carried an average of 26,800 pounds per operation in 2012. The ratio of tons per operation is expected to increase gradually over the forecast period to account for expected growth in cargo related to economic activity.

Cargo airline aircraft operations at MHR are forecast to increase an average of 1.3% per year from 5,872 in 2012 to 7,930 in 2035, as shown in Table 6-5.

General Aviation Aircraft Operations Forecasts

General aviation (GA) activity includes all flight operations by aircraft other than scheduled or charter passenger aircraft and military aircraft. GA includes not only pilot training and recreational flights on small single engine or multi-engine propeller driven aircraft, but also operations on large business jet aircraft.

On a nationwide basis, the number of general aviation aircraft operations has been in slow decline due to factors such as increases in aircraft, fuel, and insurance costs, as well as increased avionic instrument requirements. The 2008-2009 economic recession and the financial credit crisis further reduced general aviation activity nationwide. For the future, the FAA expects general aviation traffic to recover slowly.

The flight operations of GA aircraft are categorized as local or itinerant operations. Local operations are flights that operate within visual range or close proximity of the airport. Itinerant operations typically include those flights that leave the airport destined for another airport and require the filing of flight plans with the local air traffic control authorities. Historically, itinerant operations have accounted for 60% to 80% of GA operations at the Airport. In 2012, a total of 29,324 itinerant GA operations were performed at the Airport, as shown in Table 6-5.

The total number of general aviation operations is forecast to increase an average of 0.4% per year from 2012 through 2035, compared with a forecast growth rate of 0.4% per year between 2012 and 2035 for the nation as a whole.*

*U.S. Department of Transportation, Federal Aviation Administration, Terminal Area Forecasts, Fiscal Years 2011-2040, www.faa.gov.

Table 3-23
AIRCRAFT OPERATIONS FORECASTS – BASELINE
Master Plan Update
Mather Airport

The forecasts presented in this table were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

	Historical			Forecast		
	2010	2011	2012	2018	2023	2035
Air carrier						
Cargo airlines	2,568	2,670	2,766	2,840	2,930	3,510
Other *(a)*	2,029	2,015	1,903	1,940	1,980	2,060
Air carrier total	4,597	4,685	4,669	4,780	4,910	5,570
Air taxi						
Cargo airlines	5,568	3,138	3,106	3,290	3,470	4,420
Other *(a)*	6,287	8,908	9,387	9,590	9,750	10,170
Air taxi total	11,855	12,046	12,493	12,880	13,220	14,590
General aviation						
Itinerant	30,766	28,994	29,324	29,950	30,470	31,780
Local	7,720	6,679	7,408	7,560	7,700	8,030
General aviation total	38,486	35,673	36,732	37,380	38,040	39,810
Military	16,642	20,717	25,874	25,870	25,870	25,870
Total Airport	71,580	73,121	79,768	80,910	82,040	85,840

	Compound average annual percent increase				
	2010-2011	2011-2012	2012-2018	2018-2023	2023-2035
Air Carrier					
Cargo airlines	4.0%	3.6%	0.4%	0.6%	1.5%
Other *(a)*	(0.7)	(5.6)	0.3	0.4	0.3
Air carrier total	1.9%	(0.3%)	0.4%	0.5%	1.1%
Air Taxi					
Cargo airlines	(43.6%)	(1.0%)	1.0%	1.1%	2.0%
Other *(a)*	41.7	5.4	0.4	0.3	0.4
Air taxi total	1.6%	3.7%	0.5%	0.5%	0.8%
General Aviation					
Itinerant	(5.8%)	1.1%	0.4%	0.3%	0.4%
Local	(13.5)	10.9	0.3	0.4	0.4
General aviation total	(7.3%)	3.0%	0.3%	0.4%	0.4%
Military	24.5%	24.9%	(0.0%)	0.0%	0.0%
Total Airport	2.2%	9.1%	0.2%	0.3%	0.4%

(a) Includes unscheduled, empty, and ferry flights

Sources: Historical: Sacramento County Airport System records. Forecast: LeighFisher, March 2013.

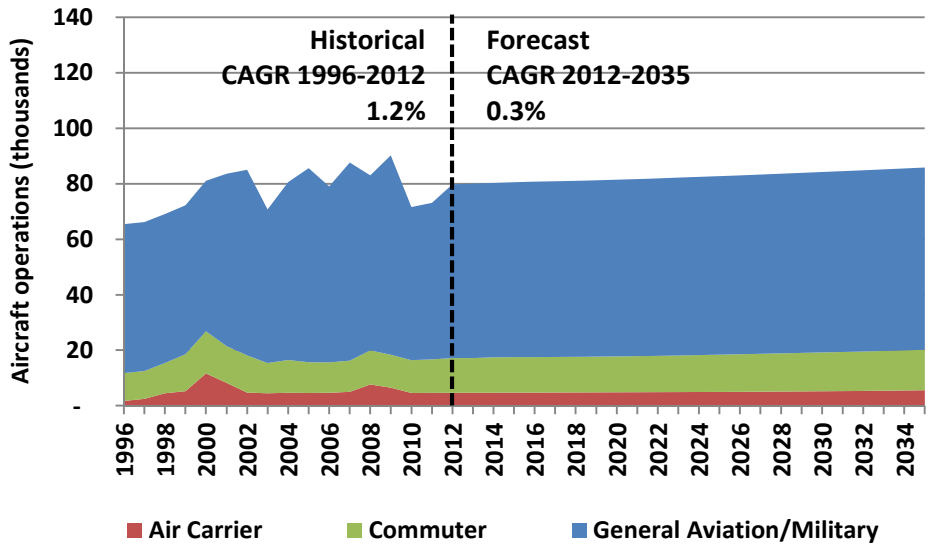
Military Aircraft Operations Forecasts

The number of military operations at the Airport averaged approximately 15,000 operations per year between 2001 and 2012. In 2012, military operations totaled 25,874, more than the 17-year average. Military operations are expected remain at a level of about 25,900 operations from 2012 through 2035, as shown in Table 6-5.

Total Aircraft Operations Forecasts

Total aircraft operations at MHR are forecast to increase from 79,768 in 2012 to 85,840 operations in 2035 an average increase of 0.3% per year, as shown in Table 6-5 and on Figure 6-7.

Figure 3-17
HISTORICAL AND FORECAST AIRCRAFT OPERATIONS
Mather Airport



Note: The forecasts presented in this figure were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

CAGR = Compound annual growth rate
Mather was officially reopened as a civilian airport on May 5, 1995.

Sources: Historical: Mather Airport records.
Forecast: LeighFisher, March 2013.

COMPARISON WITH THE FAA 2012 TAF

Table 7-1 presents a comparison of the baseline aviation demand forecasts prepared for Mather Airport and the FAA 2012 TAF (draft) for the Airport. The baseline unconstrained forecasts are the "preferred" forecasts recommended for FAA approval. The forecasts are compared for the components of commercial aircraft operations and total aircraft operations. The format of Table 7-1 is based on the template provided by the FAA for the comparison of airport planning forecasts and the FAA TAF.* As required, the results are presented for the base year of 2012 and forecast horizons years which are equal to the base year, plus 1, 5, 10 and 15 years (2013, 2017, 2022, and 2027). The MHR Master Plan Update aviation demand forecasts have been compared graphically with the FAA 2012 TAF in the figures presented throughout this report, including Figure 1-2.

The key findings of the comparison of the MHR MPU aviation demand forecasts with the FAA 2012 TAF are:

- The forecast of commercial operations for MHR varies from the FAA 2012 TAF by less than 10.0% (1.9% in 2017 and 5.0% in 2022).

- The forecast of total aircraft operations for MHR varies from the FAA 2012 TAF by less than 10.0% (0.2% in 2017 and 2022).

- Overall, the MHR MPU aviation demand forecasts are similar to the FAA 2012 TAF for the Airport and "differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period", as stipulated in the FAA forecast guidance.

Table 7-2 presents a summary of the MHR MPU aviation demand forecasts using a second template provided by the FAA.

*U.S. Department of Transportation, Federal Aviation Administration, *Forecasting Aviation Activity by Airport*, July 2001, and *Review and Approval of Aviation Forecasts*, June 2008, http://www.faa.gov.

Table 3-24
FAA TAF FORECAST COMPARISON
Master Plan Update
Mather Airport
2012-2027

	Year *(a)*	MHR MPU	FAA 2013 TAF	MHR MPU vs. 2013 TAF (percent variance)
Commercial Operations				
Base yr.	2012	17,162	17,030	0.8%
Base yr. + 5yrs.	2017	17,600	17,948	(1.9)
Base yr. + 10yrs.	2022	18,000	18,950	(5.0)
Base yr. + 15yrs.	2027	18,720	20,049	(6.6)
Total Operations				
Base yr.	2012	79,768	79,993	(0.3%)
Base yr. + 5yrs.	2017	80,860	81,030	(0.2)
Base yr. + 10yrs.	2022	81,920	82,107	(0.2)
Base yr. + 15yrs.	2027	83,300	83,281	0.0

(a) The MHR Master Plan Update was prepared on a calendar year basis and the FAA 2012 TAF was prepared on a U.S. government fiscal year basis (October through September).
(b) Commercial operations include operations by all-cargo airlines, and air taxi operators.
(c) Total operations include commercial operations plus operations by general aviation and military.

Sources: Base year 2012 (actual)--Sacramento County Airport System records.
MHR MPU Forecasts--LeighFisher, March 2013.
FAA 2012 TAF for SMF--U.S. Department of Transportation, Federal Aviation Administration.

Table 3-25

SUMMARY OF MHR MPU FORECASTS USING FAA TEMPLATE

Master Plan Update

Mather Airport

		Forecast				Average annual compound growth rates			
	Base year 2012	Base year + 1 year 2013	Base year + 5 years 2017	Base year + 10 years 2022	Base year + 15 years 2027	Base year to +1 year 2012 - 2013	Base year to +5 years 2012 - 2017	Base year to +10 years 2012 - 2022	Base year to +15 years 2012 - 2027
Aircraft operations									
Itinerant									
Air carrier	4,699	4,670	4,780	4,870	5,090	0.0%	0.5%	0.4%	0.6%
Commuter/air taxi	14,396	12,540	12,820	13,130	13,630	0.4%	0.5%	0.4%	0.6%
Total commercial operations	17,162	17,210	17,600	18,000	18,720	0.3%	0.5%	0.5%	0.6%
General aviation	28,994	29,950	29,840	30,370	30,900	0.4%	0.3%	0.4%	0.3%
Military	12,266	12,270	12,270	12,270	12,270	0.0%	0.0%	0.0%	0.0%
Local									
General aviation	7,408	7,410	7,560	7,670	7,810	0.3%	0.4%	0.3%	0.4%
Military	13,608	13,610	13,610	13,610	13,610	0.0%	0.0%	0.0%	0.0%
Total operations	78,709	80,450	80,860	81,920	83,300	0.2%	0.3%	0.3%	0.3%
Cargo/mail (enplaned + deplaned metric tons)	46,567	49,029	50,299	53,842	60,317	5.3%	1.6%	1.5%	1.7%
Based Aircraft									
Single engine (nonjet)	45	45	45	44	44	0.0%	-0.2%	-0.2%	-0.3%
Multi-engine (nonjet)	5	5	6	6	7	0.0%	2.0%	2.0%	2.0%
Jet engine	6	6	7	8	10	0.0%	3.5%	3.5%	3.5%
Helicopter	7	7	7	7	8	0.0%	0.5%	0.5%	0.5%
Other	--	--	--	--	--	--	--	--	--
Total	63	63	64	66	68	0.0%	0.4%	0.5%	0.5%
Operational factors									
GA operations per based aircraft	583	585	581	576	569	0.3%	-0.1%	-0.1%	-0.2%

Note: The SMF ADP was prepared on a calendar year basis and the FAA 2011 TAF was prepared on a U.S. government fiscal year basis (October through September).

Sources Base year 2012 (actual)--Sacramento County Airport System records. MHR MPU Forecasts--LeighFisher, March 2013.
FAA 2012 TAF for MHR--U.S. Department of Transportation, Federal Aviation Administration, www.faa.gov.

FORECASTS OF AIRCRAFT FLEET AND AVERAGE ANNUAL DAY AIRCRAFT OPERATIONS

This section summarizes the forecasts of aircraft fleet and average annual day (AAD) aircraft operations for the Airport for 2012, 2018, 2023, and 2035, including all-cargo airline, air taxi and commuter operations, general aviation, and military operations. The forecasts of AAD aircraft operations are derived from the annual forecasts of aircraft operations presented in Table 6-5. The 2012 base year distribution of AAD operations by equipment type and profile stage was developed using a combination of source data, including Airport Noise and Operations Monitoring System (ANOMS) data, cargo airline flight schedules, and the FAA's Enhanced Traffic Management System Counts (ETMSC).

AIRCRAFT FLEET FORECASTS

Table 8-1 presents the average annual day aircraft fleet mix in 2012 and forecasts for 2018, 2023, and 2035 summarized in terms of the percent of total aircraft operations at the Airport. Assumptions regarding likely changes in fleet mix over the forecast period were based on the analysis of 2012 base year data, cargo airline fleets and aircraft orders, and other reference data. .

AVERAGE ANNUAL DAY AIRCRAFT OPERATION FORECASTS

Tables 8-2, 8-3, and 8-4 present average annual day aircraft operations at Mather in 2012 (the base year) and forecasts for 2018 and 2035. The AAD aircraft operations forecasts are based on the analysis of aircraft fleets presented in Table 8-1 as well as:

- The percent of day, evening, and night* arrivals and departures by type of operation and equipment type based on detailed data for 2012
- The percent of aircraft departures by stage length in nautical miles by type of operation and equipment type based on detailed data for 2012
- It was assumed that the percent distribution by profile stage would remain relatively unchanged in 2018 and 2035

* Daytime = 7:00 a.m. to 6:59 p.m.; Evening = 7:00 p.m. to 9:59 p.m.;
Nighttime = 10:00 p.m. to 6:59 a.m.

Table 3-26

AVERAGE ANNUAL DAY AIRCRAFT FLEET MIX FORECASTS – BASELINE

Mather Airport

The forecasts presented in this table were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

Category/Aircraft type	Historical 2012	Forecast 2018	Forecast 2023	Forecast 2035
Air carrier				
Cargo airlines				
A300-600F	0.9%	1.0%	1.0%	1.3%
B-757-200	1.2%	1.1%	1.1%	1.1%
B-767-300F	1.4%	1.4%	1.5%	1.7%
	3.5%	3.5%	3.6%	4.1%
Other				
Narrowbody (B737)	2.4%	2.4%	2.4%	2.4%
Air carrier total	5.9%	5.9%	6.0%	6.5%
Air taxi				
Cargo airlines				
BE99	2.1%	2.2%	2.3%	2.8%
SH360	1.7%	1.8%	1.8%	2.2%
SW4	0.1%	0.1%	0.1%	0.1%
	3.9%	4.1%	4.2%	5.1%
Other				
Regional jet (EMB135)	5.2%	5.2%	5.2%	5.2%
Multi-engine turboprop (C402)	3.4%	3.4%	3.4%	3.4%
Business Jet multi-engine heavy (C56X)	0.4%	0.4%	0.4%	0.4%
Business Jet multi-engine light plus (H25B)	0.4%	0.4%	0.5%	0.6%
Single engine (C208)	2.3%	2.2%	2.2%	2.1%
Helicopter	0.1%	0.1%	0.1%	0.1%
	11.8%	11.8%	11.9%	11.9%
Air taxi total	15.7%	15.9%	16.1%	17.0%
General aviation				
Single engine (C172, C182, PC12)	27.8%	27.0%	26.1%	24.8%
Multi-engine turboprop (BE20, BE9L)	6.1%	6.1%	6.1%	6.1%
Business Jet multi-engine light plus (LJ45, C550)	5.6%	6.1%	6.6%	7.3%
Multi-engine piston (BE58, C414)	4.1%	4.1%	4.2%	4.2%
Business Jet multi-engine heavy (C56X)	2.0%	2.5%	3.0%	3.7%
Helicopter	0.4%	0.4%	0.4%	0.4%
General aviation total	46.0%	46.2%	46.4%	46.4%

Table 3-26 (page 2 of 2)
AVERAGE ANNUAL DAY AIRCRAFT FLEET MIX FORECASTS – BASELINE
Mather Airport

Category/Aircraft type	Historical 2012	Forecast 2018	Forecast 2023	Forecast 2035
Military				
Military trainer (T38)	14.6%	14.4%	14.2%	13.5%
Multi-engine turboprop (BE20, B350)	7.0%	6.9%	6.8%	6.5%
Helicopter (H60)	5.9%	5.8%	5.7%	5.5%
Military transport aircraft (C130, SH33)	1.1%	1.1%	1.1%	1.0%
Military fighter jet	0.8%	0.8%	0.8%	0.8%
Single engine (C182, C206)	3.0%	3.0%	2.9%	2.8%
	32.4%	32.0%	31.5%	30.1%
Total Airport	100.0%	100.0%	100.0%	100.0%

Note: Totals may not add due to rounding.

Sources: Historical: Sacramento County Airport System records. Forecast: LeighFisher, March 2013.

Table 3-8-2

AVERAGE ANNUAL DAY AIRCRAFT OPERATIONS BY TIME OF DAY, PROFILE STAGE, AND EQUIPMENT TYPE: ESTIMATED 2012

Master Plan Update

Mather Airport

	Arrivals				Departures															
					0-500 nautical miles				501-1,000 nautical miles				1,001-1,500 nautical miles				1,501-2,500 nautical miles			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
Air carrier																				
Cargo airlines																				
A300-600F	0.2	0.5	0.4	1.0	0.2	0.4	0.4	1.0	-	-	-	-	-	-	-	-	-	-	-	-
B-757-200	0.7	0.2	0.4	1.3	0.1	0.2	0.4	0.8	0.0	-	-	0.0	0.0	0.0	0.4	0.5	-	-	-	-
B-767-300F	0.7	0.0	0.8	1.5	0.0	-	0.0	0.0	-	-	-	-	0.1	0.8	0.6	1.4	-	-	-	-
Cargo airlines total	1.5	0.6	1.6	3.8	0.4	0.6	0.9	1.8	0.0	-	-	0.0	0.1	0.8	1.0	1.9	-	-	-	-
Other																				
Narrowbody (B737)	2.6	-	-	2.6	-	-	-	-	2.6	-	-	2.6	-	-	-	-	-	-	-	-
Air carrier total	4.1	0.6	1.6	6.4	0.4	0.6	0.9	1.8	2.6	-	-	2.6	0.1	0.8	1.0	1.9	-	-	-	-
Air taxi																				
Cargo airlines																				
BE99	0.2	2.0	0.1	2.3	0.7	0.2	1.4	2.3	-	-	-	-	-	-	-	-	-	-	-	-
SH360	1.5	-	0.3	1.8	1.8	0.0	0.1	1.8	-	-	-	-	-	-	-	-	-	-	-	-
SW4	0.1	-	-	0.1	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Cargo airlines total	1.9	2.0	0.4	4.3	2.6	0.2	1.4	4.3	-	-	-	-	-	-	-	-	-	-	-	-
Other																				
Regional jet (EMB135)	4.7	1.0	0.0	5.7	3.9	0.0	1.7	5.7	-	-	-	-	-	-	-	-	-	-	-	-
Multi-engine turboprop (C402)	2.7	1.0	0.0	3.7	1.3	0.1	2.1	3.4	0.2	-	-	0.2	0.0	-	-	0.0	-	-	-	0.0
Business Jet multi-engine heavy (C56X)	0.5	0.0	0.0	0.5	0.3	0.0	0.0	0.4	0.1	0.0	0.0	0.1	-	-	0.0	0.0	0.0	-	-	0.0
Business Jet multi-engine light plus (H25B)	0.4	0.0	0.0	0.4	0.3	0.0	0.0	0.3	0.1	-	0.0	0.1	-	-	-	-	-	-	-	0.0
Single engine (C208)	2.5	0.0	0.0	2.5	1.2	0.0	1.2	2.4	-	-	-	0.1	-	-	-	0.0	-	-	-	-
Helicopter	0.1	0.0	-	0.1	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Other total	10.7	2.0	0.1	12.9	7.0	0.1	5.1	12.2	0.4	0.0	0.0	0.5	0.0	-	0.0	0.0	0.0	-	-	0.0
Air taxi total	12.7	4.0	0.4	17.1	9.7	0.3	6.5	16.5	0.4	0.0	0.0	0.5	0.0	-	0.0	0.0	0.0	-	-	0.0
General aviation																				
Single engine (C172, C182, PC12)	27.2	2.4	0.8	30.4	24.8	1.3	0.8	27.0	2.9	0.1	0.4	3.4	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, BE9L)	5.6	0.6	0.4	6.7	5.0	0.1	0.4	5.5	0.8	0.0	0.2	1.0	0.1	-	-	0.1	0.0	-	-	0.0
Business Jet multi-engine light plus (LJ45, C550)	5.2	0.7	0.3	6.1	3.7	0.2	0.5	4.5	1.0	0.1	0.1	1.2	0.1	-	0.1	0.1	0.2	0.0	0.1	0.3
Multi-engine piston (BE58, C414)	3.9	0.4	0.2	4.5	2.5	0.1	0.2	2.8	1.5	-	-	1.5	0.1	-	-	0.1	-	0.1	-	0.1
Business Jet multi-engine heavy (C56X)	1.8	0.3	0.1	2.2	1.3	0.1	0.2	1.6	0.3	-	0.0	0.4	-	-	0.0	0.0	0.2	0.0	-	0.3
Helicopter	0.4	0.0	-	0.4	0.4	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
General aviation total	44.1	4.4	1.8	50.3	37.7	1.8	2.2	41.7	6.6	0.3	0.8	7.6	0.2	-	0.1	0.3	0.5	0.1	0.1	0.6
Military																				
Military trainer (T38)	15.6	0.4	-	15.9	15.1	-	-	15.1	0.8	-	-	0.8	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, B350)	6.4	0.9	0.4	7.7	5.9	0.2	0.3	6.5	0.9	0.1	-	1.0	0.2	-	-	0.2	-	-	-	-
Helicopter (H60)	4.8	1.2	0.4	6.4	6.1	0.2	0.2	6.4	-	-	-	-	-	-	-	-	-	-	-	-
Military transport aircraft (C130, SH33)	1.1	0.0	0.1	1.2	0.9	0.0	0.0	0.9	0.3	-	-	0.3	-	-	-	-	-	-	-	-
Military fighter jet	0.9	-	-	0.9	0.9	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-
Single engine (C182, C206)	2.7	0.5	0.0	3.3	2.4	0.0	0.0	2.5	-	-	-	-	0.8	-	-	0.8	-	-	-	-
Military total	**31.5**	**3.0**	**0.9**	**35.4**	**31.2**	**0.5**	**0.6**	**32.3**	**2.0**	**0.1**	**-**	**2.1**	**1.0**	**-**	**-**	**1.0**	**-**	**-**	**-**	**-**
Total Airport	**92.5**	**12.1**	**4.7**	**109.3**	**79.0**	**3.3**	**10.1**	**92.4**	**11.6**	**0.3**	**0.8**	**12.9**	**1.4**	**0.8**	**1.1**	**3.3**	**0.5**	**0.1**	**0.1**	**0.7**

Notes: Daytime = 7:00 a.m. to 6:59 p.m.; Evening = 7:00 p.m. to 9:59 p.m.; Nighttime = 10:00 p.m. to 6:59 a.m. Totals may not add due to rounding.

Sources: Historical: Sacramento County Airport System records and U.S. Department of Transportation, Federal Aviation Administration, ATADS and ETMSC online database.

Table 3-8-3

AVERAGE ANNUAL DAY AIRCRAFT OPERATIONS BY TIME OF DAY, PROFILE STAGE, AND EQUIPMENT TYPE: FORECAST 2018

Master Plan Update

Mather Airport

	Arrivals				Departures															
					0-500 nautical miles				501-1,000 nautical miles				1,001-1,500 nautical miles				1,501-2,500 nautical miles			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
Air carrier																				
Cargo airlines																				
A300-600F	0.2	0.5	0.4	1.1	0.2	0.4	0.5	1.1	-	-	-	-	-	-	-	-	-	-	-	-
B-757-200	0.7	0.2	0.4	1.2	0.1	0.2	0.4	0.7	0.0	-	-	0.0	0.0	0.0	0.4	0.5	-	-	-	-
B-767-300F	0.7	0.0	0.8	1.6	0.0	-	0.0	0.0	-	-	-	-	0.1	0.9	0.6	1.5	-	-	-	-
Cargo airlines total	1.6	0.7	1.7	3.9	0.4	0.6	0.9	1.9	0.0	-	-	0.0	0.1	0.9	1.0	2.0	-	-	-	-
Other																				
Narrowbody (B737)	2.7	-	-	2.7	-	-	-	-	2.7	-	-	2.7	-	-	-	-	-	-	-	-
Air carrier total	4.2	0.7	1.7	6.5	0.4	0.6	0.9	1.9	2.7	-	-	2.7	0.1	0.9	1.0	2.0	-	-	-	-
Air taxi																				
Cargo airlines																				
BE99	0.2	2.1	0.1	2.4	0.8	0.2	1.4	2.4	-	-	-	-	-	-	-	-	-	-	-	-
SH360	1.6	-	0.3	2.0	1.9	0.0	0.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-
SW4	0.1	-	-	0.1	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Cargo airlines total	2.0	2.1	0.4	4.5	2.8	0.2	1.5	4.5	-	-	-	-	-	-	-	-	-	-	-	-
Other																				
Regional jet (EMB135)	4.8	1.0	0.0	5.8	4.0	0.0	1.8	5.8	-	-	-	-	-	-	-	-	-	-	-	-
Multi-engine turboprop (C402)	2.7	1.0	0.0	3.7	1.3	0.1	2.1	3.5	0.2	-	-	0.2	0.0	-	-	0.0	-	-	-	0.0
Business Jet multi-engine heavy (C56X)	0.5	0.0	0.0	0.5	0.3	0.0	0.0	0.4	0.1	0.0	0.0	0.1	-	-	0.0	0.0	0.0	-	-	0.0
Business Jet multi-engine light plus (H25B)	0.5	0.0	0.0	0.5	0.3	0.0	0.0	0.4	0.1	-	0.0	0.1	-	-	-	-	-	-	-	0.0
Single engine (C208)	2.5	0.0	0.0	2.5	1.2	0.0	1.2	2.4	-	-	-	0.1	-	-	-	0.0	-	-	-	-
Helicopter	0.1	0.0	-	0.1	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Other total	11.0	2.1	0.1	13.1	7.2	0.2	5.1	12.5	0.4	0.0	0.0	0.6	0.0	-	0.0	0.0	0.0	-	-	0.0
Air taxi total	13.0	4.2	0.5	17.6	10.0	0.4	6.7	17.0	0.4	0.0	0.0	0.6	0.0	-	0.0	0.0	0.0	-	-	0.0
General aviation																				
Single engine (C172, C182, PC12)	26.8	2.4	0.8	29.9	24.4	1.3	0.8	26.5	2.9	0.1	0.4	3.4	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, BE9L)	5.7	0.6	0.4	6.8	5.0	0.1	0.4	5.6	0.8	0.0	0.2	1.1	0.1	-	-	0.1	0.0	-	-	0.0
Business Jet multi-engine light plus (LJ45, C550)	5.7	0.7	0.3	6.7	4.1	0.2	0.6	4.9	1.1	0.1	0.1	1.4	0.1	-	0.1	0.1	0.3	0.0	0.1	0.4
Multi-engine piston (BE58, C414)	4.0	0.4	0.2	4.6	2.6	0.1	0.2	2.9	1.6	-	-	1.6	0.1	-	-	0.1	-	0.1	-	0.1
Business Jet multi-engine heavy (C56X)	2.3	0.3	0.2	2.8	1.4	0.1	0.2	1.7	0.4	-	0.1	0.5	-	-	0.0	0.0	0.7	0.1	-	0.7
Helicopter	0.4	0.0	-	0.4	0.4	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
General aviation total	44.8	4.6	1.8	51.2	37.9	1.8	2.3	42.0	6.7	0.3	0.8	7.8	0.2	-	0.1	0.3	1.0	0.2	0.1	1.2
Military																				
Military trainer (T38)	15.6	0.4	-	15.9	15.1	-	-	15.1	0.8	-	-	0.8	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, B350)	6.4	0.9	0.4	7.7	5.9	0.2	0.3	6.5	0.9	0.1	-	1.0	0.2	-	-	0.2	-	-	-	-
Helicopter (H60)	4.8	1.2	0.4	6.4	6.0	0.2	0.2	6.4	-	-	-	-	-	-	-	-	-	-	-	-
Military transport aircraft (C130, SH33)	1.1	0.0	0.1	1.2	0.9	0.0	0.0	0.9	0.3	-	-	0.3	-	-	-	-	-	-	-	-
Military fighter jet	0.9	-	-	0.9	0.9	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-
Single engine (C182, C206)	2.7	0.5	0.0	3.3	2.4	0.0	0.0	2.5	-	-	-	-	0.8	-	-	0.8	-	-	-	-
Military total	**31.5**	**3.0**	**0.9**	**35.4**	**31.2**	**0.5**	**0.6**	**32.3**	**2.0**	**0.1**	**-**	**2.1**	**1.0**	**-**	**-**	**1.0**	**-**	**-**	**-**	**-**
Total Airport	**93.6**	**12.4**	**4.9**	**110.8**	**79.5**	**3.3**	**10.4**	**93.2**	**11.8**	**0.3**	**0.9**	**13.1**	**1.4**	**0.9**	**1.1**	**3.4**	**1.0**	**0.2**	**0.1**	**1.3**

Notes: Daytime = 7:00 a.m. to 6:59 p.m.; Evening = 7:00 p.m. to 9:59 p.m.; Nighttime = 10:00 p.m. to 6:59 a.m. Totals may not add due to rounding.

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Sources: Historical: Sacramento County Airport System records and U.S. Department of Transportation, Federal Aviation Administration, ATADS online database. Forecast: LeighFisher, March 2013.

Table 3-8-4

AVERAGE ANNUAL DAY AIRCRAFT OPERATIONS BY TIME OF DAY, PROFILE STAGE, AND EQUIPMENT TYPE: FORECAST 2035

Master Plan Update

Mather Airport

	Arrivals				Departures															
					0-500 nautical miles				501-1,000 nautical miles				1,001-1,500 nautical miles				1,501-2,500 nautical miles			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
Air carrier																				
Cargo airlines																				
A300-600F	0.3	0.7	0.6	1.5	0.3	0.6	0.6	1.5	-	-	-	-	-	-	-	-	-	-	-	-
B-757-200	0.7	0.2	0.4	1.3	0.1	0.2	0.4	0.8	0.0	-	-	0.0	0.0	0.0	0.5	0.5	-	-	-	-
B-767-300F	0.9	0.0	1.1	2.0	0.0	-	0.0	0.1	-	-	-	-	0.1	1.1	0.8	2.0	-	-	-	-
Cargo airlines total	1.9	0.8	2.1	4.8	0.5	0.8	1.1	2.3	0.0	-	-	0.0	0.1	1.2	1.2	2.5	-	-	-	-
Other																				
Narrowbody (B737)	2.8	-	-	2.8	-	-	-	-	2.8	-	-	2.8	-	-	-	-	-	-	-	-
Air carrier total	4.7	0.8	2.1	7.6	0.5	0.8	1.1	2.3	2.8	-	-	2.8	0.1	1.2	1.2	2.5	-	-	-	-
Air taxi																				
Cargo airlines																				
BE99	0.3	2.8	0.1	3.2	1.0	0.3	1.9	3.2	-	-	-	-	-	-	-	-	-	-	-	-
SH360	2.2	-	0.4	2.6	2.5	0.0	0.1	2.6	-	-	-	-	-	-	-	-	-	-	-	-
SW4	0.2	-	-	0.2	0.2	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-
Cargo airlines total	2.7	2.8	0.5	6.1	3.7	0.3	2.0	6.1	-	-	-	-	-	-	-	-	-	-	-	-
Other																				
Regional jet (EMB135)	5.1	1.1	0.0	6.2	4.2	0.0	1.9	6.2	-	-	-	-	-	-	-	-	-	-	-	-
Multi-engine turboprop (C402)	2.9	1.0	0.0	4.0	1.4	0.1	2.2	3.7	0.2	-	-	0.2	0.0	-	-	0.0	-	-	-	0.0
Business Jet multi-engine heavy (C56X)	0.5	0.0	0.0	0.5	0.3	0.0	0.0	0.4	0.1	0.0	0.0	0.1	-	-	0.0	0.0	0.0	-	-	0.0
Business Jet multi-engine light plus (H25B)	0.6	0.0	0.0	0.7	0.4	0.0	0.0	0.5	0.2	-	0.0	0.2	-	-	-	-	-	-	-	0.0
Single engine (C206)	2.5	0.0	0.0	2.5	1.2	0.0	1.2	2.4	-	-	-	0.1	-	-	-	0.0	-	-	-	-
Helicopter	0.1	0.0	-	0.1	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Other total	11.6	2.2	0.1	13.9	7.7	0.2	5.4	13.2	0.5	0.0	0.0	0.6	0.0	-	0.0	0.0	0.0	-	-	0.0
Air taxi total	14.3	5.0	0.6	20.0	11.4	0.4	7.4	19.3	0.5	0.0	0.0	0.6	0.0	-	0.0	0.0	0.0	-	-	0.0
General aviation																				
Single engine (C172, C182, PC12)	26.1	2.3	0.7	29.1	23.8	1.3	0.8	25.8	2.8	0.1	0.4	3.3	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, BE9L)	6.1	0.7	0.5	7.2	5.4	0.1	0.5	6.0	0.8	0.0	0.3	1.1	0.1	-	-	0.1	0.0	-	-	0.0
Business Jet multi-engine light plus (LJ45, C550)	7.2	0.9	0.4	8.5	5.2	0.3	0.8	6.2	1.4	0.1	0.2	1.7	0.1	-	0.1	0.2	0.3	0.0	0.1	0.5
Multi-engine piston (BE58, C414)	4.3	0.5	0.2	4.9	2.8	0.1	0.2	3.1	1.7	-	-	1.7	0.1	-	-	0.1	-	0.1	-	0.1
Business Jet multi-engine heavy (C56X)	3.5	0.5	0.3	4.3	2.2	0.1	0.4	2.7	0.6	-	0.1	0.7	-	-	0.0	0.0	0.8	0.1	-	0.9
Helicopter	0.4	0.0	-	0.4	0.4	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
General aviation total	47.6	5.0	2.0	54.5	39.7	1.9	2.6	44.2	7.3	0.3	0.9	8.5	0.3	-	0.1	0.4	1.2	0.2	0.1	1.5
Military																				
Military trainer (T38)	15.6	0.4	-	15.9	15.1	-	-	15.1	0.8	-	-	0.8	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, B350)	6.4	0.9	0.4	7.7	5.9	0.2	0.3	6.5	0.9	0.1	-	1.0	0.2	-	-	0.2	-	-	-	-
Helicopter (H60)	4.8	1.2	0.4	6.4	6.0	0.2	0.2	6.4	-	-	-	-	-	-	-	-	-	-	-	-
Military transport aircraft (C130, SH33)	1.1	0.0	0.1	1.2	0.9	0.0	0.0	0.9	0.3	-	-	0.3	-	-	-	-	-	-	-	-
Military fighter jet	0.9	-	-	0.9	0.9	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-
Single engine (C182, C206)	2.7	0.5	0.0	3.3	2.4	0.0	0.0	2.5	-	-	-	-	0.8	-	-	0.8	-	-	-	-
Military total	**31.5**	**3.0**	**0.9**	**35.4**	**31.2**	**0.5**	**0.6**	**32.3**	**2.0**	**0.1**	**-**	**2.1**	**1.0**	**-**	**-**	**1.0**	**-**	**-**	**-**	**-**
Total Airport	**98.1**	**13.8**	**5.6**	**117.6**	**82.8**	**3.6**	**11.6**	**98.1**	**12.6**	**0.4**	**0.9**	**14.1**	**1.4**	**1.2**	**1.4**	**4.0**	**1.2**	**0.2**	**0.1**	**1.5**

Notes: Daytime = 7:00 a.m. to 6:59 p.m.; Evening = 7:00 p.m. to 9:59 p.m.; Nighttime = 10:00 p.m. to 6:59 a.m. Totals may not add due to rounding.

DRAFT

Sources: Historical: Sacramento County Airport System records and U.S. Department of Transportation, Federal Aviation Administration, ATADS online database. Forecast: LeighFisher, March 2013.

ALTERNATIVE FORECAST SCENARIO

This appendix summarizes an alternative forecast of air cargo and total aircraft operations for Mather Airport. In addition to the baseline forecasts of aviation demand presented in Section 6, "Aviation Demand Forecasts", an alternative scenario was prepared for planning purposes to (1) recognize significant changes in the air cargo industry in the last decade and the potential for additional change, (2) consider how past and potential future changes in the cargo industry have and might affect cargo activity at Mather Airport, and (3) anticipate the facility requirements associated with higher levels of aviation activity compared with the baseline forecast.

The following sections present a discussion of the air cargo industry in 2012, a description of the alternative forecast scenario assumptions, and a summary of the forecast results for the alternative scenario.

OVERVIEW OF THE AIR CARGO INDUSTRY IN 2012

The U.S. domestic and international air freight (used interchangeably with the term air cargo) market has, for the most part, produced negative month-over-month growth rates since early 2011. With the exception of 2010, the years prior to that (2008 and 2009) have also experienced decreased activity levels (i.e., "negative growth") relative to air cargo. In addition, for the past decade U.S. domestic freight has been experiencing a transition from air transport to trucking. International air cargo, outside of the integrator* system, has experienced a long-term shift toward a handful of gateways in the United States (i.e., LAX, ORD, ATL, NYC, MIA, and DFW). International-bound air freight from the Sacramento area is trucked from the region and tendered at SFO, and in some cases LAX, for transportation on commercial airlines. Even UPS trucks its international freight (not its parcel or express product) to those gateways.

All-cargo carriers will continue to be attracted to those large air cargo gateways mentioned above. International air freight will continue to be tendered at either those large gateways, or slightly smaller airports with significant international "belly capacity" (i.e., international passenger flights that also carry international goods and materials within the cargo hold area of the aircraft), such as at SFO, EWR, and DTW. The belly carriers at SMF will continue to transport cargo, but their primary rationale for operating at SMF is based on passenger demand, not cargo.

Because of the above considerations, it is unlikely that a non-integrator will be attracted to SMF or MHR based on cargo demand alone. UPS and FedEx control the two most significant domestic air cargo networks within the Sacramento region, and the likelihood and viability of an additional major cargo carrier entering that market seems highly unlikely. Airborne Express was acquired by DHL ten years ago, and DHL itself quit the U.S. domestic market in early 2009. The Department of Airports is in the envious position of currently having significant operations of both FedEx and UPS. There is practically no other integrator in the industry that can be attracted.

Presented in this appendix are forecasts of air cargo activity for the integrated air cargo carriers serving the Sacramento Region (Region). As a regional forecast, the projections consist of activity for the integrated air carriers and affiliates ("feeders") taking place at SMF and MHR. Included in the forecast formulation are factors associated with trending practices occurring in the air cargo industry and those particular to the Region's air cargo market, associated air cargo carrier practices

*Carriers that have both air and ground fleets and other combinations, such as sea, rail, and truck. In the context of air cargo, this refers to shipping companies that utilize both aircraft and truck modes in freight transportation.

(inclusive of the integrated carriers and their affiliates) and historical SMF and MHR activity levels and trends for use in econometric forecast modeling.

Facilities accommodating the Region's integrated air cargo carrier activity are presently allocated between SMF and MHR. Foreseeable air cargo industry dynamics and market conditions specific to the Region are such that they are expected to only support two service providers (two integrated carriers and their affiliates). In consideration of this, and to respond to the policy objectives presented in the County Airport System Policy Plan and the MHR development alternatives as directed by the Board, the following scenarios are included in the aviation activity forecasts for MHR:

1. Partial Accommodation at MHR of Regional Cargo Activity – reflects a scenario whereby the Region's forecast integrated air cargo carrier activity remains split between SMF and MHR. Accordingly, provided is a lower set of activity projections for MHR, inclusive of tonnage, aircraft operations and fleet mix. The forecasts for this scenario are presented previously in the main body of this chapter.

2. Total Accommodation at MHR of Regional Cargo Activity – reflects a conservative assumption that all of the Region's forecast integrated air cargo carrier activity is accommodated at MHR (i.e., relative to the MHR Master Plan EIR impacts analysis, is considered a "worst-case" scenario whereby all regional integrated air cargo activity, including cargo flights, occurs at MHR). The forecasts for this scenario are presented in the sections that follow and also include the MHR forecasts for general aviation and military operations.

FORECAST ASSUMPTIONS

An alternative forecast scenario of cargo activity at Mather Airport was developed based on the following assumptions:

- All regional air cargo demand would be accommodated at Mather Airport, except for air cargo transported by the passenger airlines (belly cargo) at SMF.
- Regional air cargo demand includes air freight and mail handled at Mather Airport and Sacramento International Airport.
- Forecasts of regional demand are based on the existing baseline air cargo forecasts prepared for:
    - The Mather Airport Master Plan Update summarized in Section 6
    - The SMF Master Plan Update*

*Sacramento County Airport System, Master Plan Update, Sacramento International Airport, Working Paper, *Aviation Demand Forecasts*, February 2013.

- Air mail for the Sacramento Region will continue to be carried on passenger airlines and FedEx, which does not report freight and mail separately at SMF. In 2012, no air mail was handled at Mather, according to SCAS records.*

All other assumptions used in the alternative forecast scenario are unchanged from the baseline forecast.

AIR CARGO FORECASTS

Figure A-1 and Table A-1 present the alternative forecasts of air cargo at the Airport. In the alternative scenario, air cargo tonnage is forecast to increase an average of 2.0% per year between 2012 and 2035, from 108,140 tons in 2012 to 168,830 tons in 2035. If all regional air cargo were handled at Mather, an additional 94,450 tons, above the MHR baseline forecast, would need to be accommodated in 2035.

AIRCRAFT OPERATION FORECASTS

Table A-2 and Figure A-2 present the alternative scenario forecasts of aircraft operations at the Airport. In the alternative scenario, total aircraft operations are forecast to increase an average of 0.4% per year between 2012 and 2035, from 84,497 operations in 2012 to 91,970 operations in 2035. If all regional air cargo were handled at Mather, an additional 6,130 operations, above the MHR baseline forecast, would be performed in 2035.

AVERAGE ANNUAL DAY AIRCRAFT OPERATION FORECASTS

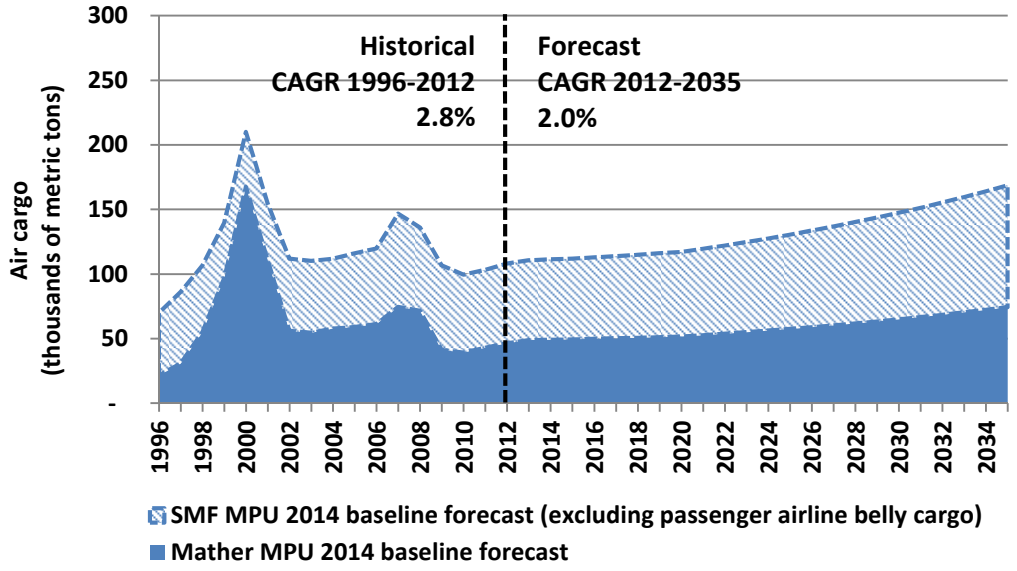
Tables A-3 and A-4 present forecasts of average annual day aircraft operations at Mather in 2018 and 2035 based on the alternative scenario annual forecasts.

*The United States Postal Service contract with FedEx expires in September 2013 and will be subject to a competitive bid process.

Figure A-1

AIR CARGO FORECASTS: ALL REGIONAL AIR CARGO DEMAND AT MATHER

Mather Airport



Note: The forecasts presented in this figure were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

CAGR = Compound annual growth rate
Includes enplaned and deplaned air cargo.
The sharp decrease in cargo in 2001 reflects the transfer of the USPS air mail contract. Mather was officially reopened as a civilian airport on May 5, 1995.

Sources: Historical: Mather Airport System records.
Forecast: LeighFisher, March 2013.

Table A-1

AIR CARGO FORECASTS: ALL REGIONAL AIR CARGO DEMAND AT MATHER

Master Plan Update

Mather Airport

The forecasts presented in this table were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

	Historical			Forecast		
	2010	2011	2012	2018	2023	2035
Air freight (in metric tons)						
Cargo integrators						
Mather	38,293	41,956	45,457	49,550	53,700	72,610
SMF	58,253	58,256	59,746	62,270	67,670	91,650
Subtotal integrators	96,546	100,212	105,203	111,820	121,370	164,260
Cargo regional feeders						
Mather	1,113	1,099	1,111	1,210	1,310	1,770
SMF	1,978	1,897	1,826	1,900	2,070	2,800
Subtotal feeders	3,091	2,996	2,937	3,110	3,380	4,570
All airlines						
Mather	39,406	43,054	46,567	50,760	55,010	74,380
SMF	60,231	60,153	61,572	64,170	69,740	94,450
Total air freight	99,637	103,208	108,140	114,930	124,750	168,830
Air freight (in metric tons)						
Enplaned	45,166	46,685	49,870	52,970	57,500	77,810
Deplaned	54,471	56,523	58,270	61,960	67,250	91,020
Air freight total	99,637	103,208	108,140	114,930	124,750	168,830
Percent of total						
Enplaned	45.3%	45.2%	46.1%	46.1%	46.1%	46.1%
Deplaned	54.7%	54.8%	53.9%	53.9%	53.9%	53.9%
All-cargo airline aircraft operations						
Cargo integrators						
Mather	2,568	2,670	2,766	2,840	2,930	3,510
SMF	1,184	1,262	1,251	1,310	1,350	1,620
	3,752	3,932	4,017	4,150	4,280	5,130
Cargo regional feeders						
Mather	5,568	3,138	3,106	3,290	3,470	4,420
SMF	3,572	3,454	3,478	3,630	3,710	4,510
	9,140	6,592	6,584	6,920	7,180	8,930
Total operations	12,892	10,524	10,601	11,070	11,460	14,060

Table A-1 *(page 2 of 2)*
AIR CARGO FORECASTS--ALL REGIONAL AIR CARGO DEMAND AT MATHER
Master Plan Update
Mather Airport

	Historical			Forecast		
	2010	2011	2012	2018	2023	2035
Air freight per operation (in metric tons)						
Cargo integrators	25.7	25.5	26.2	26.9	28.4	32.0
Cargo regional feeders	0.3	0.5	0.4	0.4	0.5	0.5
Total	7.7	9.8	10.2	10.4	10.9	12.0

	Compound average annual percent increase				
	2010-2011	2011-2012	2012-2018	2018-2023	2023-2035
Air freight					
Cargo integrators	3.8%	5.0%	1.0%	1.7%	2.6%
Cargo regional feeders	(3.1)	(2.0)	1.0	1.7	2.5
Air freight total	3.6	4.8	1.0	1.7	2.6
Enplaned	3.4%	6.8%	1.0%	1.7%	2.6%
Deplaned	3.8	3.1	1.0	1.7	2.6
All-cargo airline aircraft operations					
Cargo integrators	4.8%	2.2%	0.5%	0.6%	1.5%
Cargo regional feeders	(27.9)	(0.1)	0.8	0.7	1.8
Total	(18.4%)	0.7%	0.7%	0.7%	1.7%
Air freight per operation					
Cargo integrators	(1.0%)	2.8%	0.5%	1.0%	1.0%
Cargo regional feeders	34.4	(1.8)	0.1	0.9	0.7
Total	26.9%	4.0%	0.3%	1.0%	0.8%

Note: Excludes belly cargo at SMF.

According to SCAS records, air mail for the Sacramento Region was carried on passenger airlines and FedEx, which does not report freight and mail separately at SMF; in 2012, no air mail was handled at Mather. However, the United States Postal Service contract with FedEx expires in September 2013 and will be subject to a competitive bid process.

Sources: Historical: Sacramento County Airport System records.
Forecast: LeighFisher, March 2013.

Table A-2

AIRCRAFT OPERATIONS FORECASTS: ALL REGIONAL AIR CARGO DEMAND AT MATHER

Master Plan Update

Mather Airport

The forecasts presented in this table were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

	Historical			Forecast		
	2010	2011	2012	2018	2023	2035
Air carrier						
Cargo airlines						
Mather	2,568	2,670	2,766	2,840	2,930	3,510
SMF	1,184	1,262	1,251	1,310	1,350	1,620
Subtotal airlines	3,752	3,932	4,017	4,150	4,280	5,130
Other *(a)*	2,029	2,015	1,903	1,940	1,980	2,060
Air carrier total	5,781	5,947	5,920	6,090	6,260	7,190
Air taxi						
Cargo airlines						
Mather	5,568	3,138	3,106	3,290	3,470	4,420
SMF	3,572	3,454	3,478	3,630	3,710	4,510
Subtotal airlines	9,140	6,592	6,584	6,920	7,180	8,930
Other *(a)*	6,287	8,908	9,387	9,590	9,750	10,170
Air taxi total	15,427	15,500	15,971	16,510	16,930	19,100
General aviation						
Itinerant	30,766	28,994	29,324	29,950	30,470	31,780
Local	7,720	6,679	7,408	7,560	7,700	8,030
General aviation total	38,486	35,673	36,732	37,380	38,040	39,810
Military	16,642	20,717	25,874	25,870	25,870	25,870
Total operations						
Mather	71,580	73,121	79,768	80,910	82,040	85,840
SMF	4,756	4,716	4,729	4,940	5,060	6,130
Total operations	76,336	77,837	84,497	85,850	87,100	91,970

	Compound average annual percent increase				
	2010-2011	2011-2012	2012-2018	2018-2023	2023-2035
Air Carrier					
Cargo airlines	4.8%	2.2%	0.5%	0.6%	1.5%
Other *(a)*	(0.7%)	(5.6%)	0.3%	0.4%	0.3%
Air carrier total	2.9%	(0.5%)	0.5%	0.6%	1.2%
Air Taxi					
Cargo airlines	(27.9%)	(0.1%)	0.8%	0.7%	1.8%
Other *(a)*	41.7%	5.4%	0.4%	0.3%	0.4%
Air taxi total	0.5%	3.0%	0.6%	0.5%	1.0%
General Aviation					
Itinerant	(5.8%)	1.1%	0.4%	0.3%	0.4%
Local	(13.5%)	10.9%	0.3%	0.4%	0.4%
General aviation total	(7.3%)	3.0%	0.3%	0.4%	0.4%
Military	24.5%	24.9%	(0.0%)	0.0%	0.0%
Total Airport	2.0%	8.6%	0.3%	0.3%	0.5%

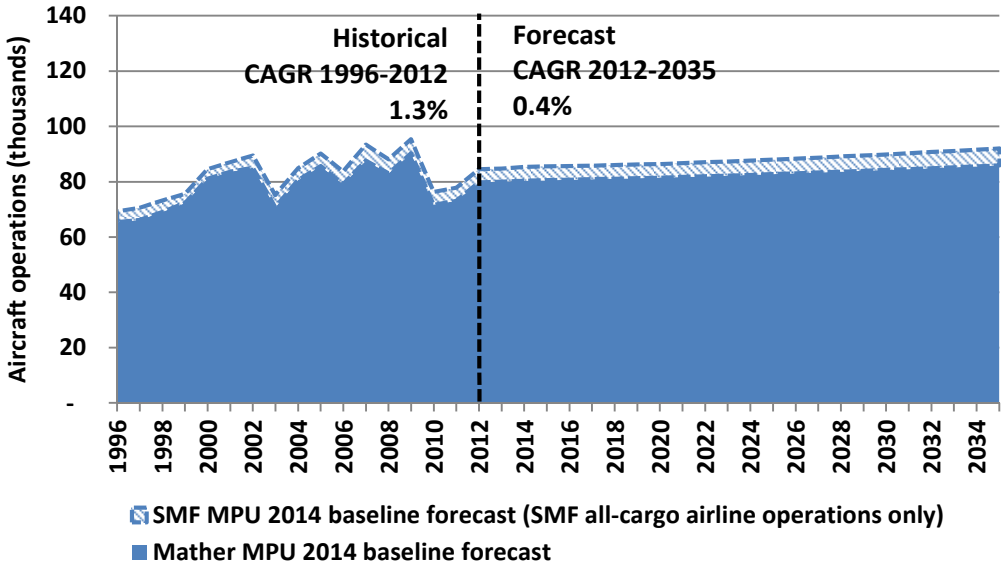
(a) Includes unscheduled, empty, and ferry flights

Sources: Historical: Sacramento County Airport System records. Forecast: LeighFisher, March 2013.

Figure A-2

AIRCRAFT OPERATIONS FORECASTS: ALL REGIONAL AIR CARGO DEMAND AT MATHER

Mather Airport



Note: The forecasts presented in this figure were prepared using the information and assumptions given in the accompanying text. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

CAGR = Compound annual growth rate
Mather was officially reopened as a civilian airport on May 5, 1995.

Sources: Historical: Mather Airport records.
Forecast: LeighFisher, March 2013.

Table 3-A-3

AVERAGE ANNUAL DAY AIRCRAFT OPERATIONS BY TIME OF DAY, PROFILE STAGE, AND EQUIPMENT TYPE: ALL REGIONAL AIR CARGO DEMAND AT MATHER IN 2018

Master Plan Update

Mather Airport

	Arrivals				Departures															
					0-500 nautical miles				501-1,000 nautical miles				1,001-1,500 nautical miles				1,501-2,500 nautical miles			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
Air carrier																				
Cargo airlines																				
A300-600F	0.2	0.5	0.4	1.1	0.2	0.5	0.5	1.1	-	-	-	-	-	-	-	-	-	-	-	-
B-757-200	0.6	0.1	0.4	1.2	0.1	0.1	0.5	0.7	0.0	-	-	0.0	0.0	0.0	0.4	0.5	-	-	-	-
B-767-300F	0.7	0.0	0.8	1.6	0.0	0.0	0.0	0.0	-	-	-	-	0.1	0.8	0.6	1.5	-	-	-	-
DC10	0.8	0.0	0.1	0.9	0.0	0.1	0.0	0.1	-	-	-	-	-	-	-	-	0.1	0.7	0.1	0.8
MD11	0.2	0.0	0.8	0.9	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	-	-	-	-	0.2	0.0	0.7	0.9
Cargo airlines total	2.6	0.7	2.5	5.7	0.3	0.7	1.0	2.0	0.0	0.0	0.0	0.0	0.1	0.9	1.0	2.0	0.3	0.7	0.7	1.7
Other																				
Narrowbody (B737)	2.7	-	-	2.7	-	-	-	-	2.7	-	-	2.7	-	-	-	-	-	-	-	-
Air carrier total	5.2	0.7	2.5	8.3	0.3	0.7	1.0	2.0	2.7	0.0	0.0	2.7	0.1	0.9	1.0	2.0	0.3	0.7	0.7	1.7
Air taxi																				
Cargo airlines																				
BE99	0.5	4.4	0.1	5.1	1.6	0.4	3.0	5.1	-	-	-	-	-	-	-	-	-	-	-	-
SH360	3.4	-	0.7	4.1	3.9	0.0	0.2	4.1	-	-	-	-	-	-	-	-	-	-	-	-
SW4	0.3	-	-	0.3	0.3	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-
Cargo airlines total	4.3	4.4	0.8	9.5	5.8	0.4	3.2	9.5	-	-	-	-	-	-	-	-	-	-	-	-
Other																				
Regional jet (EMB135)	4.8	1.0	0.0	5.8	4.0	0.0	1.8	5.8	-	-	-	-	-	-	-	-	-	-	-	-
Multi-engine turboprop (C402)	2.7	1.0	0.0	3.7	1.3	0.1	2.1	3.5	0.2	-	-	0.2	0.0	-	-	0.0	-	-	-	0.0
Business Jet multi-engine heavy (C56X)	0.5	0.0	0.0	0.5	0.3	0.0	0.0	0.4	0.1	0.0	0.0	0.1	-	-	0.0	0.0	0.0	-	-	0.0
Business Jet multi-engine light plus (H25B)	0.5	0.0	0.0	0.5	0.3	0.0	0.0	0.4	0.1	-	0.0	0.1	-	-	-	-	-	-	-	0.0
Single engine (C206)	2.5	0.0	0.0	2.5	1.2	0.0	1.2	2.4	-	-	-	0.1	-	-	-	0.0	-	-	-	-
Helicopter	0.1	0.0	-	0.1	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Other total	11.0	2.1	0.1	13.1	7.2	0.2	5.1	12.5	0.4	0.0	0.0	0.6	0.0	-	0.0	0.0	0.0	-	-	0.0
Air taxi total	15.2	6.5	0.9	22.6	13.0	0.6	8.3	22.0	0.4	0.0	0.0	0.6	0.0	-	0.0	0.0	0.0	-	-	0.0
General aviation																				
Single engine (C172, C182, PC12)	26.8	2.4	0.8	29.9	24.4	1.3	0.8	26.5	2.9	0.1	0.4	3.4	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, BE9L)	5.7	0.6	0.4	6.8	5.0	0.1	0.4	5.6	0.8	0.0	0.2	1.1	0.1	-	-	0.1	0.0	-	-	0.0
Business Jet multi-engine light plus (LJ45, C550)	5.7	0.7	0.3	6.7	4.1	0.2	0.6	4.9	1.1	0.1	0.1	1.4	0.1	-	0.1	0.1	0.3	0.0	0.1	0.4
Multi-engine piston (BE58, C414)	4.0	0.4	0.2	4.6	2.6	0.1	0.2	2.9	1.6	-	-	1.6	0.1	-	-	0.1	-	0.1	-	0.1
Business Jet multi-engine heavy (C56X)	2.3	0.3	0.2	2.8	1.4	0.1	0.2	1.7	0.4	-	0.1	0.5	-	-	0.0	0.0	0.7	0.1	-	0.7
Helicopter	0.4	0.0	-	0.4	0.4	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
General aviation total	44.8	4.6	1.8	51.2	37.9	1.8	2.3	42.0	6.7	0.3	0.8	7.8	0.2	-	0.1	0.3	1.0	0.2	0.1	1.2
Military																				
Military trainer (T38)	15.6	0.4	-	15.9	15.1	-	-	15.1	0.8	-	-	0.8	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, B350)	6.4	0.9	0.4	7.7	5.9	0.2	0.3	6.5	0.9	0.1	-	1.0	0.2	-	-	0.2	-	-	-	-
Helicopter (H60)	4.8	1.2	0.4	6.4	6.0	0.2	0.2	6.4	-	-	-	-	-	-	-	-	-	-	-	-
Military transport aircraft (C130, SH33)	1.1	0.0	0.1	1.2	0.9	0.0	0.0	0.9	0.3	-	-	0.3	-	-	-	-	-	-	-	-
Military fighter jet	0.9	-	-	0.9	0.9	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-
Single engine (C182, C206)	2.7	0.5	0.0	3.3	2.4	0.0	0.0	2.5	-	-	-	-	0.8	-	-	0.8	-	-	-	-
Military total	**31.5**	**3.0**	**0.9**	**35.4**	**31.2**	**0.5**	**0.6**	**32.3**	**2.0**	**0.1**	**-**	**2.1**	**1.0**	**-**	**-**	**1.0**	**-**	**-**	**-**	**-**
Total Airport	**96.8**	**14.7**	**6.1**	**117.6**	**82.5**	**3.6**	**12.2**	**98.3**	**11.8**	**0.3**	**0.9**	**13.2**	**1.4**	**0.9**	**1.1**	**3.4**	**1.2**	**0.9**	**0.8**	**2.9**

Notes: Daytime = 7:00 a.m. to 6:59 p.m.; Evening = 7:00 p.m. to 9:59 p.m.; Nighttime = 10:00 p.m. to 6:59 a.m. Totals may not add due to rounding.

DRAFT

Sources: Historical: Sacramento County Airport System records and U.S. Department of Transportation, Federal Aviation Administration, ATADS online database. Forecast: LeighFisher, March 2019.

Table 3-A-4

AVERAGE ANNUAL DAY AIRCRAFT OPERATIONS BY TIME OF DAY, PROFILE STAGE, AND EQUIPMENT TYPE: ALL REGIONAL AIR CARGO DEMAND AT MATHER IN 2035

Master Plan Update

Mather Airport

	Arrivals				Departures															
					0-500 nautical miles				501-1,000 nautical miles				1,001-1,500 nautical miles				1,501-2,500 nautical miles			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
Air carrier																				
Cargo airlines																				
A300-600F	0.3	0.6	0.5	1.4	0.2	0.6	0.6	1.4	-	-	-	-	-	-	-	-	-	-	-	-
B-757-200	0.7	0.2	0.5	1.3	0.1	0.1	0.5	0.8	0.0	-	-	0.0	0.0	0.0	0.5	0.5	-	-	-	-
B-767-300F	1.0	0.0	1.1	2.1	0.0	0.0	0.0	0.1	-	-	-	-	0.1	1.1	0.8	2.0	-	-	-	-
DC10	1.0	0.0	0.1	1.1	0.0	0.1	0.0	0.1	-	-	-	-	-	-	-	-	0.1	0.8	0.1	1.0
MD11	0.2	0.0	0.9	1.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-	-	-	-	0.2	0.0	0.8	1.0
Cargo airlines total	3.1	0.8	3.1	7.0	0.4	0.9	1.2	2.4	0.0	0.0	0.0	0.0	0.1	1.2	1.3	2.5	0.3	0.8	0.9	2.0
Other																				
Narrowbody (B737)	2.8	-	-	2.8	-	-	-	-	2.8	-	-	2.8	-	-	-	-	-	-	-	-
Air carrier total	5.9	0.8	3.1	9.8	0.4	0.9	1.2	2.4	2.8	0.0	0.0	2.8	0.1	1.2	1.3	2.5	0.3	0.8	0.9	2.0
Air taxi																				
Cargo airlines																				
BE99	0.7	5.7	0.2	6.5	2.1	0.6	3.9	6.5	-	-	-	-	-	-	-	-	-	-	-	-
SH360	4.4	-	0.9	5.3	5.1	0.0	0.2	5.3	-	-	-	-	-	-	-	-	-	-	-	-
SW4	0.4	-	-	0.4	0.4	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
Cargo airlines total	5.5	5.7	1.1	12.2	7.5	0.6	4.1	12.2	-	-	-	-	-	-	-	-	-	-	-	-
Other																				
Regional jet (EMB135)	5.1	1.1	0.0	6.2	4.2	0.0	1.9	6.2	-	-	-	-	-	-	-	-	-	-	-	-
Multi-engine turboprop (C402)	2.9	1.0	0.0	4.0	1.4	0.1	2.2	3.7	0.2	-	-	0.2	0.0	-	-	0.0	-	-	-	0.0
Business Jet multi-engine heavy (C56X)	0.5	0.0	0.0	0.5	0.3	0.0	0.0	0.4	0.1	0.0	0.0	0.1	-	-	0.0	0.0	0.0	-	-	0.0
Business Jet multi-engine light plus (H25B)	0.6	0.0	0.0	0.7	0.4	0.0	0.0	0.5	0.2	-	0.0	0.2	-	-	-	-	-	-	-	0.0
Single engine (C206)	2.5	0.0	0.0	2.5	1.2	0.0	1.2	2.4	-	-	-	0.1	-	-	-	0.0	-	-	-	-
Helicopter	0.1	0.0	-	0.1	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Other total	11.6	2.2	0.1	13.9	7.7	0.2	5.4	13.2	0.5	0.0	0.0	0.6	0.0	-	0.0	0.0	0.0	-	-	0.0
Air taxi total	17.1	7.9	1.1	26.2	15.2	0.7	9.5	25.4	0.5	0.0	0.0	0.6	0.0	-	0.0	0.0	0.0	-	-	0.0
General aviation																				
Single engine (C172, C182, PC12)	26.1	2.3	0.7	29.1	23.8	1.3	0.8	25.8	2.8	0.1	0.4	3.3	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, BE9L)	6.1	0.7	0.5	7.2	5.4	0.1	0.5	6.0	0.8	0.0	0.3	1.1	0.1	-	-	0.1	0.0	-	-	0.0
Business Jet multi-engine light plus (LJ45, C550)	7.2	0.9	0.4	8.5	5.2	0.3	0.8	6.2	1.4	0.1	0.2	1.7	0.1	-	0.1	0.2	0.3	0.0	0.1	0.5
Multi-engine piston (BE58, C414)	4.3	0.5	0.2	4.9	2.8	0.1	0.2	3.1	1.7	-	-	1.7	0.1	-	-	0.1	-	0.1	-	0.1
Business Jet multi-engine heavy (C56X)	3.5	0.5	0.3	4.3	2.2	0.1	0.4	2.7	0.6	-	0.1	0.7	-	-	0.0	0.0	0.8	0.1	-	0.9
Helicopter	0.4	0.0	-	0.4	0.4	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
General aviation total	47.6	5.0	2.0	54.5	39.7	1.9	2.6	44.2	7.3	0.3	0.9	8.5	0.3	-	0.1	0.4	1.2	0.2	0.1	1.5
Military																				
Military trainer (T38)	15.6	0.4	-	15.9	15.1	-	-	15.1	0.8	-	-	0.8	-	-	-	-	-	-	-	-
Multi-engine turboprop (BE20, B350)	6.4	0.9	0.4	7.7	5.9	0.2	0.3	6.5	0.9	0.1	-	1.0	0.2	-	-	0.2	-	-	-	-
Helicopter (H60)	4.8	1.2	0.4	6.4	6.0	0.2	0.2	6.4	-	-	-	-	-	-	-	-	-	-	-	-
Military transport aircraft (C130, SH33)	1.1	0.0	0.1	1.2	0.9	0.0	0.0	0.9	0.3	-	-	0.3	-	-	-	-	-	-	-	-
Military fighter jet	0.9	-	-	0.9	0.9	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-
Single engine (C182, C206)	2.7	0.5	0.0	3.3	2.4	0.0	0.0	2.5	-	-	-	-	0.8	-	-	0.8	-	-	-	-
Military total	**31.5**	**3.0**	**0.9**	**35.4**	**31.2**	**0.5**	**0.6**	**32.3**	**2.0**	**0.1**	**-**	**2.1**	**1.0**	**-**	**-**	**1.0**	**-**	**-**	**-**	**-**
Total Airport	**102.2**	**16.7**	**7.1**	**126.0**	**86.5**	**4.0**	**13.9**	**104.4**	**12.6**	**0.4**	**0.9**	**14.1**	**1.4**	**1.2**	**1.4**	**4.0**	**1.5**	**1.0**	**1.0**	**3.5**

Notes: Daytime = 7:00 a.m. to 6:59 p.m.; Evening = 7:00 p.m. to 9:59 p.m.; Nighttime = 10:00 p.m. to 6:59 a.m. Totals may not add due to rounding.

DRAFT

Sources: Historical: Sacramento County Airport System records and U.S. Department of Transportation, Federal Aviation Administration, ATADS online database. Forecast: LeighFisher, March 2012.

REGRESSION ANALYSIS

Regression analysis compares the historical relationship between a dependent variable, in this case, air freight, and an independent or "predictor" variable.* The predictor variable is eventually used to project future levels of the dependent variable. In aviation demand forecasts, the predictor variable is typically represented by an economic or demographic metric such as population, employment, or personal income. Regression analyses produce a mathematical equation that identifies the strength or reliability of the historical correlation between the dependent variable (air freight) and predictor variables. The statistical reliability of this equation is typically measured by a regression statistic known as "R-squared." An R-squared of 1.0 would represent a perfect historical correlation between the dependent and predictor variable and suggest that the measurement of this historical relationship will be a reliable predictor of future results.

The regression model defined during the forecast process to evaluate historical trends in air freight in the Sacramento Region is presented in Table B-1.

Table B-1
REGRESSION MODEL FOR AIR FREIGHT IN THE SACRAMENTO REGION

	Coefficient	t-statistic	P-value
Air freight			
Dependent variable = ln (SMF air freight)			
Independent variables			
Ln (Sacramento Region nonagricultural employment)	0.93	3.05	0.0137
Ln (West Texas Intermediate oil prices, 2011 dollars)	-0.06	-1.83	0.0999
Dummy (2007-2008)	0.22	5.85	0.0002
Constant	6.28	1.45	0.1798
Observations	13		
Adjusted R-squared	0.86		

Source: Sacramento County Airport System, Master Plan Update, Sacramento International Airport, Working Paper, *Aviation Demand Forecasts*, February 2013.

* Separate regression analyses of air mail were not prepared because of the small volume of mail relative to freight and the volatility in air mail volume historically.

This chapter presents historical and forecast aviation demand for Mather Airport. The forecasts are based on (1) a review of the forecasts of aviation activity at Mather Airport completed in August 2001, as part of the Sacramento County Airport System Policy Plan (ASPP), and (2) subsequent aviation activity.

Forecasts presented in this chapter are unconstrained, that is, based on expected economic growth and market developments, and not dependent on the assumed expansion of Airport facilities.

HISTORICAL AVIATION DEMAND

The main categories of aviation demand accommodated at Mather are air cargo (freight and mail), general aviation, and associated aircraft operations. Historical trends in these categories of activity are described below. For each category, historical data were compiled to analyze trends relevant to future activity.

Air Cargo

Historical air cargo activity was analyzed in terms of (1) elements of the cargo market, (2) cargo tonnage (freight and mail), and (3) all-cargo aircraft operations.

Elements of the Cargo Market. Many important entities are involved in air cargo transportation in Sacramento, including:

1. ***Shippers*** – Area businesses rely on transportation of goods for the conduct of their business. For shippers, the primary consideration is reliable and timely transportation. Shippers are less concerned with the specific transportation aspects that are arranged by others, and use freight forwarding agents and integrated all-cargo airlines, as described below.

2. ***Freight Forwarders*** – Freight forwarders are cargo agents that arrange for the transportation of cargo by both air and ground modes. Freight forwarders are not transportation providers themselves. In the Sacramento area, freight forwarders rely primarily on the passenger airlines for air transportation.

3. ***Integrated All-Cargo Airlines*** – Integrated all-cargo airlines (such as DHL Worldwide Express and UPS) deal directly with shippers and provide an "integrated" service from the shipper to the receiver with a combination of air and ground transportation.

4. ***Other All-Cargo Airlines*** – Other all-cargo airlines provide air transportation of cargo, but do not arrange directly with shippers.

5. ***Passenger Airlines*** – Passenger airlines use the space in the bellies of passenger aircraft to transport air cargo. Passenger airlines generally rely on freight forwarders to arrange for and consolidate the cargo shipments.

For the ASPP, surveys were distributed and individuals contacted to target the parties involved in the Sacramento area cargo market. Surveys and interviews focused on identifying current freight volumes and characteristics, future growth outlook, and issues related to serving future needs. Key information gathered from the surveys is summarized below.

- ***Shippers***. A majority of shippers surveyed stated that they play little or no role in deciding the logistics of shipping their products out of the Sacramento area. The primary concerns for these companies were time sensitivity and cost. The majority of locally generated freight is domestic, and is shipped overnight or expedited. Time sensitivity was a specific concern for high-technology manufacturers. Shippers in this category tended not to indicate specific preferences for a particular airport; as they are concerned primarily with the pickup times forwarders offered them, high-technology manufacturers allow the forwarders to choose the airport that ensures competitive time schedules and costs. Figure 3-1 shows the locations of major manufacturers in the Sacramento area that generate a large share of regional air freight. Sacramento County System Airports are estimated to handle about 50% of the locally generated air freight, with most of the remainder trucked to Bay Area airports.

- ***Freight Forwarders***. Currently, 17 primary freight forwarders are located in the Sacramento area. A majority of the forwarders are located in West Sacramento, which provides convenient access to International. Because forwarders rely primarily on the belly capacity of passenger aircraft, International is the predominant airport used by the forwarders. Only a small portion of air freight handled by freight forwarders is flown out of airports in the County System, with most trucked to San Francisco International, Los Angeles International, Oakland International, and other airports. According to the freight forwarders, the County System does not capture more of the locally generated freight because of a lack of widebody aircraft and international lift capacity.

~~Figure 3-1 – Locations of Manufacturers in the Sacramento Area~~

- ***Airlines***. All-cargo airlines serving the Sacramento area operate primarily at Mather. The airlines indicated that neither Mather nor International has a significant geographic advantage in terms of access to the entire area freight market. Advantages of operating at Mather include lack of interference from passenger airline operations. All-cargo airlines truck a portion of the area freight to airports outside the County System, particularly where they have a major West Coast operation.

Table 3-1 presents historical data on all-cargo airline market shares of cargo tonnage at Mather. In 2000, Kitty Hawk Air Cargo accounted for more than half of the cargo tonnage at Mather as a result of its air mail contract with the U.S. Postal Service (USPS). During 2001, Kitty Hawk's market share declined to 37% after this air mail contract was transferred to FedEx (which supports the USPS contract from International). The largest cargo airline other than Kitty Hawk operating at Mather in 2001 was UPS, with a 30% share of total cargo tonnage at Mather.

Table 3-1

HISTORICAL AIR CARGO MARKET SHARES
Mather Airport

	1996	2000	2001
Airborne Express	26.2%	4.2%	9.1%
Burlington Air Express *(a)*	--	5.3	--
Emery Worldwide	58.1	7.7	11.6
Kitty Hawk Air Cargo *(b)*	--	59.5	36.8
Tradewinds Airlines	--	1.7	2.5
United Parcel Service	--	21.6	30.0
Other	15.7	----	10.0
Total	100.0%	100.0%	100.0%

(a) Now BAX Global.
(b) Kitty Hawk ceased operations at Mather in August 2001. Data for 2001 represent a weighted average share of greater than 50% at the beginning of the year, and a share of 0% at the end of the year.

Source: Sacramento County Airport System records.

Cargo Tonnage. Table 3-2 presents historical air cargo data at Mather. As shown, from 1996 to 2000 there was significant growth in air cargo at Mather due to

(1) the transfer of activity from International to Mather, and (2) an increase in total regional air cargo activity. The increases in 1999 and 2000 were also related to the use of Mather as a West Coast air mail sort hub for the USPS, via a contract with Kitty Hawk.

Table 3-2

HISTORICAL AIR CARGO TONNAGE
Mather Airport

Calendar year *(a)*	Tons			Percent increase (decrease)	Percent of Sacramento County Airport System
	Freight	Mail	Total		
1996	21,568	--	21,568	--%	25%
1997	35,804	--	35,804	66.0	32
1998	55,177	--	55,177	54.1	44
1999	71,014	25,789	96,803	75.4	61
2000	67,869	99,657	167,526	73.1	73
2001	58,648	50,700	109,348	(34.7)	64

(a) Data prior to 1996 not available.

Source: Sacramento County Airport System records.

In 2001, cargo tonnage at Mather declined 34.7% compared to 2000 weight as a result of (1) national economic slowdown affecting cargo activity nationwide, (2) nationwide decline in air traffic activity following the terrorist attacks of September 11, 2001, and (3) the transition of the USPS air mail contract to FedEx in the middle of 2001.

Table 3-2 also shows Mather's share of the Airport System's cargo activity (that is, cargo tonnage at Mather divided by the total of cargo tonnage at Mather and International). In the first year of cargo operations at Mather, 1996, the Airport accommodated 25% of the Airport System cargo tonnage. This share increased to 73% in 2000, and then declined to 64% in 2001. It is expected that Mather will continue to accommodate the majority of the County Airport System cargo tonnage in the future.

Aircraft Operations. Table 3-3 presents recent historical data on all-cargo airline aircraft operations at Mather. From 1998 to 2000, the number of average daily all-cargo aircraft operations increased from 25 to 56. In 2001, the number of average

~~daily all-cargo aircraft operations declined to 40, reflecting the reduction in cargo demand described above.~~

Table 3-3

HISTORICAL ALL-CARGO AIRCRAFT OPERATIONS
Mather Airport

	Annual	Average daily
1998	9,228	25
1999	12,372	34
2000	20,524	56
2001	14,970	40

Source: Sacramento County Airport System records.

Other Aircraft Operations

Table 3-4 presents a summary of annual aircraft operations at Mather from 1998 through 2001. As shown, total aircraft operations at Mather increased from 69,080 in 1998 to 83,567 in 2001 primarily as a result of (1) an increase in air cargo operations consistent with increased cargo demand, and (2) an increase in military aircraft operations in 2001.

Table 3-4

HISTORICAL ANNUAL AIRCRAFT OPERATIONS
Mather Airport

	1998	1999	2000	2001
Air carrier cargo	4,506	5,246	11,666	7,634
Commuter cargo	4,722	7,126	8,858	7,336
Air taxi	6,200	6,200	6,291	6,557
General aviation	50,000	50,000	47,940	50,010
Military	3,652	3,650	6,316	12,030
Total	69,080	72,222	81,071	83,567
Annual average increase	-%	4.5%	12.2%	3.1%

Note: General aviation, air taxi, and military data for 1996 through 1999 were not reported; activity levels were assumed based on data for 2000.

Source: Sacramento County Airport System records.

As shown in Table 3-4, Mather has accommodated about 50,000 annual general aviation operations during the past several years. Following Mather's incorporation into the County System in 1995, a small number of general aviation operations moved to Mather from both International and Executive. Mather now accounts for about 25% of the System's general aviation aircraft operations.

Air taxi operations consist of noncommercial commuter activity that is not included in general aviation. At Mather, Intel Corporation contracts with Executive Jet Management to provide regularly scheduled charter service for its employees. Intel currently operates six departures per day.

The significant increase in military aircraft operations at Mather in 2001 was associated with the buildup of military activity in response to the terrorist attacks of September 11, 2001. This level of activity is not expected to continue in the future.

REVIEW OF AIRPORT SYSTEM POLICY PLAN FORECASTS

As described in the introduction, aviation demand forecasts prepared for the ASPP were reviewed during preparation of this Master Plan in the context of recent actual activity to determine appropriate forecasts for the Master Plan. This section summarizes the review of those forecasts.

Methodology

Air cargo activity for the ASPP was forecast based on historical trends and assumptions regarding key factors affecting future air cargo growth. Statistical analysis was conducted to evaluate the relationship between area economic growth and air cargo growth, and was used as input to the forecasts. Air cargo activity was allocated to Mather based on an assessment of airline service strategies and the trend towards increasing the use of Mather for regional cargo activity.

General aviation and other activity at Mather was forecast based on analysis of historical trends in Airport System activity and the assumed role of Mather in accommodating future regional activity.

Air Cargo Activity

Key assumptions used to prepare the ASPP cargo forecasts included:

1. Sacramento will continue to serve as a lower-cost business alternative to the San Francisco Bay Area.

2. The Sacramento economy will continue to grow at rates exceeding the national average.

3. All cargo airlines will continue to expand service in the area as a result of economic growth, access to multimodal transportation networks, and available airport capacity.

4. San Francisco International Airport will continue to be the primary source of international air service capacity for cargo operators, with limited gains in Sacramento.

For purposes of the ASPP, the following forecast range was developed to reflect uncertainty regarding future conditions affecting air cargo activity in the region and at the individual airports:

1. Base – Cargo demand generated by expected regional economic growth. In addition, an assumed reduction in air mail at Mather following the transfer of the USPS air mail contract to FedEx.

2. Low – Lower cargo demand related to slower regional economic growth, and less air mail activity remaining at Mather (in comparison to the base case).

3. High – Higher cargo demand related to faster regional economic growth and/or the increased use of Mather as a regional sort hub.

Table 3-5 presents a summary of the ASPP forecast of air cargo activity at Mather, prepared using data and information available as of June 2001. As shown, the forecast has two distinct elements: (1) in 2001, a significant reduction in cargo tonnage due to the assumed change in the air mail contract; and (2) from 2001 to 2020, long-term growth based on expected economic and air service conditions.

Table 3-5 also shows actual 2001 data in comparison to the interpolated forecast from the ASPP. As shown, actual results for 2001 are most consistent with the low forecast from the ASPP. In terms of total cargo tonnage, actual results for 2001 (110,000 tons) were 11.1% below the ASPP base forecast.

The key conclusions from our review of the ASPP forecast in relation to recent developments are:

1. The low forecast from the ASPP is most appropriate as the new "base" forecast for the Master Plan.

2. In the event that there is significant recovery in activity, the base forecast from the ASPP may be achievable, and needs to be considered in the Master Plan.

Table 3-5

REVIEW OF AIRPORT SYSTEM POLICY PLAN FORECAST—AIR CARGO
Mather Airport
(in tons, except percentages)

	2000	Forecast 2001	Forecast 2005	Forecast 2010	Forecast 2020	AAGR 2001-2020	Actual 2001 *(a)*	Forecast 2001 variance from actual
Base								
Freight	68,000	78,000	132,000	169,000	278,000	6.9%	59,000	(24.9%)
Mail	100,000	45,000	19,000	23,000	31,000	(1.9)	51,000	12.7
Total	168,000	123,000	151,000	192,000	309,000		110,000	(11.1%)
AAGR	—	(26.8%)	5.3%	4.9%	4.9%	5.0%		
Low								
Freight	68,000	75,000	113,000	135,000	190,000	5.0%	59,000	(21.9%)
Mail	100,000	35,000	17,000	21,000	28,000	(1.2)	51,000	44.9
Total	168,000	110,000	130,000	156,000	218,000		110,000	(0.6%)
AAGR	—	(34.5%)	4.3%	3.7%	3.4%	3.7%		
High								
Freight	68,000	80,000	150,000	211,000	376,000	8.5%	59,000	(26.8%)
Mail	100,000	50,000	33,000	40,000	53,000	0.3	51,000	1.4
Total	168,000	130,000	183,000	251,000	429,000		110,000	(15.9%)
AAGR	—	(22.6%)	8.9%	6.5%	5.5%	6.5%		

AAGR = Average annual growth rate

(a) Sacramento County Airport System records.

Source: Leigh Fisher Associates, August 2001.

Aircraft Operations

Key assumptions used in preparing the ASPP forecasts of aircraft operations at Mather included the following:

1. Air cargo aircraft operations were forecast based on forecast cargo tonnage, using assumptions regarding average aircraft size and tonnage per aircraft.

2. General aviation aircraft operations were forecast based on analysis of historical trends and assumptions regarding future growth in activity at System Airports in general, and at Mather in specific.

3. Air taxi and military aircraft operations represent a relatively small share of total operations at Mather. It was assumed that these operations would not increase significantly in the future.

As shown in Table 3-6, aircraft operations at Mather in 2001 were higher than the ASPP forecast. Military aircraft operations at Mather in 2001 were 85.1% higher than the ASPP forecast. This increase is attributable to the increased military activity following the terrorist attacks of September 11, 2001, and is not expected to continue in the long term. If military operations decreased to "normal" levels (i.e., year 2000), total operations in 2001 (i.e., about 77,800) would be similar to the ASPP forecast for 2001.

Table 3-6

REVIEW OF AIRPORT SYSTEM POLICY PLAN FORECAST—
TOTAL AIRCRAFT OPERATIONS
Mather Airport

		Forecast				AAGR 2001-2020	Actual 2001 (a)	Forecast 2001 variance from actual
	2000	2001	2005	2010	2020			
Base								
Air carrier	11,666	6,643	8,209	9,960	14,775		7,634	14.9%
Commuter/air taxi	15,149	15,032	17,290	19,665	25,640		13,893	(7.6)
General aviation	47,940	49,000	53,000	59,000	69,000		50,010	2.1
Military	6,316	6,500	7,300	7,300	7,300		12,030	85.1
Total	81,071	77,175	85,799	95,925	116,715		83,567	8.3%
AAGR		(4.8%)	2.7%	2.3%	2.0%	2.2%		
Low								
Air carrier	11,666	5,941	7,067	8,093	10,424		7,634	28.5%
Commuter/air taxi	15,149	14,109	15,790	17,215	20,092		13,893	(1.5)
General aviation	47,940	49,000	53,000	59,000	69,000		50,010	2.1
Military	6,316	6,500	7,300	7,300	7,300		12,030	85.1
Total	81,071	75,550	83,157	91,608	106,816		83,567	10.6%
AAGR		(6.8%)	2.4%	2.0%	1.5%	1.8%		
High								
Air carrier	11,666	7,021	9,949	13,020	20,514		7,634	8.7%
Commuter/air taxi	15,149	15,529	19,576	23,680	32,957		13,893	(10.5)
General aviation	47,940	49,000	53,000	59,000	69,000		50,010	2.1
Military	6,316	6,500	7,300	7,300	7,300		12,030	85.1
Total	81,071	78,050	89,825	103,000	129,771		83,567	7.1%
AAGR		(3.7%)	3.6%	2.8%	2.4%	2.7%		

AAGR = Average annual growth rate.

(a) Sacramento County Airport System records.

Source: Leigh Fisher Associates, August 2001.

UPDATED ANNUAL FORECASTS

Updated forecasts of annual activity at Mather were prepared on the basis of the review of the ASPP forecasts and subsequent actual activity. Table 3-7 presents a summary of the updated forecasts of air cargo and aircraft operations at Mather.

Table 3-7

FORECAST SUMMARY
Mather Airport

The forecasts presented in this table were prepared using the information and assumptions described in the accompanying text and the ASPP. Inevitably, some of the assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

	Actual		Forecast			2001-
	2000	2001	2006	2011	2021	2021
Base Range						
Air cargo (tons)						
Freight	68,000	59,000	117,000	140,000	196,000	
Mail	100,000	51,000	18,000	21,000	29,000	
Total	168,000	110,000	135,000	161,000	225,000	
Annual average increase (decrease)		(34.9%)	4.3%	3.6%	3.4%	3.7%
Aircraft operations						
Air carrier cargo	11,666	7,634	7,300	8,300	10,600	
Commuter cargo	8,858	7,238	9,600	10,900	13,600	
Air taxi	6,291	6,655	6,500	6,600	6,800	
General aviation	47,940	50,010	54,000	60,000	70,000	
Military	6,316	12,030	7,300	7,300	7,300	
Total	81,071	83,567	84,700	93,100	108,300	
Annual average increase		3.1%	0.3%	1.9%	1.5%	1.2%
High Range						
Air cargo (tons)						
Freight	68,000	59,000	139,000	178,000	292,000	
Mail	100,000	51,000	20,000	24,000	32,000	
Total	168,000	110,000	159,000	202,000	324,000	
Annual average increase (decrease)		(34.9%)	7.8%	4.9%	4.8%	5.6%
Aircraft operations						
Air carrier cargo	11,666	7,634	8,600	10,400	15,300	
Commuter cargo	8,858	7,238	11,300	13,600	19,500	
Air taxi	6,291	6,655	6,500	6,600	6,800	
General aviation	47,940	50,010	54,000	60,000	70,000	
Military	6,316	12,030	7,300	7,300	7,300	
Total	81,071	83,567	87,700	97,900	118,900	
Annual average increase		3.1%	1.0%	2.2%	2.0%	1.8%

Sources: Actual – Sacramento County Airport System records.
Forecast – Leigh Fisher Associates, May 2002.

Air Cargo and Aircraft Operations

As described in the previous section, actual activity at Mather in 2001 was most closely related to the low forecast prepared for the ASPP. It was concluded that the ASPP low forecast would be most appropriate as the new "base" forecast for the Master Plan, and that the ASPP base forecast would be most appropriate as the new "high" forecast for the Master Plan.

On the basis of the review of the ASPP forecast in relation to recent actual activity, it was concluded that the ASPP forecast of general aviation aircraft operations and other noncommercial activity was appropriate for the Master Plan.

Aircraft Fleet Mix

Table 3-8 presents the fleet mix forecast – the forecast distribution of annual aircraft operations by aircraft type. The fleet mix forecast was based on (1) research conducted for the ASPP, (2) analysis of the most recent data on actual fleet mix and airline schedules, and (3) review of airline aircraft orders.

Based Aircraft

Forecasts of based aircraft prepared for the ASPP were determined based on historical data, general industry trends, and data provided in the *FAA Terminal Area Forecast*. Since Mather's primary future role will be the accommodation of air cargo activity and other System Airports will remain dedicated to accommodating the general aviation market, it was concluded that the ASPP forecast of based aircraft was appropriate for the Master Plan. Thus, it was assumed that (1) the FAA forecast number of based aircraft at Mather will remain constant at 150 aircraft, and (2) the based aircraft fleet mix will resemble the mix of itinerant general aviation aircraft operations (see Table 3-8).

PEAK PERIOD FORECASTS

Peak period forecasts of cargo activity at Mather were derived from the annual forecasts based on recent peak period activity in relation to annual activity. Table 3-9 presents a summary of the peak period forecasts for the base case.

Table 3-8

FLEET MIX SUMMARY
Mather Airport

Aircraft type	Actual 2000	Actual 2001	Forecast 2006	Forecast 2021
Air carrier cargo				
A300	0.5%	4.2%	7.5%	3.7%
A300-600	–	–	2.5	2.7
A310	–	–	3.5	2.6
B-727-100	2.9	2.6	2.0	–
B-727-200	62.9	41.7	10.0	–
B-747	0.2	2.5	2.5	1.1
B-757	17.8	29.4	48.0	68.2
B-767	0.8	10.2	12.0	10.3
DC-10	–	1.2	4.0	11.4
DC-8	14.6	6.4	4.5	–
DC-9	0.3	1.7	2.0	–
MD-11	–	0.1	1.5	–
Total	100.0%	100.0%	100.0%	100.0%
Commuter cargo				
Heavy turboprop	18.6%	19.4%	21.7%	25.7%
Turboprop	49.6	52.3	50.0	46.0
Single engine	31.8	28.3	28.3	28.3
Total	100.0%	100.0%	100.0%	100.0%
Air taxi				
EMB-135	%	%	58.0%	60.0%
B1900	57.3	57.3	–	–
Turboprop	34.8	34.8	34.0	32.0
Multi-engine piston	7.9	7.9	8.0	8.0
Total	100.0%	100.0%	100.0%	100.0%
General aviation				
Corporate jet	20.0%	20.0%	25.0%	30.0%
Turboprop	30.0	30.0	30.0	30.0
Multi-engine piston	25.0	25.0	22.5	20.0
Single-engine	25.0	25.0	22.5	20.0
Total	100.0%	100.0%	100.0%	100.0%
Military				
C5	14.8%	14.8%	15.0%	15.0%
C10	14.8	14.8	15.0	15.0
F5	14.8	14.8	15.0	15.0
Helicopter	55.6	55.6	55.0	55.0
Total	100.0%	100.0%	100.0%	100.0%

Source: Leigh Fisher Associates, May 2002.

Table 3-9

FORECAST PEAK PERIOD AIR CARGO ACTIVITY
(Air Carrier and Commuter Cargo)
Mather Airport

	2006	2021	
	Base	Base	High
Peak month			
Cargo tonnage	13,500	22,500	32,400
- Percent of year	10.0%	10.0%	10.0%
Cargo operations	1,610	2,305	3,333
- Percent of year	9.5%	9.5%	9.5%
Peak day			
Cargo tonnage	810	1,350	1,944
- Percent of month	6.0%	6.0%	6.0%
Cargo operations	97	138	200
- Percent of month	6.0%	6.0%	6.0
Peak hour			
Cargo operations	19	28	40
- Percent of day	20%	20%	20%

Source: Leigh Fisher Associates, May 2002.

Peak Month Demand

The typical peak month for air cargo activity at Mather is December, which includes increased activity associated with holiday shipping. In 2000, the peak month for air cargo activity was December, which accounted for 9.5% of the annual total tonnage. Data for 2001 are not considered reliable for purposes of analyzing peak month activity because of the significant decrease in air cargo activity after September 11, 2001.

For purposes of this Master Plan, it was assumed that the peak month would represent about 10% of annual tonnage in future years (an average month would represent 8.3% of annual tonnage). As shown in Table 3-9, this assumption results in a base case forecast of 13,500 tons of air cargo in the peak month of 2006, and 22,500 tons of air cargo in the peak month of 2021.

The forecast of peak month air cargo aircraft operations was based on the assumed ratio of cargo tonnage per aircraft operation. It was assumed that the peak month ratio would be slightly higher than the annual ratio, based on historical data and the expectation that cargo loads are somewhat higher during the busiest period of the year. As shown in Table 3-9, this assumption results in a base case forecast of 1,610 air cargo aircraft operations in the peak month of 2006, and 2,305 air cargo aircraft operations in the peak month of 2021.

Table 3-9 also shows peak month activity in 2021 for the high case, based on the high case annual forecast presented earlier.

Peak Day Demand

Sacramento County does not collect or report data on daily cargo tonnage at Mather. However, the FAA compiles data on daily aircraft operations at Mather, from which it is possible to determine peak day cargo aircraft operations. Typically, the busiest days for cargo aircraft operations at Mather are midweek (Tuesday, Wednesday, and Thursday). From analysis of recent FAA data on daily aircraft operations, it was assumed that the peak day of the peak month would represent about 6% of the total monthly air cargo aircraft operations (an average day would represent about 3% of monthly aircraft operations). As shown in Table 3-9, this assumption results in a base case forecast of 97 peak day cargo aircraft operations in 2006, and 138 peak day cargo aircraft operations in 2021. The peak day forecast of cargo tonnage shown in Table 3-9 was derived using the assumed ratio of cargo tonnage per operation.

Peak Hour Demand

Assumptions regarding peak hour demand were developed from analysis of flight schedule data for the cargo airlines serving Mather. Currently, there is a morning departure peak (occurring at about 6 a.m.) and an evening arrival peak (occurring at about 6 p.m.). Peak hour forecasts shown in Table 3-9 were prepared based on the assumed peak hour percent of total daily activity.

ROADWAY TRAFFIC FORECASTS

In June 2002, entrance and exit traffic volumes were collected at the three primary Airport access points (Mather Field Road, Macready Avenue, and Douglas Road). Based on annual forecasts of air cargo tonnage and non-air cargo aircraft operations, separate estimates of future Airport entrance and exit volumes were developed for both cargo and non-cargo roadway traffic. It was assumed that the proportion of vehicle types entering the Airport is similar to those exiting and the proportion of trucks will increase from 3% currently to 6% in 2021 as a result of increased cargo activity. These roadway traffic forecasts are summarized in Table 3-10. Roadway traffic volumes are expected to increase 4% by 2006 and approximately 30% for both

the morning and evening peak hours and 35% daily by 2021. Currently, 57% of total vehicles and 46% of all trucks enter and exit the Airport at Mather Field Road while 21% and 22% of the total vehicles use Macready Avenue and Douglas Road, respectively. Current traffic volumes include a small portion of traffic without an origin or destination at Mather; however, the forecasts are based solely on Aircraft operations and do not account for an increase in trips related to future development or new roadway improvements.

Table 3-10

ROADWAY TRAFFIC FORECAST
Mather Airport

	Morning peak hour traffic volumes *(a)*					
	Existing		2006		2021	
	Entering	Exiting	Entering	Exiting	Entering	Exiting
Private vehicles	1,190	540	1,190	540	1,520	700
Trucks *(b)*						
Single unit	20	10	20	10	30	10
Trailer	10	10	10	10	20	10
Total	1,220	560	1,220	560	1,570	720

	Evening peak hour traffic volumes *(c)*					
	Existing		2006		2021	
	Entering	Exiting	Entering	Exiting	Entering	Exiting
Private vehicles	850	1,200	850	1,200	1,080	1,510
Trucks *(b)*						
Single unit	20	20	20	20	50	60
Trailer	10	10	10	10	20	30
Total	880	1,230	880	1,230	1,150	1,600

	Daily traffic volumes					
	Existing		2006		2021	
	Entering	Exiting	Entering	Exiting	Entering	Exiting
Private vehicles	10,680	10,340	10,720	10,380	13,920	13,480
Trucks *(b)*						
Single unit	220	210	220	210	590	570
Trailer	110	110	110	110	300	290
Total	11,010	10,660	11,050	10,700	14,810	14,340

~~*(a)* The morning peak hour occurs from 7:45 a.m. to 8:45 a.m.~~

~~*(b)* Trucks are defined as vehicles with three or more axles or two-axle vehicles with six or more wheels. Trucks are subdivided into single-unit vehicles and cabs pulling attached trailers.~~

~~*(c)* The evening peak hour occurs from 4:30 p.m. to 5:30 p.m.~~

~~Source: Leigh Fisher Associates, January 2003, based on information provided by DKS Associates, including surveys conducted in June 2002.~~

Chapter 4*

AIRPORT REQUIREMENTS

This chapter presents estimates of facility requirements for Mather to accommodate the forecast aviation demand presented in Chapter 3. Airport requirements were derived from an assessment of existing conditions and demand/capacity evaluations for major Airport components, including runways and taxiways, navigational aids, air cargo facilities, general aviation facilities, support facilities and ground access.

2013 UPDATE: The airport requirements chapter has been updated to reflect the revised forecast presented in Chapter 3.

PLANNING ACTIVITY LEVELS

Recognizing uncertainties associated with long-range aviation demand forecasts, two planning activity levels (PALs) were identified to represent future levels of activity at which key airside and landside improvements would be triggered. For this Master Plan, near-term PAL 1 corresponds to ~~2006~~ ***2018*** Base ~~Range~~ ***Case*** activity, and long-term PAL 2 corresponds to ~~2021~~ ***2035*** ~~High Range~~ ***Base Case*** activity ***forecast*** (~~see Table 3-7~~).

AIRFIELD REQUIREMENTS

The following summarizes requirements for runways and taxiways.

Runway Capacity

Runway capacity is defined as the maximum number of aircraft operations that can take place on a runway system in an hour given weather conditions, fleet mix, and air traffic control procedures. The FAA's Runway Capacity Model was used to estimate runway capacity and aircraft delay at Mather. This model, originally developed by Leigh Fisher Associates for the FAA, is an industry standard that has been used for similar analyses over the past 20 years. The model uses input parameters to determine the minimum allowable time separations (or intervals) between aircraft operations on a runway system. Time intervals are computed for different combinations of aircraft types (e.g., a heavy jet followed by a multi-engine turboprop) and operations (arrivals and departures) considering air traffic control rules, weather conditions, runway occupancy times, runway use configurations, aircraft

*Prepared Fall 2002, ***and updated May 2013***.

operating characteristics, and wake turbulence effects. The time intervals are averaged and used to estimate hourly runway capacity.

The FAA's Runway Capacity Model was used to estimate Mather's runway capacity at 96 operations per hour in VFR conditions, and 54 operations per hour in IFR conditions (see Table 2-1 for definitions).

Runway capacity can also be expressed in terms of annual service volume (ASV) using the methodologies outlined in FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*. ASV provides a reasonable estimate of annual capacity that accounts for differences in runway use, aircraft mix, and weather conditions that would be encountered during the year. Mather's ASV was calculated to be approximately 300,000 aircraft operations. Detailed description of the assumptions and analyses used to calculate Mather's runway capacity and ASV are provided in Appendix C.

Annual operations at Mather are forecast to increase from ~~83,567 in 2001,~~ ***79,768 in 2012*** to ~~84,700~~ ***80,910*** in PAL 1 and ~~118,900~~ ***85,840*** in PAL 2. Thus, Mather has sufficient airfield capacity to accommodate forecast air cargo, air taxi, general aviation, and military operations, as well as flight training activity throughout the planning period.

Taxiways

Mather's current taxiway system, including a full-length parallel taxiway north of Runway 4L-22R, provides access to all runway ends. ~~No additional parallel taxiways are necessary in the planning period.~~ ***Replacing Taxiway D with a new cross-field taxiway will increase operating efficiency and replace aging pavement.***

While additional runway capacity is not required, properly located high-speed exit taxiways would provide increased operating efficiency, especially for all-cargo aircraft arrivals.

2013 UPDATE: Given Mather has more than enough airfield capacity to accommodate the forecast activity, some taxiways have the potential to be downsized and possibly closed. Taxiway E1 may no longer be necessary for large aircraft and Taxiway D should be replaced by a new cross-field taxiway.

~~Backup~~ Runway *4L-22R*

Given its current length of 6,040 feet, Runway 4L-22R is too short for efficient use by air carrier aircraft. Therefore, closure of ~~primary~~ Runway 4R-22L for any reason, such as routine maintenance, major reconstruction/rehabilitation, or aircraft accident/ incident, requires air cargo users to temporarily operate ***at reduced aircraft operating***

weights or ranges or to divert to ~~from~~ Sacramento International Airport ***(SMF)***. ***While any service delay or degradation is significant to aircraft operators,*** ~~This~~ temporary relocation ***to SMF is of significant of concern to operators***. ***Each instance*** requires the transfer of employees and equipment, increased operating and labor costs, decreased levels of service because of disrupted schedules, and customer refunds if delivery times are not met.

Construction of a ~~backup~~ runway ***extension*** or new runway would (1) ***provide redundancy and*** allow Sacramento County to ***better*** market Mather ~~as a regional air cargo hub~~, and (2) enable Mather to be competitive with airports outside of the Sacramento area, such as those in Oakland, Stockton, Fresno, and Reno.

For purposes of this Master Plan, a ~~backup~~ runway ***extension or an additional runway*** is defined as a runway with the following characteristics: (1) strength and width to accommodate aircraft in the existing and future fleet mix; (2) sufficient length to accommodate air cargo aircraft departures at reasonable yield maximum takeoff weight (MTOW)*; and (3) physical location and flight patterns that foster the separation of general aviation and air carrier aircraft.

The redundancy provided with the extension of Runway 22R-4L or construction of a new runway will allow the consistency of operations during any sort of closure of Runway 22L-4R. The distance separating the two runways does not allow for simultaneous operations under Instrument Flight Rules (IFR), meaning both runways could not be used at the same time, under these conditions. There are no such restrictions for Visual Flight Rules (VFR), though wake vortex considerations would limit simultaneous operations involving at least one air carrier aircraft in VFR conditions). The runway extension will provide enhanced services for existing tenants and allow Mather to compete with other airports in Northern California and Nevada.

Runway Length

The assumptions and methodology used to calculate runway length are provided in Appendix D. The length of ~~primary~~ Runway 4R-22L (~~11,300~~ 11,301 feet) is sufficient for the existing and future fleet mix. The runway can accommodate large jet aircraft up to Group D (e.g., MD-11, B-747, and Lockheed C-5) without takeoff weight restrictions. Thus, there is no need to extend ~~primary~~ Runway 4R-22L in the foreseeable future.

Based on the projected fleet mix, input provided by Mather's air cargo operators, and geographic characteristics, the appropriate length for ~~a backup~~ runway ***22R-4L***

*A target of 95% MTOW is based on input provided by Mather's air cargo operators.

at Mather was determined to be between 7,000 feet and 9,000 feet. The recommended runway length is provided in Chapter 5, Airfield Alternatives.

NAVIGATIONAL AID REQUIREMENTS

The following identifies navigational aids and lighting requirements for ~~primary~~ Runway 4R-22L and ~~a~~ ***another*** potential upgraded ~~backup~~ runway. Detailed weather data, including monthly and hourly percent occurrence of VFR conditions and IFR conditions are presented in Appendix A.

~~Primary~~ Runway 4R-22L

As discussed in Chapter 2, Runway 22L currently has a Category I ILS, which allows approaches down to a decision height (DH)** not lower than 200 feet and visibility not less than ~~2,400 feet~~ ***½ mile***. The ~~anticipated~~ installation of a ***three-station*** runway visual range (RVR) reporting system and distance measuring equipment ~~in 2004~~ may provide ~~full~~ ***augmented*** Category I visibility minimums of 1,800 feet RVR*** ***(verses 2,400 feet)***, pending FAA approval.

As presented in Appendix A, at Mather VFR weather conditions (ceiling at least 1,000 feet and visibility at least 3 miles) occur 92.4% of the year; and IFR conditions occur 7.6%, but are unevenly distributed throughout the year. IFR conditions average 0.1% during summer months (June through August), and 25% during winter months (December through February), and are particularly high during December and January.

Of the total annual IFR conditions, 5.4% are Category I and 2.2% are Below-Category I (i.e., Categories II and III combined)—meaning aircraft landings are not permitted at Mather due to the Airport's current operating weather minimums. Considering that Below-Category I conditions are particularly high during the peak month for air cargo operations (December), the inability to land aircraft at Mather causes significant disruptions to efficient air cargo operations. Moreover, based on an analysis of the hourly occurrence of Below-Category I and Category III***b*** conditions during winter months, the highest occurrence of Below-Category I weather conditions coincides with the morning air cargo arrival period between 3:00 a.m. and 9:00 a.m. (see Figures A-1 and A-2 in Appendix A).

To reduce the frequency of diverted flights during inclement weather and better accommodate Airport users during peak periods, ~~Sacramento County plans to~~

**DH is the lowest height above the runway end at which a pilot must decide whether to continue the approach or execute a missed approach.

***RVR is an instrumentally derived value, measured by a transmissometer, which represents the horizontal distance a pilot can see down the runway from its approach end.

~~upgrade the~~ Runway 22L ILS ~~to~~ ***requires*** Category III capabilities ~~between 2005 and 2006~~. ***Typically, flights unable to land at Mather due to below CAT I ILS weather minimums maybe operated in a holding pattern along the MHR ILS course until conditions improve or be diverted to Sacramento International Airport (SMF), which has CAT III capabilities. Costs associated with these diversions have been reported by the operator to runs approximately $50,000 to $300,000 per flight, which occurs about 6 times a year. SMF does not currently have the capacity to accommodate the equivalent additional level of air cargo activity with existing facilities on a full time basis. There would be substantial capital investment and environmental impacts associated with the construction of the facilities required to provide an equivalent level of service at SMF.***

Table 4-1 shows the additional runway coverage provided a Category III ILS based on analysis of a 10-year period of weather data at Mather beginning January 1, 1983, and ending December 31, 1992.* It should be noted that the runway coverages presented in Table 4-1 were developed assuming that Mather could operate on west flow (Runway 22L) during the entire time IFR conditions occur at the Airport. Table 4-1 shows that the installation of a Category III system will provide about 2.2% additional weather coverage annually.

2013 UPDATE: The Category IIIb upgrade project was not originally included in the original master plan; it was considered a standalone project with independent utility. For clarity and transparency, it was evaluated as part of the associated environmental review and is now presented as a master plan project.

~~Backup~~ Runway *4L-22R*

Given the annual occurrence of VFR conditions at Mather (92.4%), the potential for ~~primary~~ Runway 4R-22L to be inoperable during adverse weather conditions is not likely. ***However, other factors also play into potential lengthy closures of Runway 4R-22L these include: construction, maintenance, or an aircraft incident.*** Weather analyses included in Appendix A indicate that it is not necessary to equip a ~~backup~~ runway ***4L-22R*** at Mather with precision instrument approach capabilities, such as a Category I ILS. However, facilities that allow operations during all weather conditions are necessary for Sacramento County to market Mather ~~as a regional air cargo hub~~ and enable Mather to be competitive with airports outside the Sacramento area. Therefore, the potential for a nonprecision approach to ~~Mather's backup~~ runway ***4L-22R*** is discussed in later chapters.

*This period represents the 10 ~~most recent~~ consecutive years for which data are available, as limited data exist after 1992 due to Mather's transition from military to civilian use.

Table 4-1

WEATHER COVERAGE PROVIDED BY CATEGORY III INSTRUMENT LANDING SYSTEM ON RUNWAY 22L
Mather Airport

Category	Minimums: Cloud ceiling/DH (feet)	Minimums: Visibility/RVR	Coverage
Existing Category I ILS			
VFR	1,000	3 miles	92.4%
CAT I	200	2,400 feet	5.4
Total coverage with CAT I			97.8%
Proposed Category III ILS			
VFR	1,000	3 miles	92.4%
CAT I *(a)*	200	1,800 feet	5.5
CAT II	100	1,200 feet	0.9
CAT III	0	0 feet	1.2
Total coverage with CAT III			100.0%
Additional coverage with CAT III			2.2%

DH = Decision height
RVR = Runway visual range

(a) Assuming full CAT I minimums.

Source: Leigh Fisher Associates, May 2002.

AIR CARGO FACILITY REQUIREMENTS

Unlike passengers, air cargo is indifferent to which airport is used, how many stops a journey incorporates, or the type of equipment used—as long as delivery deadlines are met. In addition, there are a variety of ways in which cargo can be processed at an airport, especially considering expedited freight handled by integrated carriers. Such factors significantly influence the amount and type of cargo-related facilities required to accommodate demand.

For example, UPS has a corporate strategy to minimize the space leased at most nonhub airports. Therefore, UPS transfers expedited freight containers through relatively small airport facilities to larger, off-airport facilities where cargo is sorted for delivery. While this strategy minimizes on-airport space requirements, large aircraft parking and ground support equipment (GSE) maneuvering areas are essential to effective operations. Some carriers decide whether to sort on- or off-

airport on a case-by-case basis. ~~Both of these carriers~~ ***Carriers*** use sophisticated planning software to determine the most effective location within city boundaries from which to serve the largest proportion of shipping customers. Often the carrier chooses to occupy an off-airport sort facility (at lower facility costs), closer to the center of customer activity, and truck the cargo containers directly from the aircraft.

The following presents a qualitative assessment of existing air cargo-related facilities at Mather and summarizes future cargo facility requirements.

2013 UPDATE: Under current economic conditions and fuel costs, air cargo operators, as well as commercial service airlines, are extremely aware of fuel consumption, unnecessary delays and cost impacts. Costs associated with delay and diversions are a major considerations for air cargo operators.

Assessment of Existing Air Cargo-Related Facilities

Mather currently includes ~~89,400~~ ***71,800*** square feet of building space to accommodate air cargo and 55 acres of apron designated for air cargo aircraft parking. Historically, during a peak day, ~~about~~ ***up to*** 15 cargo aircraft, including feeder aircraft, are accommodated on the apron. However, significant apron areas remain unused.

Mather's existing air cargo facilities were assessed based on observations during peak periods and interviews with air cargo tenants. This assessment is summarized in the following paragraphs and illustrated on Figure 4-1:

- **Single ingress/egress point.** All cargo vehicles enter/exit the Airport property via Mather Boulevard/Neely Way, creating bottlenecks during peak periods.

- **Insufficient Airport roadway capacity.** The effectiveness and efficiency of air cargo operations are constrained by on-Airport roadway widths and turning radii. In addition, the roadway has insufficient capacity to accommodate the number of trucks and package vans operating in air cargo areas during peak periods. ***These inefficiencies create congestion for not only the vehicle associated with air cargo operations but that of other users of the airport.***

- **Complicated roadway network.** Numerous turns and lack of signage make access to air cargo facilities confusing for carrier drivers and customers.

- **Inadequate truck parking and staging areas.** Truck parking and staging near apron access gates interfere with vehicles entering/exiting the Air Cargo Apron.

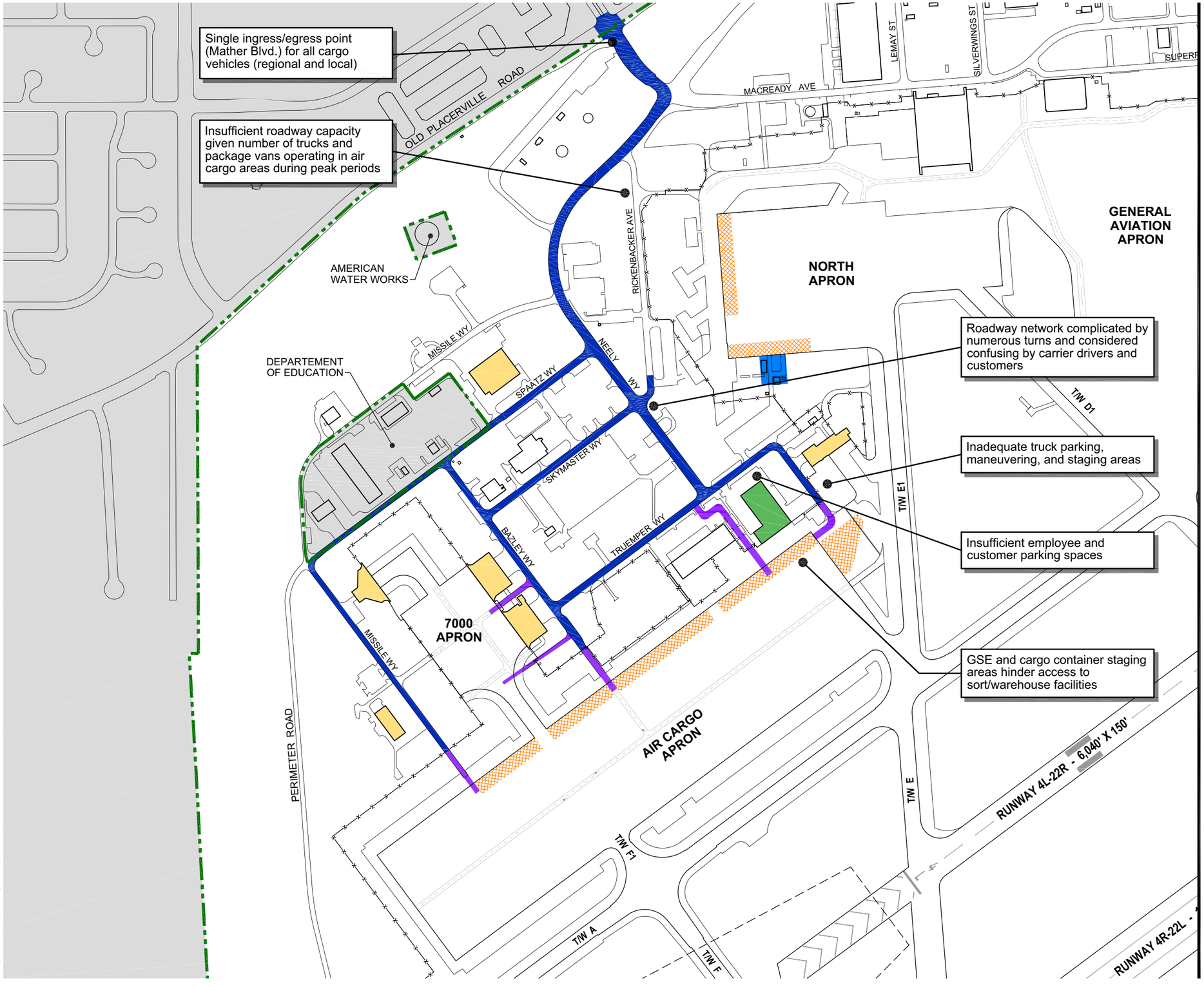
- ~~**Insufficient employee parking areas.** Current air cargo tenant leaseholds do not provide sufficient employee parking spaces.~~

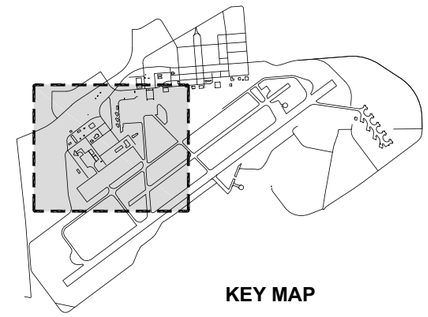
- **Inadequate GSE and cargo container staging areas.** GSE and cargo container staging areas hinder access to sort/warehouse facilities.

Freight Warehouse Space Requirements

Freight warehouse space requirements vary significantly among air cargo operators. ~~Integrated~~ ***First, integrated*** carriers use warehouse facilities to sort packages and transfer/load trucks to deliver time-sensitive packages, while heavy-freight carriers use warehouse space for pallet building/breakdown and freight storage. Second, the freight processing rate for integrated carriers is much higher than for heavy-freight carriers. Thus, an integrated carrier's warehouse facility is normally empty, while a heavy freight carrier's warehouse will tend to be congested. Third, the need for additional space or facility expansion also varies by operator. Integrated carriers can accommodate increases in cargo volumes ***without*** additional facility space through additional personnel, conveyor belts, pickup/delivery vehicles, and staging areas. On the other hand, heavy-freight operators require incremental increases in warehouse space to accommodate increases in volume.

As a result, warehouse facility requirements and use (typically expressed in terms of pounds or tons of cargo per square foot of warehouse space) vary significantly by airport. Table 4-2 provides industry benchmark data regarding airport cargo facility use ratios. Airports with a higher concentration of integrated carrier activity (e.g., Ontario, Oakland) have much greater use ratios. Airports that accommodate larger volumes of heavy freight (e.g., New York-Kennedy, Houston-Bush, and Hartsfield Atlanta) experience more "dwell time" and therefore have lower ratios of tons to square feet of cargo warehouse space.





KEY MAP

LEGEND

- Buildings/Hangars to be Removed
- DHL
- United Parcel Service (UPS)
- Airport Boundary
- Primary Access to Air Cargo Facilities
- Apron Access
- Staging Area

GSE = Ground Support Equipment

N

0 250' 500'

GRAPHIC SCALE IN FEET

SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 4-1

ASSESSMENT OF AIR CARGO FACILITIES

Mather Airport Master Plan
May 2013

File: Fig 4-1 - Assess-Cargo-Fac.dwg (Tab: Figure 4-1)

Table 4-2

COMPARISON OF SELECTED AIR CARGO FACILITIES

Airport	2001 freight (metric tons)	***2011 freight (metric tons)***	Cargo facilities (million sq ft)		Cargo building use (tons/sq ft)	Total airport area (acres)
			Warehouse	Ramp	2001 ~ ***2011***	
Ontario	462,000	***363,459***	0.3	0.3	1.54 ~ 1.21	1,700
Hartsfield Atlanta	739,927	***626,921***	2.0	1.5	0.37 ~ ***0.31***	3,750
Oakland	593,634	***489,826***	0.4	1.6	1.48 ~ ***1.22***	2,500
Fort Lauderdale-Hollywood	181,907	***96,187***	0.2	1.0	0.91 ~ ***0.48***	1,360
Houston-Bush	337,842	***410,662***	0.6	0.6	0.56 ~ ***0.68***	7,660
New York–Kennedy	1,774,402	***1,387,330***	4.1	n.a.	0.43 ~ ***0.34***	4,930
Orlando	223,545	***182,327***	1.1	0.7	0.20 ~ ***0.17***	14,500
Washington Dulles	330,914	***291,151***	0.4	1.0	0.83 ~ ***0.73***	11,000
Mather	**109,350**	***40,976***	**0.1**	**1.7**	**1.53 ~ 0.41**	**2,875**

Sources: 2001 freight data—*ACI Worldwide Airport Traffic Report and* official airport web sites.
2011 freight data—ACI Worldwide Airport Traffic Report and official airport web sites.
Cargo facilities—*Air Cargo World*, 2011 *World Airports Directory*; and official airport web sites. .
Total airport areas—Compiled by Leigh Fisher Associates based on airport layout and official airport web sites.

For planning purposes, the generally accepted cargo facility use ratio is between 0.85 to 1.0 ton per square foot of warehouse space. ~~When applying this ratio to Mather, the Airport appears to be underdeveloped in terms of warehouse space, indicating that 10,000 square feet of additional space are required.~~ In fact, although ~~89,400~~ ***71,800*** square feet of cargo facility space are available at Mather, in 2001, the Airport accommodated 109,350 tons of cargo using only 71,300 square feet of space. ***In 2011, 40,976 tons of cargo was processed at the facility***. Thus, the standard industry ratio is not completely applicable to Mather because (1) integrated carriers accommodate a disproportionate amount of the total cargo activity at Mather, and (2) UPS, which accommodated approximately 50% of the total cargo volume in 2001 at Mather, transfers freight via truck to an off-Airport sort facility. Furthermore, since

integrated carriers can accommodate increases in cargo volumes without additional facility space, future freight warehouse space requirements were developed relying on both industry accepted planning ratios and direct input provided by air cargo carriers.

The following information and key assumptions were used to develop freight warehouse space requirements:

- ~~Airborne Express* expressed the need to expand its facilities. The timing will be based on market demand, but approximately 10,000 to 15,000 square feet were assumed to be needed in PAL 1.~~

- UPS will continue to transfer cargo containers directly from aircraft to off-Airport sort facilities. ~~For this reason, UPS' need for facility development/ expansion is not significant.~~ However, additional aircraft parking and GSE space is required.

- Additional facilities for future cargo tenants will be tied to market trends (heavy-freight market, USPS mail service contracts, etc.) ***demand*** and local and regional contracts.

Future freight warehouse space requirements are presented in Table 4-3. As presented, approximately ~~85,000~~ ***40,600*** square feet of warehouse space will be required in PAL 1, and between ~~135,000~~ ***59,500*** square feet and ~~150,000~~ ***74,400*** square feet will be required in PAL 2.

Aircraft Hardstands

The future need for aircraft parking positions was estimated for peak-period activity ~~(see Table 3-9)~~, as provided in Table 4-3. The estimates were based on a review of historical data and trends, interviews with cargo carrier planning managers, and experience at similar-size airports. Most carriers anticipate the continuation of a growing trend to use feeder aircraft to serve outlying markets.

*Acquired by DHL Worldwide Express in 2003.

Table 4-3

AIR CARGO FACILITY REQUIREMENTS
Mather Airport

	2001		Requirements PAL 1	Requirements PAL 2
Forecast Air Cargo (tons in thousands)				
Freight	59		117	292
Mail	51		18	32
Total	110		135	324
Annual average growth			4.3%	5.6%
Air Cargo Facilities				
Freight warehouse space (square feet)	89,400		85,000	135,000 – 150,000
Jet aircraft parking (spaces)	20		18-20	22-25
Feeder aircraft parking (spaces)	6-8		10-12	24-27
Apron (acres)	55		30 *(a)*	40 *(a)*
Supporting Infrastructure				
GSE parking area (square feet)	168,000		180,000	225,000
Truck staging/queuing area(s)	--		*(b)*	*(c)*
Employee/customer parking (spaces)	150		275	350

GSE = Ground support equipment
PAL = Planning activity level

(a) Assuming 60,000- and 7,500-square-foot parking positions per jet and feeder aircraft, respectively.
(b) Truck areas should be made more efficient with roadwork improvements.
(c) At least twice the current truck area should be provided.

Source: Leigh Fisher Associates, March 2003.

Table 4-3

AIR CARGO FACILITY REQUIREMENTS
Mather Airport

			Requirements	
	2001	***2012***	PAL 1	PAL 2
Forecast Air Cargo (tons in thousands)				
Freight	59	***47***	51	74
Mail	51	***-***	0	0
Total	110	***46***	51	51
Annual average growth			1.4%	2.5%
Air Cargo Facilities				
Freight warehouse space (square feet)	89,400	***71,800***	***40,600***	***59,500-74,400***
Jet aircraft parking (spaces)	20	***20***	20	20
Feeder aircraft parking (spaces)	6-8	***6-8***	6-8	6-8
Apron (acres)	55	***55***	55	55
Supporting Infrastructure				
GSE parking area (square feet)	168,000	***168,000***	180,000	180,000
Truck staging/queuing area(s)	--	***--***	*(b)*	*(b)*
Employee/customer parking (spaces)	150	***150***	150	150

GSE = Ground support equipment
PAL = Planning activity level

(a) Assuming 60,000- and 7,500-square-foot parking positions per jet and feeder aircraft, respectively.
(b) Truck areas should be made more efficient with roadwork improvements.

Source: Leigh Fisher Associates, March 2003. Sacramento County Airport System, May 2013

GSE Parking Area

Dedicated space for GSE is important to the efficient transfer of freight from aircraft to warehouse or truck. Future GSE parking area requirements are provided in Table 4-3, and were determined based on coordination with air cargo carriers and generalized planning ratios intended to balance aircraft parking positions, cargo volumes, and GSE square footage. For this analysis, a ratio of 9,000 square feet of GSE space per jet aircraft parking position was assumed for both PAL 1 and PAL 2.

Truck Parking and Staging Area

The cargo market is dependent on the efficient transfer of freight to and from aircraft and trucks (both trailers and delivery vehicles). Integrated carriers rely on tractor-trailers to deliver freight containers to and from the airport, and local package vans for delivery of overnight parcels. Other cargo carriers require trucks to accommodate daily activity. Truck parking and staging area requirements were identified for PAL 1 and PAL 2 based on input provided by the cargo carriers and facilities at similar airports.

As shown in Table 4-3, ~~the~~ ***with*** growth in facility space ~~under PAL 1 would be incremental – and the associated truck maneuvering space would likely increase at the same pace. Furthermore,~~ ~~with~~ ***and*** roadwork improvements, incremental increases in truck traffic would become more efficient and, therefore, dedicated space would not be required. ~~However, additional freight activity and truck volumes associated with PAL 2 would require a significant increase in truck parking and maneuvering space. Thus, a doubling of existing space is recommended.~~

Employee and Customer Parking Areas

~~There are currently 150 employee and customer parking spaces near the cargo facilities adjacent to the Air Cargo Apron.~~ According to Airport staff, the current number of employee and customer parking spaces is ~~in~~sufficient to meet current demand. ~~It is estimated that at least 275 spaces will be required in PAL 1 and 350 spaces will be required in PAL 2.~~

2013 UPDATE: As additional air cargo warehousing facilities are proposed and constructed, appropriate parking will be included and/or existing parking may be reallocated.

Off-Airport Facility Development

In addition to on-Airport facility development, off-Airport cargo facilities have grown significantly over the last several years. Air carriers, freight forwarders, third-party logistics providers, and warehousing and distribution companies require complementary off-airport facilities that provide adequate staging and warehousing space for their freight activity. Integrated carriers rely on these facilities to properly serve local shipping demand. As the region continues to grow, integrated carriers will require an efficient transfer of package containers, delivered via tractor-trailers, to sort facilities in strategic locations around the area. The result may be an increase in aircraft and truck activity at the Airport without a direct increase in on-Airport facility expansion.

2013 UPDATE: Since the Master Plan was originally written, the industry has experienced substantial consolidation and, resulting in fewer operators at the Airport. With or without increased aircraft and truck activity at the Airport, the existing roadway and infrastructure is insufficient to efficiently accommodate the existing activity levels.

GENERAL AVIATION FACILITY REQUIREMENTS

General aviation facility requirements were based on Mather's intended future role, a review of existing facilities, market requirements, field observations, discussions with Airport tenants, and forecast data provided in Chapter 3. Requirements were developed for itinerant and based aircraft parking apron, indoor aircraft storage facilities, aviation support hangars, passenger terminal facilities, fixed base operator (FBO) facilities, GSE staging area, and vehicular parking.

Itinerant Aircraft Parking Apron

Itinerant aircraft parking facilities provide apron space for itinerant general aviation and air taxi aircraft, allowing passengers access to terminal facilities and ground transportation, and service trucks and FBO personnel access to the aircraft. Currently, Mather has 100 aircraft parking spaces on a 25-acre ramp. Of the total spaces, 40 are dedicated to itinerant aircraft parking, and 60 are dedicated to based aircraft.

The size of itinerant aircraft parking apron depends on the maximum number of parking positions needed at one time (i.e., peak demand), and the average size of aircraft to be accommodated. At Mather, general aviation and air taxi aircraft have different demand patterns and average aircraft sizes; therefore, apron requirements were calculated separately.

General Aviation. Itinerant general aviation aircraft apron requirements were based on the total number of itinerant operations during the assumed busy day of the peak month (BDPM). To determine itinerant aircraft apron demand, the following assumptions were made generally based on guidelines outlined in FAA Advisory Circular 150/5300-13, *Airport Design*:

- Peak month operations represent 10% of annual operations, and 10% more activity is accommodated on the BDPM than on the average day of the peak month (ADPM).
- A maximum of 50% of itinerant general aviation aircraft will use the itinerant apron at one time during the BDPM.
- A total of 3,200 square feet of apron, including taxilanes between parking positions and service roads, is required for each aircraft parking position.

As presented in Chapter 3, itinerant general aviation operations were assumed to represent ~~60%~~ ***80%*** of the total general aviation operations during PAL 1 and ~~70%~~ ***80%*** during PAL 2. Itinerant general aviation aircraft apron requirements are presented in Table 4-4. Approximately ~~190,000~~ ***208,000*** square feet of itinerant general aviation apron will be required to accommodate demand in PAL 1, and ~~290,000~~ ***230,400*** square feet be will required in PAL 2.

2013 UPDATE: This level of activity can be accommodated on existing infrastructure and does not require additional apron.

Table 4-4

ITINERANT GENERAL AVIATION AIRCRAFT PARKING APRON REQUIREMENTS
Mather Airport

Period	Operations ADPM *(a)*	Operations BDPM *(b)*	Demand (spaces)	Apron area (sq ft)
PAL 1	100	110	60	190,000
PAL 2	160	180	90	290,000

ADPM = Average day of the peak month
BDPM = Busy day of the peak month

(a) Itinerant general aviation operations only.
(b) BDPM is 10% greater than ADPM.

Source: Leigh Fisher Associates, March 2003.

Table 4-4

ITINERANT GENERAL AVIATION AIRCRAFT PARKING APRON REQUIREMENTS
Mather Airport

Period	Operations ADPM *(a)*	Operations BDPM *(b)*	Demand (spaces)	Apron area (sq ft)
PAL 1	100	110	55	176,000
PAL 2	106	117	59	188,800

ADPM = Average day of the peak month
BDPM = Busy day of the peak month

(a) Itinerant general aviation operations only.
(b) BDPM is 10% greater than ADPM.

Source: Sacramento County Airport System, May 2013.

Air Taxi. Air taxi aircraft parking apron requirements were derived based on estimated air taxi aircraft departures during the average weekday. The following assumptions were made to determine air taxi aircraft apron demand:

- Air taxi operations will continue to be conducted during weekdays only, which total ~~250~~ ***260*** days per calendar year.
- A maximum of 50% of assumed total weekday departures will use the apron at the same time.
- A total of 5,000 square feet of apron, including taxilanes between parking positions and service roads, is required for each aircraft parking position.

Air taxi aircraft apron requirements are presented in Table 4-5. As presented, approximately ~~30,000~~ ***125,000*** square feet of itinerant general aviation apron will be required to accommodate demand in PAL 1, and ~~35,000~~ ***140,000*** square feet will be required in PAL 2.

Table 4-5

AIR TAXI AIRCRAFT PARKING APRON REQUIREMENTS
Mather Airport

Period	Operations: Annual	Operations: Weekday departures	Demand (spaces) *(a)*	Apron area (sq ft)
PAL 1	6,500	13	6	30,000
PAL 2	6,800	14	7	35,000

(a) Assuming 50% of average weekday departures at one time.

Source: Leigh Fisher Associates, March 2003.

Table 4-5

AIR TAXI AIRCRAFT PARKING APRON REQUIREMENTS
Mather Airport

Period	Operations: Annual	Operations: Weekday departures	Demand (spaces) *(a)*	Apron area (sq ft)
PAL 1	12,800	50	25	125,000
PAL 2	14,590	56	28	140,000

(a) Assuming 50% of average weekday departures at one time.

Source: Sacramento County Airport System, March 2013.

Based Aircraft Storage Facilities

Based aircraft apron parking and indoor storage facility requirements for Mather are provided below. As discussed on Chapter 3, the number of based aircraft at Mather is expected to ~~remain constant at approximately~~ ~~150~~ ***range between 65 and 72*** throughout the planning period.

Based Aircraft Parking Apron. Based aircraft parking aprons generally serve the same functions as itinerant aircraft parking aprons. However, based aircraft parking apron requirements are assessed separately from itinerant apron requirements because the total area needed is generally less due to the separation of small and large aircraft, and closer clearances allowed between parked aircraft.

Based aircraft parking apron capacity is dependent upon aircraft fleet mix. The following assumptions were made to determine requirements:

- Of the total forecast based aircraft in PALs 1 and 2, approximately 90% of single-engine piston, 70% of multi-engine piston, and 10% of turboprop aircraft will use the based aircraft parking apron. No turbojet aircraft are anticipated to base on the outdoor apron.

- A total of 2,700 square feet of apron, including taxilanes between parking positions and service roads, is required for each aircraft parking position.

Based aircraft parking apron requirements are presented in Table 4-6.

Table 4-6

BASED AIRCRAFT PARKING APRON REQUIREMENTS
Mather Airport

Period	Based aircraft: Single-engine piston	Based aircraft: Multi-engine piston	Based aircraft: Turboprop	Apron area (sq ft)
PAL 1	30	25	5	160,000
PAL 2	30	20	5	150,000

Source: Leigh Fisher Associates, March 2003.

Table 4-6

BASED AIRCRAFT PARKING APRON REQUIREMENTS
Mather Airport

Period	Based aircraft: Single-engine piston	Based aircraft: Multi-engine piston	Based aircraft: Turboprop	Apron area (sq ft)
PAL 1	39	4	0	116,100
PAL 2	38	6	0	118,800

Source: Sacramento County Airport System, March 2013.

Demand for based aircraft apron parking ~~will slightly decrease~~ ***remains relativity constant*** between PAL 1 and PAL 2 ~~due to a decrease in the percent of multi-engine aircraft in the future fleet mix~~. As presented in Table 4-6, approximately ~~160,000~~ ***116,100*** square feet of based aircraft parking apron will be required in PAL 1, and ~~150,000~~ ***118,800*** square feet will be required in PAL 2.

Indoor Aircraft Storage Facilities. Indoor aircraft storage at Mather is provided in ~~numerous~~ hangars ~~throughout~~ the general aviation area ~~and the 7000 Apron~~. Excluding maintenance hangars and storage hangars scheduled for demolition*, ***building 4260 is the only*** indoor storage ~~facilities~~ facility at Mather, encompass***ing*** a total gross area of approximately ~~220,000~~ ***98,830*** square feet. Based on Mather's intended role as a***n*** ~~dedicated~~ air cargo facility with ~~some~~ general aviation activity, individual indoor storage facilities, such as T-hangars and shade ports, will ~~not~~ ***need to*** be provided in the future.

2013 UPDATE: As building 4260 is the only existing indoor aircraft storage facility not scheduled for demolition, new facilities will be required for any new tenant. This is consistent with inquires received from existing and prospective tenants.

Similar to based aircraft parking apron, indoor aircraft storage facility requirements are dependent on aircraft fleet mix. The following assumptions were made to determine indoor aircraft storage requirements:

*Building***s *7005, 7015 and 7030*** ~~7035~~, located on the 7000 Apron, ~~is~~ ***are*** scheduled for demolition. ***Buildings 4376 and 4677, located on the general aviation apron are scheduled for demolition. Buildings 7055, 7030 and 4473 have been demolished.***

- Of the total forecast based aircraft in PALs 1 and 2, approximately 10% of single-engine, 30% of multi-engine piston, 90% of turboprop, and 100% of jet aircraft will use indoor storage facilities.

- Each single-engine aircraft requires 1,000 square feet of hangar space; each multiengine piston aircraft requires 1,200 square feet of hangar space; each turboprop aircraft requires 1,500 square feet of hangar space; and each jet aircraft requires 2,000 square feet of hangar space.

- To allow aircraft maneuvering outside of the hangar, an apron area approximately equal to the storage capacity of the hangar is required.

Future indoor storage space and associated apron requirements are presented in Table 4-7.

Table 4-7

INDOOR STORAGE SPACE REQUIREMENTS
Mather Airport

	Based aircraft				
Period	Single-engine	Multi-engine	Turbo-prop	Jet	Total storage space (sq ft)
PAL 1	5	10	40	40	160,000
PAL 2	5	10	40	45	170,000

(a) Outdoor maneuvering apron only.

Source: Leigh Fisher Associates, March 2003.

Table 4-7

INDOOR STORAGE SPACE REQUIREMENTS
Mather Airport

Period	Based aircraft: Single-engine	Multi-engine	Turbo-prop	Jet	Total storage space (sq ft)
PAL 1	4	2	1	7	21,900
PAL 2	4	2	1	13	33,900

a) Outdoor maneuvering apron only.

Source: Sacramento County Airport System, March 2013.

As presented, approximately ~~160,000~~ ***21,900*** square feet of hangar space and ~~3.5~~ ***0.5*** acres of apron will be required to accommodate demand in PAL 1. In PAL 2, approximately ~~170,000~~ ***33,900*** square feet of hangar space and ~~4.0~~ ***0.7*** acres of apron will be necessary.

2013 UPDATE: Interest expressed by current and potential tenants is indicative of need for general aviation hangar space not necessarily reflected in the forecast. Such improvements would be funded by a third party, as discussed in Chapter 8.

Aviation Support Hangar Requirements

In addition to hangar space for aircraft storage, hangar space for general aviation-related activities and business enterprises should also be provided. These activities include, but are not limited to, aircraft maintenance and repair, aircraft sales and leasing, avionics maintenance and sales, and aviation-related office space. At Mather, approximately 48,000 square feet of hangar space in Building 4677 are currently dedicated to such activities.

2013 UPDATE: Building 4677 is scheduled for demolition. The condition of the building and capital cost associated with updated the structure to current building codes is cost prohibitive. As discussed in Chapter 8, third party development would be anticipated to fund any future development.

Requirements for aviation support hangars are market driven, and will be constructed by the County or third-party service providers based on market demand. According to input provided by Airport tenants, existing hangar space for these

activities is insufficient. ~~Therefore, support hangar requirements were calculated assuming a 20% increase in the current ratio between total annual operations and hangar space used for these activities.~~ Aviation support hangar requirements are presented in Table 4-8

Table 4-8

AVIATION SUPPORT HANGAR REQUIREMENTS
Mather Airport

Period	Annual operations	Total space (sq ft)	Apron area (acres) *(a)*
PAL 1	84,700	60,000	1.5
PAL 2	118,900	85,000	2.0

(a) Outdoor maneuvering apron only.

Source: Leigh Fisher Associates, March 2003.

Table 4-8

AVIATION SUPPORT HANGAR REQUIREMENTS
Mather Airport

Period	Annual operations	Total space (sq ft)	Apron area (acres) *(a)*
PAL 1	12,880	180,000	-
PAL 2	14,590	60,000	-

(a) no additional area is expected to be required.

Source: Sacramento County Airport System, March 2013.

As shown , approximately ~~60,000~~ ***180,000*** square feet of hangar space will be required to accommodate demand in PAL 1, and approximately ~~85,000~~ ***60,000*** square feet of hangar space will be required in PAL 2.

2013 UPDATE: Market demand continues to drive the need for aviation support hangars at the Airport. Based on discussions with current and prospective tenants as well as the updated forecast in Chapter 3, it is expected that as much as 180,000 square feet of new hangar space will be required to accommodate demand in PAL 1, and 60,000 square feet of hangar space will be required in PAL 2. It should also be noted that existing facilities are not suitable to meet these demands.

Passenger Terminal Facilities

Passenger terminal facility requirements for air taxi and general aviation operations are presented in the following sections.

Air Taxi. The current 12,500-square-foot air taxi terminal (Building 4475) is used exclusively by Intel Corporation to accommodate the company's shuttle passengers. The terminal is used by approximately 60% of air taxi aircraft operations at Mather (e.g., those associated with Intel Corporation). Remaining air taxi passengers use the general aviation terminal (see following section). According to Intel personnel, the terminal is ***no longer*** adequate for current air taxi enplanement levels.

The following assumptions were made to determine future air taxi passenger terminal requirements:

- Approximately 60% of average weekday air taxi departures will continue to be served by the air taxi terminal.

- 50% of total weekday departures will use the apron at the same time.
- Air taxi aircraft average 30-passenger-seats per departure.

Air taxi passenger terminal requirements are presented in Table 4-9 and were calculated assuming a planning ratio of 100 square feet of building space per enplaned passenger.

Table 4-9

PASSENGER TERMINAL FACILITY REQUIREMENTS
Mather Airport
(in square feet)

Period	Air taxi	General aviation	Total
PAL 1	12,000	2,500	14,500
PAL 2	12,000	4,000	16,000

Source: Leigh Fisher Associates, March 2003.

Table 4-9

PASSENGER TERMINAL FACILITY REQUIREMENTS
Mather Airport
(in square feet)

Period	Air taxi	General aviation	Total
PAL 1	33,000	4,500	37,500
PAL 2	36,000	4,800	40,800

Source: Sacramento County Airport System, May 2013.

General Aviation. The Airport's existing general aviation terminal (Building 4580), constructed in 1996, encompasses 12,700 square feet and is divided into two functional areas. The primary area consists of approximately 10,000 square feet and is used for office space by the Airport's FBO (~~Trajen Flight Support~~ ***Atlantic Aviation***) and other businesses. The remaining space encompasses approximately 2,700 square feet and includes a lounge, lobby area, and lavatories to accommodate general aviation users.

Planning criteria for general aviation terminal buildings are typically based on itinerant aircraft operations and peak-period demand levels. Demand for general aviation terminal facilities at Mather was calculated based on itinerant general aviation departures* and 40% of air taxi (e.g., those not associated with Intel Corporation) departures during an assumed peak hour—which is estimated to represent 15% of ADPM operations. General aviation passenger terminal requirements are presented in Table 4-9 and were calculated assuming a planning ratio of 3.0 persons (pilots and passengers) per operation, and 100 square feet of building space per person.

As presented in Table 4-9, approximately ~~14,500~~ ***37,500*** square feet of passenger terminal space will be required in PAL 1, and approximately ~~16,000~~ ***40,800*** square feet will be required in PAL 2. Based on these requirements, additional general aviation terminal building space should be provided in PAL 2; however, the existing air taxi terminal building has adequate capacity to accommodate forecast passenger demand throughout the planning period. Additional office space may be provided based on market conditions.

Fixed Base Operators

~~Trajen Flight Support~~ ***Atlantic Aviation***, the Airport's only full-service FBO, provides aircraft fueling services for itinerant and based aircraft (including air cargo); aircraft, airframe, and engine maintenance; management of the tiedown apron; and aircraft storage. ~~Trajen~~ ***Atlantic*** operates from the general aviation terminal building and provides services on the adjacent apron area. ~~Trajen~~ ***Atlantic*** leases two large conventional hangars for aircraft storage ***and maintenance*** (Buildings 4376 and 7005). ~~Maintenance services are provided by Mather Aviation in a 48,000-square-foot hangar (Building 4677) subleased from Trajen.~~

Requirements for FBOs are normally demand-driven, and/or based on the range (or lack) of services offered by aviation service providers. For instance, some small general aviation airports accommodate multiple FBOs, each providing a limited number of services; on the other hand, many airports with more general aviation activity than Mather have only one full-service FBO. In general, it can be assumed that 50,000 annual general aviation operations can support one ***full-service*** FBO. Since annual general aviation aircraft operations are not forecast to exceed 70,000 during the planning period, a second full-service FBO is not recommended.

2013 UPDATE: The Sacramento County Airport System expects to release a request for proposals (RFP) for a fixed base operator (FBO) at Mather.

*~~Itinerant general aviation operations represent 60% of the total general aviation operations during PAL 1 and 70% during PAL 2.~~

Automobile Parking

Future automobile parking requirements were determined based on the following generalized planning ratios:

- 1 parking space for every 5 based aircraft parking positions and every 2,000 square feet of aircraft storage hangar space
- 3 parking spaces for every 2,000 square feet of support hangar space
- 1 parking space for every 500 square feet of passenger terminal facility
- Each parking space requires 40 square yards (360 square feet), including circulation routes and clearances

Automobile parking requirements are presented in Table 4-10, and were determined based on the assumed demand for general aviation facilities discussed above.

Table 4-10

AUTOMOBILE PARKING REQUIREMENTS
Mather Airport

	Required spaces					
Period	Based aircraft apron	Storage hangars	Aviation support hangars	Passenger terminal *(a)*	Total *(b)*	Parking area (square feet)
PAL 1	12	80	60	50	200	72,000
PAL 2	12	85	85	50	230	81,000

(a) Calculated based on the Airport's existing general aviation terminal (Building 4580) at 12,700 square feet plus air taxi terminal requirements at 12,000 square feet.
(b) Total rounded for generalized planning purposes.

Source: Leigh Fisher Associates, March 2003.

Table 4-10

AUTOMOBILE PARKING REQUIREMENTS
Mather Airport

Period	Required spaces: Based aircraft apron	Storage hangars	Aviation support hangars	Passenger terminal *(a)*	Total *(b)*	Parking area (square feet)
PAL 1	9	11	135	75	230	83,000
PAL 2	9	17	90	82	198	71,000

~~*(a)* Calculated based on the Airport's existing general aviation terminal (Building 4580) at 12,700 square feet plus air taxi terminal requirements at 12,000 square feet.~~

(b) Total rounded for generalized planning purposes.

Source: . Sacramento County Airport System, May 2013

~~As shown, approximately 200 spaces and 72,000 square feet of automobile parking space are required to accommodate general aviation demand in PAL 1, and approximately 230 spaces and 81,000 square feet are required by PAL 2. It should be noted that specific parking requirements (and sizes) set forth in local zoning regulations may require additional or fewer spaces.~~

General Aviation GSE Parking Requirements

Typical general aviation GSE includes fueling/defueling trucks, baggage belt loaders, air stairs, and personnel carts. Current Airport GSE is owned and operated by ~~Trajen Flight Support~~ ***Atlantic Aviation*** and includes the following: 14 fueling trucks, 2 pick-up trucks, 2 ground power units, 2 tugs, 1 crew car, 1 van, and 1 lavatory service cart. However, some GSE is dedicated to fueling/servicing air cargo aircraft and, therefore, the actual number of GSE required for general aviation operations is assumed to be less.

Future GSE parking requirements for the general aviation area were determined based on the following generalized planning ratios:

- 1 fueling truck for every 10,000 general aviation annual operations
- 1 nonfueling, miscellaneous GSE for every 15,000 annual operations
- Each fuel truck parking space requires 900 square feet
- Each GSE parking space requires 270 square feet

Future GSE parking requirements are presented in Table 4-11.

Table 4-11

GENERAL AVIATION GSE PARKING REQUIREMENTS
Mather Airport

Period	GSE demand		Total spaces	Total apron area (sq ft)
	Fueling	Misc/service		
PAL 1	4	5	9	4950
PAL 2	4	6	10	5220

Source: Leigh Fisher Associates, March 2013.

As shown, approximately ~~6,500~~ ***4,950*** square feet of GSE parking space are required to accommodate demand in PAL 1, and approximately ~~8,500~~ ***5,220*** square feet are necessary by PAL 2. The above requirements are based on generalized planning ratios, while specific requirements may be market driven.

AIRPORT SUPPORT FACILITY REQUIREMENTS

Airport support facilities include fuel storage, airport administration and operations, airfield and equipment maintenance, aircraft rescue and fire fighting, and air traffic control facilities. Requirements are based on field observations, discussions with Airport staff, and facilities at similarly sized airports.

Fuel Storage Facilities

Fuel storage facility requirements were estimated to determine the holding capacity of fueling facilities needed over the planning horizon for both Jet A and AvGas*. The Airport's existing 6.7-acre fuel farm, located north of the air cargo area (see Figure 2-4), is maintained by Sacramento County. ~~Trajen Flight Support~~ ***Atlantic Aviation*** provides fueling operations for based and itinerant aircraft, including air cargo. The fuel farm is also used for storage of fueling equipment, including fuel delivery trucks and a 3,000-gallon AvGas storage truck. Fuel is transported from the fuel farm to aircraft via fuel trucks that remain parked on the west side of the general aviation apron.

The fuel farm's current storage capacity is 420,000 gallons of Jet A fuel. ~~Fuel is pumped from an off-Airport fuel terminal, via pipeline, to the fuel tank weekly, or~~

*Jet A fuel is generally used by turboprop and turbojet aircraft; AvGas is used by piston aircraft.

~~as needed.~~ A second 840,000-gallon tank could be operational in 6 months, if needed, for a total capacity of 1,260,000 gallons. In addition, a 12,000-gallon tank of AvGas ~~is currently being~~ ***has been*** installed.

~~Average monthly flowage during 2001 was 1.2 million gallons of Jet A and 9,000 gallons of AvGas; however, fuel flowage increases significantly during the peak month. To assess storage needs, existing fuel storage capacity was compared to assumed weekly fuel flowage during the peak month. Future fuel storage requirements presented in Table 4-12 were estimated assuming that the ratio of fuel flowage to aircraft departures remains constant in the future.~~

Table 4-12

FUEL STORAGE REQUIREMENTS
Mather Airport
(in gallons)

Period	AvGas flowage		Jet A Fuel flowage	
	Peak month	Weekly	Peak month	Weekly
PAL 1	12,000	3,000	2,400,000	600,000
PAL 2	16,000	4,000	4,900,000	1,250,000

Source: Leigh Fisher Associates, March 2003.

~~Estimates reflect Jet A fuel supply required for air cargo, general aviation, and military aircraft operations. As shown, future fuel storage requirements are expected to increase from approximately 600,000 gallons per week in PAL 1 to 1,250,000 gallons per week in PAL 2. AvGas fuel storage required for general aviation piston aircraft operations is expected to increase from approximately 3,000 gallons per week in PAL 1 to 4,000 gallons per week in PAL 2. Based on the future weekly fuel storage requirements presented in Table 4-12, future storage requirements can be accommodated by the existing airport fuel storage system.~~

2013 UPDATE: Construction began on a new fuel farm in early 2013, and is expected to be complete late 2013. The project will install two new 1190 barrel capacity jet fuel storage tanks and related fuel dispensing equipment, one existing tank with a 285 barrel capacity will be relocated. The new location is approximately 0.80 acres located at the west end of the west cargo apron. The existing fuel farm will be demolished in the future. While the new and retired facilities represent a net reduction in fuel capacity, planning capacity is adequate for current and future demand at Mather.

Airport Administration and Operations

Airport administration and operations functions are accommodated in approximately 4,600 square feet of the Airport Administration Building (Building 4642), which has a total area of 7,150 square feet. Remaining space is occupied by Sacramento County General Services or leased to private tenants. ~~Currently, Sacramento County employs four administrative employees and two operations personnel at Mather.~~

Requirements for administrative facilities depend on the number of administrative functions provided at Mather, rather than activity levels, while requirements for operations facilities are dependent on the number of employees. According to staff, the number of Airport operations staff is not likely to exceed five people in the future.

To determine future facility requirements, it was assumed that a total of six administrative personnel and four operations personnel will work at Mather in both PALs 1 and 2. Based on a ratio of 800 square feet of office and support space to staff member, a total of 7,500 square feet of facility space is required to accommodate Airport administration and operations functions in PALs 1 and 2.

Airfield and Equipment Maintenance

Airfield maintenance personnel perform minor pavement repairs, mow nonpaved areas, and perform other services necessary to maintain the airfield in operable condition. Airfield maintenance is currently co-located with the Airport's ARFF in Building 7075, and encompasses 2,850 square feet of indoor space for employee support and training, and 50,000 square feet of outdoor vehicle/equipment parking space. Airport personnel have indicated that the existing facility provides adequate indoor and outdoor equipment/vehicle storage space, but inadequate employee office and training space.

Equipment maintenance personnel, currently located in Building 7001, perform repairs on Airport vehicles and equipment, including those used by ARFF, Airfield Maintenance, and Airport Operations. According to Airport personnel, the current 4,900-square-foot facility provides adequate space for employees and equipment; however, having airfield access and proximity to the ARFF and Airfield Maintenance units would be desirable.

Based on future airfield facility requirements and input provided by maintenance personnel, a future combined airfield maintenance/equipment maintenance facility should encompass 8,000 square feet of indoor space for employee support and training, and 50,000 square feet of outdoor vehicle/equipment parking space.

Aircraft Rescue and Fire Fighting Facility

Mather's existing ARFF facility (Building 7075) is adjacent to Taxiway E and provides 4,300 square feet of space for fire fighting equipment and emergency vehicles, and approximately 4,000 square feet of training space and living quarters for staff personnel on duty.

Mather is not a Federal Aviation Regulations (FAR) Part 139 certified airport and, therefore, is not required to comply with FAR Part 139 requirements for ARFF facilities*. In the event that Mather obtains FAR Part 139 certification, the size and location of ARFF facilities, number of personnel on duty, as well as required extinguishing agents would depend on the Airport's ARFF index, which is based on the type and number of scheduled commercial air carrier passenger operations. Mather currently provides ARFF services that meet FAR Part 139 airport Index B requirements. Based on the forecast operations and fleet mix, Mather's ARFF index is not expected to change during the planning period.

Based on Index B, future ARFF facility requirements include a 4,000-square-foot facility to accommodate staff personnel on duty and 1,500 square-feet of indoor vehicle parking for fire fighting equipment and emergency vehicles.

Air Traffic Control Facilities

Airport traffic control tower (ATCT) facilities, constructed in 1985, include the tower and personnel/visitor parking. There are no records available regarding the seismic standards of the tower. The ATCT is well-located for visibility and has adequate room for future upgrades. No change in the ATCT structure or location is required during the planning period. Internal equipment and infrastructure may require upgrades if the tower is reclassified for Category II/III operations.

2013 UPDATE: The Mather ATCT facility was not included in the recent list of ATCT's to be closed due to sequestration.

GROUND ACCESS REQUIREMENTS

Roadway requirements to serve planned Airport facilities include a roadway system that accommodates anticipated growth in cargo and general aviation activity and addresses current access issues. Recommended roadway improvements include (1) direct access to the general aviation and air cargo areas, and (2) a continuous

*Federal Aviation Regulation (FAR) Part 139 ARFF requirements apply to airports with scheduled air carrier passenger service using aircraft that seat 30 or more people.

roadway along the landside of proposed facilities ***and (3) an extension of Truemper Way to DeBellevue Street***.

Direct access to the general aviation and air cargo areas will be provided via the primary roadways (existing and planned) at Mather, which include:

- The Von Karman Street/Whitehead Street couplet, ~~which have recently been reconstructed and~~ which provide the most direct access from U.S. 50 at the Mather Field Road interchange.

- Macready Avenue, which provides access via Old Placerville Road to U.S. 50 interchanges at Bradshaw Road and Mather Field Road.

- ***The future extension of DeBellevue Street onto the proposed general aviation flight line.***

- The future Routier Road extension, which will follow the western edge of the Airport and provide access to Old Placerville Road and to areas south of the Airport.

- ***The future upgrade and extension of Truemper Way will provide for improved internal access and circulation along both the air cargo and general aviation flightlines.***

Continuous roadway along the landside of the proposed aviation facilities will efficiently accommodate heavy truck movements by providing one travel lane in each direction along with either a center two-way left turn lane or channelized left turn lanes at intersections. It may be appropriate to add a landscape strip between the edge of pavement and the sidewalk, in accordance with practice on other new roadways at Mather ***and the Mather Field Specific Plan***. As the majority of air cargo ***and general aviation hangar*** facilities are located along this new roadway, it will be easier to locate and access these facilities. Heavy truck traffic will also be reduced on other roadways in the immediate area.

FACILITY REQUIREMENTS SUMMARY

Table 4-13 presents the facility requirements identified for PALs 1 and 2. These requirements provide the basis for the alternatives presented in Chapters 5 and 6.

Table 4-13

FACILITY REQUIREMENTS SUMMARY
Mather Airport

Function	Facility	Existing	PAL 1	PAL 2
Airfield	~~Primary~~ runway 22L-4R			
	Length (feet)	11,300	11,300	11,300
	Navaids	Cat I ILS	Cat III ILS	Cat III ILS
	~~Backup~~ runway 22R-4L			
	Length (feet) *(a)*	6,040	~~7,000–9,000~~ 6,040	7,000–9,000
	Navaids	Visual	Nonprecision	Nonprecision
Air cargo	Freight warehouse space (square feet)	89,400	85,000	135-150,000
	Jet aircraft parking (spaces)	20	18-20	22-25
	Feeder aircraft parking (spaces)	6-8	10-12	24-27
	Cargo apron (acres) *(b)*	55	30	40
	GSE parking area (square feet)	168,000	180,000	225,000
	Truck staging/queuing (square feet)		*(c)*	*(d)*
	Employee/customer parking (spaces)	150	275	350
General aviation	Itinerant aircraft parking apron *(e)*			
	Spaces	40	65	100
	Apron (acres)	17	6	8
	Based aircraft parking apron			
	Spaces	60	60	55
	Apron (acres)	8	4	4
	Individual aircraft storage (square feet) *(f)*	220,000	160,000	170,000
	Aviation support hangars *(g)* (square feet)	48,000	60,000	85,000
	Passenger terminal facilities			
	General aviation (square feet) *(h)*	2,700	2,500	4,000
	Air taxi (square feet)	12,000	12,000	12,000
	Full-service FBO (number)	1	1	1
	Vehicle parking (spaces)	200	200	230
	GSE parking (square feet)	Misc.	6,500	8,500
	Total hangar (square feet) *(i)*	270,000	220,000	255,000
	Total apron (acres) *(j)*	27	18	22
Airport support	Fuel storage capacity			
	Jet A (gallons)	1,260,000	600,000	1,250,000
	Av Gas (gallons)	3,000 (*k*)	3,000	4,000
	Airport admin/operations (square feet)	7,200	7,500	7,500
	Airfield maintenance (square feet) *(l)*	8,000	8,000	8,000
	Aircraft rescue and fire fighting (square feet)	15,500	5,500	5,500

FBO = Fixed base operator
GSE = Ground support equipment
ILS = Instrument landing system
PAL = Planning activity level

(a) Variance based on % of operations accommodated given various operating factors.
(b) Assuming 60,000- and 7,500-square-foot parking positions per jet and feeder aircraft, respectively.
(c) Truck areas should be made more efficient with roadwork improvements.
(d) At least twice the current truck area should be provided.
(e) Includes air taxi aircraft.
(f) Includes buildings 4260, 4376, 7005, 7010, 7015, 7040.
(g) Includes building 4677.
(h) Calculated as the space in the existing terminal building not dedicated to Airport's FBO and office space.
(i) Includes based indoor aircraft storage and aviation support hangars.
(j) Includes itinerant and based aircraft parking aprons, and apron area for maneuvering outside of storage facilities.
(k) 12,000-gallon Av Gas tank currently under construction.
(l) Assuming co-location with equipment maintenance facility.

Source: Leigh Fisher Associates, March 2003.

Table 4-13

FACILITY REQUIREMENTS SUMMARY
Mather Airport

Function	Facility	Existing	PAL 1	PAL 2
Airfield	Runway 22L-4R			
	Length (feet)	11,300	11,300	11,300
	Navaids	Cat I ILS	Cat III ILS	Cat III ILS
	Runway 22R-4L			
	Length (feet) *(a)*	6,040	6,040	7,000–9,000
	Navaids	Visual	Nonprecision	Nonprecision
Air cargo	Freight warehouse space (square feet)	71,800	40,600	59-74,400
	Jet aircraft parking (spaces)	20	20	20
	Feeder aircraft parking (spaces)	6-8	6-8	6-8
	Cargo apron (acres) *(b)*	55	55	55
	GSE parking area (square feet)	168,000	180,000	180,000
	Truck staging/queuing (square feet)		*(c)*	*(d)*
	Employee/customer parking (spaces)	150	150	150
General aviation	Itinerant aircraft parking apron *(e)*			
	Spaces	40	43	44
	Apron (acres)	17	4	4
	Based aircraft parking apron			
	Spaces	60	33	34
	Apron (acres)	8	3	3
	Individual aircraft storage (square feet) (*f*)	220,000	21,900	33,900
	Aviation support hangars (*g*) (square feet)	48,000	180,000	60,000
	Passenger terminal facilities			
	General aviation (square feet)	2,700	4,500	4,800
	Air taxi (square feet)	12,000	33,000	36,000
	Full-service FBO (number)	1	1	1
	Vehicle parking (spaces)	200	230	198
	GSE parking (square feet)	Misc.	4,950	5,200
	Total hangar (square feet) *(i)*	270,000	201,900	93,900
	Total apron (acres) *(j)*	27	7	7
Airport support	Fuel storage capacity			
	Jet A (gallons)	1,260,000	600,000	1,250,000
	Av Gas (gallons)	3,000 (*k*)	3,000	4,000
	Airport admin/operations (square feet)	7,200	7,500	7,500
	Airfield maintenance (square feet) *(l)*	8,000	8,000	8,000
	Aircraft rescue and fire fighting (square feet)	15,500	5,500	5,500

FBO = Fixed base operator
GSE = Ground support equipment
ILS = Instrument landing system
PAL = Planning activity level

(a) Variance based on % of operations accommodated given various operating factors.
(b) Assuming 60,000- and 7,500-square-foot parking positions per jet and feeder aircraft, respectively.
(c) Truck areas should be made more efficient with roadwork improvements.
(d) At least twice the current truck area should be provided.
(e) Includes air taxi aircraft.
(f) Includes buildings 4260, 4376, 7005, 7010, 7015, 7040.
(g) Includes building 4677.
.
(i) Includes based indoor aircraft storage and aviation support hangars.
(j) Includes itinerant and based aircraft parking aprons,.
(k) 12,000-gallon Av Gas tank currently under construction.
(l) Assuming co-location with equipment maintenance facility.

Source: Leigh Fisher Associates, March 2003.

Chapter 5*

AIRFIELD ALTERNATIVES

This chapter summarizes airfield development alternatives intended to accommodate near- and long-term demand at Mather. ~~Particular emphasis of this Master Plan is on the ultimate disposition of the Airport's backup runway (Runway 4L-22R).~~ Based on the requirements summarized in Chapter 4, ~~five~~ ***six*** airfield alternatives were developed ~~to provide Mather with a backup runway capable of accommodating the projected fleet mix~~.

2013 Update: When the Master Plan was initiated, adequate runway capacity (sufficient length and strength to accommodate large aircraft when runway 22L-4R is unavailable) was determined to be a critical infrastructure requirement for continuity of operations by large aircraft and an enabling project for the upgrade of the runway 22L ILS to Category IIIb Instrument Landing System (ILS) capability. While additional capacity for a second runway still has utility and remains a recommended project, it is no longer an enabling project for the upgrade of the ILS and has been shifted to PAL 2.

The upgrade of Runway 4L-22R ILS to Category IIIb approach capability is the primary airfield development project of PAL 1. The lack of CAT III capabilities causes major disruptions to the major tenant during their peak operating season.

ASSUMPTIONS

The following assumptions were developed to guide the preparation of airfield development alternatives:

- Based on Mather's existing and projected Airport Reference Code, facilities ***associated with Runway 4R-22L*** should accommodate Group V aircraft, which require 150-foot-wide runways and 75-foot-wide taxiways. ***Facilities associated with Runway 4L-22R should accommodate Group IV aircraft, which require the same runway and taxiway widths but with shoulder width of 25 feet rather than 35 feet required for Group V.***

- Existing pavements***, in good condition,*** should be used to the maximum extent possible.

- ~~Pavement strengths will be upgraded to accommodate the projected fleet mix based on FAA criteria for taxiway/runway facilities.~~

*Prepared Fall 2002, ***updated in May 2013***.

- Maintain at least 1,000-foot separation between parallel runways to allow simultaneous visual approaches during VMC. ***Note: simultaneous approaches are not permitted under non-VMC conditions. Additionally, minimum separation criteria due to wake vortex criteria are applicable when large aircraft are operating at Mather further restrict simultaneous operations to medium to small aircraft.***

- Runway 22R Comprehensive Land Use Plan (CLUP) approach/departure zone should not extend more than 700 feet northeast of the Airport property line along the extended runway centerline.

- FAR Part 77 visual approach protection should be provided on Runways 4L and 4R.

RUNWAY 4L-22R DEVELOPMENT ALTERNATIVES

Runway 4L-22R alternatives were developed with input from key Airport users and include near- and long-term variations, ***which correspond to the timeframes of PAL 1 (2014-2018) and PAL 2 (2019-2035), respectively***. Each near-term variation incorporates FAR Part 77 visual approach protection on Runway 22R, and each long-term variation incorporates nonprecision approach protection on Runway 22R. A precision instrument approach on Runway 22R was not considered to be feasible because of the excessive threshold displacement required to avoid CLUP approach/departure zone impacts on off-Airport land uses. In general, land uses within CLUP zones are restricted to industrial, agricultural, and mining.

Near-Term Alternatives

Figures 5-1 through 5-4 depict near-term Runway 4L-22R development alternatives. In ~~each~~ alternative***s 1-4***, visual approach protection on Runway 22R, a 400-foot-long blast pad at the Runway 4L end, and 35-foot-wide paved shoulders along the entire runway length were assumed. ***In alternative 6, no modifications are proposed.***

- **Alternative 1—Basic Upgrade.** Upgrade Runway 4L-22R from a basic utility runway to an air carrier-capable runway by providing FAA-required RPZs for air carrier runways. No additional airfield facilities would be provided and the runway's current length would remain unchanged.

- **Alternative 2 (Near-Term)—7,200-Foot Visual Runway 22R.** Extend Runway 22R by 1,160 feet to Taxiway F.

- **Alternative 3 (Near-Term)—8,500-Foot Visual Runway 22R.** Extend Runway 22R by 2,460 feet, and construct a new connector taxiway west of Taxiway F.

- **Alternative 4 (Near-Term*)*—9,000-Foot Visual Runway 22R.** Extend Runway 22R by 2,960 feet, and construct a new connector taxiway west of Taxiway F.

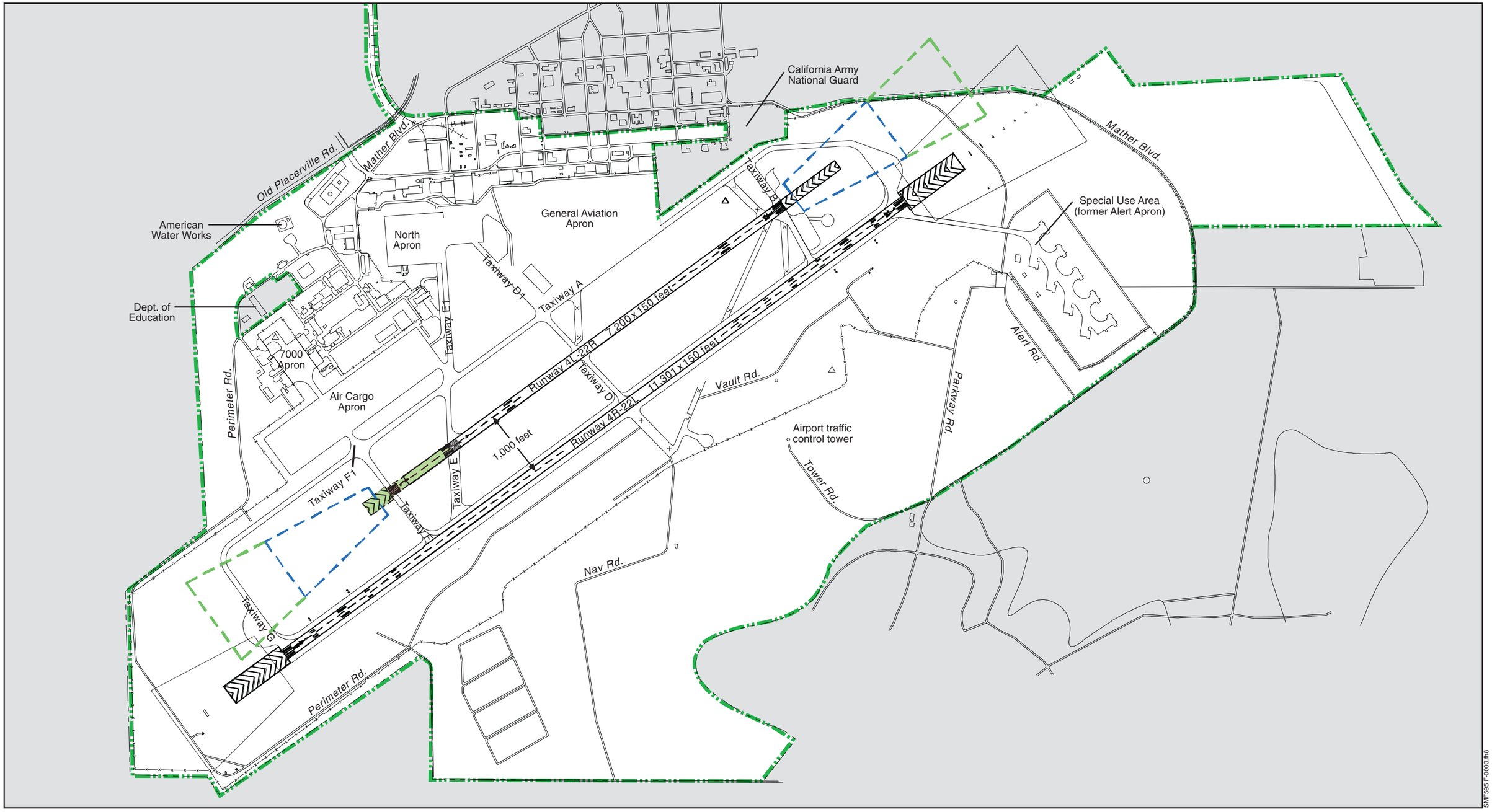
- ***Alternative 6 (Near-Term)—No Action, no improvement to Runway 22R and it's associated taxiways are proposed. Precision Approach Path Indicators (PAPI) which, primarily assists by providing visual glide slope guidance in non-precision approaches environment will be installed on Runways 22R and 22L.***

Near-term arrival and departure runway lengths are provided below:

Near-term Alternative	Runway length (feet)	
	Departure	Arrival
1	6,040	6,040
2	7,200	7,200
3	8,500	8,500
4	9,000	9,000
6	***6,040***	***6,040***

Long-Term Alternatives

Figures 5-5 through 5-7 depict long-term Runway 4L-22R development alternatives. Each represents a logical evolution from ~~near-term~~ Alternatives 2 through ~~4~~ ***6***, respectively. In ~~each~~ alternative***s 1-5*** , it was assumed that Runway 22R will be equipped with a nonprecision approach. The Runway 22R arrival threshold would be displaced approximately 1,800 feet to locate the CLUP approach zone within 700 feet of the Airport property line along the extended runway centerline. Additionally, a



LEGEND

- Airport boundary
- Near-term airfield pavement
- Proposed RPZ
- Proposed CLUP Arrival/Departure Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

N

700 0 700 1,400

Graphic Scale in Feet

SMF595 F-0003.fh8

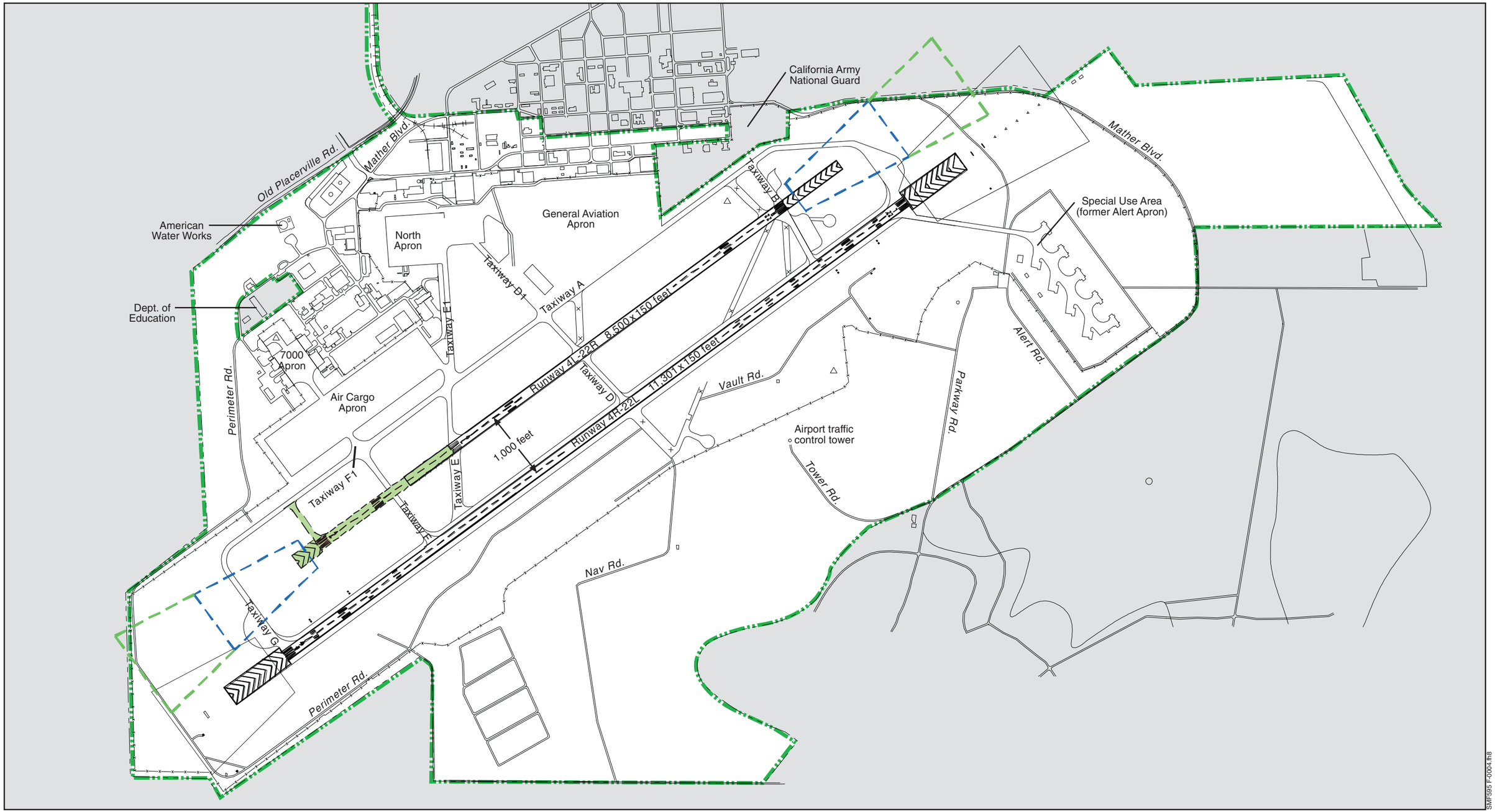
Figure 5-2

ALTERNATIVE 2 (NEAR-TERM)
7,200-FOOT VISUAL RUNWAY 22R

Mather Airport Master Plan

December 2003

LEIGH FISHER ASSOCIATES



SMF595 F-0004.fh8

LEGEND

- Airport boundary
- Near-term airfield pavement
- Proposed RPZ
- Proposed CLUP Arrival/Departure Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

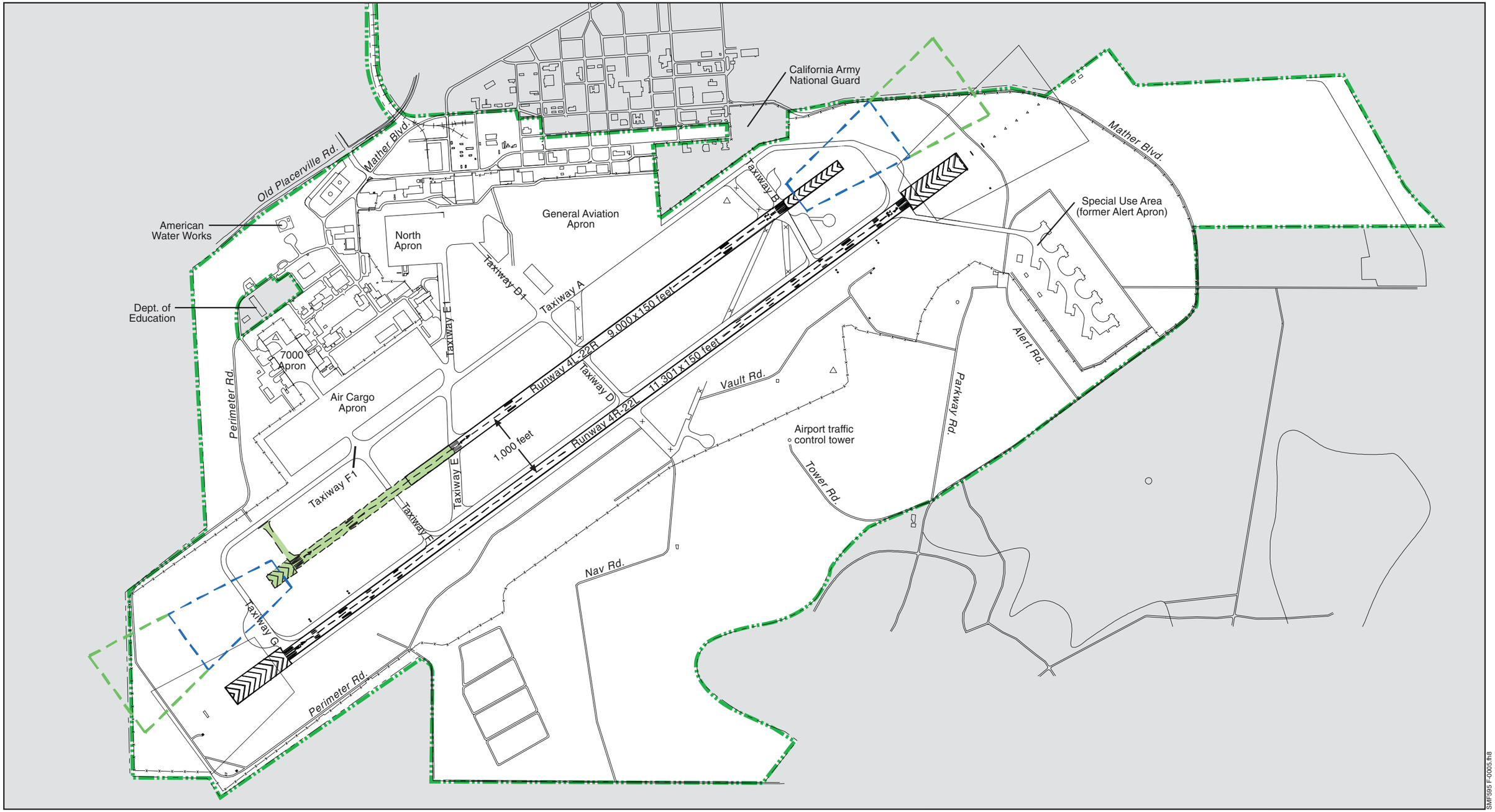
N

700 0 700 1,400

Graphic Scale in Feet

Figure 5-3
ALTERNATIVE 3 (NEAR-TERM)
8,500-FOOT VISUAL RUNWAY 22R
Mather Airport Master Plan
December 2003

LEIGH FISHER ASSOCIATES



SMF595 F-0005.fh8

LEGEND

- Airport boundary
- Near-term airfield pavement
- Proposed RPZ
- Proposed CLUP Arrival/Departure Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

N

700 0 700 1,400

Graphic Scale in Feet

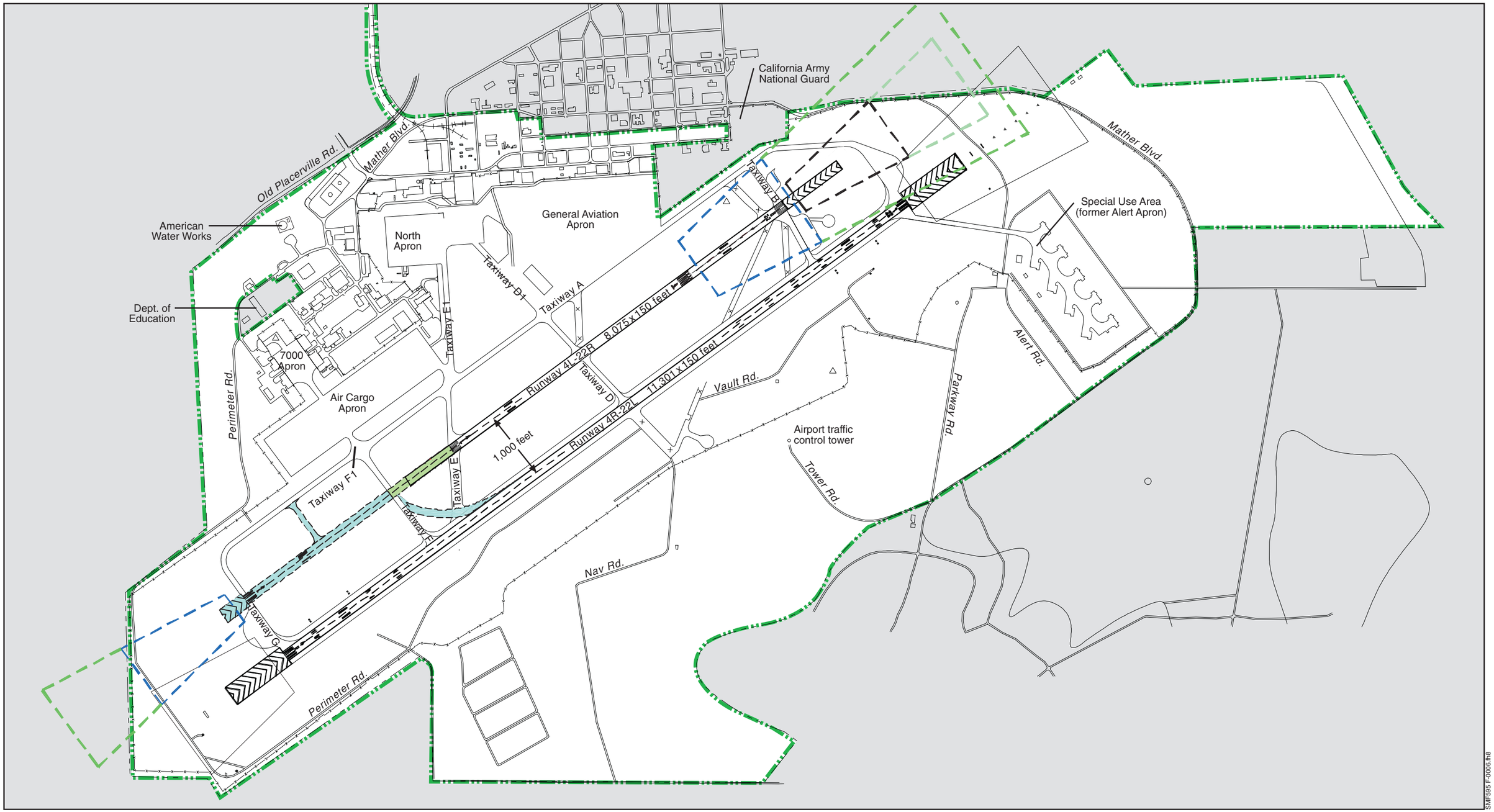
Figure 5-4

ALTERNATIVE 4 (NEAR-TERM)
9,000-FOOT VISUAL RUNWAY 22R

Mather Airport Master Plan

December 2003

LEIGH FISHER ASSOCIATES



LEGEND

- Airport boundary
- Near-term airfield pavement
- Long-term airfield pavement
- Proposed Arrival RPZ
- Proposed Departure RPZ
- Proposed Arrival CLUP Zone
- Proposed Departure CLUP Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

Note: Runway 22R departure length would be 9,850 feet with FAA approval of declared distances.

N

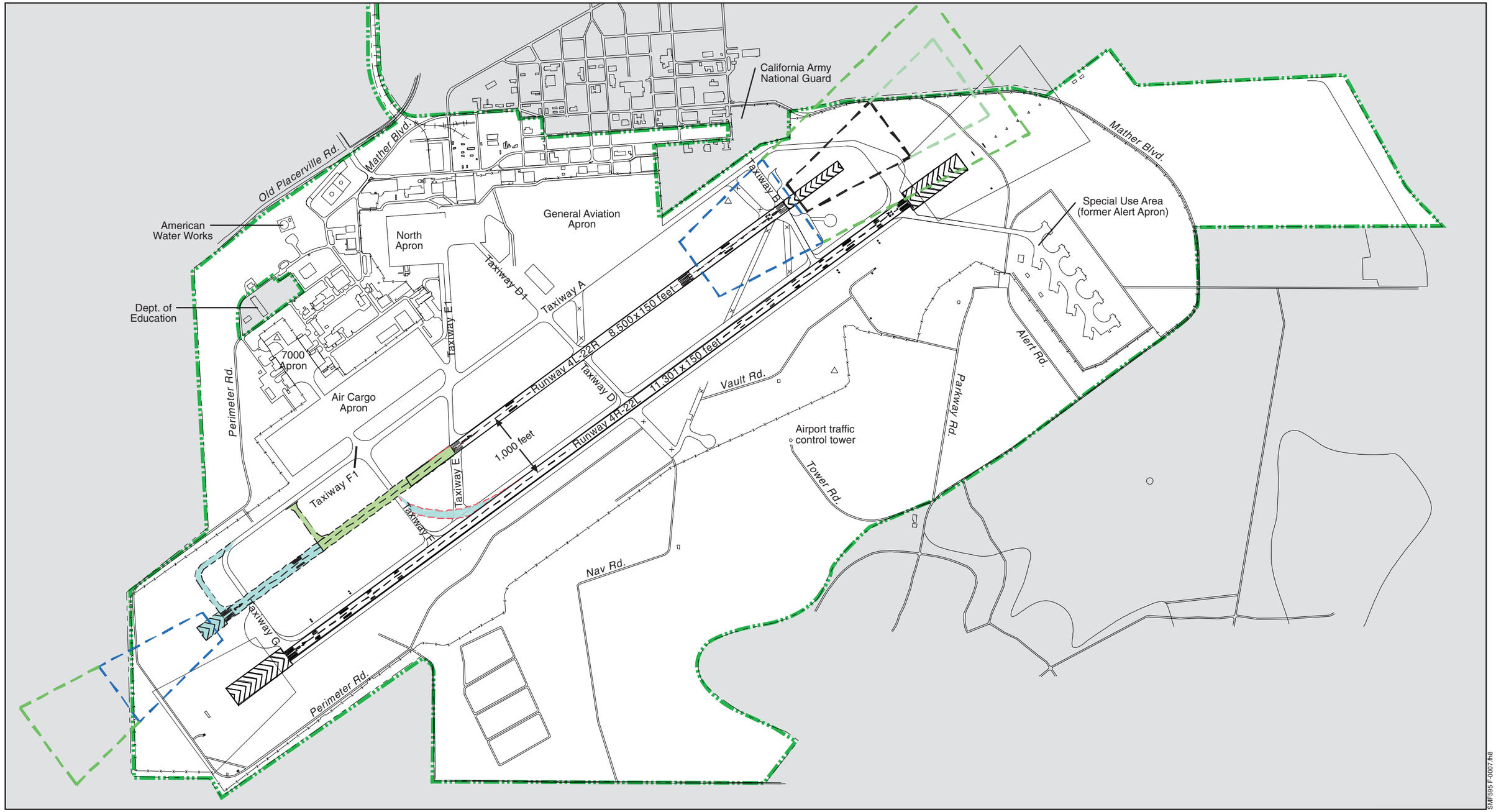
700 0 700 1,400

Graphic Scale in Feet

Figure 5-5
ALTERNATIVE 2 (LONG-TERM)
8,075-FOOT NONPRECISION RUNWAY 22R
Mather Airport Master Plan
December 2003

LEIGH FISHER ASSOCIATES

SMF595 F-0006.fh8



LEGEND

- Airport boundary
- Near-term airfield pavement
- Long-term airfield pavement
- Proposed Arrival RPZ
- Proposed Departure RPZ
- Proposed Arrival CLUP Zone
- Proposed Departure CLUP Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

Note: Runway 22R departure length would be 10,275 feet with FAA approval of declared distances.

N

700 0 700 1,400

Graphic Scale in Feet

SMF595 F-0007.fh8

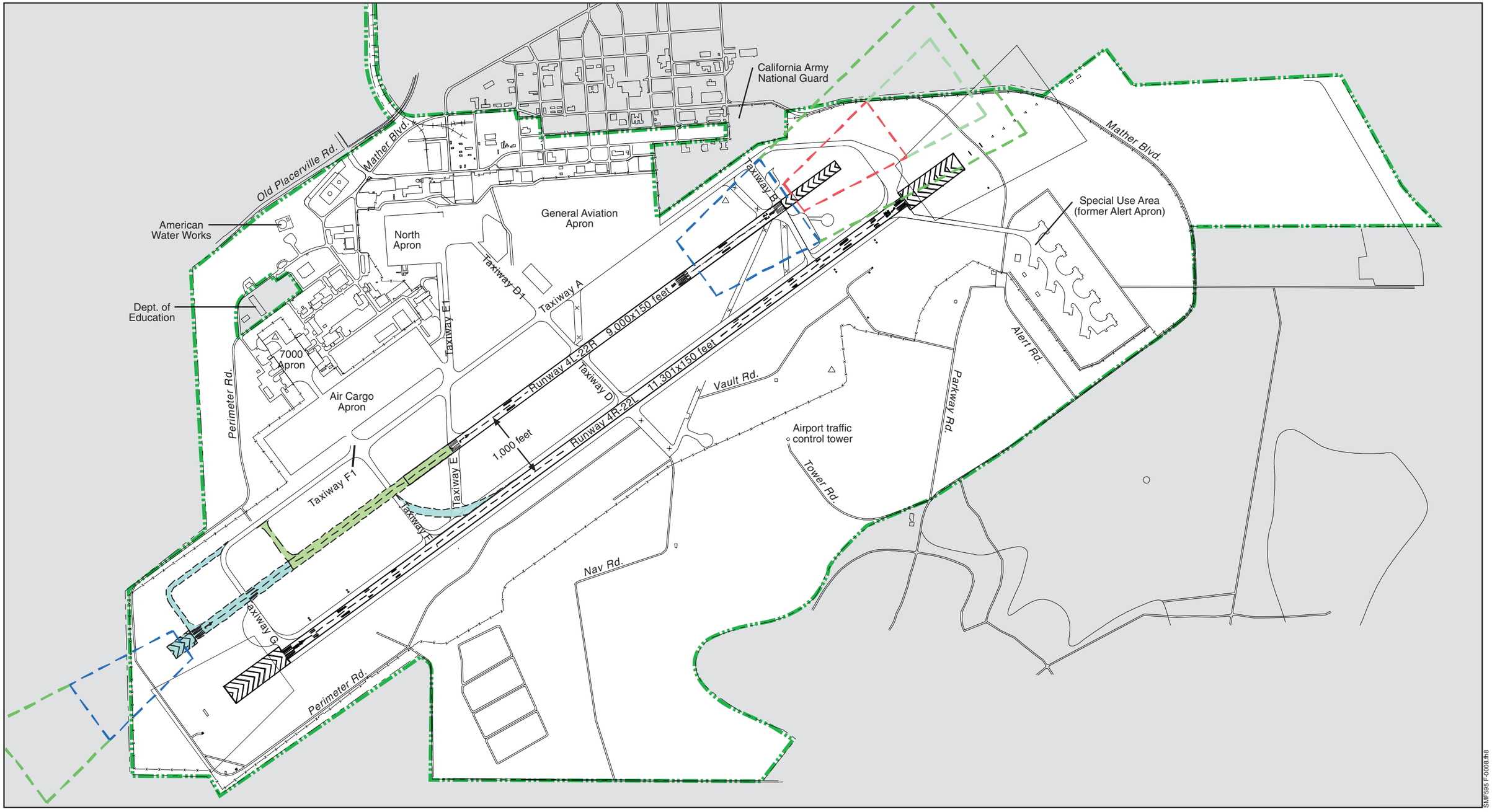
Figure 5-6

ALTERNATIVE 3 (LONG-TERM)
8,500-FOOT NONPRECISION RUNWAY 22R

Mather Airport Master Plan

December 2003

LEIGH FISHER ASSOCIATES



LEGEND

- Airport boundary
- Near-term airfield pavement
- Long-term airfield pavement
- Proposed Arrival RPZ
- Proposed Departure RPZ
- Proposed Arrival CLUP Zone
- Proposed Departure CLUP Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

Note: Runway 22R departure length would be 10,915 feet with FAA approval of declared distances.

N

700 0 700 1,400

Graphic Scale in Feet

SMF595 F-0008.fh8

Figure 5-7
ALTERNATIVE 4 (LONG-TERM)
9,000-FOOT NONPRECISION RUNWAY 22R
Mather Airport Master Plan
October 2003

LEIGH FISHER ASSOCIATES

PETER A McCUEN BLVD
MATHER BLVD
CALIFORNIA ARMY NATIONAL GUARD
OLD PLACERVILLE ROAD
AMERICAN WATER WORKS
GENERAL AVIATION APRON
NORTH APRON
Taxiway B
Taxiway A1
MATHER BLVD
SPECIAL USE AREA (former Alert Apron)
Taxiway Z
DOUGLAS RD
Taxiway A
Taxiway D1
Taxiway E1
RUNWAY 4L-22R - 7,178' X 150'
RUNWAY 4R-22L - 11,301' X 150'
DEPT. OF EDUCATION
7000 APRON
PERIMETER ROAD
AIR CARGO APRON
Taxiway D
Taxiway E
1,000 Feet
ALERT ROAD
PARKWAY ROAD
MATHER BLVD
AIRPORT TRAFFIC CONTROL TOWER
TOWER ROAD
Taxiway A
Taxiway F
Taxiway G
PERIMETER ROAD

SACRAMENTO COUNTY AIRPORT SYSTEM

LEGEND

- Airport Boundary
- Near-Term Airfield Grading
- ILS Improvement
- Proposed RPZ
- Proposed CLUP Arrival/Departure Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

N

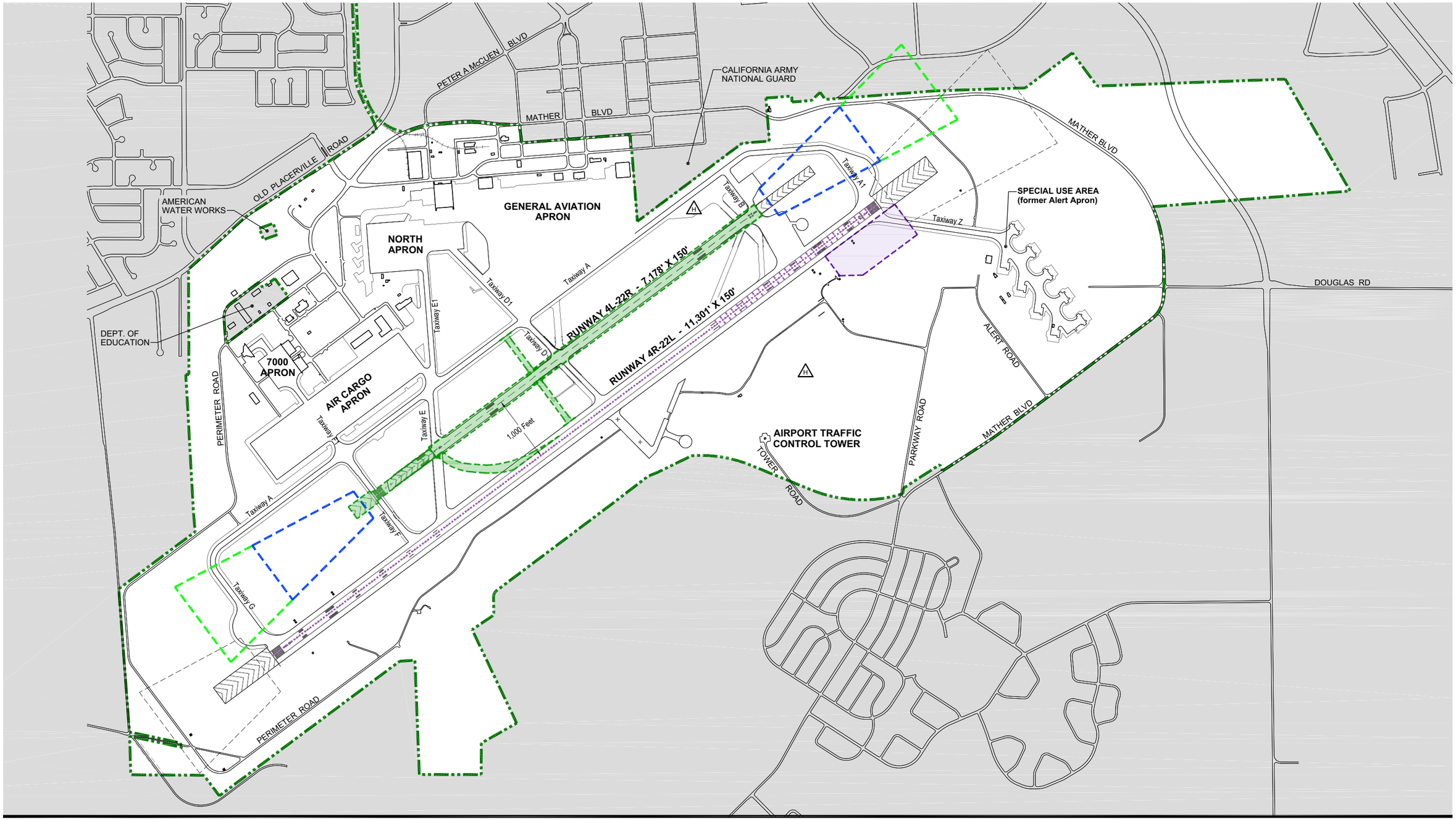
0 700' 1,400'
GRAPHIC SCALE IN FEET

File: Fig 5-8a - Alt 6 Near Term.dwg [Tab: Figure 5-8A]

Figure 5-8A

ALTERNATIVE 6 (NEAR-TERM) AIRSIDE

Mather Airport Master Plan
April 2013



LEGEND

- Airport Boundary
- Near-Term Airfield Grading
- Long-Term Airfield Pavement
- ILS Improvement
- Proposed RPZ
- Proposed CLUP Arrival/Departure Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

N

0 700' 1,400'

GRAPHIC SCALE IN FEET

Figure 5-8B

ALTERNATIVE 6 (LONG-TERM) AIRSIDE

Mather Airport Master Plan
April 2013

File: Fig 5-8b - Alt 6 Long Term.dwg (Tab: Figure 5-8B)

high-speed exit taxiway located 7,000 feet from the Runway 22L landing threshold is included on ~~all~~ long-term alternatives ***2-4, in Alternative 6 the high-speed exit taxiway is 6,500 feet from the Runway 22L landing threshold,*** to increase aircraft operating efficiency.

- **Alternative 2 (Long-Term) – 8,075-*Foot Nonprecision Runway 22R.*** Extend near-term Alternative 2 Runway 22R by 2,650 feet to Taxiway G.

- **Alternative 3 (Long-Term) – 8,500-*Foot Nonprecision Runway 22R.*** Extend near-term Alternative 3 Runway 22R by 1,800 feet and construct a new connector taxiway west of Taxiway G.

- **Alternative 4 (Long-Term) – 9,000-*Foot Nonprecision Runway 22R.*** Extend near-term Alternative 4 Runway 22R by 1,800 feet and construct a new connector taxiway west of existing Taxiway G.

- ***Alternative 6 (Long-Term) – 7,178-Foot Nonprecision Runway 22R. Extend Runway 22R by 1,098 feet and replace Taxiway D with a new taxiway to the west.***

  On June 12, 2009, the Federal Aviation Administration (FAA) issued a letter to the Sacramento County Airport System clarifying that FAA would only support the recommended design requirements for Airport Reference Code (ARC) D-IV standards for application on Runway 4L-22R. This changed the requirement for 35-foot runway shoulders to 25 feet. For purposes of the master plan this requirement is considered in Alternative 6, only. No re-analysis for this factor is necessary or impactful to alternatives 1 through 4.

2013 UPDATE: Alternatives 2-4 were not adjusted to reflect the new D-IV standards for Runway 4L-22R.

Arrival and departure runway lengths are presented below. Numbers in parentheses indicate potential departure runway lengths if the FAA were to approve the use of declared distances.

Long-term Alternative	Runway length (feet)	
	Arrival	Departure
2	8,075	8,075 (9,850)
3	8,500	8,500 (10,275)
4	9,000	9,000 (10,915)
6	***7,178***	***7,178***

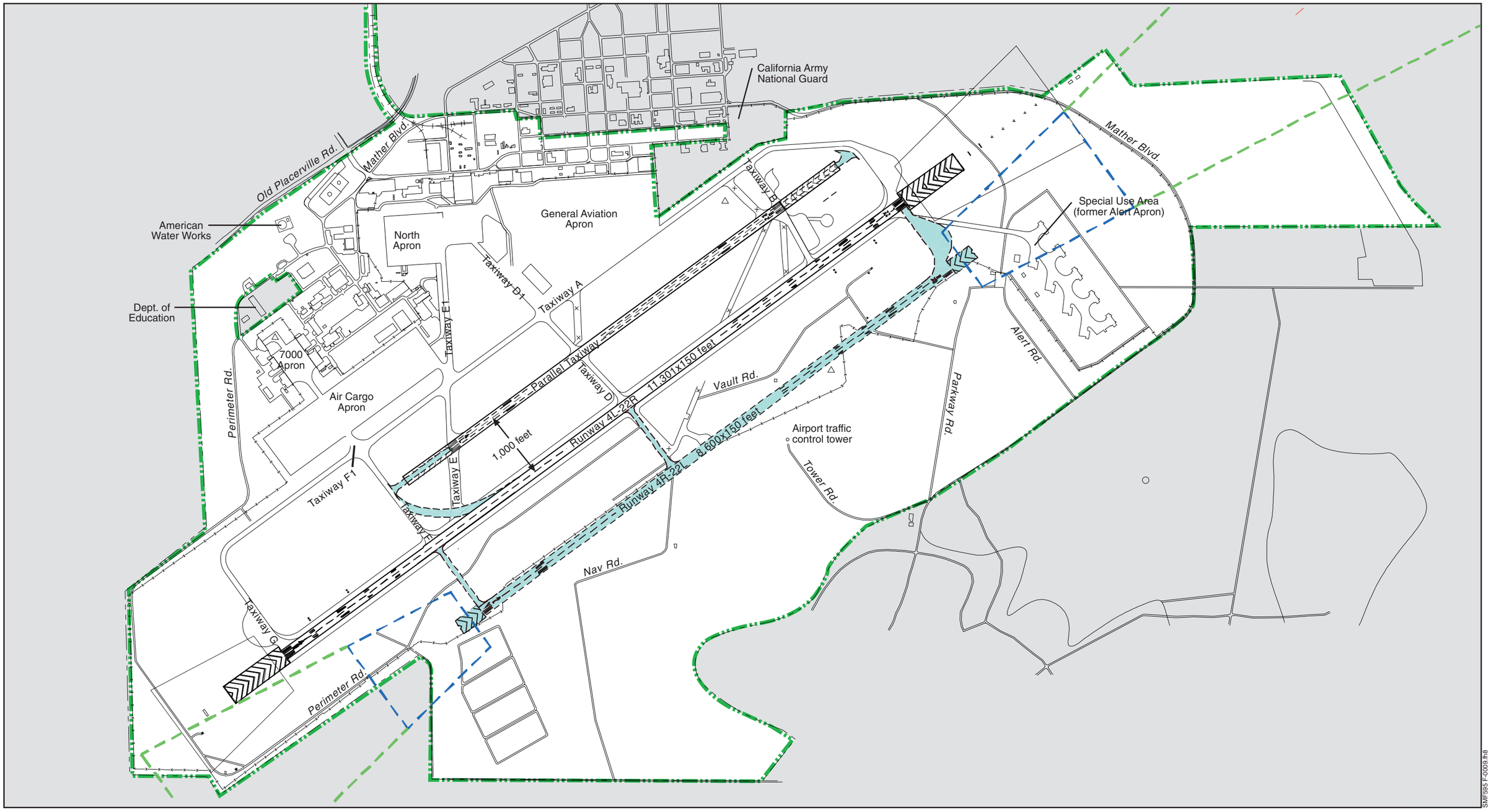
~~Similar to near-term alternatives, each~~ Each long-term alternative includes a 400-foot-long blast pad at the Runway 4L end, and ~~35~~ ***25***-foot-wide paved shoulders

along the entire runway length. ***Extension and improvement of Runway 4L-22R has potential to impact wetlands in the area. These impacts were not originally recognized in developing the original alternative. Alternative 6, a 1,098 foot extension of Runway 22R, minimizes impacts to wetlands in the vicinity when compared to the other alternatives. The Runway Safety Area (RSA) of Alternative 6 impacts several wetlands and vernal pool areas. To avoid or reduce impacts, the grading of the RSA would be limited to only those areas with longitudinal slope greater than 5 percent (per FAA design guidance). Additionally, the paved blast pad would be eliminated to further reduce wetland impacts. This approach has been vetted by the FAA.***

NEW RUNWAY 4R-22L ALTERNATIVE *(ALTERNATIVE 5)*

Figure 5-8 depicts a long-term runway development alternative that includes construction of an 8,600-foot-long by 150-foot-wide outboard Runway 4R-22L located 1,200 feet south of existing primary Runway 4R-22L (***to be*** renamed Runway 4L-22R). Other characteristics include the following:

- FAR Part 77 precision approach protection provided on Runway 22L, and nonprecision approach protection provided on Runway 4R
- Connector taxiways provided at both runway ends and the approximate midpoint
- Runway 4L-22R converted to a parallel taxiway; taxiways would be extended to connect converted Runway 4L-22R to Taxiway F and Taxiway A
- High-speed exit taxiway on Runway 22R



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LEGEND

- Airport boundary
- Long-term airfield pavement
- Proposed Arrival RPZ
- Proposed Arrival/Departure CLUP Zone
- Runway 4R-22L RPZ

CLUP = Comprehensive Land Use Plan
RPZ = Runway Protection Zone

N

700 0 700 1,400

Graphic Scale in Feet

Figure 5-8

ALTERNATIVE 5 (LONG-TERM)
8,600-FOOT PRECISION RUNWAY4R-22L

Mather Airport Master Plan

December 2003

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The 1,200-foot spacing between the parallel runways would accommodate a Group VI taxiway between the runways and allow simultaneous approaches during VMC. The pros and cons associated with alternative parallel runway separations are presented in Table 5-1.

2013 UPDATE: Final transfer of the Mather property from the U.S. Air Force did not include the preserve area south of the airfield, due in part to its high quality vernal pool habitat. The removal of this area from Mather Airport makes Alternative 5 permanently no longer viable.

EVALUATION OF ALTERNATIVES

Each airfield alternative was assessed with regard to potential off-Airport land use impacts, accommodation of the future fleet mix, generalized cost, and additional land acquisition ***and recognized environmental factors***.

Land Use Planning and Policy

The effects of each airfield alternative on planned land uses in the Airport environs were analyzed based on established land use planning policy and guidelines.

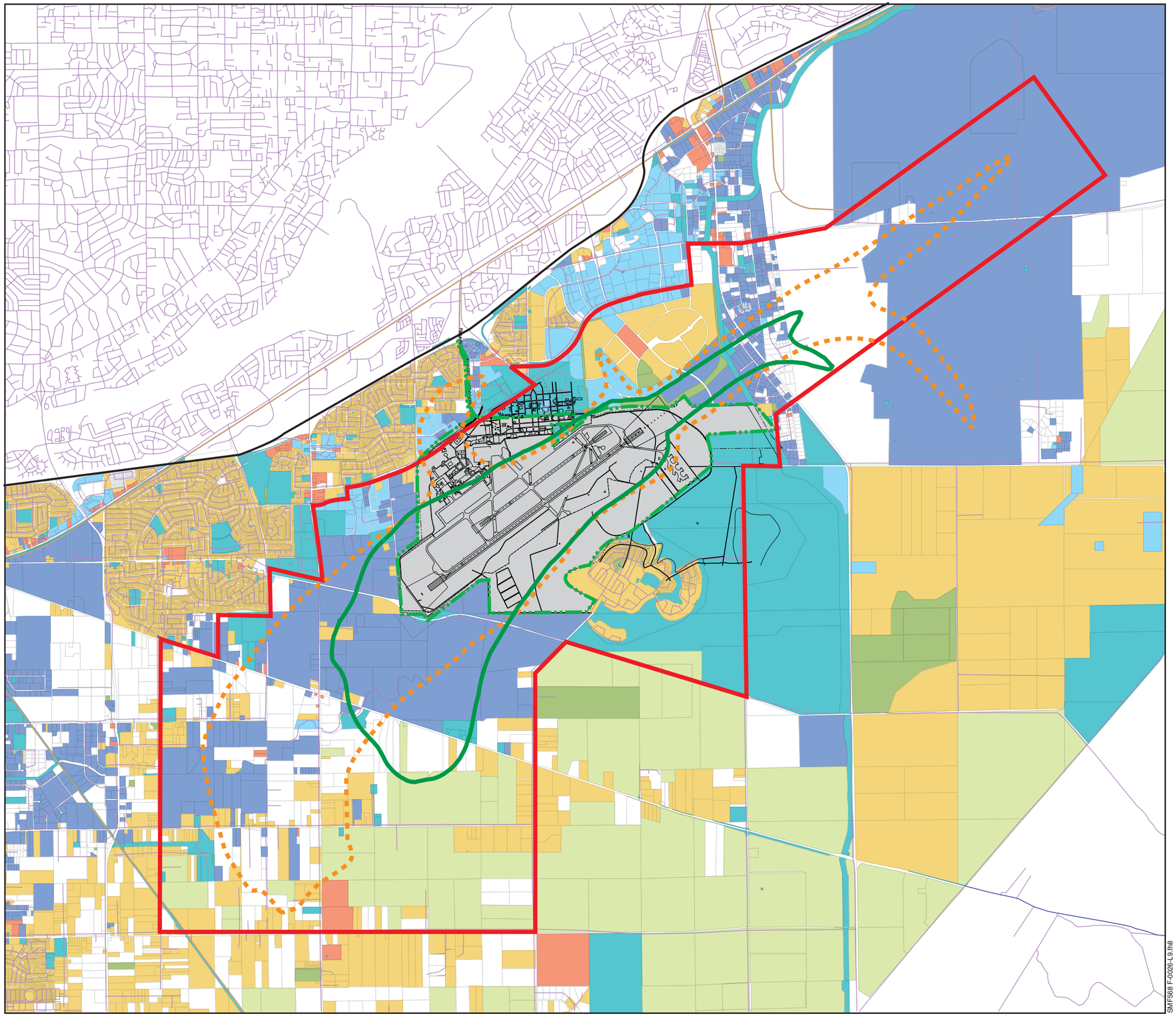
Figures 5-1 through 5-8 include the FAA-defined departure and arrival RPZs and CLUP approach and departure zones for Alternatives 1 through ~~5~~6. The RPZs for planned/proposed runways in each near-term alternative are located on-Airport property. The Runway 4L (or 4R) arrival RPZ slightly extends off Airport property in each long-term alternative. It was assumed that Sacramento County would acquire off-Airport property beneath the RPZ.

The dimensions of CLUP approach and departure zones are defined based on the dimensions of RPZs and associated FAR Part 77 approach surfaces. In general, land uses within CLUP zones are restricted to industrial, agricultural, and mining. None of the CLUP zones associated with Alternatives 1 through ~~5~~6 would affect off-Airport areas planned for residential, commercial, and/or office use (see Figure 2-1).

Aircraft Noise

Noise exposure contours for Alternatives 1 through 5 were developed based on forecast operations in PALs 1 and 2 as presented on Figures 5-9 and 5-10, respectively. The assumptions and data used to analyze aircraft noise are presented in Appendix E. Table 5-2 presents the total area and off-Airport acres that would be exposed to CNEL 60 and higher. Based on Sacramento County policy, noncompatible land uses include residential, office, and public uses exposed to CNEL 60 and higher.

In PAL 1, the total off-Airport area exposed to CNEL 60 would be similar among the alternatives, and differs by a maximum of 20 acres between Alternatives 1-5 ~~and 4~~. In PAL 2, the total off-Airport area exposed to CNEL 60 differs by a maximum of 14 acres between Alternatives 1-5 ~~and 4~~. Alternative 5 would result in the largest off-Airport area exposed to CNEL 60.



LEGEND

CNEL 60 noise exposure area

- Alternative 1 through 4
- Mather CLUP
- Mather Airport Policy Area
- Airport boundary

Generalized land uses (2005)

- Airport
- Residential
- Commercial
- Office
- Industrial
- Public
- Agricultural
- Open space

CLUP = Comprehensive Land Use Plan
CNEL = Community Noise Equivalent Level

Note: Land use information not obtained for areas north of U.S. Highway 50.

Activity on runway 4L-22R on PAL 1 not substantial enough to generate signficant differences in noise exposure among alternatives 1 through 4.

Sources: Base map ~~L~~eigh Fisher Associates, June 2001, based on U.S. Department of Commerce, Bureau of the Census Tiger files.

Noise contours ~~L~~eigh Fisher Associates, May 2002. Based on analyses using the FAA's Integrated Noise Model, Version 6.0.

Generalized land uses ~~E~~conomic & Planning Systems, Inc., based on data provided by Sacramento County, June 2001.

Mather CLUP noise exposure area ~~A~~irport Land Use Commission for Sacramento, Sutter, Yolo, and Yuba Counties, May 1997.

Villages of Zinfandel land use ~~D~~raft Supplemental Environmental Impact Report, *Villages of Zinfandel*, Sacramento County, October 2001.

N

2,500 0 2,500 5,000

Graphic Scale in Feet

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Figure 5-9
PAL 1 NOISE EXPOSURE
Mather Airport Master Plan
December 2003

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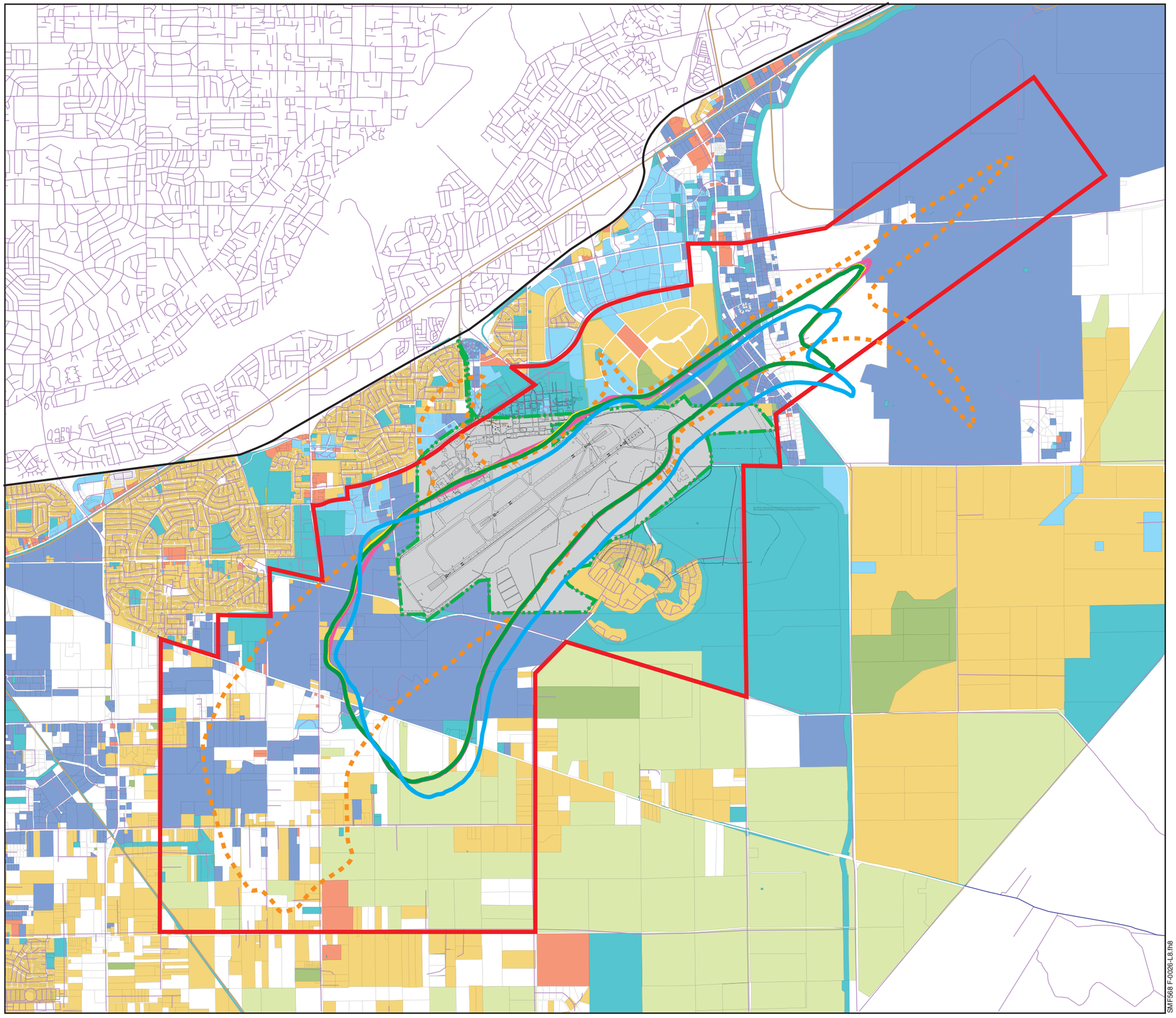

LEGEND

CNEL 60 noise exposure area

- Alternative 1
- Alternative 2
- Alternative 3
- Alternative 4
- Alternative 5
- Mather CLUP
- Mather Airport Policy Area
- Airport boundary

Generalized land uses (2005)

- Airport
- Residential
- Commercial
- Office
- Industrial
- Public
- Agricultural
- Open space

CLUP = Comprehensive Land Use Plan
CNEL = Community Noise Equivalent Level

Note: Land use information not obtained for areas north of U.S. Highway 50.

Sources: Base map ~~L~~eigh Fisher Associates, June 2001, based on U.S. Department of Commerce, Bureau of the Census Tiger files.

Noise contours ~~L~~eigh Fisher Associates, May 2002. Based on analyses using the FAA's Integrated Noise Model, Version 6.0.

Generalized land uses ~~E~~conomic & Planning Systems, Inc., based on data provided by Sacramento County, June 2001.

Mather CLUP noise exposure area ~~A~~irport Land Use Commission for Sacramento, Sutter, Yolo, and Yuba Counties, May 1997.

Villages of Zinfandel land use ~~D~~raft Supplemental Environmental Impact Report, *Villages of Zinfandel*, Sacramento County, October 2001.

N

2,500 0 2,500 5,000

Graphic Scale in Feet

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Figure 5-10
PAL 2 NOISE EXPOSURE
Mather Airport Master Plan
December 2003

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Table 5-2

NOISE EXPOSURE SUMMARY—AREA EXPOSED TO CNEL 60 AND HIGHER
Mather Airport

	Acres	
	Total area	Off-Airport
PAL 1		
Alternative 1 - Basic Upgrade	3,502	1,849
Alternative 2 - 7,200 Visual	3,505	1,851
Alternative 3 - 8,500 Visual	3,504	1,851
Alternative 4 - 9,000 Visual	3,520	1,869
Alternative 5 - South Runway	n.a.	n.a.
Alternative 6 – No Action	***n.a.***	***n.a***
PAL 2		
Alternative 1 - Basic Upgrade	3,795	2,079
Alternative 2 - 8,000 Nonprecision	3,812	2,100
Alternative 3 - 8,500 Nonprecision	3,811	2,100
Alternative 4 - 9,000 Nonprecision	3,802	2,093
Alternative 5 - South Runway	4,123	2,215
Alternative 6 – 7,178 Visual*		

n.a. = not applicable.

= analysis will be conduct in the DEIR process.

Source: Leigh Fisher Associates, May 2002.

2013 Update: Noise analysis will be updated as part of the DEIR process and incorporated into the final Master Plan.

Accommodation of Fleet Mix

Detailed information regarding runway length requirements is provide in Appendix D. Table 5-3 summarizes the percentage of the fleet mix in PALs 1 and 2 that would be accommodated with each airfield alternative.

Table 5-3

ACCOMMODATION OF FUTURE FLEET MIX
Mather Airport

		Departures		
	Arrivals *(a)*	90% MTOW	95% MTOW	100% MTOW
PAL 1				
Alternative 1 - Basic Upgrade	68%	62%	12%	0%
Alternative 2 - 7,200 Visual	87	85	70	50
Alternative 3 - 8,500 Visual	99	94	88	65
Alternative 4 - 9,000 Visual	99	99	90	67
Alternative 5 - South Runway	n.a.	n.a.	n.a.	n.a.
Alternative 6 – No Action	***n.a.***	***n.a.***	***n.a.***	***n.a.***
PAL 2				
Alternative 1 - Basic Upgrade	70%	70%	8%	0%
Alternative 2 - 8,000 Nonprecision	98	96	80	70
Alternative 3 - 8,500 Nonprecision	98	98	92	70
Alternative 4 - 9,000 Nonprecision	98	98	94	70
Alternative 5 - South Runway	98	98	92	70
Alternative 6 – 7,178 Nonprecision*				

MTOW = Maximum takeoff weight
n.a. = not applicable.
*** analysis will be conducted in the DEIR.***

(a) Assuming wet runway conditions.

Source: Leigh Fisher Associates, May 2002.

Development Costs

~~General order-of-magnitude cost estimates for Alternatives 1 through 5 6 are presented in Table 5-4. Cost estimates include construction for airfield facilities (e.g., runways, connector taxiways), land acquisition, and mitigation of environmental impacts.~~

2013 UPDATE: Significant changes in design and scope of the proposed projects for airfield facilities have taken place since this Plan was originally drafted. As presented in Alternative 6 and recommended in Chapter 7, the recommended length of Runway 22R is now 7,178 feet, and design group IV requirements. The cost estimates originally prepaid for the master plan are now over ten years old and can no longer be considered valid. Given these factors, the cost estimates for Alternatives 1-6 were not recalculated. Chapter 8 presents the cost estimates for the projects in Alternative 6.

Table 5-4

AIRFIELD ALTERNATIVE DEVELOPMENT COSTS
Mather Airport
(in millions of dollars)

	Airfield development *(a)*		Land acquisition *(b)*	Environmental mitigation *(c)*	Total	
	Asphalt	Concrete			Asphalt	Concrete
PAL 1						
Alternative 1 - Basic Upgrade	$ 3.9	$ 3.9	$ --	$ --	$ 3.9	$ 3.9
Alternative 2 - 7,200 Visual	13.3	16.8	--	3.3	16.6	20.1
Alternative 3 - 8,500 Visual	22.5	29.5	0.1	5.5	28.1	35.0
Alternative 4 - 9,000 Visual	25.2	33.1	0.4	6.2	31.7	39.7
Alternative 5 - South Runway	--	--	--	--	--	--
Alternative 6 – No Action	***--***	***--***	***--***	***--***	***--***	***--***
PAL 2						
Alternative 1 - Basic Upgrade	$ --	$ --	$ --	$ --	$ --	$ --
Alternative 2 - 8,075 Nonprecision	34.3	39.9	0.8	4.3	39.4	45.0
Alternative 3 - 8,500 Nonprecision	34.5	40.3	0.9	3.4	38.8	44.6
Alternative 4 - 9,000 Nonprecision	35.8	42.1	0.9	3.5	40.1	46.5
Alternative 5 - South Runway	93.2	122.4	3.0	70.0	166.2	195.4
Alternative 6 – 7,178 Visual	***13.3***	***16.8***	***--***	***--***	***13.3***	***16.8***
Total Cost *(d)*						
Alternative 1	$ 3.9	$ 3.9	$ --	$ --	$ 3.9	$ 3.9
Alternative 2	47.5	56.8	0.8	7.6	55.9	65.2
Alternative 3	57.0	69.8	1.0	8.9	66.9	79.7
Alternative 4	61.0	75.2	1.2	9.7	71.9	86.1
Alternative 5	93.2	122.4	3.0	70.0	166.2	195.4
Alternative 6	***13.3***	***16.8***	***--***	***--***	***13.3***	***16.8***

(a) Assuming existing Runway 4L-22R pavement will be sufficient to accommodate PAL 1 fleet mix as a backup runway. Alternatives 2, 3, and 4 in PAL 2 include pavement upgrades. Includes 10% design contingency to allow for work unknown at this time. Excludes the following: legal and accounting fees; design, engineering, and consultant fees; plan check; building permit fees; testing and inspections; fire and risk insurance; and removal of unforeseen underground obstructions.

(b) Assuming Sacramento County will acquire off-Airport areas located beneath the runway protection zones and will consider acquiring areas located beneath the Comprehensive Land Use Plan approach/departure surfaces on west side of the Airport.

(c) Includes cost to mitigate impacts to vernal pools and endangered species. Alternative 5 includes cost to mitigate hazardous materials.

(d) Sum of PAL 1 and PAL 2 improvements.

Sources: Airfield development costs - Hanscomb Inc., May 2002.
Land acquisition costs - The Hoyt Company, May 2002.
Environmental mitigation - Sacramento County Airport System, based on data provided by Sacramento County Department of Environmental Review and Assessment, May 2002.

Summary of Key Issues

The following conclusions are based on the data and analyses presented in the preceding sections:

- ~~Differences in off-Airport areas exposed to CNEL 60 and higher among Alternatives 1 through 4 *and 6,* are minor, reflecting the limited use of backup Runway 4L-22R. The additional off-Airport areas exposed to CNEL 60 and higher in Alternative 5 are based on the assumption that new Runway 4R-22L would be used by the full-range of aircraft in the future fleet mix as a regular (not backup) runway.~~

- ~~An 8,500-foot runway would accommodate approximately 94% of departures at 90% MTOW in 2006, and 98% of departures at 90% MTOW in 2021. Additional benefits provided by extending Runway 4L-22R beyond 8,500 feet would be minimal.~~

- ~~The cost for near-term alternatives, which ranges from $3.9 million (Alternative 1) to $39.7 million (Alternative 4, concrete), is within the range of the County's estimated funding capacity for Mather presented in Chapter 2.~~

- ~~The additional cost to provide nonprecision approach capabilities on Runway 4L-22R, reflected in the long-term alternatives, is excessive given the relatively minimal benefit provided by such instrumentation.~~

- ***Category IIIb Instrument Landing System (ILS) is required on Runway 4R-22L to reduce the frequency of diverted flights during inclement weather and reduce the cost associated with these diversions for existing tenants.***

- ***The extension of Runway 4L-22R to 7,178 feet will allow for continuous operations in event of the closure of Runway 4R-22L.***

COORDINATION AMONG STAKEHOLDERS AND THE PUBLIC

Airfield alternatives, background data, and evaluation results were presented to a project focus group, the Mather Master Plan Working Group, and the general public at two public information workshops, and to the Sacramento County Board of Supervisors during an August 7, 2002, workshop.

2013 UPDATE: On December 9, 2003 the Board was presented the Draft Final Master Plan with the staff recommendation to transmit the Draft Final Master

Plan to the Department of Environmental Review and Assessment (DERA) with the direction to undertake environmental review pursuant to the requirements of the California Environmental Quality Act (CEQA). The Board approved this recommendation on February 17, 2004 after briefings were presented to the following jurisdictions:

- *Folsom City Council on January 13, 2004*
- *El Dorado County Board of Supervisors January 27, 2004*
- *Rancho Cordova City Council on February 2, 3004*

Per the direction of the Board, a Draft Environmental Impact Report (DEIR) was prepared and circulated in July 2012. Comments received on the DEIR necessitated the need to update the Master Plan forecast, project description, and associated environmental review. The updates to this Master Plan address current conditions and respond to comments received during the DEIR process. These changes and updated documents will be presented to the Board on May 21st, 2013. In April and May 2013, Representatives of the Cities of Folsom and Rancho Cordova as well as El Dorado County were briefed on the updated plan. Subsequent to the Board update, DERA will issue a new Notice to Preparation (NOP) and a new DEIR will be prepared and circulated.

Chapter 6*

LANDSIDE, ACCESS, AND CIRCULATION ALTERNATIVES

Landside, access, and circulation alternatives in this Master Plan were developed with the intent of (1) providing facilities to accommodate future aviation demand and the requirements summarized in Chapter 4, (2) foster the orderly and systematic development of the Airport with distinct and logical separations between aviation and nonaviation uses, ~~and~~ (3) enhance Mather's ability to accommodate air cargo and general aviation uses, while preserving the Airport's ~~potential~~ ***capacity*** to serve ~~as a~~ ***future*** regional air cargo ~~hub if demand warrants such development in the future~~ ***and general aviation growth, and (4) increase safety for existing conditions as well as future improvements.***

Current aviation-related land uses at Mather exceed future requirements, ***but the existing facilities do not***. Therefore, particular emphasis for landside alternatives is on maximizing space for commercial/
industrial and other nonaviation development that could generate additional revenue ~~for Sacramento County~~. ***Maximizing opportunities to consolidate the aviation-related land uses near the flightline will reduce maintenance costs and also optimize the efficiency of airfield operations while providing additional opportunities for landside development.***

PLANNING OBJECTIVES AND GUIDELINES

The following planning objectives and guidelines were identified with the assistance of Airport tenants and County staff to guide the development of landside components.

Air Cargo Facilities

- Maximize previous infrastructure investments (County and private).
- Ensure that future facilities are appropriately sized and configured to accommodate forecast air cargo volumes, vehicular parking, cargo containers, and GSE staging areas.
- Locate truck parking and staging areas to not hinder vehicle circulation or apron access.

*Prepared Spring 2003 ***and updated in early 2013***.

General Aviation/Air Taxi

- ~~Provide distinct and functional separations~~ Allow flexibility to meet the current and future tenant needs with respect to between aircraft storage facilities, maintenance and support facilities, and passenger (FBO and air taxi) facilities.

- Locate facilities that typically accommodate high-use aircraft, which require FBO services and support facilities, and locate facilities that are self-sustaining ~~away from~~ ***in convenient proximity to*** aircraft movement and operating areas.

- Situate storage, parking, and support facilities to maximize safety and operational efficiency, and minimize construction of security facilities.

- Locate vehicular access and parking facilities to minimize pedestrian walking distances and conflicts between passengers, aircraft, and vehicular flows.

Airport Support

- Co-locate Airport support functions (e.g., administration, operations, airfield maintenance, ~~ARFF~~) in one designated area contiguous and central to the Air Operations Area (AOA). ***The new ARFF location is near the Airport Traffic Control Tower.***

- Prioritize redevelopment of Airport support facilities beginning with those that currently do not meet existing user requirements.

Ground Access and Circulation

- Simplify on-Airport roadway networks to relieve congestion during peak periods, increase effectiveness and efficiency of air cargo ground operations, and provide less confusing roadway networks.

- Establish primary and secondary Airport ingress/egress points.

- Provide routes to air cargo facilities that ***maximize safety and*** minimize turns and intersections.

- Provide adequate Airport roadway capacity, ***connectivity and safety*** by increasing on-Airport roadway ***connections,*** widths and turning radii.

DESCRIPTION OF PROPOSED ALTERNATIVES

The following sections describe ~~two~~ ***three*** landside, access, and circulation alternatives and identify new facility construction or facility upgrades to meet PAL 1 and PAL 2 requirements.

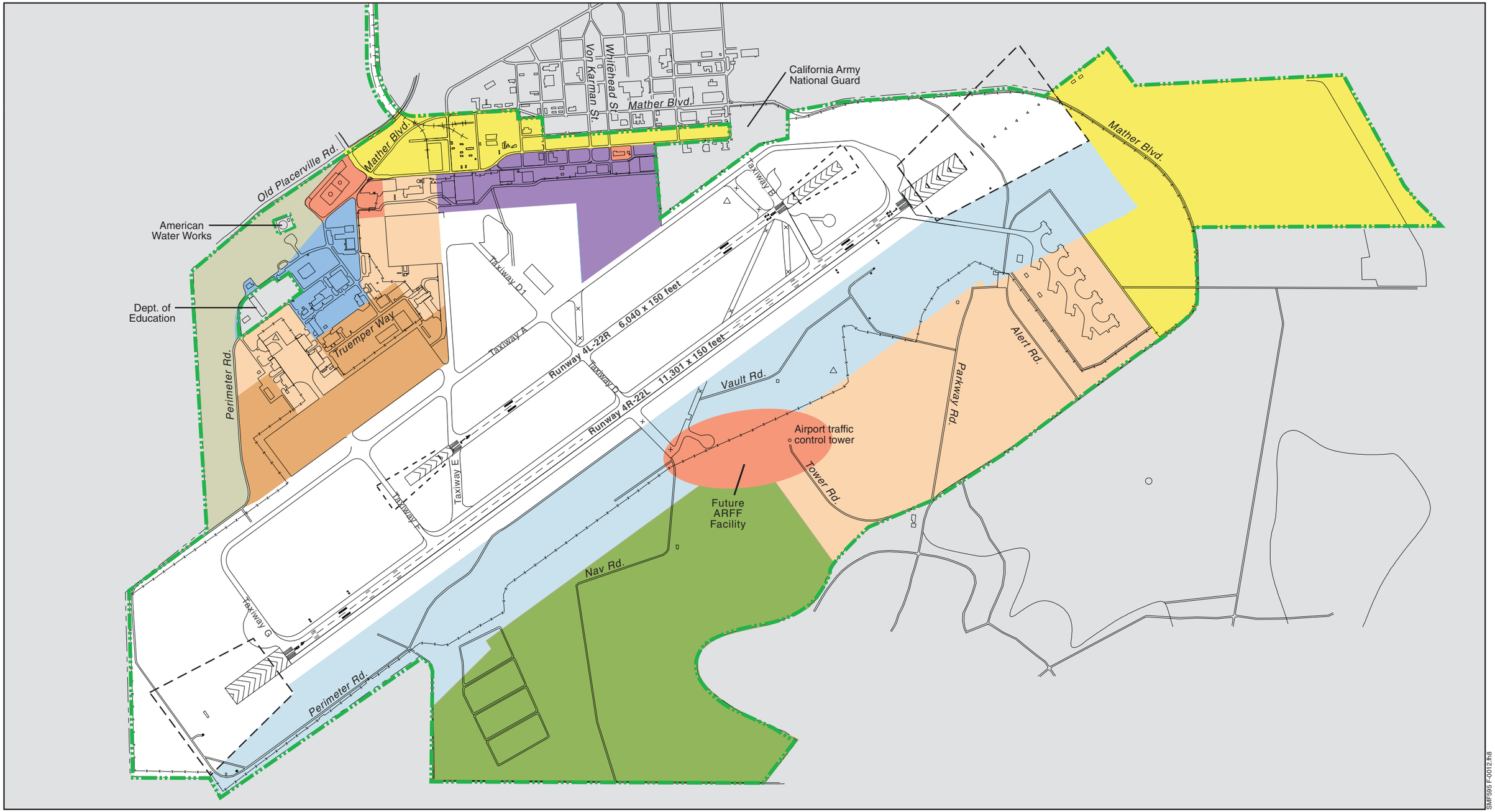
Alternative 1

The long-term land use plan for Mather reflecting Alternative 1 is depicted on Figure 6-1. Figures 6-2 and 6-3 depict more detailed landside development under Alternative 1 in PALs 1 and 2, respectively.

As illustrated, Alternative 1 is characterized by a gradual expansion of areas currently used for air cargo and general aviation, minimum disruption of existing development patterns, and maximizing the use of existing infrastructure and Airport roadways. Air cargo facilities would be developed on the east and west sides of the Air Cargo Apron, and adjacent to the North Apron, forming an L-shaped land use pattern. General aviation facilities would continue to be developed along Superfortress Avenue, maximizing the use of existing hangars and facilities. Airport support uses would be located near the intersection of Mather Boulevard and Macready Avenue and on the south side of the airfield.

Facility requirements necessary to accommodate PAL 1 and PAL 2 demand (see Chapter 4) could be accommodated under Alternative 1. Table 6-1 summarizes the acreage associated with each land use designation in Alternative 1.

2013 UPDATE: The actual acreage of the Airport was redefined during the formal property transfer between the U.S. Air Force and the County. The environmental preserve is no longer a part of the Airport.



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LEGEND

- Air cargo (100 acres)
- General aviation (80 acres)
- Airport support (70 acres)
- Airfield (1,000 acres)
- Airfield reserve (390 acres)
- Reserved aviation development (375 acres)
- Industrial (50 acres)
- Commercial (335 acres)
- Reserved nonaviation development (85 acres)
- Environmental preserve (390 acres)
- Runway Protection Zone
- Airport boundary

N

700 0 700 1,400

Graphic Scale in Feet

Figure 6-1

ALTERNATIVE 1—LONG-TERM AIRPORT LAND USES

Mather Airport Master Plan

December 2003

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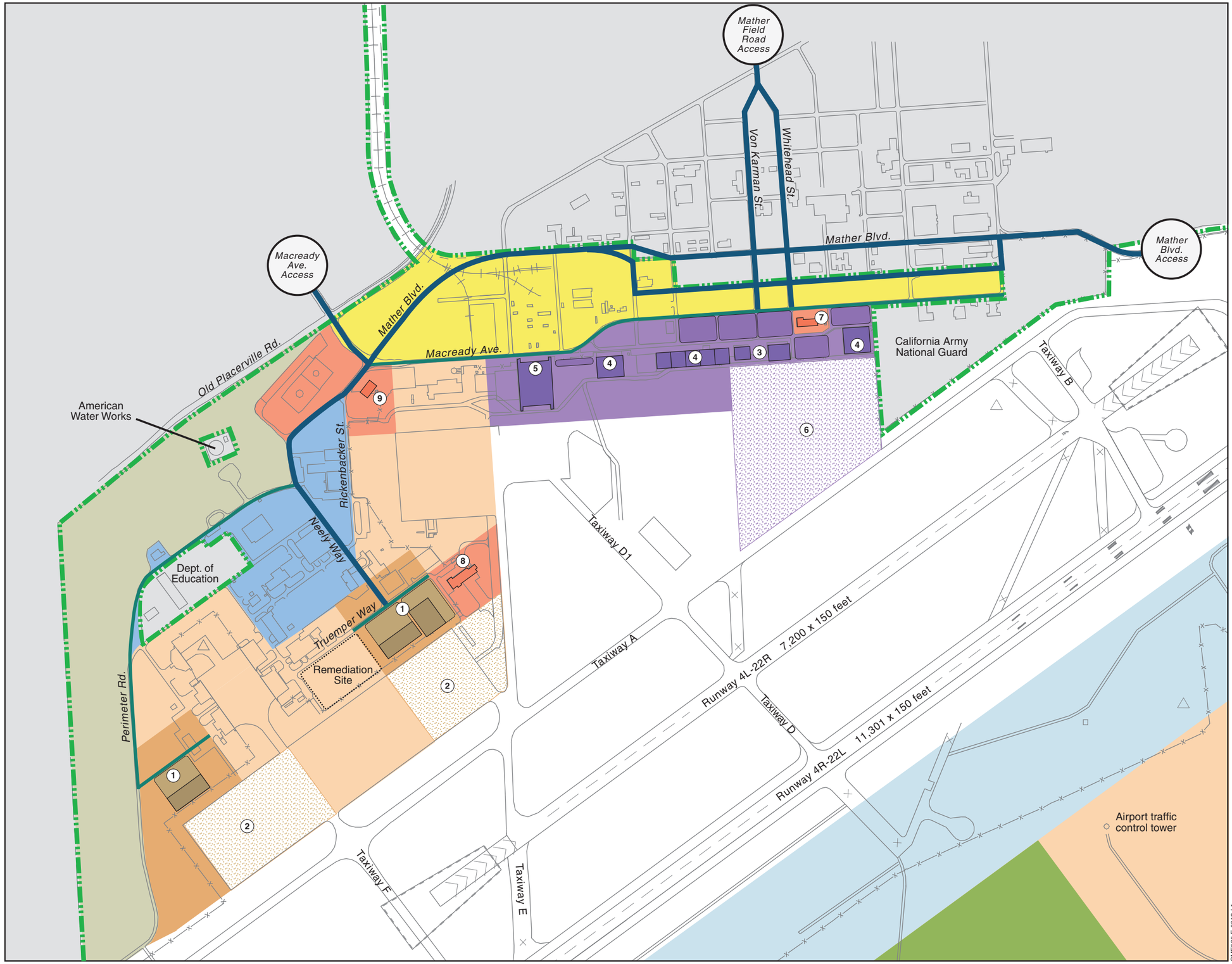

LEGEND

- Air cargo
  - (1) Cargo buildings and related facilities
  - (2) Cargo apron
- General aviation
  - (3) FBO, passenger terminal, and air taxi facilities
  - (4) Aircraft storage hangars
  - (5) Aviation support hangars
  - (6) General aviation apron
- Airport support
  - (7) Airport administration and operations
  - (8) ARFF
  - (9) Airfield and equipment maintenance
- Airfield
- Airfield reserve
- Reserved aviation development
- Industrial
- Commercial
- Reserved nonaviation development
- Environmental preserve
- Airport boundary
- Primary access road
- Primary circulation road

ARFF = Aircraft rescue and fire fighting
FBO = Fixed base operator
PAL = Planning Activity Level

N

400 0 400 800

Graphic scale in feet

Figure 6-2

ALTERNATIVE 1—
LANDSIDE DEVELOPMENT, PAL 1

Mather Airport Master Plan

December 2003

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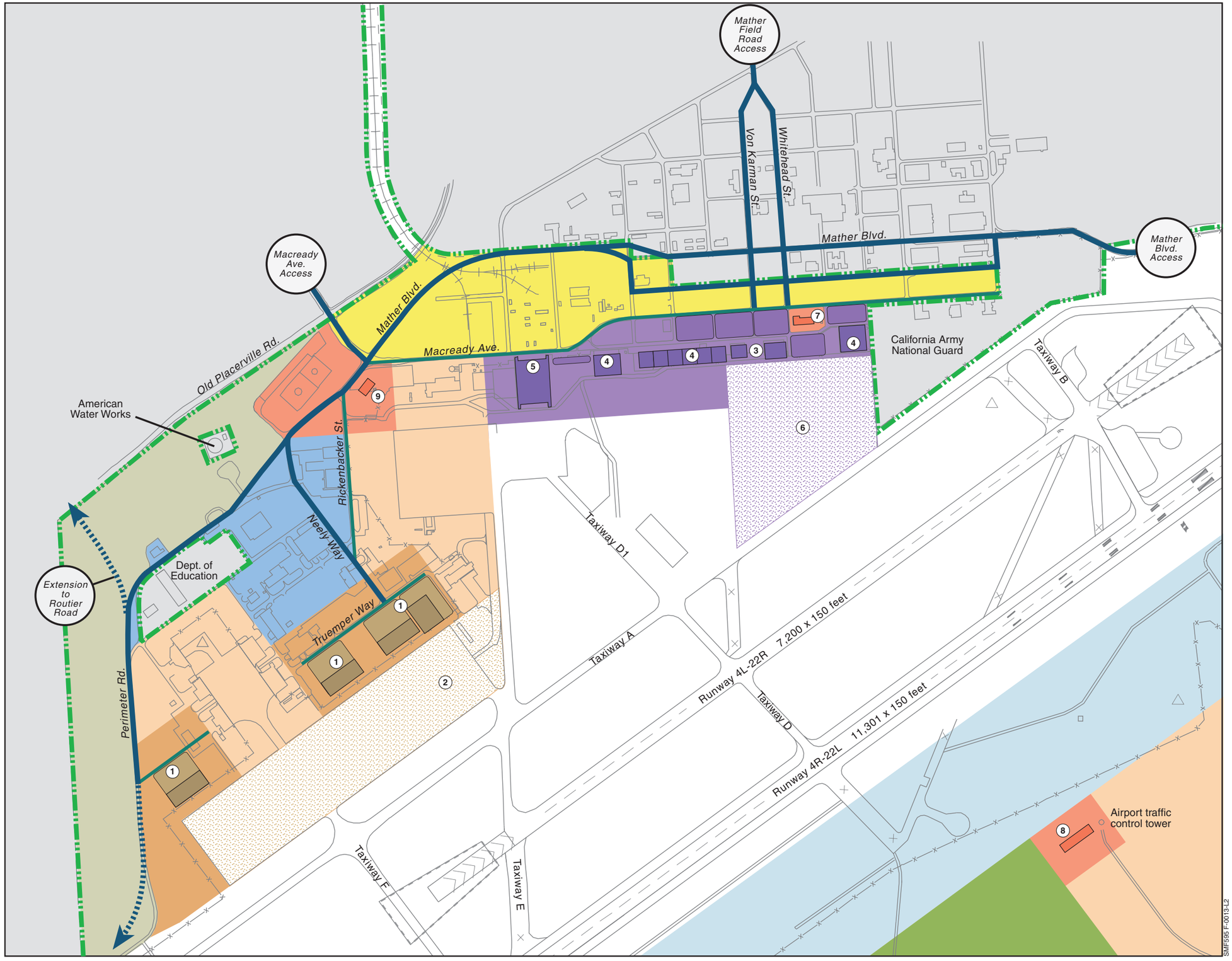

LEGEND

- Air cargo
  - (1) Cargo buildings and related facilities
  - (2) Cargo apron
- General aviation
  - (3) FBO, passenger terminal, and air taxi facilities
  - (4) Aircraft storage hangars
  - (5) Aviation support hangars
  - (6) General aviation apron
- Airport support
  - (7) Airport administration and operations
  - (8) ARFF
  - (9) Airfield and equipment maintenance
- Airfield
- Airfield reserve
- Reserved aviation development
- Industrial
- Commercial
- Reserved nonaviation development
- Environmental preserve
- Airport boundary
- Primary access road
- Primary circulation road

ARFF = Aircraft rescue and fire fighting
FBO = Fixed base operator
PAL = Planning Activity Level

N

400 0 400 800

Graphic scale in feet

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Figure 6-3
ALTERNATIVE 1—
LANDSIDE DEVELOPMENT, PAL 2
Mather Airport Master Plan
December 2003

LEIGH FISHER ASSOCIATES

Table 6-1

SUMMARY OF LANDSIDE ALTERNATIVE LAND USE AREAS
Mather Airport

Land use designation	Land area (acres) Existing	Alternative 1	Alternative 2	*Alternative 3*
Air cargo	100	100	115	***85***
General aviation	115	80	75	***110***
Airport support	15	70	25	***65***
Airfield	925	1,000	985	***865***
Airfield reserve	--	390	420	***350***
Aviation reserve	--	375	305	***210***
Industrial	--	50	125	***--***
Commercial	150	335	335	***280***
Nonaviation reserve	--	85	85	***285***
Environmental preserve	--	390	405	***--***

Alternative 2

The long-term land use plan for Mather reflecting Alternative 2 is depicted on Figure 6-4. Figures 6-5 and 6-6 depict more detailed landside development under Alternative 2 in PALs 1 and 2, respectively.

As illustrated, Alternative 2 is a "linear" concept where air cargo, general aviation, and ground access facilities would be redeveloped parallel to the airfield. Alternative 2 is intended to maximize nonaviation land use areas for future revenue-generating opportunities. Airport support functions and land areas reserved for future aviation use would be located between air cargo and general aviation development. Land use areas on the south side of the airfield are similar to those under Alternative 1.

Facility requirements necessary to accommodate PAL 1 and PAL 2 demand (see Chapter 4) could be accommodated under Alternative 2. Table 6-1 summarizes the acreage associated with each land use designation in Alternative 2.

Alternative 3

The long-term land use plan for Mather reflecting Alternative 3 is depicted on Figure figures 6-7 and 6-8 depict more detailed landside development under Alternative 3 in PALs 1 and 2, respectively.

As illustrated, Alternative 3 is a hybrid of Alternative 2 with a reduced emphasis on air cargo development and increased general aviation presence. Similar to Alternative 2, Alternative 3 is intended to maximize non-aviation land use areas for future revenue-generating opportunities and position general aviation and air cargo linearly along the airfield.

Air cargo facilities would be developed on the air cargo apron. General aviation facilities would be developed along an adjusted flightline parallel to Taxiway A and an extended Truemper Way. Shifting all aviation-related development south of Truemper Way, this alternative increases opportunities for landside development and reduces the amount of historically underutilized aviation-related pavement to be maintained.

The reserved non-aviation development area, to the north of Truemper Way and Perimeter Road, allows for maximum opportunities for future non-aviation growth. Growth would generally be expected to conform to the Mather Specific Plan.

The landside facility requirements calculated in Chapter 4 considers both standard industry formulas and the updated forecast from Chapter 3. Another important consideration, which has been factored into Alternative 3, is the demand expressed by both current and potential tenants and the space requirements they have indicated.

Fright Warehouse Space Requirements: As stated in Chapter 4, the industry accepted ratio for determining cargo facility use, predicts the need for approximately 40,600 to 74,400 square feet of freight warehouse space over the lifetime of this plan. Preliminary discussions with the existing tenant, their existing facilities, current business practices and existing off-airport facilities have yielded the recommendation for 9,000 square feet of facility space. It is assumed that if a second integrated cargo carrier was to develop facilities, they would require a similar amount of space.

Based Aircraft Storage Facilities: Alternative 3 is recommending three aircraft storage hangars in PAL 1 (60,000 square feet each) and one additional 60,000 square foot hangar in PAL 2. The use of these future buildings is flexible depending upon demand. Base off of interested expressed by both existing and potential tenants, these builds could potentially serve as a new air taxi terminal, a new general aviation terminal, an aviation support hangar and/or indoor aircraft storage and maintenance facilities. Additionally, a component of general aviation that is not currently focused on a the Airport, is the development of T-hangars, facilities allowing individuals to rent hangar space to store their personnel plane.

Facility requirements necessary to accommodate PAL 1 and PAL 2 demand (see Chapter 4) could be accommodated under Alternative 3. Table 6-1 summarizes the acreage associated with each land use designation in Alternative 3. As discussed in Chapter 8, this development is assumed to be funded by a third-party as such, it is

anticipated that these facilities would not be developed until there is an interested party.

Evaluation of Alternatives

Table 6-2 presents an evaluation matrix for both landside development alternatives with regard to the potential to accommodate facility requirements, estimated order-of-magnitude costs, phasing efficiency, preservation of prior investments, reservation of land for revenue-generating uses, potential off-Airport roadway impacts, and user/stakeholder acceptability.

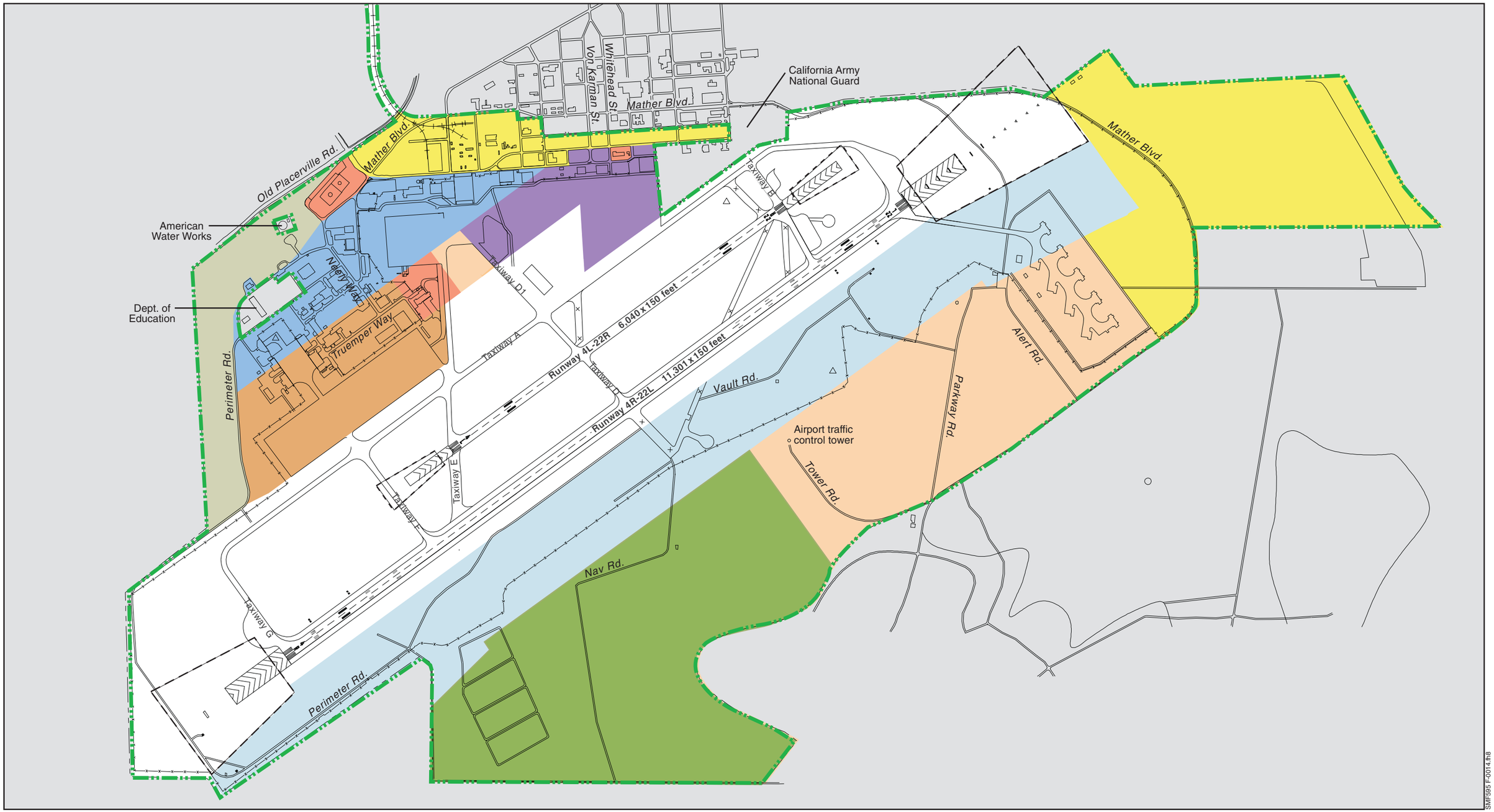
COORDINATION AMONG STAKEHOLDERS AND THE PUBLIC

The alternatives, background data, and evaluation results were presented to a project focus group, the Mather Master Plan Working Group, and the general public at a public information workshop, and to the Sacramento County Board of Supervisors on June 10, 2003.

2013 UPDATE: On December 9, 2003 the Board was presented the Draft Final Master Plan with the staff recommendation to transmit the Draft Final Master Plan to the Department of Environmental Review and Assessment (DERA) with the direction to undertake environmental review pursuant to the requirements of the California Environmental Quality Act (CEQA). The Board approved this recommendation on February 17, 2004 after briefings were presented to the following jurisdictions:

- ***Folsom City Council on January 13, 2004***
- ***El Dorado County Board of Supervisors January 27, 2004***
- ***Rancho Cordova City Council on February 2, 3004***

Per the direction of the Board, a Draft Environmental Impact Report (DEIR) was prepared and circulated in July 2012. Comments received on the DEIR necessitated the need to update the Master Plan forecast, project description, and associated environmental review. The updates to this Master Plan address current conditions and respond to comments received during the DEIR process. These changes and updated documents will be presented to the Board on May 21st, 2013. In April and May 2013, Representatives of the Cities of Folsom and Rancho Cordova as well as El Dorado County were briefed on the updated plan. Subsequent to the Board update, DERA will issue a new Notice to Preparation (NOP) and a new DEIR will be prepared and circulated.



LEGEND

- Air cargo (115 acres)
- General aviation (75 acres)
- Airport support (25 acres)
- Airfield (985 acres)
- Airfield reserve (420 acres)
- Reserved aviation development (305 acres)
- Industrial (125 acres)
- Commercial (335 acres)
- Reserved nonaviation development (85 acres)
- Environmental preserve (405 acres)
- Runway Protection Zone
- Airport boundary

N

700 0 700 1,400

Graphic Scale in Feet

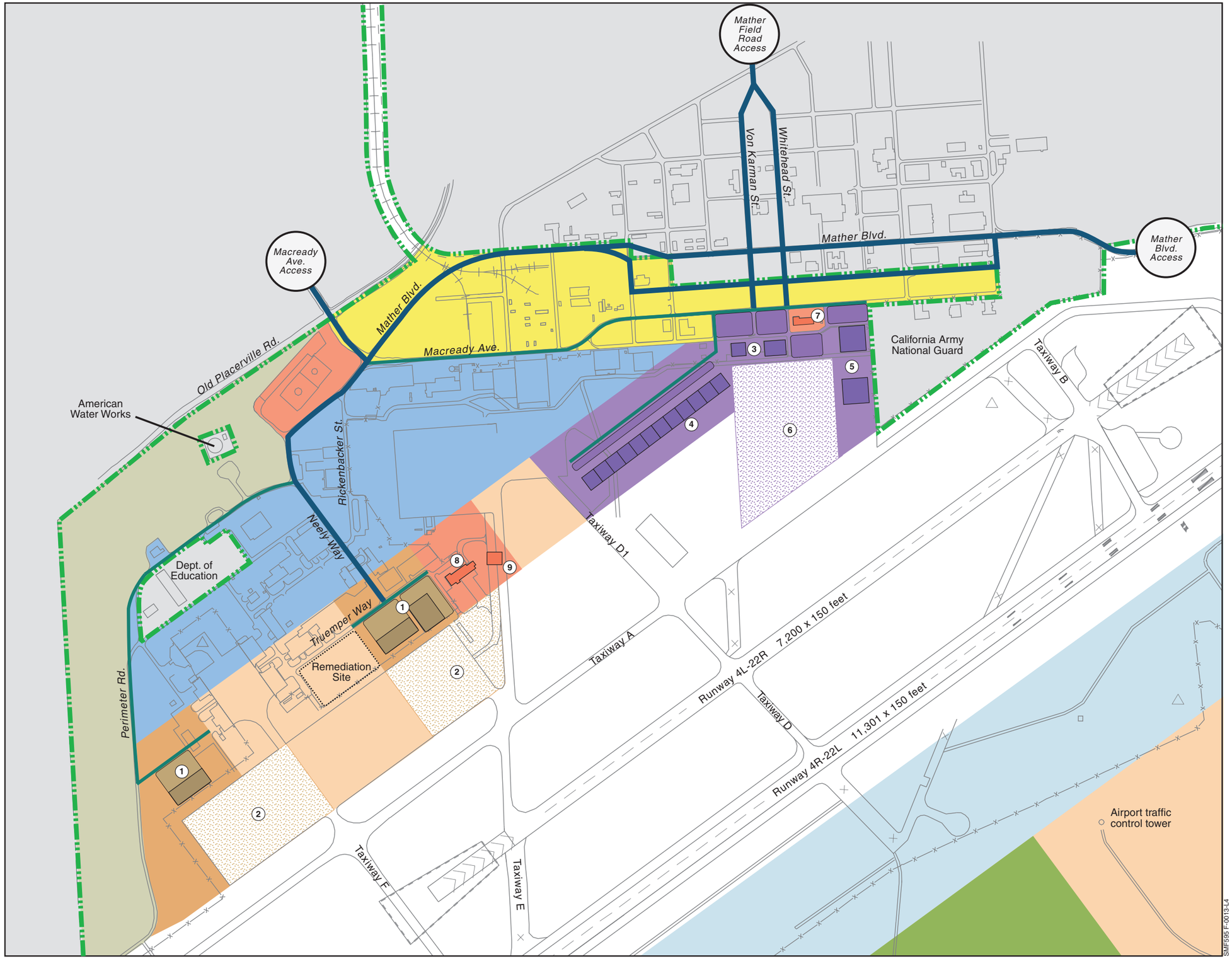
Figure 6-4

ALTERNATIVE 2—LONG-TERM AIRPORT LAND USES

Mather Airport Master Plan

December 2003

LEIGH FISHER ASSOCIATES



LEGEND

- Air cargo
  - (1) Cargo buildings and related facilities
  - (2) Cargo apron
- General aviation
  - (3) FBO, passenger terminal, and air taxi facilities
  - (4) Aircraft storage hangars
  - (5) Aviation support hangars
  - (6) General aviation apron
- Airport support
  - (7) Airport administration and operations
  - (8) ARFF
  - (9) Airfield and equipment maintenance
- Airfield
- Airfield reserve
- Reserved aviation development
- Industrial
- Commercial
- Reserved nonaviation development
- Environmental preserve
- Airport boundary
- Primary access road
- Primary circulation road

ARFF = Aircraft rescue and fire fighting
FBO = Fixed base operator
PAL = Planning Activity Level

N

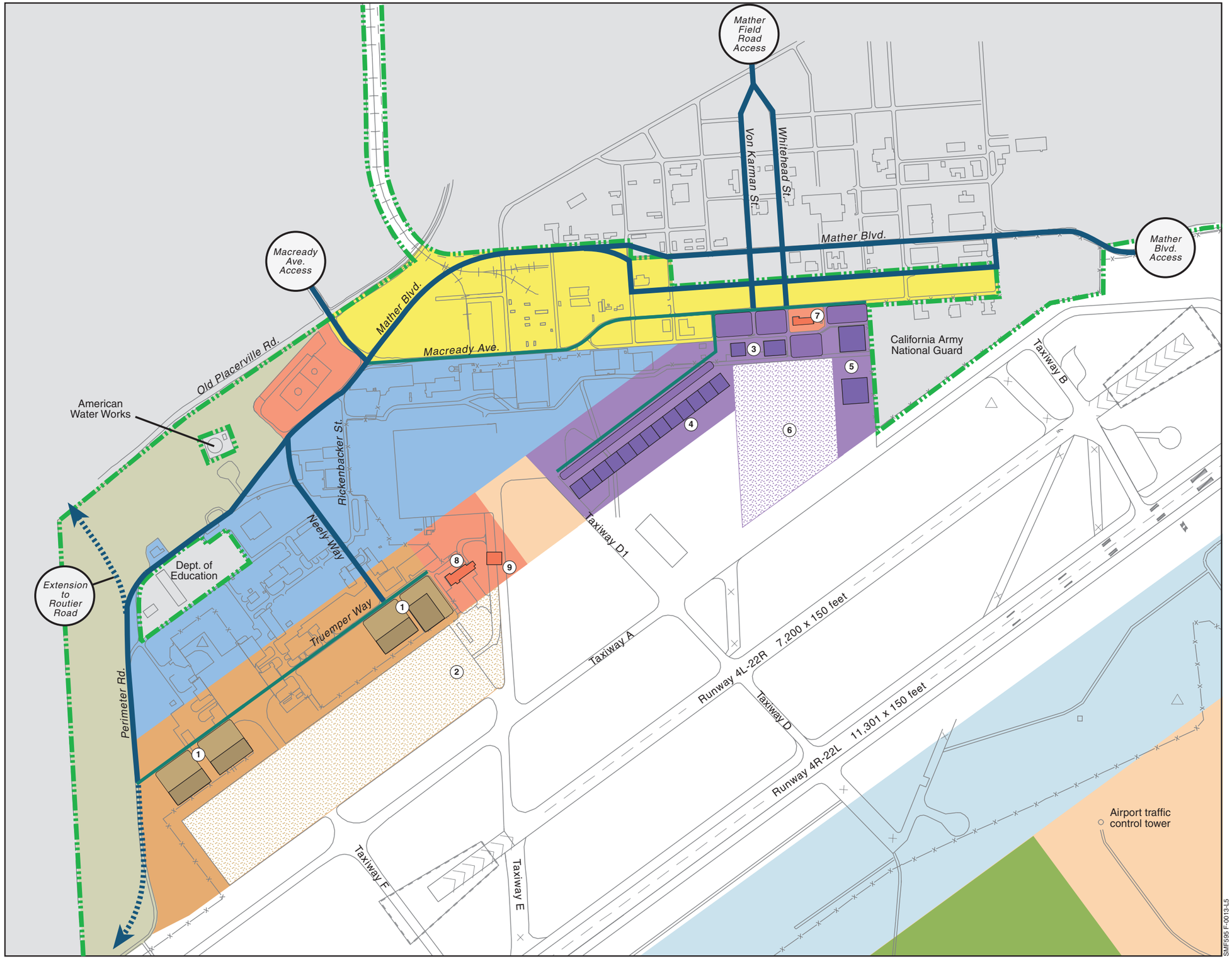
400 0 400 800

Graphic scale in feet

SMF595 F-0013-L4

Figure 6-5
ALTERNATIVE 2—LANDSIDE DEVELOPMENT, PAL 1
Mather Airport Master Plan
December 2003

LEIGH FISHER ASSOCIATES



LEGEND

- Air cargo
  - (1) Cargo buildings and related facilities
  - (2) Cargo apron
- General aviation
  - (3) FBO, passenger terminal, and air taxi facilities
  - (4) Aircraft storage hangars
  - (5) Aviation support hangars
  - (6) General aviation apron
- Airport support
  - (7) Airport administration and operations
  - (8) ARFF
  - (9) Airfield and equipment maintenance
- Airfield
- Airfield reserve
- Reserved aviation development
- Industrial
- Commercial
- Reserved nonaviation development
- Environmental preserve
- Airport boundary
- Primary access road
- Primary circulation road

ARFF = Aircraft rescue and fire fighting
FBO = Fixed base operator
PAL = Planning Activity Level

N

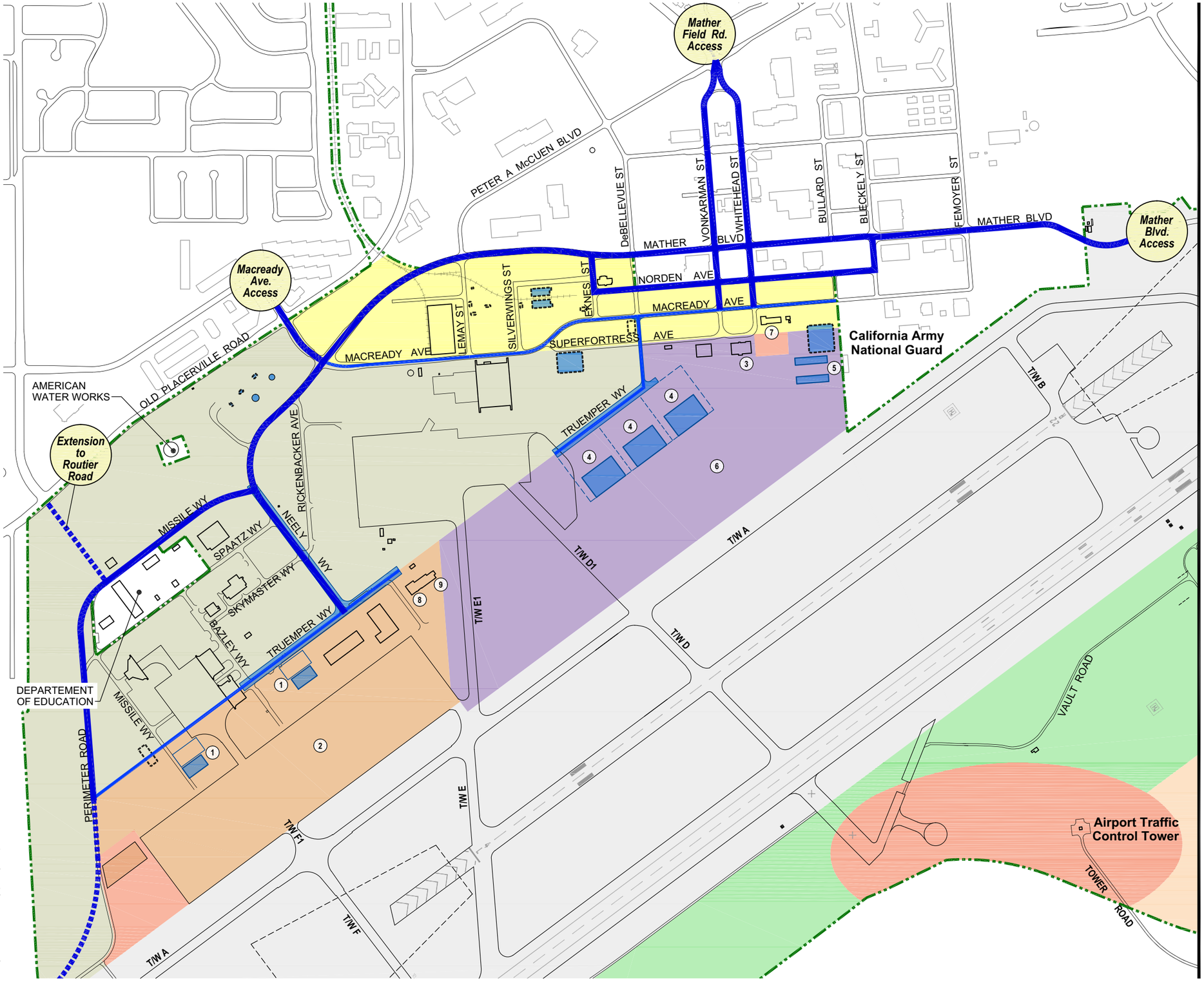
400 0 400 800

Graphic scale in feet

SMF595 F-0013-L5

Figure 6-6
ALTERNATIVE 2—LANDSIDE DEVELOPMENT, PAL 2
Mather Airport Master Plan
December 2003

LEIGH FISHER ASSOCIATES



LEGEND

- Air Cargo
  - (1) Cargo Buildings and Related Facilities
  - (2) Cargo Apron
- General Aviation
  - (3) FBO, Passenger Terminal, and Air Taxi
  - (4) Aviation Support Hangars
  - (5) Aircraft Storage Hangars
  - (6) General Aviation Apron
- Airport Support
  - (7) Airport Administration and Operations
  - (8) ARFF
  - (9) Airfield and Equipment Maintenance
- Airfield
- Airfield Reserve
- Reserved Aviation Development
- Reserved Non-Aviation Development
- Commercial
- Denotes Demolition or Removal
- Airport Boundary
- Primary Access Road
- Primary Circulation Road

ARFF = Aircraft Rescue and Fire Fighting
FBO = Fixed Base Operator
PAL = Planning Activity Level

N

0 400' 800'

GRAPHIC SCALE IN FEET

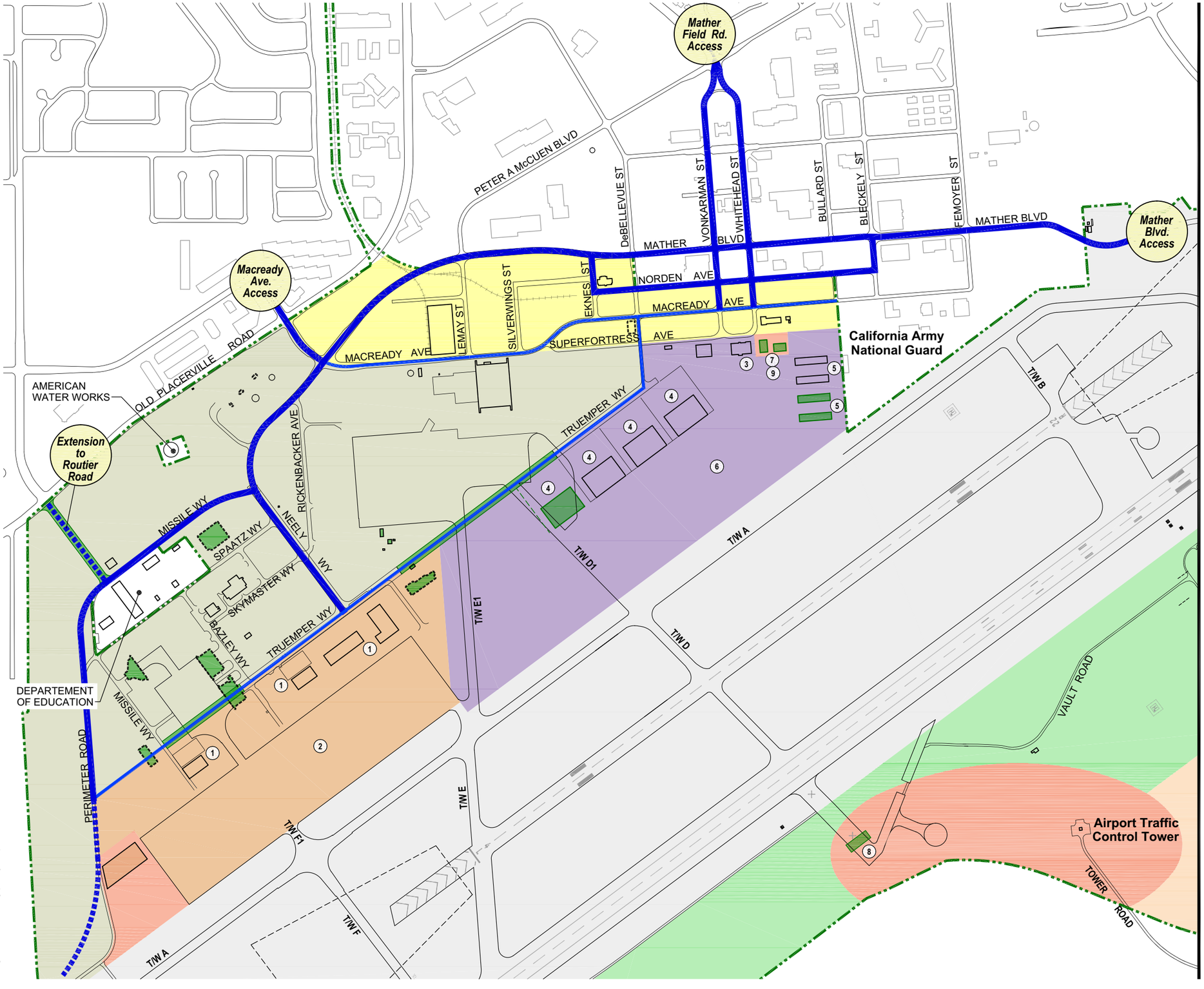
SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 6-7

ALTERNATIVE 3
LANDSIDE DEVELOPMENT PAL 1

Mather Airport Master Plan
May 2013

File: Fig 6-7 - PAL-1-Landside.dwg (Tab: Figure 6-7)



LEGEND

- Air Cargo
  - (1) Cargo Buildings and Related Facilities
  - (2) Cargo Apron
- General Aviation
  - (3) FBO, Passenger Terminal, and Air Taxi
  - (4) Aviation Support Hangars
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- Airport Support
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FBO = Fixed Base Operator
PAL = Planning Activity Level

N

0 400' 800'

GRAPHIC SCALE IN FEET

SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 6-8

ALTERNATIVE 3
LANDSIDE DEVELOPMENT PAL 2

Mather Airport Master Plan
May 2013

File: Fig 6-8 - PAL-2-Landside.dwg (Tab: Figure 6-8)

Chapter 7*

RECOMMENDED DEVELOPMENT CONCEPT

This chapter presents the Recommended Development Concept for Mather Airport. The Recommended Development Concept was established in cooperation with the Mather Master Plan Working Group and unanimously adopted by the Sacramento County Board of Supervisors during a February 17, 2004, workshop.

2013 UPDATE: There have been many changes in the economy, aviation and the air cargo industry since the recommended development concept was presented to the Sacramento County Board of Supervisors in 2004. The recommended development concept has been refined to address these changes and was presented to the Board on May 21st, 2013.

The major findings and conclusions of the master planning process include:

- ***Upgrade Runway 4R-22L instrument landing system to Category IIIb.***

- ~~Backup~~ Runway 4L-22R should be extended to ~~7,200~~ ***7,178*** feet. The runway will continue to include visual approaches on both ends (non-precision).

- ~~Backup~~ Runway 4L-22R should include informal runway use policies that ~~restrict~~ ***orient*** it's use to ~~backup~~ ***primarily general aviation*** functions ~~only (i.e., use~~ ***except*** when ~~primary~~ Runway 4R-22L is not operational~~)~~; and informal flight track management measures that minimize aircraft noise exposure over noise sensitive land uses in the airport environs~~. It is intended that runway use and flight track management polices be identified, analyzed, and selected in the subsequent Environmental Impact Report (EIR).~~ A discussion of potential runway use and flight track management measures is provided in Appendix F.

  2013 UPDATE: Standard operating procedures and voluntary nighttime noise abatement procedures are already in place at Mather Airport.

- Air cargo ~~and general aviation~~ uses should ~~generally remain in their current locations~~ ***be located on the air cargo apron. This location is in close proximity to movement areas (runways and taxiways) which will*** ~~to~~ ***optimize efficiency,*** maximize previous investments and capitalize on existing development patterns.

- ***General aviation uses should be located on the general aviation apron. Shifting the flightline to the South, in line with Truempuer Way, will allow***

*Prepared Summer 2003.

development to be closer to the taxiways and runways while reducing the amount of pavement maintained by the Airport.

- Airport support functions (e.g., administration, operations, and maintenance) should be ~~centralized and~~ located contiguous to the Air Operations Area (AOA).

- Previously developed parcels that include infrastructure (utilities, roads, etc.) but are not located adjacent to the AOA should be reserved for land uses that may provide revenue-generating opportunities for Sacramento County.

- Existing Airport access points—Macready Avenue, Mather Field Road, and Mather Boulevard—should be maintained. In the long term, additional ingress/egress should be provided via Routier Road on the Airport's west side.

- Key on-Airport roadways should be improved/upgraded ***and extended*** to facilitate the movement of cargo and other vehicles during peak periods, and improve the efficiency, and effectiveness of air cargo ground operations***, while reducing internal congestion at peak activity periods.***

- No land acquisition is necessary to support the Recommended Development Concept. However, the County may acquire property interests to ensure protection of approach areas.

The recommended long-term land uses for Mather, reflecting the Recommended Development Concept, are depicted on Figure 7-1. Figures 7-2 and 7-3 depict recommended land uses and landside development in PALs 1 and 2, respectively. Recommended airfield facilities, landside facilities, and land uses are discussed in the following sections. The phasing plan and stakeholder and public coordination are also discussed.

RECOMMENDED AIRFIELD FACILITIES

During the planning process, alternatives were considered that provided runway lengths up to 9,000 feet. The Sacramento County Board of Supervisors decided that the Recommended Development Concept should include an extension of ~~backup~~ Runway 4L-22R to 7,200 feet.

2013 UPDATE: The new recommended runway length of 7,178 feet was fine-tuned from the original recommendation of 7,200 feet. This slight reduction in length is result of additional survey and engineering investigations conducted in support of the 2012 DEIR.

Near-Term Recommendation

The near-term recommendations to upgrade Runway 4R-22L instrument landing system to Category IIIb is based on providing tenants the ability to operate under low visibility weather conditions, which, typically coincide with seasonal peaks in air cargo operations. On average, six days a year, flights are forced to fly in a holding pattern north east of Mather and/or divert from Mather to Sacramento International Airport when cloud ceiling or visibility is below current ILS minimums. Both holding and diversion increase impacts on community residents and operators, impacts which can be avoided with the upgrade of the ILS to Category IIIB instrument approach capability which Mather currently lacks.

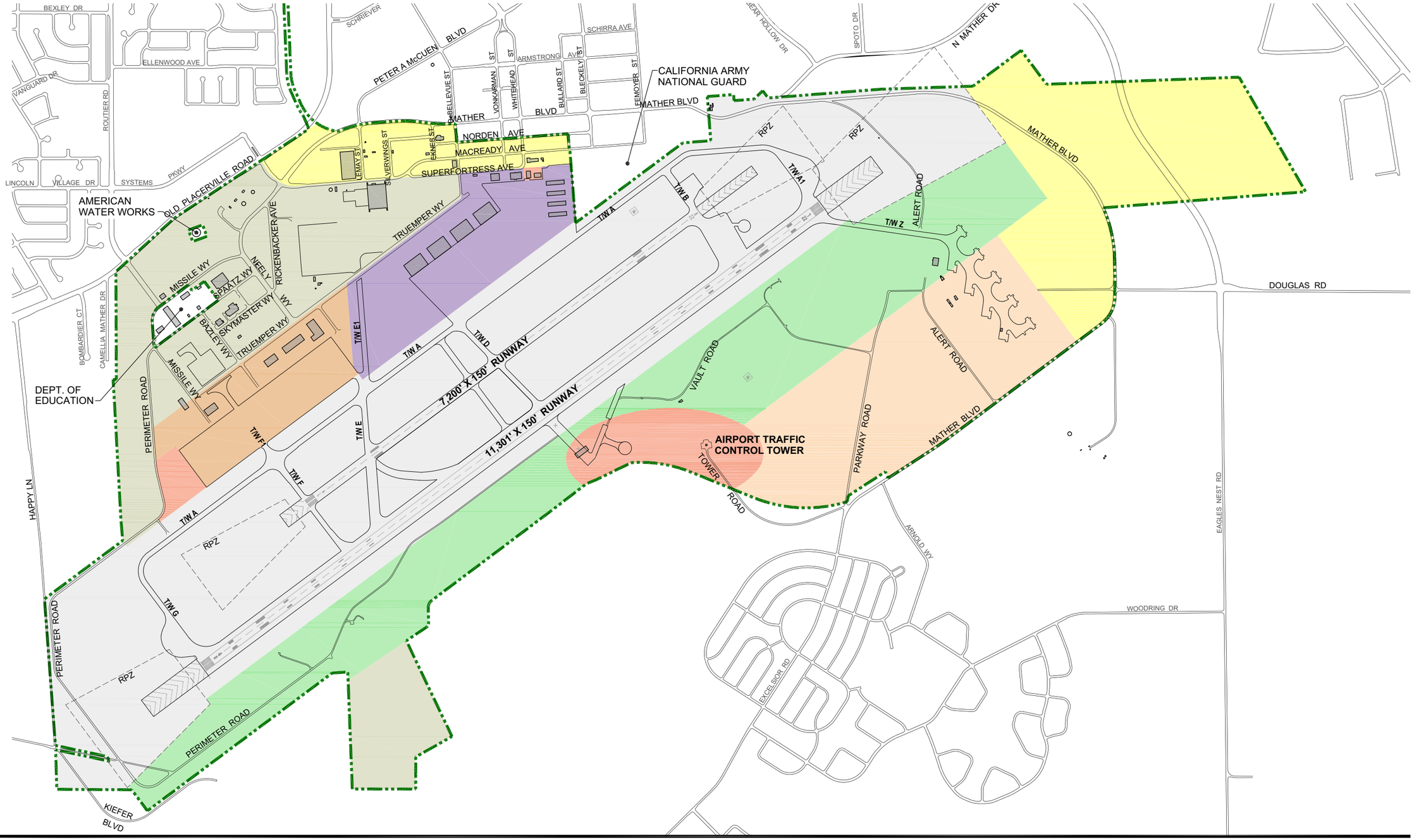
Long-Term Recommendations

The ~~near-term~~ ***long-term*** recommendation to extend ~~backup~~ Runway 4L-22R to ~~7,200~~ ***7,178*** feet is based on enhancing the reliability of facilities, and facilitating the County's ability to market Mather to ~~air cargo carriers~~ ***existing and potential future tenants***. An extension to Runway 4L-22R is not required to increase capacity—rather an extended runway would permit ~~the air cargo carriers~~ ***large aircraft*** to continue to land and take off at Mather in the event that Runway 4R-22L is not operational.

Appendix D presents technical analyses that document the relationship between the ~~backup~~ runway ***4L-22R's*** length and the percent of future air cargo aircraft operations that could be accommodated on the runway. On April 24, 2002, a project Focus Group, consisting of Airport staff, stakeholders, and key air cargo airline staff (three Airborne representatives—including the Chief Pilot; a UPS representative, and a FedEx representative), reviewed the technical analyses, and concluded that a recommendation to extend Runway 4L-22R to *about* 7,500 feet was acceptable and would provide better operational flexibility than the runway's current length of 6,040 feet.

Based on this feedback, it was recommended that Runway 4L-22R be extended to Taxiway F (resulting in a runway length of ~~7,200~~ ***7,178*** feet) as an effective means of providing operational flexibility and containing costs, as a new access/egress taxiway would not have to be constructed. Such an extension would permit 87% of cargo arrivals and 85% of cargo departures to operate on the runway at 90% MTOW in the event that Runway 4R-22L is not operational (see Appendix D).

2013 UPDATE: The length of the runway extension was refined to 7,178 feet, to Taxiway F, during the 2012 draft environmental review process as a result of refined survey and engineering analysis.



LEGEND

- Air Cargo (85 acres ±)
- General Aviation (110 acres ±)
- Airport Support (65 acres ±)
- Airfield (865 acres ±)
- Airfield Reserve (350 acres ±)
- Reserved Aviation Development (210 acres ±)
- Reserved Non-Aviation Development (285 acres ±)
- Commercial (280 acres ±)
- Runway Protection Zone (RPZ)
- Airport Boundary (2,265 acres)

N

0 700' 1,400'

GRAPHIC SCALE IN FEET

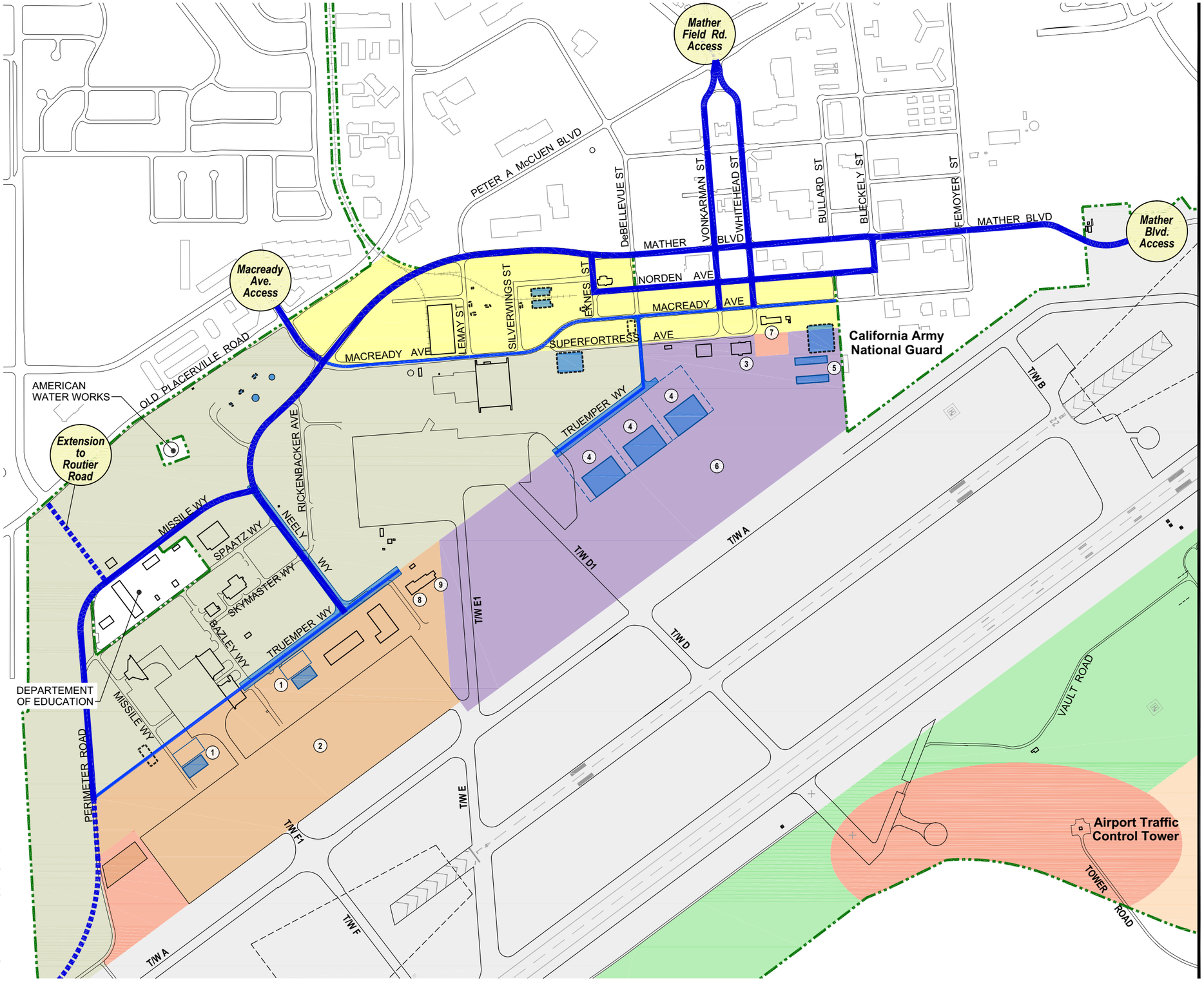
SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 7-1

RECOMMENDED DEVELOPMENT CONCEPT-LONG-TERM AIRPORT LAND USES

Mather Airport Master Plan
May 2013

File: Fig 7-1 - Land-Use-A.dwg (Tab: Figure 7-1)



LEGEND

- Air Cargo
  - (1) Cargo Buildings and Related Facilities
  - (2) Cargo Apron
- General Aviation
  - (3) FBO, Passenger Terminal, and Air Taxi
  - (4) Aviation Support Hangars
  - (5) Aircraft Storage Hangars
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  - (7) Airport Administration and Operations
  - (8) ARFF
  - (9) Airfield and Equipment Maintenance
- Airfield
- Airfield Reserve
- Reserved Aviation Development
- Reserved Non-Aviation Development
- Commercial
- Denotes Demolition or Removal
- Airport Boundary
- Primary Access Road
- Primary Circulation Road

ARFF = Aircraft Rescue and Fire Fighting
FBO = Fixed Base Operator
PAL = Planning Activity Level

N

0 400' 800'

GRAPHIC SCALE IN FEET

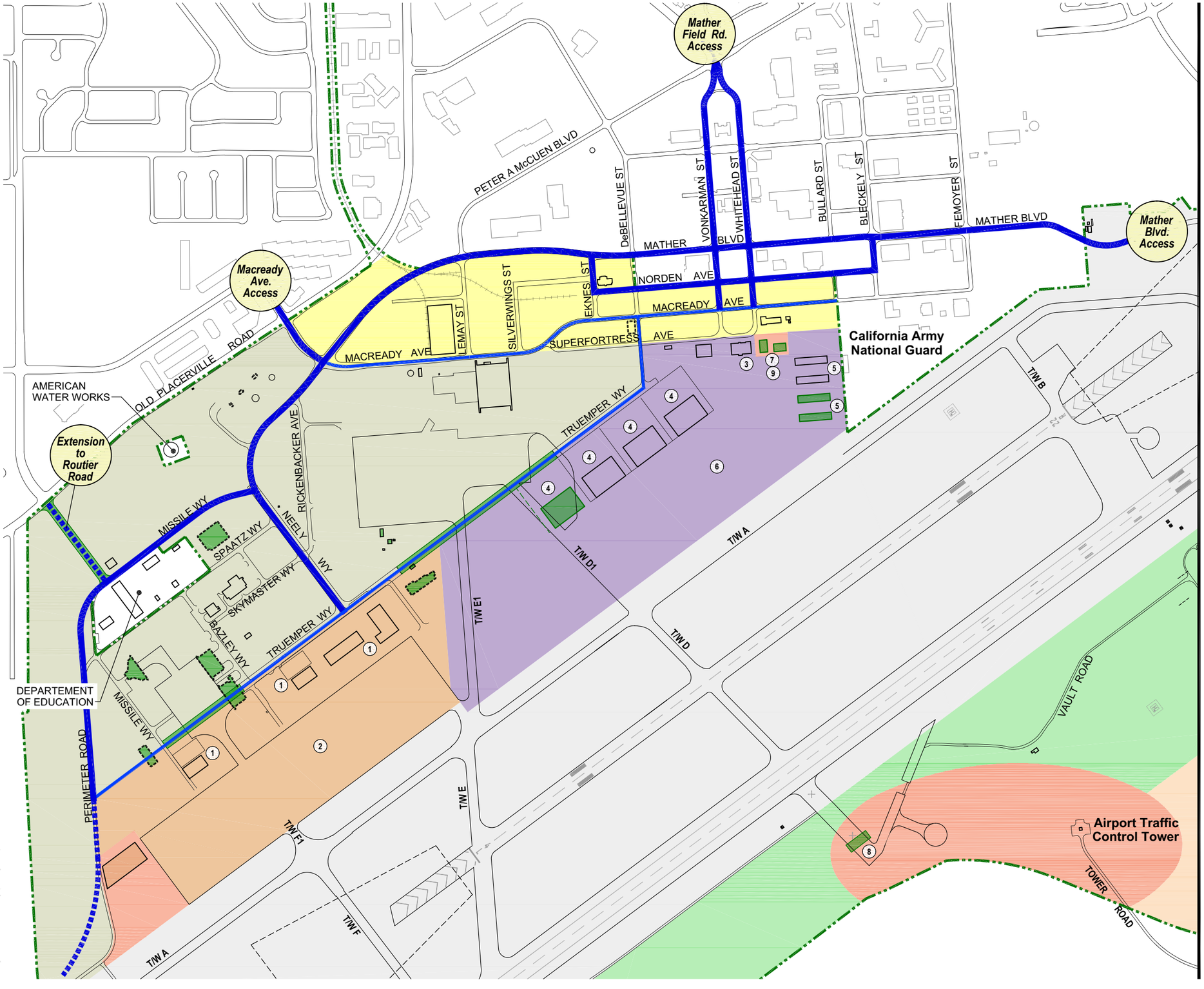
SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 7-2

ALTERNATIVE 3
LANDSIDE DEVELOPMENT PAL 1

Mather Airport Master Plan
May 2013

File: Fig 6-7 - PAL-1-Landside.dwg (Tab: Figure 7-2)



LEGEND

- Air Cargo
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PAL = Planning Activity Level

N

0 400' 800'

GRAPHIC SCALE IN FEET

SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 7-3

ALTERNATIVE 3
LANDSIDE DEVELOPMENT PAL 2

Mather Airport Master Plan
May 2013

File: Fig 6-8 - PAL-2-Landside.dwg (Tab: Figure 7-3)

Additional airfield facilities recommended in the ~~near~~ ***long*** term include the following:

- Upgrade Runway 4L-22R dimensional standards to ~~ARC D-V~~ ***ARC D-IV*** for visual runways (entails increasing RPZ, runway object free area [ROFA], and runway safety area [RSA] dimensions)

- ~~Paved blast pad (400 feet long by 220 feet wide) at the new approach end of Runway 4L per ARC D-V~~

- Runway 22L high-speed exit taxiway located approximately 6,000 feet from the runway threshold, connecting to the intersection of Taxiway E and Runway 4L-22R

- Runway 4R exit taxiway located approximately ~~8,000~~ ***5,650*** feet from the runway threshold, crossing Runway 4L-22R and connecting into Taxiway A.

Recommended taxiways are intended to enhance operations on ~~primary~~ Runway 4R-22L, as well as improve the long-term operational flexibility of the Airport.

Policy Recommendation

It is recommended that ~~backup~~ Runway 4L-22R include informal runway use policies that ~~restrict~~ ***orient*** it's use to ~~backup functions only (i.e., use~~ ***primarily general aviation operations except*** when ~~primary~~ Runway 4R-22L is not operational~~)~~; and informal flight track management measures that minimize aircraft noise exposure over noise sensitive land uses in the airport environs. ~~Runway use and flight track management polices will be identified, analyzed, and selected in the subsequent Environmental Impact Report (EIR).~~ A discussion of potential runway use and flight track management measures is included in Appendix F.

2013 UPDATE: Standard operating procedures and voluntary nighttime noise abatement procedures are already in place at Mather Airport.

RECOMMENDED LANDSIDE, ACCESS, AND CIRCULATION FACILITIES

With regard to landside, access, and circulation facilities, the Recommended Development Concept represents a "hybrid" of the two alternatives presented in Chapter 6. The following air cargo, general aviation, airport support, and roadway and parking improvements are recommended to accommodate PAL 1 and PAL 2 demand (see Figures 7-2 and 7-3), respectively:

PAL 1

Air cargo

~~Construct a 38,000-square-foot cargo sort and warehouse facility and associated 60,000-square-foot vehicle parking lot adjacent to the Air Cargo Apron~~

~~Upgrade apron pavements immediately east of the Air Cargo Apron (current air cargo feeder ramp) for use by heavy jets~~

Construct two sort and warehouse facilities (9,000 sq.ft. each)

Construct two associated vehicle parking/circulation (30,000 sq.ft. each)

Close North Cargo Apron

General aviation

~~Construct 75,000 square feet of aircraft storage hangars~~

~~Upgrade Building 4260 for maintenance/support activity~~

Construct three aircraft hangar facilities (60,000 sq.ft. each)

Construct two general aviation T-hangar rows – Phase 1 (East Apron)

Airport support

~~Construct an 8,000-square-foot airfield maintenance facility~~

Roadways and parking

Upgrade ~~Macready Avenue, Rickenbacker Street, and~~ Truemper Way

~~Construct two 60,000-square-foot parking lots along Macready Avenue~~

Construct DeBellevue Road extension onto apron area

Construct Truemper Drive extension (Phase 1)

Construct Neely Road upgrade

Demolition/Site Preparation

Demolish four buildings (two warehouse and two hangar in the general aviation area)

Demolish existing old fuel farm

PAL 2

Air cargo

~~Construct 460,000 square feet of additional apron between the existing Air Cargo Apron and North Apron~~

~~Construct a 38,000-square-foot cargo sort and warehouse facility and associated 60,000-square-foot vehicle parking lot adjacent to the Air Cargo Apron~~

~~Construct a 38,000-square-foot cargo sort and warehouse facility and associated 60,000-square-foot vehicle parking lot adjacent to the North Apron~~

General aviation

~~Construct 15,000 square feet of aircraft storage hangars~~

Construct one aircraft hangar (60,000 sq.ft.)

Construct two general aviation T-hangar rows – Phase 2 (East Apron)

Airport support

Construct a 5,500-square-foot ARFF facility on the south side of the airfield

Construct a 7,500-square-foot administration and operations building

Construct a 8,000-square-foot airfield maintenance facility

Roadways and parking

Upgrade Truemper Way

~~Construct a 60,000-square-foot parking lot along Macready Avenue~~

Demolition/Site Preparation

Three hangars, one building north of air cargo apron

One existing ARFF building

Five small buildings (North Apron)

One building between Spaatz Way and Missile Way

RECOMMENDED LAND USES

A primary goal of the Master Plan was to determine appropriate land use "envelopes" for accommodating the major Airport functions for the foreseeable future, including: air cargo, general aviation, Airport support, other aviation-related land uses, nonaviation land uses, ~~and "swing" areas,~~ as discussed below.

Air Cargo

As presented on Figures 7-2 and 7-3, areas reserved for air cargo development remain on the west side of the Airport. ~~By PAL 2, it is recommended that additional apron be provided between the existing Air Cargo Apron and North Apron to provide one continuous "L" shaped apron for cargo operations. Future cargo facilities would be located near the intersection of Truemper Way and Rickenbacker Street. As presented, areas adjacent to the 7000 Apron are also reserved for air cargo to facilitate County plans to market and lease existing hangar facilities for air cargo maintenance uses.~~ The total area reserved for air cargo encompasses ~~120~~ ***85*** acres ***along the air cargo apron***.

To facilitate the movement of cargo and other vehicles during peak periods, and improve the efficiency and effectiveness of air cargo ground operations, it is recommended that ~~Rickenbacker Street~~, Truemper Way, and Neely Way be improved/upgraded. In the long-term ~~(beyond PAL 2)~~, additional ingress/egress

should be provided via Routier Road on the Airport's west side ***and Truemper Way should be extended and connected to the general aviation area***.

~~A rendering depicting one concept for the ultimate (beyond PAL 2) development of commercial, industrial, and air cargo facilities in the air cargo area is presented on Figure 7-4~~

General Aviation

As presented on Figures 7-2 and 7-3, areas reserved for future general aviation development remain on the north side of the Airport. By PAL 2, it is recommended that ~~90,000~~ ***240,000*** square feet of additional hangar space be provided west of existing facilities, between Macready Avenue and the existing General Aviation Apron, ***and south in closer proximity to aircraft movement areas***. Future itinerant and based aircraft parking would be accommodated on the east side of the General Aviation Apron. To facilitate ground access, it is recommended that ***DeBellevue Street be extended to the south and Truemper Way be extended, in phases, northeast across the apron*** ~~Macready Avenue be improved/upgraded between Mather Boulevard and Whitehead Street, and that additional automobile parking be provided on the south side of Macready Avenue~~. The total area reserved for general aviation encompasses ~~80~~ ***110*** acres.

Airport Support

As presented on Figure 7-1, the Recommended Development Concept includes ~~two~~ ***three*** areas reserved for Airport support facilities. One area is located near the existing ~~fuel farm at the intersection of Mather Boulevard and Macready Avenue, and is planned to include~~ administrative ***offices, near Whitehead Street and Superfortress Avenue*** and ***will continue to be the site of airport administration and the future*** airfield maintenance facilities. ***The second area is the new fuel farm location, on the west end of the Air Cargo Apron.*** The ~~other~~ ***third*** area is located in the undeveloped area on the south side of the airfield and is reserved for a future ARFF facility.

Other Aviation-Related Land Uses

As presented on Figure 7-1, approximately ~~390~~ ***350*** acres parallel to and south of Runway 4R-22L are designated as airfield reserve, and approximately ~~280~~ ***210*** acres in the undeveloped area on the south side of the Airport are reserved for airfield-related development. It is intended that these areas be reserved for future taxiways, aircraft parking aprons, and aviation-related facilities (additional cargo, general aviation, aviation maintenance, etc.) if demand conditions warrant such development beyond the 20-year planning period.

Nonaviation Land Uses

Approximately 75 acres on the north side of the Airport between Mather Boulevard and Macready Avenue are reserved for commercial development, which may include office space and retail facilities. An additional large area is reserved for commercial development on the east side of the Airport~~. In addition, approximately 20 acres on the west side of the Airport, adjacent to the 7000 Apron, are reserved for industrial development, which may include manufacturing and warehouse facilities.~~

Approximately 85 acres between the Airport boundary and Perimeter Road are reserved for nonaviation development, indicating that this area should be reserved for long-term development beyond the 20-year planning period.

2013 UPDATE: Approximately 200 acres north of Truemper Way are reserved for nonaviation development that would generally conform to the Mather Specific Plan. Development in these areas could include manufacturing and warehouse facilities and light commercial office spaces. This area is centrally located in the existing developed area on the north sides of the Airport. The area is compatible with either industrial or commercial uses based on existing infrastructure, location relative to ground access facilities, and location adjacent to industrial and air cargo uses. The area could be developed in industrial uses to support air cargo operations, including specialized warehouse facilities and/or truck staging areas.

~~Approximately 385 acres in the undeveloped area on the south side of the Airport are designated as environmental preserve.~~

"Swing" Areas

~~As presented on Figures 7-1 through 7-3, the Recommended Development Concept includes three areas reserved for multiple land uses (stripped areas). These "swing" areas include parcels within the land use designation that may be compatible with surrounding uses, and demand conditions should dictate what type of development ultimately occurs in these areas. Each swing area is described below.~~

2013 UPDATE: Previous to this update, the plan identified several "swing areas," these areas had potential development opportunities for more than one land use (air cargo/general aviation, air cargo/industrial and industrial/commercial). While these swing areas provided flexibility to develop the airport, the development was restricted until space in adjacent area was no longer available. The Master Plan now recommends a more general classification of non-aviation development, which could allow commercial and/or industrial uses. This methodology will allow for maximum flexibility as opportunities arise for development on the Airport and does not restrict growth in one area until after development is complete in another.

- ~~***Air Cargo/General Aviation Swing Area*** – This swing area is north of the air cargo area, and west of the general aviation area, near the intersection of Mather Boulevard and Macready Avenue. The area is compatible with either air cargo or general aviation development based on its location relative to airfield and ground access facilities, but should remain undeveloped until space in either adjacent land use is no longer available.~~

- ~~***Air Cargo/Industrial Swing Area*** – This swing area is west of the air cargo area, and south of the area preserved for industrial use. The area is compatible with either air cargo or industrial development based on its location relative to airfield and ground access facilities, but should be developed only after space in either adjacent land use is no longer available.~~

- ~~***Industrial/Commercial Swing Area*** – This swing area is centrally located in the developed area on the north side of the Airport. The area is compatible with either industrial or commercial use based on existing infrastructure, location relative to ground access facilities, and location adjacent to industrial and air cargo uses. The area could be developed in industrial uses to support air cargo operations, including specialized warehouse facilities, sort facilities, and/or truck staging areas. However, commercial uses would also be compatible if demand for industrial/cargo facilities is accommodated in other areas.~~

PHASING PLAN

A recommended phasing plan depicting implementation of recommended facilities in the Recommended Development Concept is presented on Figure 7-5.

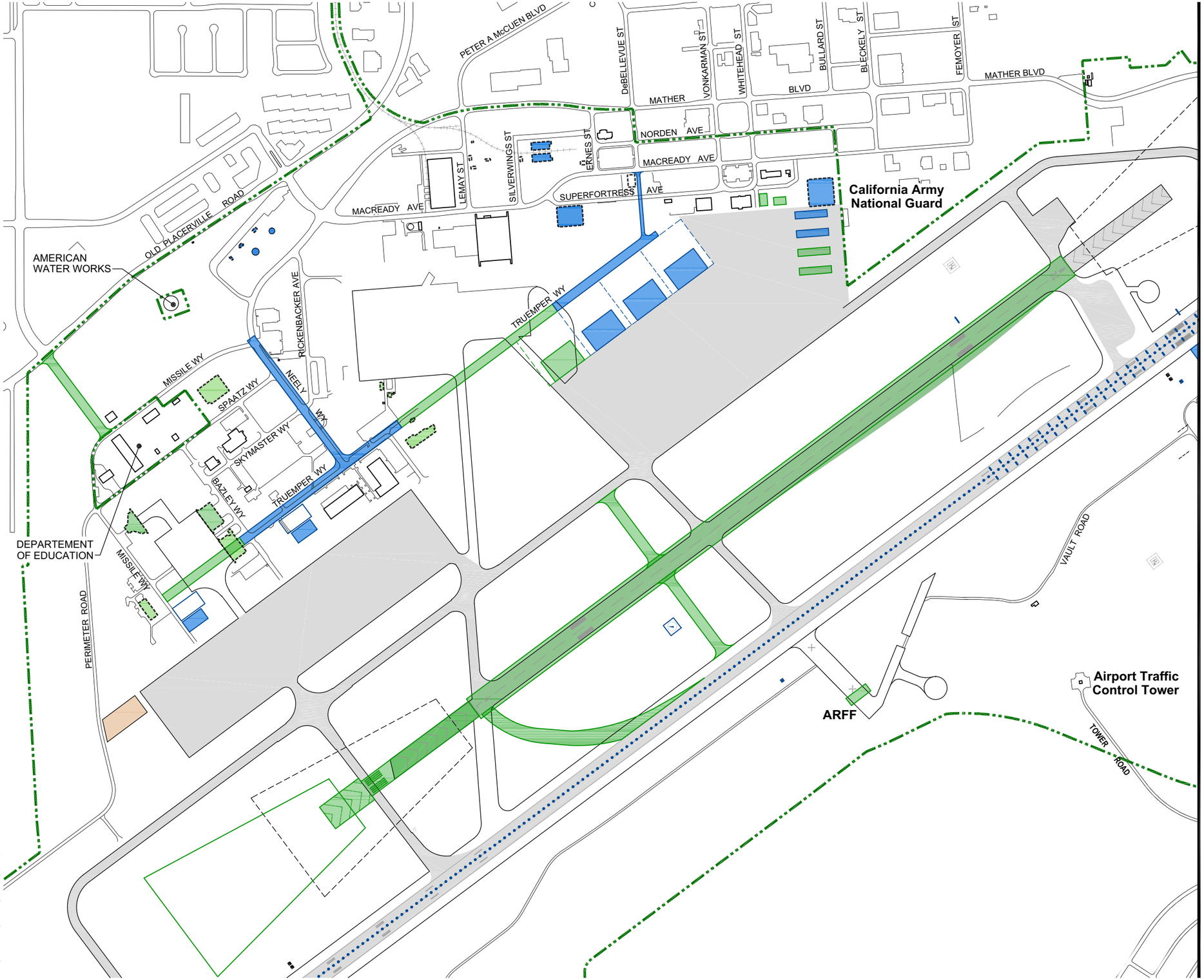
COORDINATION AMONG STAKEHOLDERS AND THE PUBLIC

The Recommended Development Concept, relevant background data, conceptual renderings, and the phasing plan were discussed at the Sacramento County Board of Supervisors workshops on August 20, 2003, December 9, 2003, and February 17, 2004. The public was provided opportunity to provide written and oral comments throughout the planning process. The Board unanimously adopted the Recommended Development Concept at the workshop on February 17, 2004.

2013 UPDATE: On December 9, 2003 the Board was presented the Draft Final Master Plan with the staff recommendation to transmit the Draft Final Master Plan to the Department of Environmental Review and Assessment (DERA) with the direction to undertake environmental review pursuant to the requirements of the California Environmental Quality Act (CEQA). The Board approved this recommendation on February 17, 2004 after briefings were presented to the following jurisdictions:

- ***Folsom City Council on January 13, 2004***
- ***El Dorado County Board of Supervisors January 27, 2004***
- ***Rancho Cordova City Council on February 2, 3004***

Per the direction of the Board, a Draft Environmental Impact Report (DEIR) was prepared and circulated in July 2012. Comments received on the DEIR necessitated the need to update the Master Plan forecast, project description, and associated environmental review. The updates to this Master Plan address current conditions and respond to comments received during the DEIR process. These changes and updated documents will be presented to the Board on May 21st, 2013. In April and May 2013, Representatives of the Cities of Folsom and Rancho Cordova as well as El Dorado County were briefed on the updated plan. Subsequent to the Board update, DERA will issue a new Notice to Preparation (NOP) and a new DEIR will be prepared and circulated.



LEGEND

- Airport Boundary
- Apron / Runway / Taxiway
- PAL 1 Improvement
- PAL 1 ILS Improvement
- PAL 2 Improvement
- Denotes Demolition or Removal

Note: Improvements refer to recommended projects included in chapter 7.

Source: Sacramento County Department of Airports

N

0 400' 800'

GRAPHIC SCALE IN FEET

SACRAMENTO COUNTY AIRPORT SYSTEM

Figure 7-5

RECOMMENDED PHASING PLAN

Mather Airport Master Plan
May 2013

File: Fig 7-5 - Phasing-Plan.dwg (Tab: Figure 7-5)

Chapter 8*

FINANCIAL PLAN

This chapter presents a preliminary financial plan for the capital improvements included in the Recommended Development Concept, along with an evaluation of ~~the~~ ***general*** implications of the financial plan on the financial operations of both Mather Airport and the Sacramento County Airport System. This chapter includes: (1) a summary of the approach used in developing the plan of finance, (2) a summary of Master Plan project cost estimates and associated funding sources, (3) a discussion of estimated financial implications, and (4) a summary of conclusions. ~~A discussion of the Airport System's current financial framework, providing a context within which Mather's capital improvements are financed, is provided in Appendix B.~~

2013 UPDATE: The financial plan for the Master Plan project has been updated to reflect the 2013 recommended development plan. As discussed below, 57% of project funding is expected to come from outside sources (federal grants and third parties). The information presented in this chapter is based on available information and the County will continue to develop the Airport consistent with the best course of action at the time of project implementation. The financial feasibility of future projects will ultimately be determined by the provisions of future airline and/or tenant agreements, available funding sources, and participation in federal grant-in-aid programs (assuming the future availability of such grants), and the ability to generate discretionary cash flow.

This 2013 financial plan does not contemplate the issuance of airport revenue bonds to fund the recommended development plan. Any reference to airport revenue bonds, which were contemplated in the 2003 plan, has been deleted as they are no longer an expected source of funding for the projects identified in this plan.

FINANCIAL PLAN DEVELOPMENT APPROACH

Once the Recommended Development Concept was identified, specific projects required for each planning activity level were determined and associated costs were estimated (and escalated for future inflation).

*Prepared Fall 2003 ***and updated in April 2013***.

Funding Strategy

Funding sources for individual projects included in the Recommended Development Concept were allocated based on (1) a funding strategy for individual projects based on eligibility for grant funding and optimal funding strategy as discussed below, (2) projections of funding availability~~, and (3) the Mather "share" of Airport System funding sources~~.

2013 UPDATE: The County Airport System does not allocate a "share" of available funding for each airport. Every proposed project is evaluated upon its own merit and competes with other proposed projects for available funding.

Aligning the sources of capital funds with the allowable and optimal uses is essential to maximizing financing capacity. Certain sources of funds, such as federal grants, have restrictions on how they can be used. ~~Funding sources such as airport revenue bond proceeds are more effective when targeted to projects having a direct income stream, especially when airline approvals are required~~.

Third-party funding sources were assumed for ~~certain~~ general aviation and air cargo facilities that were assumed to be developed through private investment (see "Development Approaches" below).

In preparing the financial plan, the current Airport System Capital Improvement Program (CIP) was reviewed to ensure that existing funding commitments were accounted for and that they do not conflict with Master Plan funding assumptions. ~~With the exception of two specific projects that are reflected in both the CIP and the Master Plan, projects included in the CIP are planned to be completed prior to those in the Master Plan~~. ~~Following the completion of the Master Plan, the County expects to update the CIP as appropriate.~~

Planning Activity Levels

For purposes of the Master Plan financial analysis, PAL 1 projects were assumed to be completed and operational in Fiscal Year (FY) ~~2006~~ ***2018*** and PAL 2 projects were assumed to be completed and operational in FY ~~2021~~ ***2035*** (for Fiscal Years ending June 30).

Development Approaches

Development of future Airport facilities can be accomplished by third-party developers leasing ground from the County (referred to here as the "ground lease" approach) or the County can elect to proceed with development in-house, over-seeing the activities of contractors (referred to here as the "County as developer" approach. Generally, the ground lease approach would involve minimum County

investment, minimum County risk, and ~~minimum~~ ***lower level of potential*** financial return to the County ***as compared to the County as developer approach***.

The ground lease and County as developer approaches represent opposite ends of the development spectrum in terms of County investment, risk, and return. The County could also use other approaches, such as the use of prepaid ground leases. Airport facilities will likely be developed under a mix of development approaches. For purposes of preparing the financial plan, the ground lease approach (i.e., third-party development of ~~certain~~ general aviation and cargo facilities) was assumed.

As discussed in later sections, the County as developer approach was analyzed separately to provide a potential range of Mather Airport net revenue projections.

~~Financial Analysis~~

~~It was assumed that net project costs remaining after grant, Airport System, third-party, and other funding would be funded with Airport System Revenue Bond proceeds. Future Airport System Revenue Bond debt service is added to the existing base of airline payments for purposes of projecting future airline payments.~~

~~Based on the funding assumptions and future bond financings described above, a detailed financial analysis incorporating debt service, operating expenses, and nonairline revenues associated with Master Plan projects was prepared to determine the financial feasibility of the Master Plan – specifically the effects on the financial operations of the Airport System (including airline cost per enplaned passenger and landing fees).~~

FINANCIAL PLAN

Table 8-1 presents the financial plan for capital improvements included in the Recommended Development Concept. The financial plan is based on funding strategy and development approach assumptions discussed earlier in this chapter. As reflected, estimated costs and sources of funds are shown by project (and by PAL). Cost estimates associated with Master Plan projects reflect allowances for ~~cost escalation~~, engineering, design, program management fees, and contingencies. ***Project cost estimates are expressed in 2013 dollars. Costs for future-year project implementation should consider appropriate cost escalation factors.*** A discussion of the sources of funds reflected in Table 8-1 follows. The description of and basis for the recommended Master Plan capital improvements are presented in the earlier chapters of this Master Plan.

Sources of Funds

The principal sources of funding for Master Plan improvements are expected to include the following:

- Federal grants-in-aid under the ***Airport Improvement Program*** **(**AIP***)*** (entitlement grants and discretionary grants)
- Airport System funds
- Third party/other funding
- ~~Proceeds from the sale of Airport System Revenue Bonds (debt issued to finance Airport System improvements, supported by the net revenues of the Airport System)~~

The amount of funding available from these sources will depend primarily on future aviation activity at Mather and other airports in the System, future economic development in the region, future County decisions regarding the development of Mather Airport facilities (e.g., ground lease approach vs. County as developer approach vs. other possible approaches), potential third-party investment, FAA priorities for the national airport system, and future AIP authorizations. If the assumed funds are not available, certain projects would need to be deferred until funds become available ~~or Airport and/or Airport System users agree to support funding of the projects from bond proceeds or other sources~~.

More detailed discussion of the individual sources of funds outlined above follows.

Table 8-1
MASTER PLAN PROJECT COSTS AND SOURCES OF FUNDS
Mather Airport

Project Description	Total cost	Sources of funds: Federal grants	Airport System funds	Third-party / other funds	Revenue bond proceeds	Total
PAL 1						
Airfield						
Upgrade Instrument Landing System on RW 22L to Category IIIb	$14,950,000		$14,950,000			$14,950,000
Install a PAPI on RW 22R	$201,250	$181,125	$20,125			$201,250
Install a PAPI on RW 22L	$201,250	$181,125	$20,125			$201,250
Subtotal Airfield	$15,352,500	$362,250	$14,990,250	$0	$0	$15,352,500
Air Cargo Facilities						
Construct Two Sort and Warehouse Facilities (9,000 sq ft each)	$1,759,500			$1,759,500		$1,759,500
Two Associated Vehicle Parking/Circulation (30,000 sq ft each)	$1,495,000			$1,495,000		$1,495,000
Close North Cargo Apron	$471,500			$471,500		$471,500
Subtotal Air Cargo	$3,726,000	$0	$0	$3,726,000	$0	$3,726,000
General Aviation Facilities						
Construct three aircraft storage hangars	$25,875,000			$25,875,000		$25,875,000
Construct Two GA T-Hangar Rows - Phase 1	$2,535,750			$2,535,750		$2,535,750
Subtotal General Aviation	$28,410,750	$0	$0	$28,410,750	$0	$28,410,750
Roadways and Parking						
Upgrade Truemper Way	$2,932,500		$2,932,500			$2,932,500
DeBellevue Extension onto Apron Area	$891,250		$891,250			$891,250
Truemper Extension (Phase 1)	$3,910,000		$3,910,000			$3,910,000
Neely Upgrade	$2,760,000		$2,760,000			$2,760,000
Subtotal Roadways and Parking	$10,493,750	$0	$10,493,750	$0	$0	$10,493,750
Demolition/Site Preparation						
Demolish Four buildings (Two Warehouse and Two Old Hangars in the GA	$517,500		$517,500			$517,500
Old Fuel Farm	$287,500		$287,500			$287,500
Subtotal Demolition/Site Preparation	$805,000	$0	$805,000	$0	$0	$805,000
PAL 1 total	$58,788,000	$362,250	$26,289,000	$32,136,750	$0	$58,788,000

Table 8-1 *(page 2 of 2)*

MASTER PLAN PROJECT COSTS AND SOURCES OF FUNDS

Mather Airport

Project Description	Total cost	Sources of funds: Federal grants	Airport System funds	Third-party / other funds	Revenue bond proceeds	Total
PAL 2						
Airfield						
Extend Runway 4L/22R (1,160 feet to Taxiway F)	$2,846,250	$2,561,625	$284,625			$2,846,250
Construct Exit Taxiway (from Runway 4R/22L to Taxiway A)	$4,197,500	$3,777,750	$419,750			$4,197,500
Runway Safety Area Grading	$138,000	$124,200	$13,800			$138,000
Runway Overlay 4L/22R	$3,680,000	$3,312,000	$368,000			$3,680,000
Construct High-Speed Exit Taxiway (from Runway 4R-22L to Taxiway E)	$6,647,000	$5,982,300	$664,700			$6,647,000
Pave Shoulders for Runway 4R/22R	$2,530,000	$2,277,000	$253,000			$2,530,000
Close Taxiways E-1 and D	$1,437,500	$1,293,750	$143,750			$1,437,500
Subtotal Airfield	$21,476,250	$19,328,625	$2,147,625	$0	$0	$21,476,250
General Aviation Facilities						
Construct One Aircraft Storage Hangar (60,000 sq ft)	$8,625,000			$8,625,000		$8,625,000
Construct Two GA T-Hangar Rows - Phase 2 (East Apron)	$1,267,875			$1,267,875		$1,267,875
Subtotal General Aviation Facilities	$9,892,875	$0	$0	$9,892,875	$0	$9,892,875
Support Buildings						
Construct Airfield Maintenance Facility (8,000 sq ft)	$1,380,000		$1,380,000			$1,380,000
Construct ARFF Facility (5,500 sq ft - on South Side of Airport)	$4,111,250		$4,111,250			$4,111,250
Construct Administration and Operations Building(7,500 sq ft)	$2,156,250		$2,156,250			$2,156,250
Subtotal Support Buildings	$7,647,500	$0	$7,647,500	$0	$0	$7,647,500
Roadways and Parking						
New Airport Ingress/Egress Access via Routier Road	$2,530,000		$2,530,000			$2,530,000
Truemper Extension (Phase 2)	$6,750,000		$6,750,000			$6,750,000
Subtotal Roadways and Parking	$9,280,000	$0	$9,280,000	$0	$0	$9,280,000
Demolition/Site Preparation						
Three Hangars, One Building North of Air Cargo Apron	$402,500		$402,500			$402,500
One Existing ARFF Building	$172,500		$172,500			$172,500
Five Small UPS Buildings (North Apron)	$34,500		$34,500			$34,500
One Building Between Spaatz and Missile	$230,000		$230,000			$230,000
Subtotal Demolition/Site Perparation	$839,500	$0	$839,500	$0	$0	$839,500
PAL 2 total	$49,136,125	$19,328,625	$19,914,625	$9,892,875	$0	$49,136,125
TOTAL MASTER PLAN (PALs 1 and 2)	$107,924,125	$19,690,875	$46,203,625	$42,029,625	$0	$107,924,125

Federal Grants. AIP funds are distributed by the FAA to airport operators in the form of (1) entitlement grants, based on enplanement levels and cargo activity, and (2) discretionary grants, based on FAA determinations of priority for enhancing the capacity of the national air transportation system. Typically, for any given AIP-eligible project at ~~a small hub airport, AIP grants cannot fund over 90% of the project's cost. For medium- and large-hub airports, AIP grants cannot fund over 75% of project costs~~ ***Mather, 90% of the project cost is eligible for grant funding***.

The Airport Improvement Program is authorized by the Airport and Airway Improvement Act of 1982 (the Act). The Act authorized funding for the AIP from the Airport and Airway Trust Fund for airport development, airport planning, and noise compatibility planning and programs. The Airport and Airway Trust Fund is funded through several aviation user taxes (including a 10% federal tax on airline tickets), air freight, and aviation gasoline.

In general, AIP grants can be used for land acquisition, noise mitigation, airfield improvements, on-airport roadways, public areas of terminal buildings, and safety and security systems and equipment. In allocating its discretionary funds, the FAA gives priority to projects that enhance airport safety, security, and capacity where capacity constraints have been demonstrated. As a result of new legislation since the September 11, 2001, terrorist attacks, priority has also been given to projects that satisfy new federal safety requirements.

In addition to ***traditional*** AIP grants, the Department has received other federal grants for Mather Airport projects, including ***the Military Airport Program*** (MAP) grants ~~(such as certain funding expected to be received in connection with improvements to Building 4260)~~. In 2002, the Department received $8.25 million of federal Economic Development Administration grants to fund upgrades to the Airport's infrastructure. Additional MAP grants and Economic Development Administration grants have not been assumed for Master Plan projects.

2013 UPDATE: Mather has received over $5,000,000 in FAA MAP grant funding for various improvements on the Airport. The Airport has graduated from the MAP program and no additional funding from this program can be expected.

~~The following assumptions underlie the amount of federal grants assumed for Master Plan projects (as reflected in Table 8-1):~~

~~1. A small federal grant will be received in connection with the Runway 4L-22R extension project in PAL 1 2 (equal to approximately $2.9 million or 25% of the project cost) – with the remainder of project costs assumed to be funded with Airport System Revenue Bond proceeds and third party funds. A larger federal grant was not assumed for this project based on the assumption that it would not meet FAA benefit-cost analysis guidelines.~~

~~2. Other airfield projects, such as taxiway improvements, air cargo feeder ramp improvements, construction of an airfield maintenance facility, and construction of an ARFF facility would received federal funding equal to 90% of project costs.~~

~~3. A significant federal grant (equal to approximately $18.0 million or 90% of project costs), possibly in connection with an FAA letter of intent, would be received for the Runway 4L-22R extension project in PAL 2.~~

~~4. Approximately $1.5 million of Military Airports Program (MAP) grants is expected to be used by the County for upgrades to Building 4260.~~

AIP discretionary grant funding assumed for the Master Plan amounts to, on average, $2 million ~~to $3 million~~ per Fiscal Year~~. In recent Fiscal Years, the Department has received approximately $2 million to $5 million AIP discretionary grants – receiving a $4.9 million grant in FY 2001 for airfield, roadway, and building repair projects and a $2.4 million grant in FY 2002 for rehabilitation of Runway 4R-22L.~~ To the extent that such discretionary amounts are not available to fund Master Plan projects, it is expected that these projects would be deferred until funds become available ~~or Airport and/or Airport System users agree to support funding of the projects from bond proceeds~~ ***from AIP*** or other sources.

As reflected in Table 8-1, airfield projects such as PAPI installation, runway extension/improvements and taxiway improvements/construction are eligible to receive federal funding, currently equal to 90% of the project cost. The FAA generally programs grant funding five years in advance, and priorities for funding are based on FAA priorities within the national airspace system.

2013 UPDATE: In recent fiscal years, the Airport has received the following AIP grant funding, demonstrating a mix of entitlement, discretionary and MAP funding sources:

Fiscal Year	*Grant Amount*	*Project*
2002	***$2,363,861***	***Runway 4R/22L Rehabilitation***
2003	***$3,800,129***	***Runway 4R/22L & Air Carg Rehabilitation, and Buildin 4260 Upgrade***
2004	***$2,458,732***	***Rehabilitate Access Road, Building 4260 Upgrades***
2005	***$750,000***	***Master Plan Update Environmental Review***

2006	***$380,000***	***Building 4260 Improvement***
2007	***$915,000***	***Building 4260 Re-Roof***
2010	***$3,041,791***	***Rehabilitate West Cargo Apron***
2011	***$999,131***	***Miscellaneous Building Abatement and Demolition***
2012	***$2,017,800***	***Replace Fuel Farm***
TOTAL	***$16,726,444***	

Airport System Funds. Under the terms of the County's ~~Bond Resolution and the Airline Agreements~~ ***Airport System Bond Indenture***, deposits to the Airport System's Capital Improvement Fund are made each Fiscal Year. The Department can use amounts in the Capital Improvement Fund for any legal Airport System purpose. As reflected in Table 8-1, Airport System funds have been assumed to help fund project costs associated with airfield improvements, ~~building improvements~~, a new airfield maintenance facility, a new administration/operations building, ***roadways*** and required demolition.

Airport System funding assumed for Master Plan projects (approximately ~~$10.6 million through FY 2021) amounts to, on average, $0.6 million~~ ***$19.7 million through FY 2035) amounts to, on average $0.9 million*** per Fiscal Year. ~~Based on actual deposits to the Capital Improvement Fund in recent Fiscal Years, this average annual amount for Master Plan projects represents less than 10% of available annual Airport System funds.~~

In the County's current 5-year CIP, use of Airport System funds for Mather Airport represents approximately ~~10%~~ ***33%*** of total Airport System funds assumed for the CIP, ***due to the assumed approach of self-funding the Category IIIb Instrument Landing System and associated navigation and lighting aids.*** If the County decides to develop certain facilities based on an approach other than the ground lease alternative, investment of additional Airport System funds would likely be required.

Third-Party/Other Funding. Historically, certain facilities at the Airport have been funded through private investment (such as development of the ~~Airborne Express~~ facility ***built by Airborne Express, Building 7080***). As discussed earlier in this chapter, it was assumed in developing the financial plan that the County will pursue development of certain general aviation and cargo facilities at the Airport using the ground lease approach (with limited investment by the County).

As reflected in Table 8-1, third-party funding has been assumed for the construction of aircraft storage hangars and air cargo facilities in both PAL 1 and PAL 2. ~~Third-party/other funding has also been assumed for a small portion of costs associated with runway extension projects in both PAL 1 and PAL 2.~~

Roadway projects in PAL 1 and PAL 2 were assumed to be funded ***by Airport System funds but the possibility does exist for*** "other" funds, including potential fuel tax, Measure A, and/or County roadway funding.

Third-party/other funding assumed for the Master Plan totals approximately ~~$71.0 million (approximately 47% of Master Plan project costs)~~ ***$42.0 million (approximately 39% of Master Plan project costs).***

Airport System Revenue Bonds. ~~The County has previously issued bonds supported by Airport System net revenues to pay for capital projects. As of September 1, 2003, five series of County Airport System Revenue Bonds were outstanding, with outstanding principal of approximately $240 million. Debt service associated with the Department's existing Airport System Revenue Bonds, in addition to 25% debt service coverage, is included in the calculation of airline rates and charges.~~

~~As reflected in Table 8-1, the issuance of future Airport System Revenue Bonds was assumed in PAL 1 and PAL 2 to fund extension projects for Runway 4L-22R and an apron expansion project. Financing assumptions for future bond issues include a 6.00% bond interest rate for tax-exempt bonds, capitalized interest during project construction, required debt service reserves, and issuance costs.~~

~~Figure 8-1 reflects, in general terms, the funding strategy assumed for individual projects and the expected financial effects of such projects.~~ ***At this time, the County does not plan to issue bonds for development of the projects identified in this Plan.***

Prior Financing Capacity Analysis

~~The financial plan is generally consistent with the range of funding sources projected to be available in the financing capacity analysis (see Chapter 2).~~

The financing capacity analysis, which provided an estimate of the County's capacity to finance capital improvements at the System Airports, was undertaken to serve as a "reasonableness check" on the proposed investments to be recommended in the Master Plan. More specifically, the analysis served to define a range of Master Plan project costs ~~(over and above those for already committed CIP projects)~~ that the Department could reasonably expect to support from ~~Airport System Revenue Bonds, federal grants, and other funds (at reasonable rates to Airport users),~~ ***available revenue sources*** and to provide context to ensure that all master planning work was performed taking into account the limits of affordability.

Figure 8-1

PROJECT FUNDING STRATEGY

Mather Airport

PROJECTS	PREFERRED FUNDING SOURCES				FINANCIAL IMPACT		
	Federal grants	Third party/other	Airport System funds	Bond proceeds	Debt service	Operating expenses	Revenues to County
PAL 1							
Extend Runway 4L-22R to 7,200 feet	✓	✓		✓	✓	✓	
Runway 4L-22R paved shoulders	✓		✓				
Taxiway improvements	✓		✓				
Cargo facilities		✓	✓			✓	✓
Apron improvements	✓		✓				✓
Building improvements	✓		✓			✓	✓
Aircraft storage hangars		✓					✓
Airfield maintenance facility	✓		✓			✓	
Roadway improvements		✓					
Parking lots		✓					✓
PAL 2							
Extend Runway 4L-22R to 8,500 feet	✓	✓		✓	✓	✓	
Apron improvements	✓			✓	✓		✓
Cargo facilities		✓	✓			✓	✓
Aircraft storage hangars		✓				✓	✓
ARFF facility	✓	✓	✓			✓	
Administration/operations building	✓		✓			✓	
Airfield maintenance facility						✓	
Parking lots		✓	✓				✓
Demolition			✓				

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2013 UPDATE: Figure 8-1 has been completely revised to reflect the recommended projects and anticipated funding mechanisms.

Figure 8-1
PROJECT FUNDING STRATEGY
Mather Airport

PROJECTS	PREFERRED FUNDING SOURCES				FINANCIAL IMPACT		
	Federal grants	Third party/ other	Airport System funds	Bond proceeds	Debt service	Operating expenses	Non-airline Revenues
PAL 1							
Upgrade Instrument Landing System on RW 22L to Category IIIb			✓			✓	✓
Install a PAPI on RW 22R			✓			✓	
Install a PAPI on RW 22L			✓			✓	
Cargo Facilities		✓					✓
Close North Cargo Apron*			✓			✓	
aircraft hangars		✓					✓
GA T-Hangars		✓	✓				✓
Demolition*		✓	✓			✓	
PAL 2							
Extend Runway 4L/22R	✓		✓			✓	
Construct Exit Taxiway	✓		✓			✓	
Runway Safety Area Grading	✓		✓			✓	
Runway Overlay 4L/22R*	✓		✓			✓	
High-Speed Exit Taxiway	✓		✓			✓	
Pave Shoulders for Runway 4R/22R	✓		✓			✓	
Close Taxiways E-1 and D*			✓			✓	
Aircraft Hangar		✓					✓
GA T-Hangars		✓	✓				✓
Airfield maintenance facility			✓			✓	
ARFF facility			✓			✓	
Administration/operations building			✓			✓	
Roadways			✓			✓	
Demolition*			✓			✓	

Project is expected to reduce operating expenses

In the analysis, the financing capacity of the entire Airport System was considered, and then an appropriate share of potential funding for capital improvements at Mather Airport was determined. In addition, existing financing commitments, such as funds required to pay debt service for prior Airport System projects, were considered. Because of uncertainties regarding the nature of future projects (during the early stages of the Master Plan), assumptions regarding available Airport System funds and third-party funds were specifically excluded from the financing capacity analysis. For purposes of the Master Plan financial plan, these funding sources were later added to the financial analysis as specific projects were identified.

FINANCIAL IMPLICATIONS

~~Debt Service Requirements~~

~~The assumed issuance of Airport System Revenue Bonds to finance Master Plan capital improvements, as described earlier, is estimated to result in approximately $2.4 million in additional annual debt service (by FY 2021) to be paid from Airport System net revenues. Total annual debt service for Airport System Revenue Bonds was $12.1 million in FY 2002.~~

~~As discussed previously in this chapter, the financial operations of the Airport System are governed in part by the provisions of the Bond Resolution under which the County is authorized to issue Airport System Revenue Bonds. Under the Bond Resolution, the County must demonstrate that Airport System net revenues, i.e., revenues less maintenance and operating expenses, equal at least 125% of (or 1.25 times) the annual debt service of Airport System Revenue Bonds. Based on existing debt service and future bond issues assumed in the financial plan, annual debt service coverage ratios during the planning period are expected to exceed the 1.25 times debt service coverage requirement of the Bond Resolution.~~

Maintenance and Operation Expenses

As indicated on Figure 8-1, Master Plan projects expected to incur additional operating expenses include planned ***Cat IIIb ILS***, ***roadways***, runway extension, ~~cargo facility construction,~~ ~~building improvements~~, a new airfield maintenance facility, a new ARFF facility, ~~aircraft storage hangars~~, and a new administration/operations building. ~~Additional operating expenses were projected based on historical expenses for similar facilities at the Airport and inflation.~~

The County is responsible for maintaining airfield facilities, County-occupied facilities, the exterior of leased Airport buildings (including roof, gutters, foundation, and office area heating and air conditioning), and Airport roadways.

Operating expenses at the Airport are included in the ~~total Airport System requirement~~ ***reliever airports operating deficit included*** ~~used~~ in the calculation of the Airport System landing fee.

Nonairline Revenues

Projections of nonairline revenues for Master Plan projects include revenues associated with cargo building leases ~~(such as Building 4260)~~, ground lease payments, aircraft storage hangar rentals, and automobile parking space rentals. ~~Nonairline revenues were projected based on historical revenues for similar facilities at the Airport.~~

The opportunity exists for nonairline revenue to be generated with the proposed non-aviation development presented in Chapter 7. While the potential revenue cannot be quantified, the aviation related projects proposed in this plan will provide the essential airfield infrastructure to facilitate the nonaviation growth on the Airport.

Nonairline revenues at the Airport offset ~~the total Airport System requirement (including expenses and debt service)~~ ***operating expenses and debt service at the Airport in the reliever airports operating deficit*** used in the calculation of the Airport System landing fee.

Impact on Mather Airport Financial Operations

Mather Airport revenues represented approximately 5.0% of total Airport System revenues in FY 2002, ***2% of total Airport System revenues in FY 2012*** and, as shown in Table 8-2, consisted primarily of building rentals, landing fees, ground lease payments~~, and other revenues~~.

Table 8-2

Mather Airport

EXISTING AIRPORT REVENUE SOURCES

	FY 2002	Percent of total	***FY 2012***	***Percent of total***
Building rentals	$1,848,484	51.6%	***$1,569,080***	***33.6%***
Landing fees	1,256,681	35.0	***2,124,338***	***45.5***
Ground rentals	443,819	12.4	***846,971***	***18.1***
Other	36,672	1.0	***130,469***	***2.8***
	$3,585,656	100.0%	***$4,670,858***	***100.0%***

Source: Sacramento County Airport System records.

~~As discussed in previous sections, the incremental net revenue impact (equal to operating expenses plus debt service requirements less nonairline revenues) associated with projects in the Master Plan was projected for purposes of analyzing the incremental financial impact of such projects on the Airport and the Airport System. In addition, net revenues for the Airport were projected based on historical results, assumptions for inflation, and increases associated with Master Plan projects.~~

~~In addition, annual net revenues for the Airport as a whole were projected for both the "ground lease" and "County as developer "approaches, as reflected on Figure 8-2. These projections of net revenues provide a potential range of Mather Airport net revenue under both approaches. It should be noted that, although the net revenues under the County as developer approach are higher than under the ground lease approach, initial investment and financial risk would be greater in the County as developer approach.~~

Impact on County Airport System

Airline Cost per Enplaned Passenger. ~~Airline rates and charges are calculated to permit cost recovery of capital and maintenance and operation expenses after taking into account nonairline revenues.~~

~~An essential test of the County's ability to issue additional debt, i.e., impose additional debt service requirements on the airline rate base, is the "reasonableness" of the amount of required airline payments of rentals and fees. (Another essential test is meeting the required 1.25 times debt service coverage ratio under the Bond Resolution.)~~

~~An industry-accepted benchmark for evaluating the reasonableness of such fees is the sum of all such airline payments per enplaned passenger. From the financial results for the Airport System in FY 2002, the average airline payment per enplaned passenger (for all airlines) was $5.14.~~

~~From the financial plan summarized in Table 8-1 and expected incremental debt service, operating expenses, and nonairline revenues, it is estimated that the financing of Master Plan capital improvements would have an immaterial effect on total airline payments per enplaned passenger. As reflected in Table 8-3 and Figure 8-3, incremental airline costs per enplaned passenger projected for Mather Airport Master Plan projects are not considered to be significant (with increments less than 1% of FY 2002+ levels)~~.

2013 UPDATE: On May 1, 2008, the County terminated the Scheduled Airline Operating Agreement and Terminal Building Lease and effective July 1, 2008, the County adopted a new airline Rate Ordinance pursuant to which airline rates and charges were calculated for fiscal years 2009 through 2013. Under the Rate Ordinance, landing fees are calculated according to a cost center residual methodology and terminal building rentals are calculated according to a commercial compensatory methodology.

There is no scheduled commercial passenger activity at Mather, and such service is not contemplated in this Plan. The only impact to the airline cost per enplaned passenger is the result of the reliever airports operating deficit, which is recovered in the landing fee.

Table 8-3

ESTIMATED FINANCIAL IMPACT ON COUNTY AIRPORT SYSTEM
Mather Airport

	PAL 1	PAL 2 *(a)*
Additional debt service requirements *(b)*	$640,000	$2,992,000
Additional operating expenses	60,000	175,000
Additional nonairline revenues	(458,000)	(2,819,000)
Net impact of Mather Airport Master Plan projects *(c)*	$242,000	$348,000
Projected Airport System enplaned passengers	5,331,000	8,211,000
Projected total airline aircraft landed weight *(d)*	7,230,000	10,346,000
Incremental airline cost per enplaned passenger	$0.05	$0.04
Incremental landing fee adjustment *(e)*	0.03	0.03

(a) Inclusive of additional debt service, expenses, and nonairline revenues associated with PAL 1.
(b) Includes 25% debt service coverage charged to airlines.
(c) Net impact on total Airport System airline requirement (included in landing fee calculation).
(d) In 1,000-pound units.
(e) Per 1,000-pound unit of landed weight.

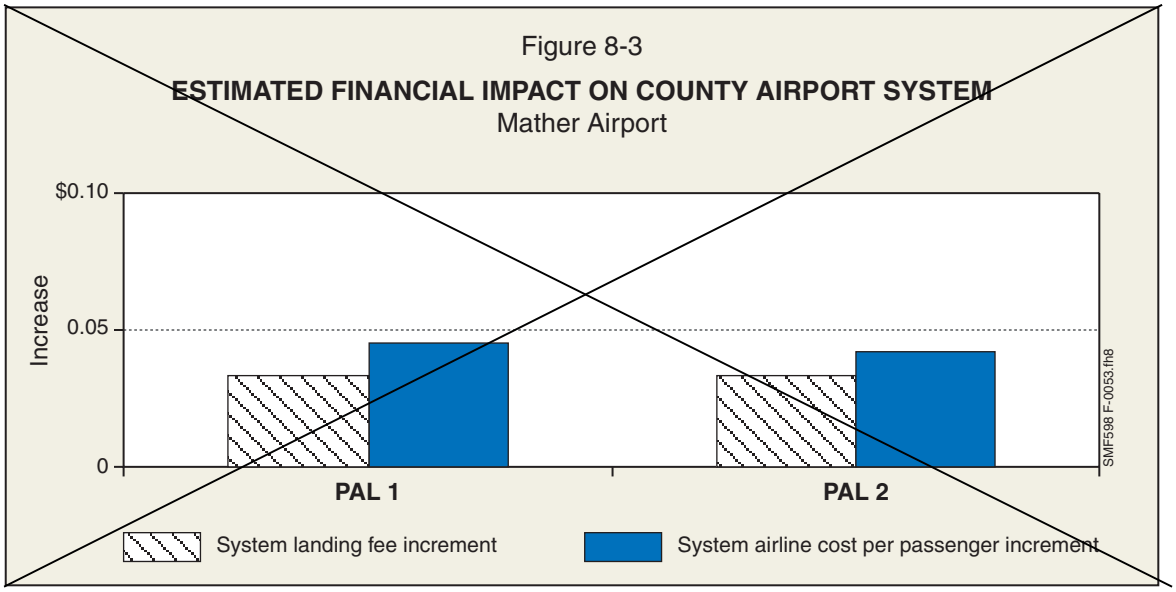
Landing Fee. From the financial plan summarized in Table 8-1 and expected incremental ~~debt service,~~ operating expenses, and nonairline revenues associated with Master Plan projects, it is estimated that the financing of Master Plan capital improvements would have an immaterial effect on the Airport System landing fee. Incremental expenses ~~and debt service~~ associated with Master Plan projects (offset by nonairline revenues) would be included in the ~~total Airport System requirement~~ ***reliever airports operating deficit*** used in the calculation of airline landing fees ***at all System Airports***.

~~As reflected in Table 8-3 and Figure 8-3, incremental landing fee amounts projected for Mather Airport Master Plan projects are not significant (with projected increments equal to less than 2% of the FY 2004 landing fee).~~

Figure 8-3

ESTIMATED FINANCIAL IMPACT ON COUNTY AIRPORT SYSTEM

Mather Airport



Factors Affecting Financial Implications

The preliminary financial plan and estimated financial implications are based on the assumed timing and cost of Master Plan capital improvements and assumptions regarding the availability of funds as outlined in this chapter. Events or developments that are likely to affect the actual implementation of Master Plan improvements include:

1. ***Facility Requirements***—The requirements for Mather Airport facilities are determined primarily by associated levels of demand, but are also affected by safety and security requirements and the intensity or efficiency with which facilities are used. Changes in facility use as a result of new federal requirements or modification of existing operational policies could result in the acceleration or deferral of construction of certain new facilities.

2. ***Aviation Demand***—Population and economic growth in the Sacramento area could result in higher-than-projected demand for Mather Airport facilities. Conversely, aviation demand for facilities could be lower as a result of economic slowdown, war, terrorist activity, public health concerns, or other factors. In either case, the need for facilities and the availability of certain funding sources would be affected.

3. ***Alternative Funding Sources***—Significant changes in the availability of any of the sources of funds assumed for the preliminary financial plan would require the Department to reevaluate the implementation and/or timing of Master Plan projects. A reduction in any funding source would require an offsetting increase in another source of funds or deferral of projects.

CONCLUSIONS

The County will continue develop the Airport consistent with funding sources available at the time of project implementation. The financial feasibility of future projects will be determined by the provisions of future airline and/or tenant agreements, available funding sources, and participation in federal grant-in-aid programs (assuming the future availability of such grants), ~~revenue bond capacity,~~ and the ability to generate discretionary cash flow.

As noted earlier, assuming that estimated project costs and airline traffic activity are realized, and AIP grants remain a significant source of County funding, the Master Plan financial analysis suggests that the County should be able to fund the projects identified in the Master Plan while meeting the requirements of the ~~Bond Resolution~~ ***County's Airport System Bond Indenture*** and maintaining reasonable rates to Airport System users.

~~The Master Plan financial projections were prepared on the basis of available information and assumptions set forth in this chapter. It is believed that such information and assumptions provide a reasonable basis for the projections to the level of detail appropriate for an airport master plan. However, as discussed, some of the assumptions used to develop the projections will not be realized and unanticipated events and circumstances may occur. Therefore, the actual results will vary from those projected, and such variations could be material.~~

The Master Plan financial plan is preliminary in nature and is not intended to be used to support the sale of bonds, to obtain grants, or to obtain other forms of financing. When the County decides to ~~pursue the sale of bonds,~~ apply for grants, or secure other forms of financing, more detailed cost estimates and financial analysis would be required.