CHAPTER ONE

Inventory

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INVENTORY

The purpose of the airport layout plan (ALP) narrative report is to provide the City of Livermore, the California Department of Transportation - Division of Aeronautics (Caltrans), and the Federal Aviation Administration (FAA) with a clear vision of necessary airport improvements over the next 20 years. This document will focus on the facility changes and development direction of the airport that has occurred since the previous ALP was completed in 2007.

The ALP set contains several technical drawings, including the airport layout drawing which depicts both the current and planned future conditions for the airport. The ALP set also includes updated Terminal Area, Airport Land Use, Part 77 Airspace, Approach and Departure Surfaces, and Exhibit A - Property Map drawings.

AIRPORT HISTORY AND ADMINISTRATION

The Livermore region has a rich aviation history. A private airport was first established in 1929 near what is now Rincon Avenue. In April of 1942, to support naval pilot training, the airport was taken over by the federal government and established as a Naval Auxiliary Airfield. During WWII, the airport provided auxiliary air service in support of the Livermore Naval Air Station (now Lawrence Livermore National Laboratory). After WWII, the City of Livermore operated the airport under lease from the Navy until acquiring the facility in 1953. The airport was then known as the Livermore Sky Ranch.

Due to its close proximity to the City's downtown, city leaders desired to relocate the airport. By late 1965, initial construction of the Livermore Municipal Air-

port was complete at the current site. The initial airport encompassed 257 acres, provided a 4,000-foot asphalt runway and parallel taxiway, an aircraft parking apron with 100 tie-down positions, and was home to more than 50 based aircraft. The first hangars were constructed in 1970 and the airport traffic control tower was constructed in 1973.

The airport has been continually updated and improved since its initial construction. Today, the airport provides a parallel runway system with primary Runway 7L-25R measuring 5,253 feet in length and Runway 7R-25L measuring 2,699 feet in length. The primary runway is lighted, extending the hours of operation into nighttime, and the secondary runway is an unlit training runway. The airport encompasses approximately 644 acres and has 24 City-owned buildings that consist of 392 aircraft storage units, a 2,400 square foot (sf) administration building, an aircraft storage shelter, and an 18,000 sf corporate-style hangar with an additional 2,400 sf of office space. The aircraft apron provides 250 tie-down positions of which over 50 are leased. The airport maintains a waiting list of over 150 individuals for an enclosed hangar space.

The airport supports nearly 500 based aircraft and experienced more than 130,000 operations in 2012. The airport has an airport traffic control tower (ATCT) that is owned and operated by the FAA. The tower is open from 7:00 a.m. to 9:00 p.m. daily.

Table 1A presents the federal grant history for the airport since 1998.

TABLE 1A
Federal Grant History
Livermore Municipal Airport

Year	Description	Grant #	Grant Amount
2012	ALP Update and Narrative Report	3-06-0123-023-2012	$148,500
2011	Wildlife Hazard Assessment	3-06-0123-022-2011	$100,000
2011	Modify Service Road, Rehabilitate Runway 7L-25R	3-06-0123-021-2011	$2,003,727
2010	Rehabilitate Runway	3-06-0123-020-2010	$104,802
2008	Rehabilitate Runway and Taxiway	3-06-0123-019-2008	$731,878
2007	Rehabilitate Apron	3-06-0123-018-2007	$93,904
2003	Install Airfield Guidance Signs	3-06-0123-017-2003	$276,494
1998	Airport Master Plan Study	3-06-0123-016-1998	$135,000
1998	Construct Apron, Extend Taxiway, Rehabilitate Apron and Taxiway, Rehabilitate Runway Lighting	3-06-0123-015-1998	$652,500
		TOTAL	**$4,246,805**

Source: Airport records

ADMINISTRATION

The airport is owned and operated by the City of Livermore and is a division of the Public Works Department. The City employs a full-time professional airport manager and staff. The airport manager reports to the Director of Public Works. An Airport Commission has been established by the Livermore City Council. The Airport Commission is comprised of five volunteer members, appointed by the City Council, to serve four year terms. The Airport Commission meets monthly and has the following duties and responsibilities:

1. The Commission is advisory to the City Council on:
   a. Determinations of demand in support of future Airport development pursuant to section 1 of Resolution 2010-058,
   b. Rendering a determination whether redevelopment of existing facilities may occur based upon need for significant rehabilitation, improvement or replacement,
   c. Other Airport matters initiated and referred to the Commission by the City Council.
2. The Commission is advisory to the Planning Commission on:
   a. Proposed development within the City's Airport Protection Area (APA) including proposed changes to the APA or the zoning at the Airport,
3. The Commission supports the goals and priorities adopted by the City Council relative to the Airport's operations.
4. The Commission promotes the Airport as an economic development tool and disaster recovery facility that benefits Livermore residents and the Tri-Valley.
5. The Commission has a regulatory responsibility to:
   a. Make a commercial aeronautical activity appeal determination pursuant to Livermore Municipal Code section 11.08.160,
   b. Amend and approve the large hangar waiting list policy pursuant to Livermore Municipal Code section 11.08.180,
   c. Conduct appeal hearings pursuant to Livermore Municipal Code section 11.08.190.
6. The Commission is advisory to staff on:
   a. Airport safety and security matters,
   b. Operational policies and regulations pertaining to tenants and users of the Airport,
   c. The Airport noise monitoring and reduction program,
   d. Planning for public and private development on the Airport, consistent with adopted City General Plan policies, the adopted Community Development Code (Zoning Code), and the adopted 20 Year Capital Improvement Program Budget
   e. The draft 20-Year Capital Improvement Program Budget,
   f. Other matters related to the Airport that are initiated and referred by staff to the Commission.

AIRPORT SETTING AND ACCESS

Livermore Municipal Airport is located in the northeast portion of Alameda County in the Tri-Valley area. The airport lies three miles northwest of downtown Livermore and approximately two miles east of the City of Pleasanton. With an airfield elevation of 400 feet above mean sea level (MSL), the airport lies on the Livermore/Amador Valley floor with surrounding ridges rising to approximately 1,400 feet MSL.

A municipal golf course borders the airport along its northwest edge. Several light industrial parks are located north-

east of the airport. Immediately west of the airport is the Paragon Outlets retail development. The closest residential development is 1.3 miles to the west and 0.75 miles to the east. To the immediate south of the airport are numerous aggregate mining pits and associated ponds.

The airport is easily accessible from the existing surface transportation system. Interstate-580 traverses to the immediate north of the airport. The interchange at Airway Boulevard provides direct access to the airport terminal area and West Jack London Boulevard provides access to the south side of the airfield. The location of Livermore Municipal Airport in its regional setting is depicted on **Exhibit 1A**.

CLIMATE

Weather conditions are important to the planning and development of an airport. Temperature is an important factor in determining runway length requirements, while wind direction and speed are used to determine optimum runway orientation. The need for navigational aids and lighting is determined by the percentage of time that visibility is impaired due to cloud coverage or other conditions.

Livermore has a Mediterranean climate with warm to hot, dry summers and mild to cool, wet winters. Summer daytime temperatures average in the mid-to-upper 80s Fahrenheit (F) and can occasionally reach the 100s (F). Nights tend to be cool with average lows in the 50s (F) and 60s (F). The area averages 15.2 inches of rainfall, most of which comes in the winter months. **Table 1B** summarizes monthly climatic data for the City of Livermore.

TABLE 1B
Climate Summary
Livermore, CA

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High Temp. Avg. (°F)[1]	56.9	61.8	65.3	71.2	77.0	84.0	89.1	88.7	85.9	77.9	64.8	57.0
Low Temp. Avg. (°F)[1]	37.4	40.3	42.3	44.2	48.5	52.5	54.9	55.0	53.2	48.4	41.5	36.9
Precip. Avg.(in.)[1]	3.0	2.8	2.5	1.0	0.4	0.1	0.0	0.1	0.2	0.8	1.9	2.0
Windspeed(mph)[2]	7.0	7.1	8.3	8.5	8.9	9.5	8.7	8.4	7.4	6.4	5.9	6.2
Sunshine (%)[2]	48%	65%	74%	82%	89%	94%	97%	96%	93%	85%	78%	50%

Source: [1]National Climatic Data Center - *Climatography of the United States No. 81 (30-years of data from 1971-2000)*
[2]*www.city-data.com analysis of weather station data.*

AIRPORT PLANNING ROLE

Airport planning exists on many levels: national, state, and local. Each level has a different emphasis and purpose. On the national level, Livermore Municipal Airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). This federal plan identifies 3,332 existing airports which are considered significant to the national air transportation system. The NPIAS is published and used by the FAA in administering the Airport Improvement Program (AIP) which is the source of federal funds for airport improvement projects across the country. The AIP program is funded exclusively by user fees and user taxes, such as those on fuel and airline tickets. The 2013-2017 NPIAS estimates $42.5 billion is needed for airport development across the country over the next five years. An airport

Exhibit 1A
LOCATION MAP

must be included in the NPIAS to be eligible for federal funding assistance through the AIP.

The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying specific airport improvements. The current issue of the NPIAS identifies approximately $1.65 million in development needs over the next five years for Livermore Municipal Airport. This figure is not a guarantee of federal funding; instead, this figure represents development needs as presented to the FAA by the airport administration in the annual airport capital improvement program.

Airports that apply for and accept AIP grants must adhere to various grant assurances. These assurances include maintaining the airport facility safely and efficiently in accordance with specific conditions. The duration of the assurances depends on the type of airport, the useful life of the facility being developed, and other factors. Typically, the useful life for an airport development project is a minimum of 20 years. Thus, when an airport accepts AIP grants, they are obligated to maintain that facility in accordance with FAA standards for at least that long.

Of the $42.5 billion in airport development needs nationally, approximately 30 percent is designated for 2,831 general aviation airports (includes reliever airports). Livermore Municipal Airport is designated as a general aviation reliever airport.

In 2012, the FAA published *General Aviation Airports: A National Asset*. The purpose of the report is to further classify general aviation airports into four categories: national, regional, local, and basic airports. Of the 2,952 general aviation airports included in the study, 497 were not specifically classified due to types of activity and characteristics that did not provide for clear classification within one of the four groups. **Exhibit 1B** summarizes the composition of the National Airspace System as well as the general aviation classifications and functions.

With this report, which has been integrated into the NPIAS, the FAA is recognizing the important contribution that general aviation airports provide to the national aviation system and economy. General aviation contributed $38.8 billion in economic output in 2009. When factoring in manufacturing and visitor expenditures, general aviation accounted for an economic contribution of $76.5 billion.

The new categories for general aviation airports are intended to help guide policymakers when making decisions regarding airports. The study recognized that categorizing all general aviation airports the same did not properly identify the important role of each airport within a community and the benefits of a large and diverse aviation system.

Livermore Municipal Airport is categorized as one of the 467 "regional" general aviation facilities. Regional general aviation airports serve large metropolitan areas, support greater than 10 domestic flights over 500 miles, account for greater than 1,000 instrument operations, and have greater than one based jet or more than 100 based aircraft. Regional airports also account for 37 percent of the total flying at the studied general aviation airports and 42 percent of flying with flight plans. There is a substantial amount of charter (air taxi), jet flying, and helicopter operations.

At the state level, the airport is included in the *California Aviation System Plan* (CASP). The purpose of the CASP is to ensure that the state has an adequate and efficient system of airports to serve its

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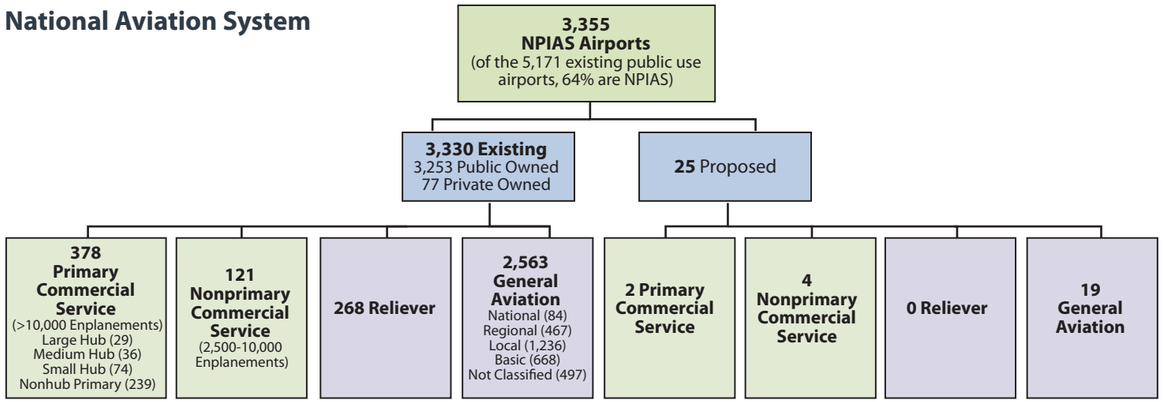
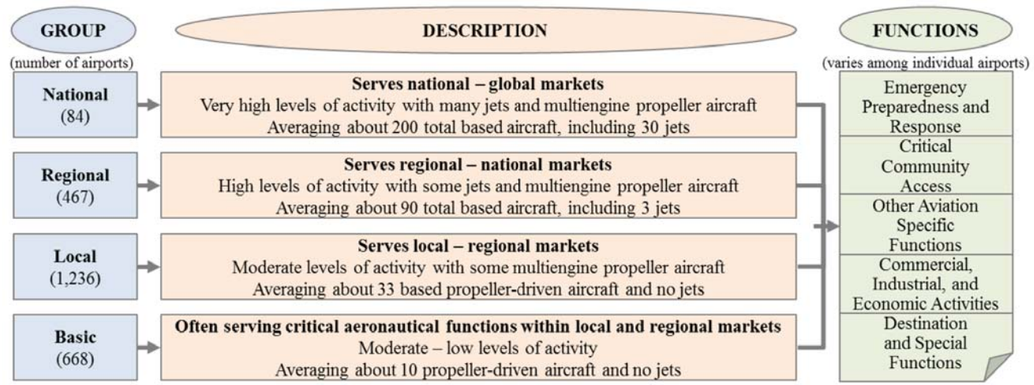
National Aviation System

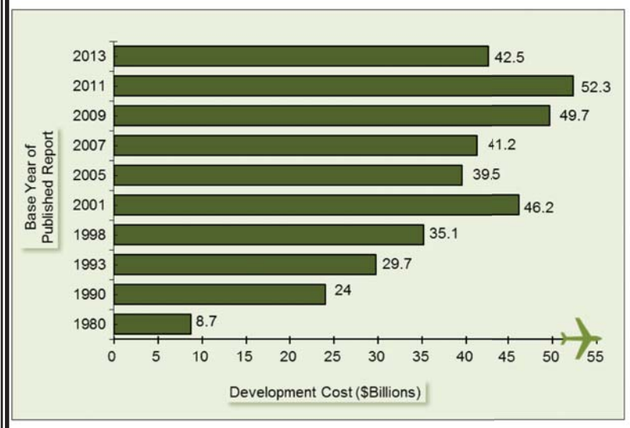


There are more than 19,800 aviation facilities in the United States. 5,171 of those are public use facilities. The National Plan of Integrated Airport Systems (NPIAS) includes 3,355 public use landing facilities, of which 3,330 are existing and 25 are proposed.

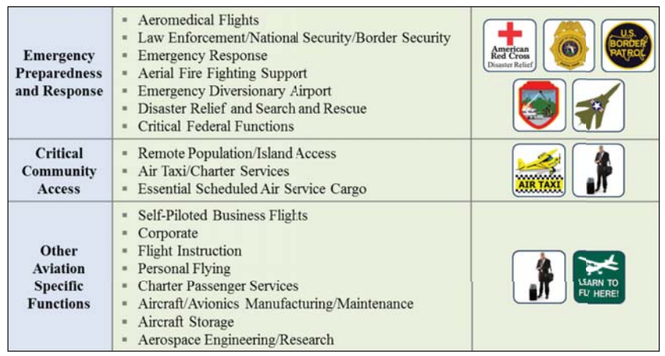
General Aviation Airports



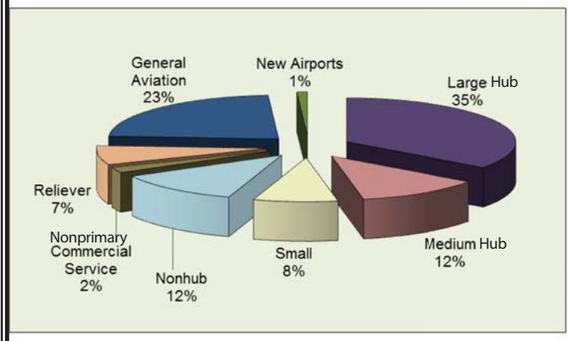
The FAA has further categorized general aviation airports to help guide policy makers when making decisions regarding airport development.

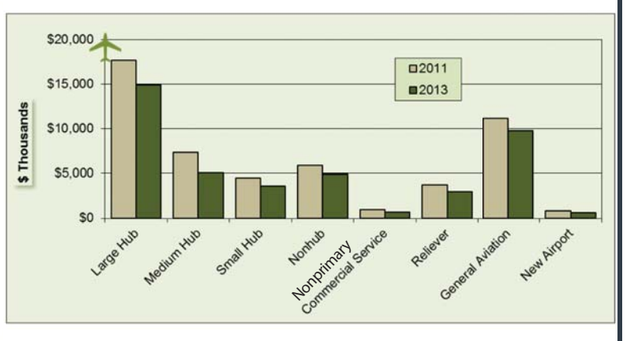


The FAA estimates that over the next five years, (2013-2017), there will be $42.5 billion of airport infrastructure projects eligible for Airport Improvement Program (AIP) funding.



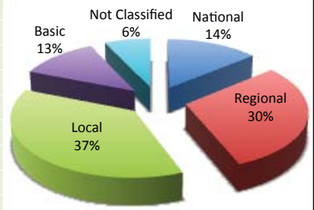
General aviation airports provide important services for both local communities and the national aviation system.





The 449 commercial service (primary and nonprimary) airports account for 69% of the total development in the NPIAS. The 2,563 general aviation and 268 reliever airports account for 30% of development.

Category	National	Regional	Local	Basic	Not Classified	TOTAL
Safety	$75,705,614	$86,710,307	$70,021,759	$16,866,556	$7,026,559	$256,330,795
Security	$30,588,072	$70,028,017	$116,979,036	$54,635,381	$42,428,521	$314,659,027
Reconstruction	$566,808,683	$1,151,264,524	$1,408,160,656	$505,127,646	$225,522,854	$3,856,884,363
Standards	$824,339,636	$2,215,374,810	$2,967,664,186	$1,013,246,603	$533,257,040	$7,553,882,275
Environmental	$15,797,438	$9,895,920	$25,330,900	$13,827,647	$4,270,342	$69,122,247
Noise	$59,033,952	$12,492,106	$4,410,211	$0	$0	$75,936,269
Capacity	$167,431,296	$218,153,518	$168,522,546	$56,143,576	$32,282,883	$642,533,819
Terminal	$48,187,551	$61,979,002	$70,218,522	$21,798,925	$9,867,688	$212,051,688
Access	$47,984,641	$109,815,827	$104,412,928	$42,708,943	$13,451,896	$318,374,235
Other	$7,571,000	$27,813,731	$49,226,059	$26,995,300	$15,686,691	$127,292,781
Total	$1,843,447,883	$3,963,527,762	$4,984,946,803	$1,751,350,577	$883,794,474	$13,427,067,499



Airports in the general aviation categories account for $13.4 billion of the $42.5 billion in identified development need over the next five years.

Source: National Plan of Integrated Airport Systems 2013-2017

Source: General Aviation Airports: A National Asset (May 2012)

Exhibit 1B
NATIONAL AVIATION SYSTEM
COMPOSITION AND DEVELOPMENT NEEDS

aviation needs well into the 21st century. The CASP defines the role of each airport in the state's aviation system and establishes funding needs.

The CASP identifies seven airport classifications for the state. They are: Primary Commercial Service, Non-Primary Commercial Service, Metropolitan GA, Regional GA, Community GA, Limited Use GA, and Military. Livermore Municipal Airport is classified as a Metropolitan General Aviation airport.

The airport layout plan is the primary local planning document. The airport layout plan is intended to provide a 20-year vision for airport development based on aviation demand forecasts. Forecasts beyond five years may become less reliable. The most recent FAA approved forecasts were completed in 2008 as part of an Environmental Impact Report (EIR). This ALP Update and Narrative Report will utilize the long term forecasts from the EIR.

CURRENT AIRPORT ACTIVITY

The primary aviation activity indicators for general aviation airports are operations and based aircraft. The information below presents historical data through 2012.

OPERATIONS

Table 1C presents the operations count for the airport as recorded by the airport traffic control tower. As can be seen, from calendar year (CY) 2005 to CY 2007 the airport was experiencing an increasing trend in operations, reaching 181,724 operations by 2007. In 2008, the airport experienced a significant drop in operations, a trend that continued through 2010. In 2011, the airport began to see a recovery of activity levels which then dropped slightly in 2012.

The trend line shown is reflective of many airports across the country. The economic recession, which began in the fourth quarter of 2007 and lasted into 2009, had a significant and negative impact on aviation operations nationally. The slow recovery has led to a slow rebound to previous activity levels. Only recently are many airports, including Livermore Municipal Airport, beginning to see increasing operations trends.

TABLE 1C
Historical Operations (Calendar Year)
Livermore Municipal Airport

TYPE OF OPERATION	2005	2006	2007	2008	2009	2010	2011	2012
Itinerant								
General Aviation	74,423	72,567	74,480	66,938	58,397	50,328	54,785	53,901
Air Taxi/Commuter	1,554	1,584	1,612	1,331	810	741	668	860
Military	186	78	325	98	272	105	135	110
Total Itinerant	**76,163**	**74,229**	**76,417**	**68,367**	**59,479**	**51,174**	**55,588**	**54,871**
Local								
General Aviation	94,296	100,695	104,977	89,735	73,853	75,289	81,883	77,560
Military	24	2	330	21	0	14	20	4
Total Local	**94,320**	**100,697**	**105,307**	**89,756**	**73,853**	**75,303**	**81,903**	**77,564**
Total Operations	**170,483**	**174,926**	**181,724**	**158,123**	**133,332**	**126,477**	**137,491**	**132,435**

Source: FAA Air Traffic Activity System (ATADS)

It should be noted that Livermore Municipal Airport can experience rather large changes in operations from year to year. Year to year changes of more than 10,000 operations is not unusual.

BASED AIRCRAFT

The number of based aircraft at an airport is dynamic as aircraft can relocate frequently. For 2012, several estimates of based aircraft exist including the FAA Terminal Area Forecast (TAF) (446); the FAA Form 5010 (420); and the GCR and Associates based aircraft count (455). Because of the wide variance in based aircraft figures, the airport conducted a physical inventory of based aircraft and determined that there are currently 495 based aircraft at the airport.

AVIATION DEMAND FOREACSTS

In October 2008, a set of "unconstrained forecasts" of aviation demand were developed for the airport. These forecasts were included in the *Livermore Municipal Airport General Plan Amendment and Rezoning EIR* and were approved by the FAA. By agreement with the FAA, these forecasts are to be utilized in this ALP Narrative Report. Unconstrained forecasts are those that may reasonably be expected to occur at an airport over a specific period of time. While unconstrained forecasts provide an indication of the long-term growth potential at an airport, actual growth potential – which is affected by many influences at the local, regional, and national levels – may fluctuate above or below the unconstrained forecast levels.

Based on the EIR forecast, operations are expected to increase to 220,100 by 2030. Operations are classified by the airport traffic control tower as either "itinerant" or "local." Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. A local operation is a take-off or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or "touch-and-go" operations at the airport. Generally, local operations are for training purposes. In 2012, 54,871(41 percent) of the operations at the Airport were itinerant and 77,564 (59 percent) were local. This composition of itinerant and local operations is expected to remain fairly constant through 2030. In 2030, approximately 90,430 (41 percent) of the operations at the airport were forecast to be itinerant and 129,670 (59 percent) were forecast to be local.

Many aspects of facility planning relate to levels of peaking activity – times when the airport is busiest. For example, the appropriate size of an administration building can be estimated by determining the number of people that could reasonably be expected to use the facility at a given time.

The following planning definitions apply to the peak periods:

- **Peak Month** -- The calendar month when peak aircraft operations occur.
- **Design Day** -- The average day in the peak month.
- **Busy Day** -- The busy day of a typical week in the peak month.
- **Design Hour** -- The peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. The peak period forecasts represent reasonable planning standards that can be

applied without overbuilding or being too restrictive.

Typically, the peak month for general aviation operations represents between 10 and 12 percent of total operations. Review of historical data for Livermore Municipal Airport determined the peak month to represent 10 percent of annual operations.

The design day was then calculated by dividing the peak month by the number of days in the month (30). The busy day was calculated as 1.25 times the design day activity. Design hour operations were calculated at 15 percent of design day operations. **Table 1D** summarizes the FAA approved forecasts of aviation demand for Livermore Municipal Airport.

FAA TERMINAL AREA FORECAST (TAF)

The FAA produces annual estimates of airport activity in terms of operations and based aircraft. These forecasts are presented in the TAF. The TAF is primarily used by FAA for budgeting reasons and should be compared to any forecasts the airport may utilize for consistency.

TABLE 1D
Forecast Summary
Livermore Municipal Airport

TYPE OF OPERATION	Base Year[1] 2012	Forecast[2] 2030
Itinerant		
General Aviation	53,901	86,400
Air taxi	860	3,800
Military	110	230
Total Itinerant	**54,871**	**90,430**
Local		
General Aviation	77,560	129,600
Military	4	70
Total Local	**77,564**	**129,670**
Total Operations	**132,435**	**220,100**
BASED AIRCRAFT TYPE	**Base Year[3] 2012**	**Forecast[2] 2030**
Single Engine	459	620
Multi-Engine	27	73
Jets/Turboprops	4/3	20
Helicopters	2	7
Total Based Aircraft	**495**	**720**
PEAKING OPERATIONS CHARACTERISTICS[4]		
Peak Month (10%)	13,244	22,010
Design Day	441	734
Busy Day	552	917
Design Hour (15%)	66	110

[1] FAA Air Traffic Activity System (ATADS) - Tower records.
[2] 2008 *Livermore Municipal Airport General Plan Amendment and Rezoning EIR.*
[3] Physical counts taken by airport management in December, 2012.
[4] Calculated on industry standard averages.

The TAF estimates 128,463 total operations for 2013 which is lower than the airport actually experienced in 2012. The TAF estimates a slow growth trend going forward with 139,027 operations by the long term (2030). The long term operations TAF estimate is well below the operational levels the airport experienced prior to the economic recession. While the TAF does appear to take into consideration the economic downturn and slow recovery, it presents a very conservative recovery in operations for Livermore Municipal Airport. As of 2013, the airport is once again trending upward.

For long term planning purposes, this study will utilize the EIR forecasts, as previously determined in consultation with FAA. The EIR forecasts were approved by the FAA for use in this study.

AREA LAND USE

Land use surrounding an airport is a critical consideration. It is important for the operator of a public use airport to take proactive steps to protect the airport environment for the safe operations of aircraft and for the safety of people and property on the ground. Airport operators should be cognizant of the current land use activities surrounding the airport and should take steps to insure that future uses are compatible to the maximum extent practicable.

Areas to the northeast of the airport include a mix of low intensity industrial and commercial buildings. Immediately to the northwest is the Los Positas Golf Course, which is owned and operated by the City of Livermore. Land uses to the immediate east of the airport include the City water reclamation plant and various low intensity industrial uses, and then beginning approximately three-quarters of a mile from the Runway 25R threshold, begins single family residential housing.

West Jack London Boulevard borders the airport on the south. Land uses south of the roadway include an area to the southeast intended for light industrial and commercial development. Immediately south are gravel quarries and associated ponds. The gravel quarries are outside the city limits of Livermore but within the City's Planning Area.

To the northwest is the Paragon Outlets retail development and undeveloped land and ponds. Further to the west beginning approximately 1.4 miles from the Runway 7L threshold is single family residential development. **Exhibit 1C** presents current land uses in the vicinity of the airport.

AIRPORT PROTECTION

The City of Livermore has taken positive steps to ensure the viability of the airport. In 1993, the City established an Airport Protection Area (APA). The APA forms a rectangular boundary around the airport and includes the area located within 7,100 feet west of the Runway 7L threshold, 5,000 feet east of the Runway 25R threshold, 5,000 feet north and south as measured from the edge of the closest runway. New or intensive expansion of residential development within the APA is prohibited.

The Alameda County Airport Land Use Commission (ALUC) updated the *Airport Land Use Compatibility Plan (*ALUCP*)* in 2012. The plan establishes an Airport Influence Area (AIA). The AIA extends west to Santa Rita Road and south to Stanley Boulevard. To the east, the limits of the AIA follow North Livermore Avenue, and to the north it extends from Tassajara

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Exhibit 1C
EXISTING LAND USE

Road to North Livermore Avenue. The AIA includes portions of the cities of Livermore, Pleasanton, Dublin, and unincorporated Alameda County. The AIA is the area within which the ALUC is authorized to review local land use actions affecting the area, including adoption of amendments of general plans, specific plans, zoning ordinances, and building regulations.

Planned future land uses should be considered when planning airport improvements. **Exhibit 1D** is a compilation of land use zoning from these entities in the AIA as sourced from the ALUCP.

The ALUCP identifies seven different safety zones which are based on runway length and flight patterns. Land Use development criteria have been developed for each of the safety compatibility zones. **Exhibit 1E** presents the airport planning and safety zones as well as the jurisdictional boundaries associated with the airport.

Airspace protection policies have been established by the ALUC that, together with regulations established by local land use jurisdictions and the state and federal government, are to ensure that hazards to the navigable airspace are avoided. Airspace protection measures are based on FAA policies as outlined in Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airpsace*.

AIRSIDE FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities directly associated with aircraft operations. The landside category includes those facilities necessary to provide a safe transition from surface to air transportation and support aircraft servicing, storage, maintenance, and operational safety.

Airside facilities include runways, taxiways, airfield lighting, and navigational aids. Airside facilities are identified on **Exhibit 1F**. **Table 1E** summarizes airside facility data at Livermore Municipal Airport.

RUNWAY/TAXIWAY SYSTEM

Livermore Municipal Airport is served by two parallel asphalt runways. Runway 7L-25R, the primary runway, measures 5,253 feet long, 100 feet wide, and is oriented in an east-west manner. Both ends of the runway have 150-foot long blast pads. Runway 7R-25L is the secondary runway measuring 2,699 feet long by 75 feet wide. This runway is located 500 feet, centerline to centerline, to the south of the primary runway and is also constructed of asphalt. This runway is unlit and is utilized in visual only conditions.

Runway 7L-25R has a pavement strength rating of 45,000 pounds single wheel type landing gear (S) and 60,000 pounds dual wheel type landing gear (D). "S" refers to the design of certain aircraft landing gear which has a single wheel on each main landing gear strut; "D" refers to certain aircraft landing gear which has two wheels on each main landing gear strut. Runway 7R-25L has a pavement strength rating of 12,600 S.

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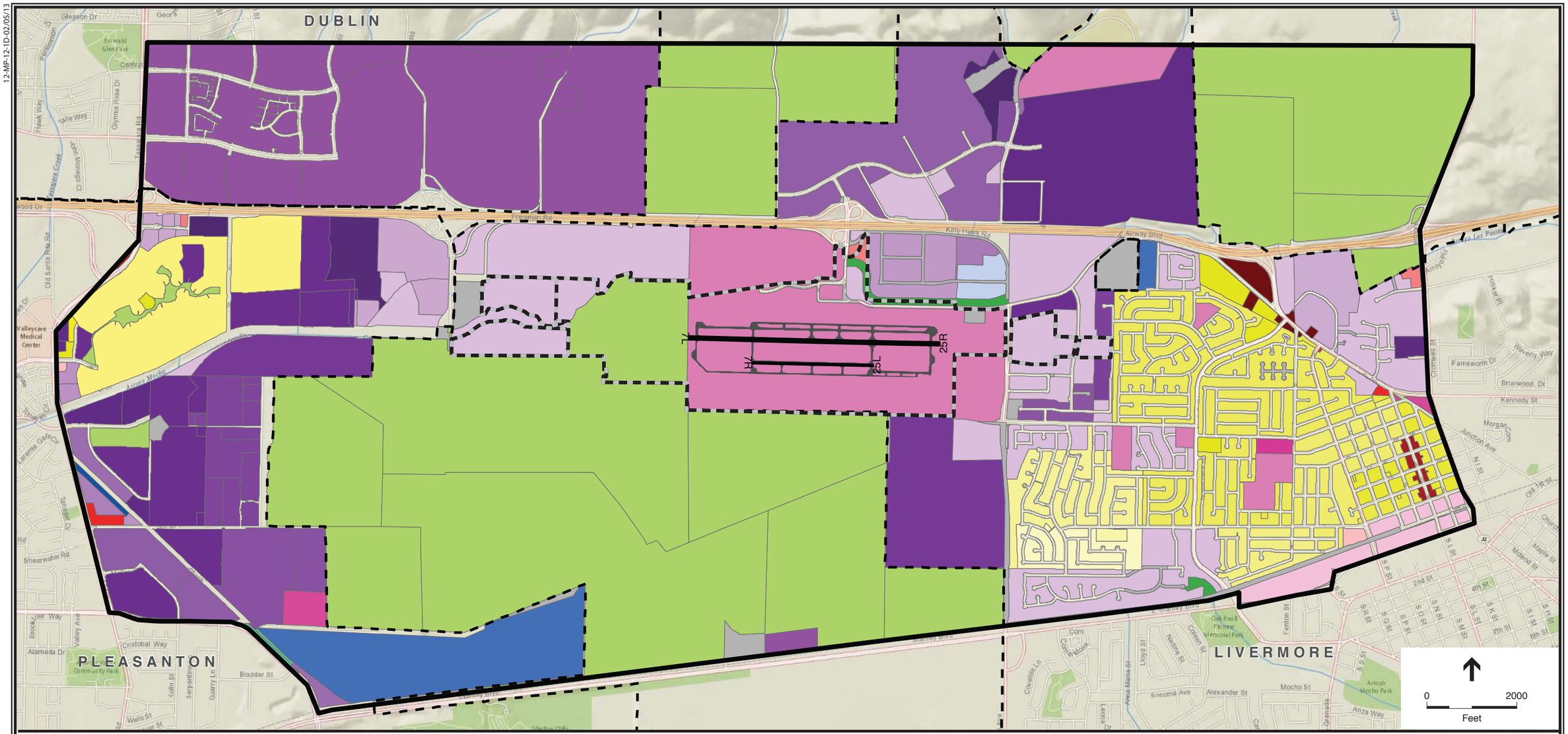


City of Livermore

- DSP - Downtown Specfic Plan
- E - Public/Quasi-Public
- E-HP-H - Public/Quasi-Public
- NM-2 - Neighborhood Mixed
- CB - Commercial
- CHS - Commercial
- CO - Commercial
- CP - Commercial
- CS - Commercial
- I-1 - Industrial
- I-2 - Industrial
- PD - Planned Development
- PD-16 - Planned Development
- PD-17 - Planned Development
- PDC-00-176 - Planned Development
- PDC-00-195 - Planned Development
- PDI-00-178 - Planned Development
- PDI-00-181 - Planned Development
- PDI-00-182 - Planned Development
- PDI-00-188 - Planned Development
- PDI-01-002 - Planned Development
- PDI-01-003 - Planned Development
- PDI-01-020 - Planned Development
- PDI-03-003 - Planned Development
- PDR-00-168 - Planned Development
- PDR-01-001 - Planned Development
- PDR-01-016 - Planned Development
- RS-3 - Single Family Res
- RS-3-HP-H - Single Family Res
- RS-4 - Single Family Res
- RL-5 - Single Family Res
- RL-5-0 - Single Family Res
- RL-6 - Single Family Res
- RM - Mutiple Family Res
- R-2 - Mutiple Family Res
- RG-12 - Mutiple Family Res
- RG-16 - Mutiple Family Res
- OS-A - Open Space Agriculture
- OS-F - Open Space Flood
- Unclassified

City of Pleasanton

- P - Public and Institutional
- C-N - Commercial Neighborhood
- C-F - Commercial Freeway
- O - Office Commercial
- C-C - Commercial Central
- I-G-40 - General Industrial
- I-P - Industrial Park
- PUD-P - Park
- PUD-C - Commercial-PUD
- PUD-C-O - Commercial and Offices-PUD
- PUD-O/C-C - Commercial Office / Commercial Central-PUD
- PUD-I - Industrial-PUD
- PUD-R-1-65 - Single Family Residential-PUD
- PUD-LDR/HDR/PI & Mixed PI/MDR - Low Density Residential/High Density Residential/Public & Inst-Mixed Public & Inst/Medium Density Residential-PUD
- PUD-LDR - Low Density Residential
- PUD-LDR/MDR - Low Density Residential/Medium Density Residential-PUD
- PUD-MDR - Medium Density Residential
- PUD-HDR - High Density Residential
- PUD-HDR/C - High Density Residential/Commercial
- PUD-RM-25 - Multiple Family Residential-PUD
- R-1-65 - Single Family Residential
- RM-15 - Multiple Family Residential
- RM-25 - Multiple Family Residential
- A - Agriculture
- S - Study District
- COP - Unknown

City of Dublin

- Planned Development

Alameda County

- A - Agriculture
- PD - Planned Development
- U - Unclassified

- Airport Boundary
- Airport Influence Area
- Jurisdictional Boundary

Source: Alameda County, 2012; City of Livermore, 2012; City of Pleasanton, 2012; City of Dublin, 2012; National Geographic, 2012; and ESA Airports, 2012

Exhibit 1D
AREA ZONING

12-MP-12-1E-02/04/13

DUBLIN

EAST COUNTY PLANNING AREA

LIVERMORE

PLEASANTON

EAST COUNTY PLANNING AREA

Tassajara Rd

N Livermore Ave

Caytano Creek

Las Positas Rd

Tassajara Creek

580

6,000

6,800

3,500

1,900

1,000

3,000

1,425

750

1,000

7L

25R

7R

25L

500

1,200

1,000

1,500

1,750

6,800

3,500

4,000

2,700

3,000

1,000

7R & 25L RPZ Dimensions
Length = 1,000 /
W1 = 250 /W2 = 450

2,000

2,000

3,800

3,800

5,500

Murrieta Blvd

Portola Ave

84

1st St

East Ave

S L St

S Livermore Ave

College Ave

Holmes St

Santa Rita Rd

El Charro Rd

Arroyo Mocho

Valley Ave

Stanley Blvd

Arroyo del Valle

Bernal Ave

Vineyard Ave

1st St

Vineyard Ave

Arroyo del Valle

0 2400
Feet

- Primary Surface
- Zone 1: Runway Protection Zone
- Zone 2: Inner Approach/Departure Zone
- Zone 3: Inner Turning Zone
- Zone 4: Outer Approach/Departure Zone
- Zone 5: Sideline Safety Zone
- Zone 6: Traffic Pattern Zone
- Zone 7: Area between Zone 6 and the AIA boundary

- APA: Airport Protection Area
- AIA: Airport Influence Area
- Airport Property
- Jurisdictional Boundaries

Source: ESA Airports, ESRI, California Airport Land Use Planning Handbook (Caltrans, 2002)

Exhibit 1E
AIRPORT PLANNING
AND SAFETY ZONES

12-MP-12–02/04/13

Exhibit 1F
AIRSIDE FACILITIES

TABLE 1E
Airside Facility Data
Livermore Municipal Airport

Field Elevation: 400 MSL	**Runway 7L-25R**	**Runway 7R-25L**
Runway Length	5,253'	2,699
Runway Width	100'	75'
Runway Surface Material (Condition)	Asphalt (Good)	Asphalt (Good)
Runway Markings (Condition)	Precision (Good)	Basic (Good)
Runway Lighting	Medium Intensity (HIRL)	None
Runway Load Bearing Strength (pounds)	45,000S/ 60,000D	12,500S
Runway Gradient	0.50%	0.60%
Traffic Pattern	7L-Left/25R-Right	7R-Right/25L-Left
Taxiway Lighting	Medium Intensity (MITL)	
Taxiway, Taxilanes & Apron Lightning and Marking	Various Centerline Marking, Tie-Down Area Marking, Reflectors	
Visual Approach Aids	VASI-4L (25R) PAPI-4R (7L) MALSR (25R)	None
Instrument Approach Aids	ILS (25R) RNAV (GPS) (25R)	None
Weather and Navigational Aids	Automated Surface Observing System (ASOS) Lighted Wind Cone Airport Beacon Automated Terminal Information Service (ATIS) Airport Traffic Control Tower (ATCT) Limited Aviation Weather Reporting Station (LAWRS)	

GPS - Global Positioning System
MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
S/D/DT - Single Wheel Landing Strut/ Dual Wheel Landing Strut

Source: Airport/Facility Directory - Southwest U.S. (Effective January 10, 2013); Airport records.

Both runways slope gently from the high end on the east to the low end on the west. The elevation difference for Runway 7L-25R is 27 feet for a runway gradient of 0.5 percent. The elevation difference for Runway 7R-25L is 15.8 feet for a runway gradient of 0.6 percent.

Runway 7L-25R is served by full length parallel Taxiway A, which is 250 feet centerline to centerline, north of the runway. There are four entrance/exit taxiways and two threshold taxiways. Runway 7R-25L is served by parallel Taxiway L which is 240 feet south of the runway. There are three entrance/exit taxiways and two threshold taxiways.

PAVEMENT MARKINGS AND CONDITION

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. Runway 7L-25R has precision markings on both ends which include runway edge marking, threshold bar, threshold markings, runway designation, fixed distance marks, centerline, touchdown zone markings, and aiming point. The basic markings on Runway 7R-25L identify the runway centerline and designation.

Both ends of Runway 7R-25L have blast pads that are marked with chevrons

which indicate the pavement is not usable.

Taxiway and apron centerline markings are provided to assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxilane edges. Pavement markings also identify aircraft tiedown positions and aircraft holding positions. Near both ends of Taxiway A, the word 'TAXI' is marked to alert pilots in case they are inadvertently lined up for landing on the taxiway.

Airport sponsors are required to maintain pavement surfaces for their useful life. Runway 7L-25R was recently overlaid and remarked and is in good condition. Runway 7R-25L is listed by the FAA as being in good condition; however, it is in need of an overlay as well.

AIRFIELD LIGHTING

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of lighting systems are installed at the airport for this purpose. These lighting systems, categorized by function, are summarized as follows:

Identification Lighting: The location of the airport at night is universally identified by a rotating beacon. The rotating beacon projects two beams of light, one white and one green, set 180 degrees apart. The rotating beacon at Livermore Municipal Airport is located atop a 50-foot tall steel lattice tower located at the southwest edge of the administration building parking lot.

Runway and Taxiway Lighting: Runway and taxiway lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. The lights are set atop a fixture that is approximately 30 inches above the ground. The light fixtures are frangible, meaning that if one is struck by an object, such as an aircraft wheel, they can easily break away, thus limiting the potential damage to an aircraft. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas.

Runway 7L-25R is equipped with medium intensity runway lighting (MIRL). Runway 7R-25L is unlit, making this runway usable only during daylight hours. All taxiways have medium intensity taxiway lighting (MITL).

Visual Approach Lighting: Approaches to Runway 7L are aided by the presence of precision approach path indicator lights (PAPI-4R), which provide visual approach slope guidance. PAPIs consist of a system of lights located 600 feet from the runway threshold, which when interpreted by the pilot, give them an indication of being above, below, or on the correct descent path to the runway. Runway 25R is equipped with a visual approach slope indicator lighting system located on the south side of the runway. VASIs differ from the PAPIs in that the lighting boxes are separated by some distance. For Runway 25R, the first VASI light box is 500 feet from the runway threshold and the second is 1,450 feet from the threshold.

Runway 25R is equipped with a medium intensity approach lighting system with runway alignment indicator lights (MALSR). The MALSR provides a lighted grid on the approach to the runway end. The MALSR is a requirement as there is a

precision instrument approach to this runway end.

Runway End Identification Lights (REILs): REILs provide rapid and positive identification of the approach end of a runway. A REIL consists of two synchronized flashing lights, located laterally on each side of the runway threshold, facing the approaching aircraft. There are no REILS installed at the airport.

Airfield Signs: Airfield identification signs assist pilots in identifying their location on the airfield and direct them to their desired location. Lighted signs are located throughout the airfield.

Pilot-Controlled Lighting: With the pilot-controlled lighting (PCL) system, pilots can turn on certain airfield lights from their aircraft through a series of clicks of their radio transmitter when the tower is closed. When the tower is closed, Runway 7L-25R edge lighting is set to low intensity and the MALSR and taxiway lights are off. To increase the intensity of the runway edge lights and turn on the MALSR and taxiway edge lights, utilize frequency 118.1 MHz. The PAPI and VASI operate continuously.

WEATHER AND COMMUNICATION INFORMATION

The airport is equipped with a lighted wind sock, which provides pilots with information about wind conditions, and a segmented circle, which provides traffic pattern information. The lighted wind sock and segmented circle are co-located equidistant between the two runways. A supplemental, unlit wind sock is located near the Runway 7L threshold to the south of Taxiway A.

Livermore Municipal Airport is equipped with an Automated Surface Observation System (ASOS). An ASOS automatically records various weather conditions at the airport such as wind speed, wind gusts, wind direction, temperature, dew point, altimeter setting, density altitude, visibility, precipitation, and cloud ceiling height. This information is then transmitted at regular intervals and can be access by pilots via a published telephone number, through ATCT personnel, or on the ATIS system. The ASOS is located between the two runways, adjacent to the segmented circle.

Livermore Municipal Airport also utilizes the common traffic advisory frequency (CTAF). This radio frequency (118.1 MHz) is used by pilots in the vicinity of the airport to communicate with each other about approaches or departures from the airport when the tower is closed or directly to the tower controllers when it is open. The UNICOM (Universal Communication) frequency (122.95 MHz) can be utilized to contact the airport fixed base operator (FBO).

The airport traffic control tower (ATCT) can be contacted on frequencies 118.1 MHz and 239.25 MHz from 7:00 a.m. to 9:00 p.m. while the tower is open. ATCT ground control and clearance delivery is available on frequency 121.6 MHz. The tower personnel are certified weather observers, which makes the airport a Limited Aviation Weather Reporting Station (LAWRS).

Approach and Departure Control services are available from Oakland Center Air Route Traffic Control Center (ARTCC) via frequency 121.5 MHz. NorCal TRACON (Terminal Radar Approach Control) provides safety alerts, separation, and sequencing of aircraft arriving, departing,

and transitioning over 19,000 square miles in northern California. NorCal TRACON is the step between local control from the on-airport ATCT and services from Oakland Center ARTCC. NorCal Approach to any runway and Departures to the east can be reached via 123.85. Departures to the west require communication with NorCal Departure at 125.35.

AIRFIELD HOT SPOTS

The FAA publishes at list of "hot spots" identified at each airport. A hot spot is defined as a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary. There are six hot spots at Livermore Municipal Airport, the location of which is identified on **Exhibit 1B** and described in **Table 1F**.

TABLE 1F
FAA Identified 'Hot Spots'
Livermore Municipal Airport

Designation	Description
HS 1	Pilots instructed to hold short of Rwy 25R at Twy B sometimes fail to comply. Pilots sometimes land on Rwy 25R without clearance.
HS 2	Pilots instructed to hold short of Rwy 25L at Twy C sometimes fail to comply.
HS 3	Pilots instructed to hold short of Rwy 07L at Twy H sometimes fail to comply.
HS 4	Pilots instructed to hold short of Rwy 07R at Twy G sometimes fail to comply.
HS 5	Pilots instructed to hold short of Rwy 25R at Twy G sometimes fail to comply.
HS 6	Pilots may be confused at the intersections of Twy J, A, and G sometimes fail to comply with taxi instructions.

Source: FAA Hot Spots diagram accessed at http://aeronav.faa.gov/pdfs/sw_hotspot_10jan2013.pdf

NAVIGATIONAL AIDS

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft operating in the vicinity of Livermore Municipal Airport include a nondirectional beacon (NDB), several very high frequency omnidirectional range (VOR) facilities, and the global positioning system (GPS).

The NDB transmits nondirectional signals whereby the pilot of an aircraft equipped with direction-finding equipment can determine their bearing to and from the radio beacon in order to track to the beacon station. The REIGA NDB is located 6.5 nautical miles (nm) to the east of the airport. The TRACY NDB is located 17.8 nm to the east.

A VOR, in general, provides azimuth readings to pilots of properly equipped aircraft transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR/DME) to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC.

VOR facilities within 30 nm of the airport include OAKLAND, SAN JOSE, CONCORD, SAN FRANCISCO, and WOODSIDE.

GPS is an additional navigational aid for pilots. GPS was initially developed by the United States Department of Defense for military navigation around the world. GPS differs from VOR in that pilots are not required to navigate using a specific ground-based facility. GPS uses satellites placed in orbit around the earth that transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and other navigational information. With GPS, pilots can navigate directly to any airport and are not required to navigate using a ground-based facility.

INSTRUMENT APPROACH/ DEPARTURE PROCEDURES

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating and landing at an airport during low visibility and low cloud-ceiling conditions.

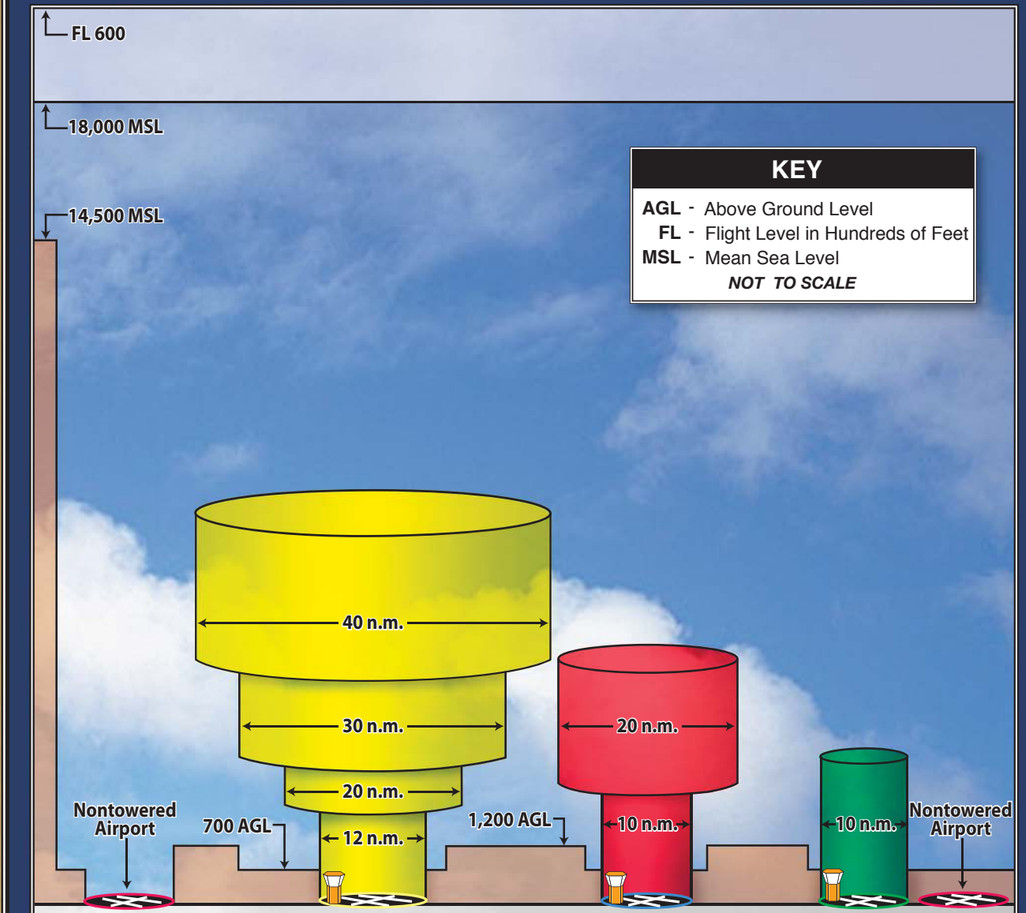
Visibility minimums define the horizontal distance that the pilot must be able to see to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for a pilot to complete the approach. If the observed visibility or cloud ceilings are below the prescribed minimums, the pilot cannot complete the instrument approach. There are currently two published instrument approaches to Livermore Municipal Airport.

Runway 25R is served by two instrument approaches, both of which have several variants. Straight-in approaches utilizing the ILS provide cloud ceilings as low as 200 feet above the ground and visibility minimums as low as ½-mile. A localizer performance and vertical guidance (LPV) approach (GPS) provides minimums as low as 32 feet and cloud ceilings of 320 feet above the ground.

Both approaches can also be utilized as a circling approach, which allows pilots to land on any active runway at the airport. While providing flexibility for the pilot to land on the runway most closely aligned with the prevailing wind, a circling approach will have higher visibility minimums in order to provide pilots with sufficient visibility and ground clearance to navigate visually from the approach to the desired runway end for landing. **Table 1G** summarizes the instrument approaches at Livermore Municipal Airport.

According to the FAA instrument flight procedures production plan, an RNAV (GPS) approach is planned to Runway 7L. This approach is scheduled for publication on April 3, 2014. The details of the approach are not known at this time.

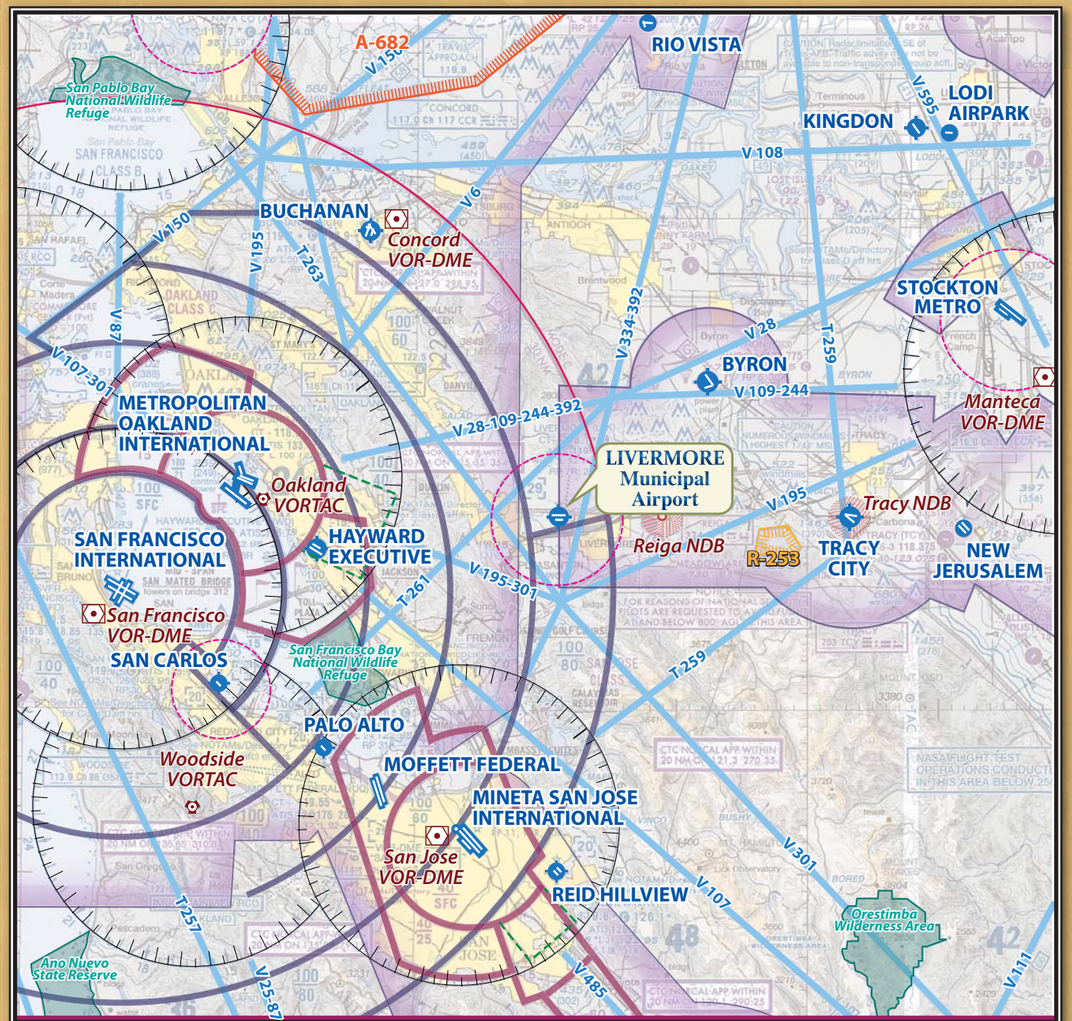
Instrument departure procedures are predetermined departure routes for pilots to follow when instructed. Livermore One Departure directs pilots departing to the west to climb to 1,200 feet then continue climbing while turning right to heading 20° until they intersect heading 60° at which point they follow the 60° heading until reaching a designated flyover point. The Byron One Departure instructs pilots departing to the east to climb straight out until reaching the Reiga NDB, at which point several directional options are available.



CLASSIFICATION	DEFINITION
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600.
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.

Source: "Airspace Reclassification and Charting Changes for VFR Products," National Oceanic and Atmospheric Administration, National Ocean Service. Chart adapted by Coffman Associates from AOPA Pilot, January 1993.

AIRSPACE CLASSIFICATION



LEGEND

- Airport with hard-surfaced runways less than 8,069′
- Airports with hard surfaced runways greater than 8,069′
- Non-Directional Radiobeacon
- VORTAC
- VOR-DME
- Compass Rose
- Wilderness Area
- Victor Airways
- Mode C
- Class B Airspace
- Class C Airspace
- Class D Airspace
- Class E Airspace
- Class E Airspace with floor 700 ft. above surface
- Prohibited, Restricted, and Warning Area
- Alert Area

NORTH

NOT TO SCALE

Source: U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Navigation Services - Effective August 23, 2012 - March 7, 2013

VICINITY AIRSPACE

TABLE 1G
Instrument Approach Data
Livermore Municipal Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE			
	Category A	**Category B**	**Category C**	**Category D**
ILS Rwy 25R				
ILS Straight-In	200'/½-mile			
LOC Straight-In	543'/½-mile		543'/1-mile	543'/1¼-mile
Circling	543'/1-mile		543'/1½-mile	703'/2¼-mile
RNAV (GPS) Rwy 25R				
LPV DA	320'/¾-mile			
LNAV MDA	680'/¾-mile		680'/1½-mile	680'/1¾-mile
Circling	680'/1-mile		680'/2-mile	680'/2¼-mile

Aircraft Categories are based on 1.3 times the stall speed in landing configuration as follows:

Category A:	0-90 knots (e.g., Cessna 172)
Category B:	91-120 knots (e.g., Beechcraft KingAir)
Category C:	121-140 knots (e.g., Canadair Challenger)
Category D:	141-166 knots (e.g., Gulfstream IV)

Abbreviations:
ILS - Instrument Landing System
LPV - Localizer Performance with Vertical Guidance
LP - Lateral Performance
GPS - Global Positioning System
LNAV/RNAV/VNAV - A technical variant of GPS
Note: (xxx/ x-mile) = Visibility/Cloud ceiling height

Source: U.S. Terminal Procedures, Southwest Region (Effective January 10, 2013)

AREA AIRSPACE

The *Federal Aviation Administration* (FAA) *Act of 1958* established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigational facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. System components shared jointly with the military are also included as part of this system.

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the NAS. The U.S. airspace structure provides for categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G as described below. **Exhibit 1G** generally illustrates each airspace type in three-dimensional form.

- Class A airspace is controlled airspace and includes all airspace from 18,000 feet MSL to Flight Level 600 (approximately 60,000 feet MSL).

- Class B airspace is controlled airspace surrounding high-activity commercial service airports (i.e., San Francisco International Airport).

- Class C airspace is controlled airspace surrounding lower-activity commercial service (i.e., Oakland International Airport) and some military airports.

- Class D airspace is controlled airspace surrounding low-activity commercial service and general aviation airports with an ATCT, such as Livermore Municipal Airport.

All aircraft operating within Classes A, B, C, and D airspace must be in constant contact with the air traffic control facility responsible for that particular airspace sector.

- Class E airspace is controlled airspace surrounding an airport that encompasses all instrument approach procedures and low-altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio contact with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist.

- Class G airspace is uncontrolled airspace that does not require communication with an air traffic control facility.

Airspace within the vicinity of Livermore Municipal Airport is depicted on **Exhibit 1G**. The airport operates in Class D airspace when the ATCT is open. The Class D airspace extends upward from the surface to and including 2,900 feet MSL within a four-mile radius of the airport. The airport operates in Class G airspace that extends from the ground to 700 feet and in Class E airspace 700 feet to 18,000 feet MSL when the tower is closed.

Victor Airways

Victor Airways are designated navigational routes extending between VOR facilities. Victor Airways are identified on sectional charges with a "V" followed by a number. Victor Airways have a floor of 1,200 feet AGL and extend upward to an altitude of 18,000 feet MSL and are eight nautical miles wide. There are numerous Victor Airways in the vicinity due to the location complexity of the airport space. Those closest to Livermore Municipal Airport include V334 east of the airport, V195 south of the airport, and V-28 north of the airport.

Military Training Routes

A Military Training Route or MTR is a specified training route for military pilot proficiency. Military aircraft can operate on the MTR at speeds in excess of 350 knots and at an elevation of up to 10,000 feet MSL. Military training routes are designated on sectional charts with "IR" or "VR" followed by a number. There are no military training routes in the region.

Military Operations Areas (MOAs)

A Military Operations Area (MOA) is airspace designated for military training use. This is not restricted airspace as civil pilots can use the airspace. However, they should be on alert for the possibility of military traffic. A pilot may need to be aware that military aircraft can be found in high concentrations, conducting aerobatic maneuvers, and possibly operating at high speeds at lower elevations. The

activity status of an MOA is advertised by a *Notice to Airmen* (NOTAM) and noted on Sectional Charts. There are no MOAs in the region.

The aviation sectional chart identifies an area located approximately 5 miles to the east of the airport that pilots should avoid. The chart says, "For reasons of national security pilots are requested to avoid flight at and below 800 feet AGL…" This area is associated with the Lawrence Livermore National Laboratory.

Mode C

Large commercial service airports typically have a surrounding Mode C ring. Aircraft operating within the Mode C ring are required to have an operable radio transponder. Livermore Municipal Airport is within the Mode C ring associated with San Francisco International Airport.

LANDSIDE FACILITIES

Landside facilities are the ground-based facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include the administration building, aircraft storage/ maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, and roadway access. Landside facilities are identified on **Exhibit 1H**.

AIRPORT BUSINESSES

Livermore Municipal Airport supports both aviation and non-aviation-related businesses. Aviation-related businesses include an FBO, several aircraft maintenance businesses, and a restaurant. The following describes the businesses with a presence at the airport:

Ahart Aviation Services: Flight training, maintenance, and aircraft rental.
Attitude Aviation: Flight training.
Aerial Advertising: Aerial banner towing and aerial photo mapping and photography.
Ralph Huy Aviation: Aircraft annuals and general maintenance.
J&R Electronics: Aviation electronics sales, repairs, and installation.
Tri-Valley Aviation: Full service aircraft maintenance and repair.
Precision Static Testing: Transponder repair and pilot recertification.
John Quayle Aviation Services: Aviation consultant.
Red Sky Aviation LLC: Flight training.
Beeb's Sports Bar and Grill: Restaurant accessible from the aircraft apron.
City of Livermore: Serves as the airport FBO providing fueling, line services, and other pilot services.

AIRCRAFT HANGAR FACILITIES

It is important to identify the types, sizes, and availability of hangar space at the airport in order to ultimately determine the long term need for additional facilities. Hangars can be categorized as T-hangars, box hangars, or conventional hangars. T-hangar units are intended for storage of a single small aircraft. They are "T" shaped, thus their name, and are typically nested together to maximize space and to lower the cost of construction.

Box hangars can be rectangular or square and typically provide between 2,500 and 6,000 square feet of storage space. These hangars are often stand-alone structures, but they can be connected as well. Box hangars provide greater flexibility than T-hangars because they do not have interior support structures that limit aircraft posi-

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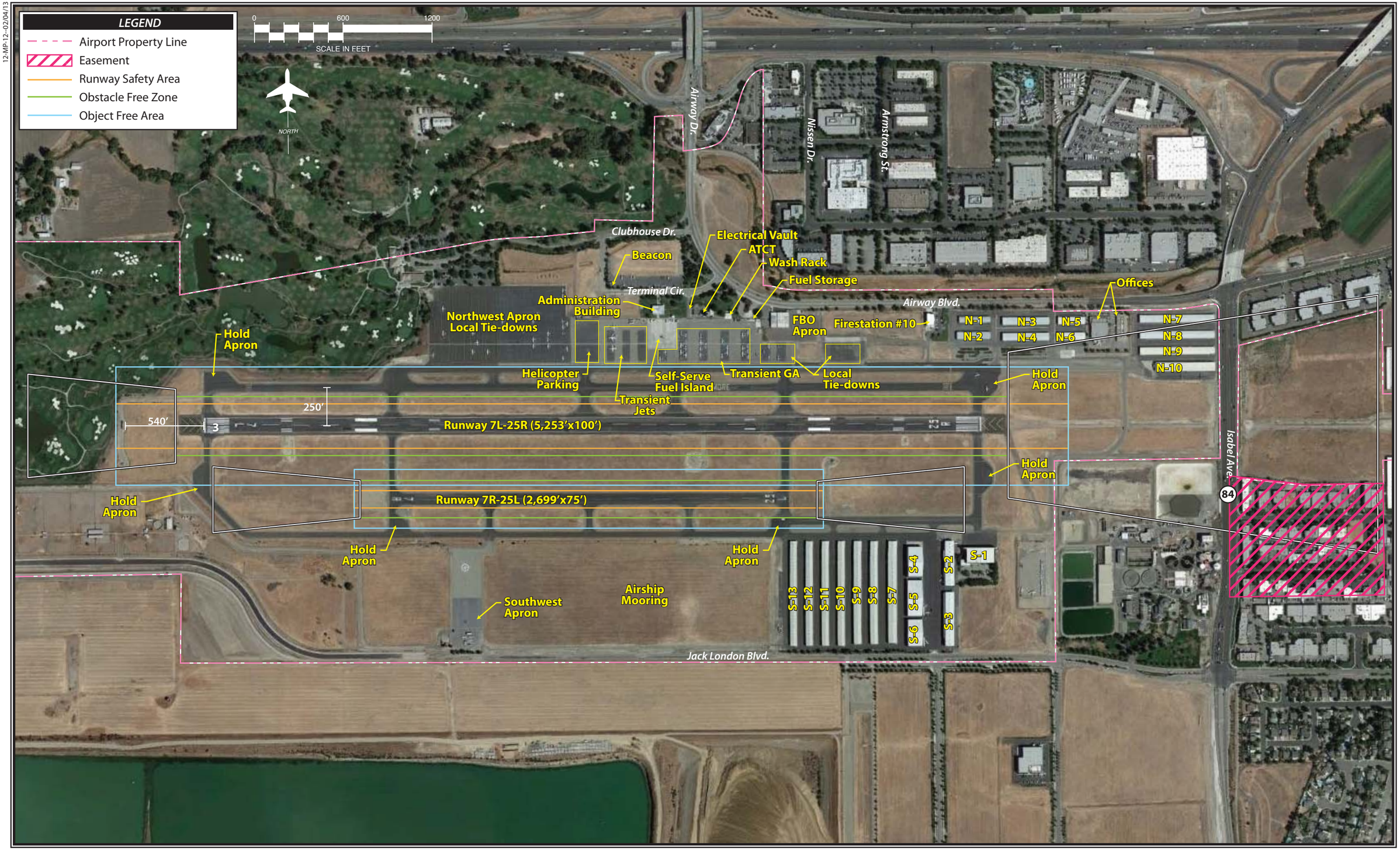

Exhibit 1H
LANDSIDE FACILITIES

tioning. Box hangars are typically equipped with utilities such as electricity, water, and possibly sewer service.

Conventional hangars are large, clear-span hangars that typically house airport businesses or serve bulk aircraft storage needs. Operators of larger corporate aircraft may utilize these hangars as well.

The airport has 24 City-owned buildings that consist of 392 aircraft storage units, a 2,400sf administration building, an aircraft storage shelter, and an 18,000 sf corporate-style hangar with an additional 2,400 square feet of office space. The aircraft apron provides 250 tie-down positions of which over 50 are leased. The airport maintains a wait list of over 150 individuals for an enclosed hangar space.

Table 1H presents a summary of the buildings and hangars at Livermore Municipal Airport.

TABLE 1H
Hangar and Building Inventory
Livermore Municipal Airport

Hangar Type	Unit Size (sf)	Quantity	Total (sf)
Small T	900	240	216,000
Medium T	980	60	58,800
Large T	1,234	28	34,552
Box 45x40	1,800	4	7,200
Box 48x40	1,920	5	9,600
Small Executive 55x60	3,300	5	16,500
Large Executive 60x60	3,600	20	72,000
Corporate	10,000	2	20,000
Shade Hangar	900	9	8,100
T-Combo, North	1,375	15	20,625
T-Combo, South (small)	1,392	7	9,744
T-Combo, South (medium)	1,472	4	5,888
T-Combo, South (large)	1,784	1	1,784
	TOTAL	**400**	**480,793**

Source: Airport records

ADMINISTRATION BUILDING

The existing administration building is approximately 2,600 square feet in size. The building is showing significant signs of age and does not have adequate space to accommodate typical general aviation functions.

AIRCRAFT PARKING APRON

There are seven identified aircraft aprons on the airport. To the west of the administration building is the large aircraft tie-down apron encompassing approximately 53,000 square yards of pavement. The next apron area to the east is designated for helicopter parking and encompasses approximately 4,700 square yards. The eastern half of the large tie-down apron and the helicopter apron has been identified for lease to a potential developer of FBO services.

The transient apron, located to the immediate west of the administration building encompasses approximately 6,000 square yards. This area is utilized for turbine aircraft and provides approximately 9 positions. Immediately in front of the administration building are the self-serve

fuel pumps and four aircraft tie-down positions. To the east of the administration building is the transient apron for piston aircraft encompassing approximately 14,000 square yards. The last apron area to the east encompasses approximately 5,500 square yards of pavement and is intended for locally based aircraft. There is an apron encompassing approximately 13,000 square yards on the south side of the airport. This apron has a compass rose painted on it and is also utilized for helicopter training operations.

In total on the north side of the airfield, there is approximately 6,000 square yards of apron space for transient turbine aircraft, 14,000 square yards for transient piston aircraft, 4,700 square yards for helicopter parking, and 58,500 square yards for local aircraft tie-downs. The south side of the airfield includes the 13,000 square yard apron with the compass rose.

AUTOMOBILE PARKING AND HANGAR VEHICLE ACCESS

Vehicle parking and road access to hangars and terminal facilities are an important consideration in airport planning. It is desirable to segregate vehicle access and aircraft movement areas to the greatest extent possible.

The administration building is accessed by Terminal Circle which extends from Airway Boulevard. The larger conventional hangars have road access and dedicated vehicle parking. The row of connected box hangars on the southeast side of the airport has parallel vehicle parking. All other hangars require people to drive on aircraft movement surfaces in order to access them.

EMERGENCY RESPONSE

The airport owns a fire station that is located on Airway Boulevard on the north side of the airport. The Livermore-Pleasanton Fire Department operates the facility as Station Number 10, which also serves the community. The fire station does have direct access to the airfield should there be an emergency at the airport.

Since the airport is not a commercial service facility, an on-airport fire station is not required. As such, the fire station is operated to serve the community and may not meet various FAA requirements for an on-airport fire station.

AIRPORT MAINTENANCE

The airport does not have a dedicated maintenance facility to house equipment such as mowers. Currently, this equipment is stored in one of the hangars within hangar building N-10. Were this hangar not utilized for maintenance equipment, it could be made available for lease.

FUEL FACILITIES

The airport maintains an underground fuel farm on the north edge of the main apron. There are three tanks, each with a 15,000 gallon capacity. Two of the tanks are reserved for 100LL (AvGas) and one is for Jet A fuel. The airport leases four fuel delivery trucks. Two of the trucks are for AvGas and have capacities of 2,000 gallons and 1,200 gallons. Two of the trucks are for Jet A fuel and have capacities of 3,000 gallons each. The airport maintains a self-serve fuel island immediately in front of the administration building. There are two fuel pumps for AvGAS.

FENCING

Perimeter fencing provides an important security function and a wildlife prevention function. For general aviation airports, full perimeter fencing is not required; however, it is common for airports located in more urbanized areas. There is a variety of fencing types at the airport. Immediately in front of the administration building is three-foot high wrought-iron fencing. Six-foot high chain-link fencing surrounds the rest of the airport perimeter.

SOLAR ARRAY

Chevron Corporation is installing a solar array system on the airport. The primary purpose of the system is to provide electricity to the airport. The energy derived will be directed to the airport electrical vault. The solar array is planned to be completed by the summer of 2013. It is located immediately north of the administration building and will occupy the northeast portion of the existing parking lot.

ADDITIONAL AIRPORT DOCUMENTATION

It is recommended that general aviation airports with significant activity maintain various procedural documents which provide guidance for airport management and tenants on airport issues. Typically, this includes a Minimum Standards document that is meant to encourage and ensure the provision of adequate services and facilities, economic health, and orderly development of aviation and related aeronautical activities at the airport. A Rules and Regulations document outlines the airport rules for administration and tenants. Livermore Municipal Airport has rules and regulations and minimum standards documents.

DOCUMENT SOURCES

As previously mentioned, a variety of different sources were utilized in the inventory process. The following listing reflects a partial compilation of these sources. This does not include data provided by the airport management as part of their records, nor does it include airport drawings and photographs which were referenced for information. On-site inventory and interviews with staff tenants also contributed to the inventory effort.

Livermore Municipal Airport – Airport Land Use Compatibility Plan. Prepared for Alameda County ALUC by ESA. Published August 2012.

Livermore Municipal Airport General Plan Amendment and Rezoning EIR. Prepared by LSA Associates. Published 2009.

Airport/Facility Directory, Southwest U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, Effective March 7, 2013.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration (2013-2017).

U.S. Terminal Procedures, Southwest U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, Effective April 4, 2013.

San Francisco Sectional Chart, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Effective March 7, 2013.

A number of Internet sites were also used to collect information for the inventory chapter. These include the following:

Air Carrier Activity Information System (ACAIS):
www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/

California Department of Finance:
http://www.dof.ca.gov/html/fs_data/latestecondata/FS_Def&Source.htm

California Department of Transportation – Division of Aeronautics (Caltrans):
http://www.dot.ca.gov/hq/planning/aeronaut/index.html

AirNav:
www.airnav.com

City of Livermore:
http://www.cityoflivermore.net/

FAA:
www.faa.gov

Alameda County:
http://www.acgov.org/

Association of Bay Area Governments (ABAG):
http://www.abag.ca.gov/

Livermore Municipal Airport:
http://www.cityoflivermore.net/citygov/pw/airport/default.asp

U.S. Bureau of Labor Statistics:
www.bls.gov/

U.S. Census Bureau:
www.census.gov