

CHAPTER 4

Oakland International Airport and Vicinity Data

4.1 Introduction

Oakland International Airport (OAK) is located in Alameda County approximately 7 nautical miles east of the City of San Francisco (see Figure 1-1). The Airport is situated on the southwestern edge of the City of Oakland, a city with a population of 397,067 residents as of 2006¹.

Construction of Oakland Municipal Airport (what is now North Field) began in June of 1927; part of which included the building of a 7,020 foot runway, the longest in the world for its day. Over the next 15 years leading up to World War II, multiple additions were made to the airport, including five hangars, passenger terminal/administrative offices, and a restaurant. During World War II, Oakland Municipal Airport was used as the marshalling point for all planes bound for the U.S. forces in the Pacific. In 1945, a parallel 6,200-foot east-west runway was constructed.

After World War II, OAK was returned to the Port of Oakland. In 1960, construction began on a new 10,000 foot jet runway and facilities complex south of the OAK's existing facilities. The new 600-acre complex would consist of a passenger terminal topped by a ten-story control tower, a separate air cargo building, and a jet hangar. In 1962, the new OAK facilities opened to the public. Since all the renovation in the 1960's, OAK has continued to grow, establishing itself as an important economic resource in the Bay Area. A second passenger terminal was completed in 1985 and expanded in 2007. OAK handled 14.5 million passengers and nearly 700,000 tons of air cargo in 2007.

4.2 Surrounding Airport Environs

4.2.1 Jurisdictions

Oakland International Airport (OAK) is owned and operated by the Port of Oakland, an autonomous department of the City of Oakland, under the exclusive control and management of the Board of Port Commissioners.

¹ U.S. Census Bureau, www.census.gov, 2007.

4.2.2 Adjacent and Surrounding Land Uses

Figures 4-1 and 4-2 represent generalized land uses and zoning, respectively, in the OAK AIA. Due to the fact that the cities of Alameda and Oakland combined their land use and zoning maps, the data presented in this figure has been generalized in order to fit the format of other jurisdictions within the AIA. More detailed land use maps are available through each jurisdiction encompassed by the OAK AIA.

OAK is bound to the east by Metropolitan Golf Links, Chuck Corica Municipal Golf Complex to the west, Doolittle Drive to the north, and San Francisco Bay to the west. As shown in Figure 4-1, land uses in the vicinity of OAK include commercial, industrial, and urban open-space uses. No residential uses are adjacent to airport property. Within the City of Oakland, heavy industrial uses predominate to the north and northeast of the airport, with two sports arenas and residential land uses beyond that. To the southeast is the City of San Leandro and a mix of natural, industrial, and residential land uses. Beyond the City of San Leandro is the unincorporated community of San Lorenzo, and south of San Lorenzo is the City of Hayward. Bay Farm Island, a residential community of the City of Alameda, is north of OAK.

To the north of OAK and within the City of Oakland, is the residential neighborhood of Elmhurst. Southeast of the airport in the City of San Leandro, are the neighborhoods of Little Alaska, Mulford Gardens, and Marina Faire; all of which are west of Doolittle Drive. Additional residential land uses in San Leandro, referred to as the Davis, Eastshore, Davis West, Cherrywood, Manor, and Bonaire neighborhoods, can be found either east or west of Interstate 880. Northwest of OAK is Bay Farm Island, a collection of residential neighborhoods which are a part of the City of Alameda. Polices and land use regulations associated with these neighborhoods are contained within land use elements or specific plans of the cities of Oakland, San Leandro, and Alameda.

In the eastern vicinity of OAK, the predominant zoning is industrial. Industrial uses near OAK can be found along Edgewater Drive, Oakport Street, and Pardee Drive in the City of Oakland. Commercial uses associated with Airport Business Park to the north of Hegenberger Road are owned by the Port of Oakland. One-family, apartment, and medium-density residential zoning are east and southeast of the airport. In the City of San Leandro, the primary zoning found within the vicinity of OAK is industrial, with a mix of residential multi-family and single-family districts as well. Further south, in the City of Hayward, the predominate zoning within the OAK AIA is industrial, with some single family residential, commercial, and planned development as well. The majority of zoning districts in the City of Alameda (including Bay Farm Island) is a mix of residential and commercial, with an emphasis on one-family residential uses towards the center of the community and general industrial zoning on the outskirts.

4.2.3 Alameda County Land Uses

The residential community of San Lorenzo, an unincorporated area of Alameda County, is located south of OAK. This unincorporated urban community is part of the Eden Planning Unit of the County and is zoned for single family residence (R-1) by the County (see Figure 4-2).

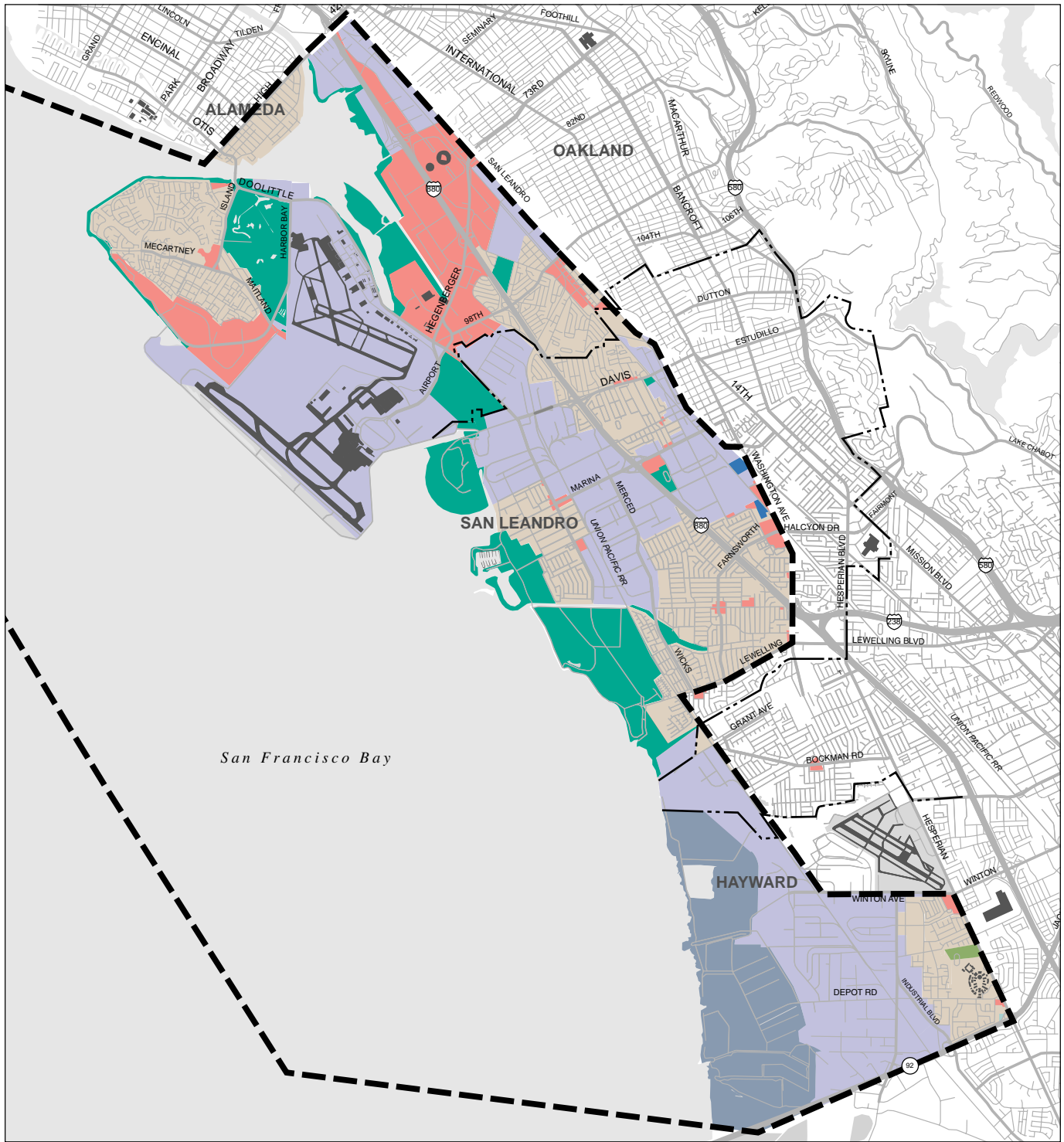
4.2.4 Noise-Sensitive Land Uses

The portion of the City of Oakland within OAK's AIA contains numerous noise-sensitive land uses. These include: Martin Luther King Jr. Regional Park, Brookfield Village Park, Columbian Gardens Park, Tyrone Carney Park, Sobrante Park, Brookfield Elementary School, Sobrante Park Elementary, Madison Middle School, and several places of worship.

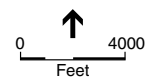
Noise-sensitive land uses in the City of Alameda's Bay Farm Island community within OAK's AIA include: Tillman Park, Leydecker Park, Godfrey Park, Doc Harrington Park, Amelia Earhart Elementary, Chinese Christian School, a daycare center, and several places of worship.

South of the Airport, in the City of San Leandro, noise-sensitive land uses within the AIA include: Oyster Bay Regional Shoreline, Cherry Grove Park, Thrasher Park, Mulford Park, Pacific Recreation Complex, Marina Park, Bonaire Park, Floresta Park, Stenzel Park, Dayton Playground, Washington Manor Park, Lewelling Playground, Grover Cleveland School, John Muir Middle School, Woodrow Wilson Elementary School, Garfield Elementary School, Pacific High School, James Madison School, Corvallis Elementary, Monroe Elementary School, Marina High School, Saint Felicitas School, Redwood Christian High School, Washington Manor Elementary School, Burbank Preschool, and numerous places of worship.

Beyond the City of San Leandro, in the unincorporated community of San Lorenzo, noise-sensitive land uses within OAK's AIA include: Mervin Morris Park, Del Rey Park, San Lorenzo Park, Arroyo High School, Bay Elementary School, and Del Rey Elementary School.



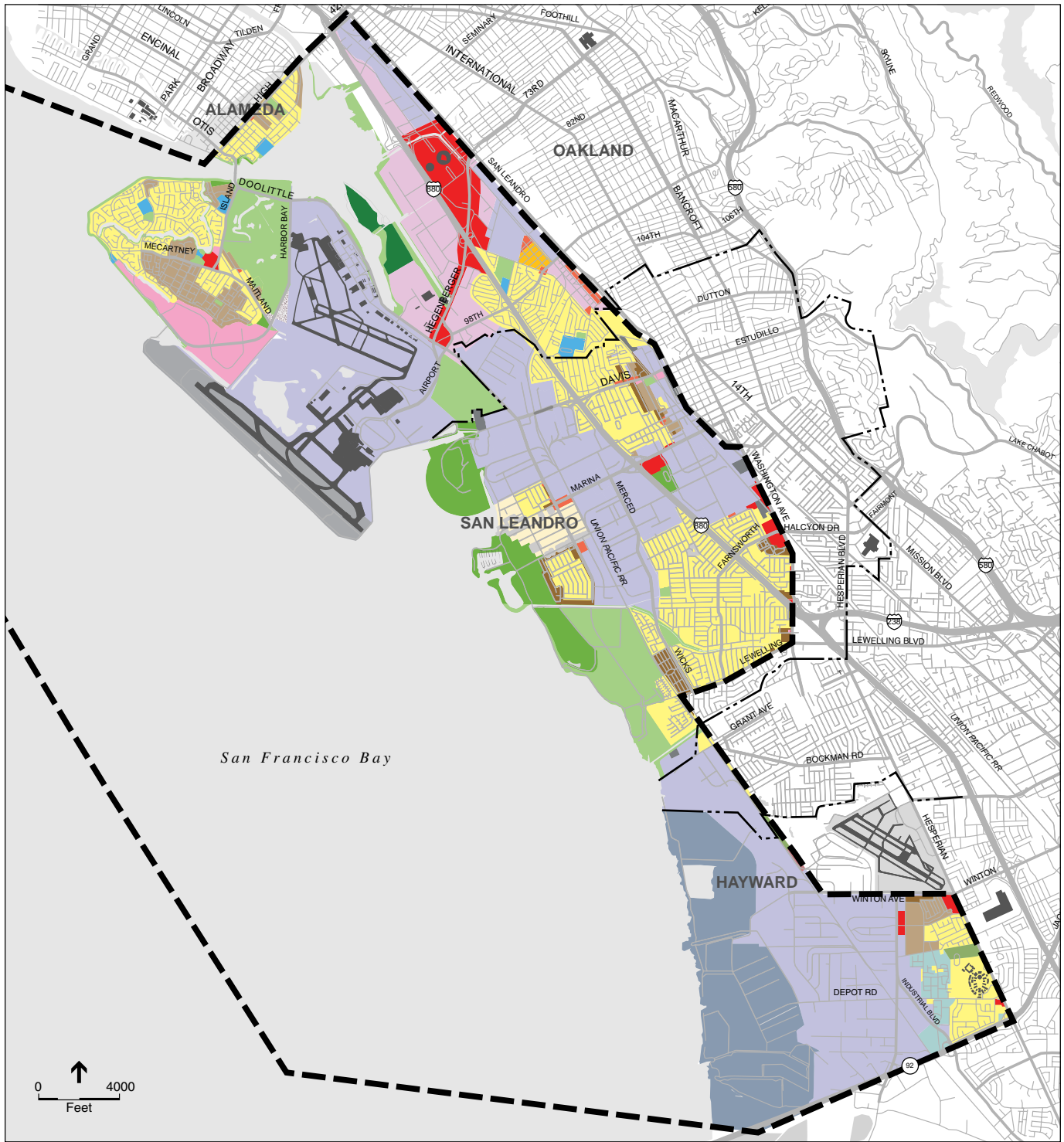
- | | | |
|---|---|--|
| Residential | Public and Quasi-Public | Airport Influence Area |
| Commercial | Open Space | Jurisdictional Boundaries |
| Industrial | Flood Plain | |
| Agricultural | Planned Development | |



SOURCE: City of Alameda, 1991; City of Hayward, 2002; City of Oakland, 2005; City of San Leandro, 2002; County of Alameda, 2004; Thomas Brothers Maps; and ESA, 2007

Oakland International Airport Land Use Compatibility Plan . 202229

Figure 4-1
Generalized Land Use in Vicinity of
Oakland International Airport



- | | | | |
|----------------------------|-----------------------|---------------------------------|---------------------------|
| Low Density Residential | Commercial | Commercial Recreation | Open Space Habitat |
| Medium Density Residential | Professional / Office | Public / Institutional / School | Airport Influence Area |
| High Density Residential | Public / Semi-Public | Agricultural | Jurisdictional Boundaries |
| Mixed-Housing Residential | Industrial | Open Space | |
| Outer District Residential | Mixed Business | Resource Conservation Area | |
| Neighborhood Commercial | Planned Development | Flood Plain | |

SOURCE: City of Alameda, 2001; City of Hayward, 2007; City of Oakland, 2005; City of San Leandro, 2007; County of Alameda, 2004; Thomas Brothers Maps; and ESA, 2007

Oakland International Airport Land Use Compatibility Plan . 202229

Figure 4-2
Generalized Zoning in Vicinity of
Oakland International Airport

4.2.5 Future Airport Vicinity Land Uses

OAK is located in the southwestern portion of the City of Oakland, and the AIA includes portions of the cities of Alameda, San Leandro, and Hayward, as well as unincorporated areas of Alameda County. OAK is identified in the *City of Oakland General Plan's Land Use and Transportation Element* as part of the East Oakland planning area, which is an area bound by High Street to the north, I-580 to the east, the city border between Oakland and San Leandro to the south, and the San Francisco Bay to the west. The City's *General Plan* identifies portions of this planning area within OAK's AIA for development and re-development opportunities, which primarily involve commercial and industrial land uses. Residential uses, which primarily occur in the Elmhurst area, are identified in the *General Plan* for revitalization programs and urban design assistance, but further intensification is not recommended in the Plan.

Bay Farm Island, the portion of the City of Alameda within OAK's AIA, is predominately residential uses, with some commercial and industrial uses at the edges of Bay Farm Island.

4.3 Land Use Regulations and Policies

The State of California requires all local governments to enact a general plan which establishes policies to guide future development of the city or county. The policies of the general plan are implemented through ordinances regulating development, including the zoning ordinance, which regulates the use of land, the density of development, and the height and bulk of buildings. Local governments also regulate development through building codes which set detailed standards for construction.

This section summarizes goals, objectives, and policies of the Cities of Oakland, San Leandro, Alameda, and Hayward and Alameda County that are applicable to airport land use compatibility for OAK.

4.3.1 City of Oakland General Plan Land Use and Transportation Element, Adopted March of 1998, Amended through 2015

The *City of Oakland General Plan Land Use and Transportation Element* was updated in 1998. No significant changes to land use patterns are proposed as part of the *General Plan*. The *General Plan* designates land uses in the vicinity of the airport as commercial, light industrial, hotel, and office uses. The predominant zoning in the vicinity of OAK is industrial.

The *City of Oakland Land Use and Transportation Element* states the following airport land use compatibility related policies:

Seaport and Airport Objectives and Policies

- W6.2 Development of sites proximate to airport flight paths should be in conformance with Federal and State standards, as articulated in Federal Aviation Regulation, Part 77 and Part 150, ALUC planning guidelines, and any other applicable regulations and amendments.
- W7.1 Outside the seaport and airport, land should be developed with a variety of uses that benefit from the close proximity to the seaport and airport and that enhance the unique characteristics of the seaport and airport. These lands should be developed with uses which can buffer adjacent neighborhoods from impacts related to such activities.
- W7.2 Other commercial and industrial uses should be encouraged at appropriate locations (Port-owned or not) where they can provide economic opportunity to the community at large.

Housing Production, Conservation, and Enhancement Objectives and Policies

- N3.9 Residential developments should be encouraged to face the street and to orient their units to desirable sunlight and views, while avoiding unreasonably blocking sunlight and views for neighboring buildings, respecting the privacy needs of residents of the development and surrounding properties, providing for sufficient conveniently located on-site open space, and avoiding undue noise exposure.

Residential and Non-Residential Activities Objectives and Policies

- N5.2 Residential areas should be buffered and reinforced from conflicting uses through the establishment of performance-based regulations, the removal of non-conforming uses, and other tools.

4.3.2 City of Oakland General Plan Noise Element, Adopted June 2005

The City of Oakland's original *General Plan Noise Element* was adopted in 1974. Since then, Oakland's land use patterns have changed, and its population and economy have expanded. In 2005, as a response to this growth, the City has updated the *Noise Element*, and many of its policies, in an effort to protect Oakland residents from exposure to excessive noise levels. Like most cities, the City of Oakland's major noise sources are transportation activities; specifically, motor vehicle traffic on major thoroughfares, rail activity, and operations from nearby airports.

The 2005 *City of Oakland General Plan Noise Element* includes a number of policies that are related to aircraft and airport noise. These include the following relevant policies:

Policy 1: Ensure the compatibility of existing and, especially, of proposed development projects not only with neighboring land uses, but also with their surrounding noise environment.

- 1.3 Continue working with the Alameda County Community Development Agency (in its role as the County's Airport Land Use Commission) and with the Port of Oakland to ensure consistency with the County's airport land use plan of the City's various master planning documents, zoning ordinance and land-use development proposals near Oakland's airport.

Policy 2: Protect the noise environment by controlling the generation of noise by both stationary and mobile noise sources.

- 2.3 Encourage the Port of Oakland to continue promoting its noise abatement office and programs for Oakland International Airport.

4.3.3 City of San Leandro General Plan, Adopted in 2002, Amended through 2015

The *City of San Leandro General Plan* was updated in 2002. No significant land use changes to land use patterns are proposed as part of the *General Plan*. The *General Plan* designates land uses in the vicinity of the airport as commercial uses, light industrial, and residential. The predominant zoning in the vicinity of OAK is industrial.

The *City of San Leandro General Plan* states the following airport land use compatibility related policies:

3.10 Conversion of Non-Residential Land to Housing and Public Uses

Encourage the development of new housing on underutilized commercial and industrial sites which meet the following criteria: ...Sites which are not constrained by external environmental factors, including freeway, railroad, and airport noise.

37.01 Monitoring of Airport Plans

Actively and aggressively participate in forums and discussions regarding operations and expansion plans for Oakland International Airport. Seek local representation on task forces, commissions, and advisory boards established to guide airport policies and programs.

37.02 Mitigation of Airport Noise

Pursue mitigation of airport noise impacts to the fullest extent possible. Support and advocate for operational practices, changes to aircraft, new technologies, and physical improvements that would reduce the number of properties in San Leandro that are impacted by noise.

37.06 Airport Safety Zones

Regulate land uses within designated airport safety zones, height referral areas, and noise compatibility zones to minimize the possibility of future noise conflicts and accident hazards.

4.3.4 City of Alameda General Plan, Adopted in 1991, Amended through 2010

The *City of Alameda General Plan* was updated in 1991. No significant land use changes to land use patterns are proposed as part of the *General Plan*. The *General Plan* designates land uses in the vicinity of the airport as residential uses, commercial, and light industrial. The predominant zoning in the vicinity of OAK is residential.

4.3.4.1 Airport Environs Element

The *City of Alameda General Plan Airport Environs Element* states the following airport land use compatibility related policies:

Guiding Policies: Airport Impact Areas

- 7.2.a Regulate development in Alameda to minimize hazards in safety zones designated by the Alameda County Airport Land Use Commission.
- 7.2.b Do not approve incompatible development in noise/safety sensitive areas.
- 7.2.c Seek ways to ensure provision of effective sound mitigation for all housing units in noise impact areas.
- 7.2.e Ensure that purchasers of property currently or potentially subject to normally unacceptable noise levels are aware of such conditions, of City policies regarding mitigation, and of limitations to the City's ability to abate nuisances when such properties are subject to an aviation easement.

4.3.5 City of Hayward General Plan, Adopted 2002, Amended through July 15, 2003

The *City of Hayward General Plan* was updated in 2002. No significant changes to land use patterns are proposed as part of the *General Plan*. The *General Plan* designates land uses in the vicinity of airport as commercial uses, medium and high-density residential, hotel, commercial, and office uses within the Airport planning district.

The *City of Hayward General Plan* states the following airport land use compatibility related policies:

Guidelines for the Review of New Development:

- A.1 Indoor noise level shall not exceed an Ldn of 45 dB in new housing units.

- A.3 If the primary noise source is aircraft or a railroad, noise levels in new residential development exposed to an exterior Ldn of 60 dB or greater should be limited to a maximum instantaneous noise level in bedrooms at night of 50 dB(A). Maximum instantaneous noise levels in bedrooms during the daytime and in other rooms should not exceed 55 dB(A).

- C. Locate noise-sensitive uses away from noise sources unless mitigation measures are included in development plans. Protect schools, hospitals, libraries, churches, convalescent homes, and other noise sensitive uses from noise levels exceeding those allowed in residential areas.

4.3.5.1 City of Hayward Noise Element Policies

The City of Hayward *General Plan Noise Element* states that “Other significant sources of noise in the community, including aircraft operations in the vicinity of the Hayward Executive Airport and at Oakland International Airport, railroad train operations along the Union Pacific Railroad lines, and the Bay Area Rapid Transit system are expected to remain essentially as they are today.” Therefore, the same noise policies adopted in the 1986 City of Hayward *General Plan* continue to apply.

The 1986 City of Hayward *Noise Element* includes a number of policies that are related to aircraft and airport noise. These include the following relevant policies:

Policy: The City will seek to protect the public health, safety, and welfare against the adverse effects of excessive noise, consistent with the economic and environmental well-being of the City, and reaffirm desirability of quiet surroundings.

- 1. Provide educational material and assistance to the public regarding noise mitigation.

- 2. Maintain conformity of new development with the principles and standards for land use compatibility, noise exposure and noise mitigation contained in the Noise Element.

- 9. Continue to monitor the effectiveness of noise control programs at Hayward Executive Airport.

- 12. Encourage mitigation of noise through appropriate site planning, building orientation, interior layout and building materials.

4.3.6 Eden Area Plan, Alameda County, California, Updated March 2010

The Airport lies within the City of Oakland and is not subject to Alameda County *General Plan* policies. However, the following County policies are discussed since a portion of the unincorporated community of San Lorenzo lies within OAK's AIA. The unincorporated community of San Lorenzo is included as part of the *Eden Area Plan* prepared by Alameda County. The *Plan* is a statement of Alameda County's conservation and development policy for the Eden area. Land use designations in the vicinity of OAK in unincorporated Alameda County are predominantly suburban and low-density residential and limited neighborhood commercial along major arterials.

4.4 Existing Airport Land Uses

Existing and planned facilities at OAK are shown in Figure 4-3, which is the OAK airport layout plan (ALP). OAK is located on a 2,600-acre site approximately nine miles south of the City of Oakland's downtown area, and is in the City of Oakland's general industrial/transportation zoning district, which includes aviation-related commercial, industrial, and public uses. OAK is divided into two distinct areas: North Field and South Field.

4.4.1 North Field

OAK's North Field, which consists of two parallel runways 6,212 feet (Runway 9R/27L) and 5,454 feet (Runway 9L/27R) in length and a third crosswind runway (Runway 15/33), 3,372 feet in length, is used primarily for general aviation (GA) (i.e., non-air carrier) operations. North Field has its own Air Traffic Control Tower, and is also the location for all of OAK's fixed based operators (FBOs), including Kaiser Air and Business Jet Center, and general aviation hangars.

The approach path for Runway 15-33 consists of residential uses in the City of Alameda approximately 1.3 miles away with the San Leandro Bay in between. To the southwest of Runway 15-33 is airport property and the San Francisco Bay. Land uses west of Runway 9L-27R include a golf course and residential uses within approximately 1 mile of the runway end. East of Runway 9L-27R is another golf course and beyond that is industrial and residential land uses, located approximately 0.7 and 1.3 miles away from Runway 27R. The proximity of residential and industrial land uses to either end of Runway 9R-27L are nearly the same as that of Runway 9L-27R due to their parallel configuration.

4.4.2 South Field

OAK's South Field, which is defined as the area south of Ron Cowan Parkway, contains a single, 10,000-foot long runway (11/29), and is used primarily for air carrier passenger and cargo aircraft operations. The approach path for Runway 11-29 consists primarily of the San Francisco Bay.

South Field also includes approximately 208 acres of passenger facilities, including Terminals 1 (16 aircraft gates) and 2 (13 aircraft gates), the South Air Traffic Control Tower, and air cargo facilities (approximately 104 acres), the largest of which is the FedEx Metroplex (their west coast hub operation). North Field and South Field are connected by a single, north-to-south oriented taxiway (Taxiway B).

4.4.3 Typical Flight Procedures

The standard flight procedures as outlined by Oakland International Airport are as follows:

Runway 15-33. Aircraft departing Runway 33 must make a right, northerly turn over San Leandro Bay until reaching I-880 freeway and continue per ATC instructions. No straight or left crosswind/downwind departures are allowed. Straight in arrivals to Runway 15 are not recommended, unless required by safety or wind conditions.

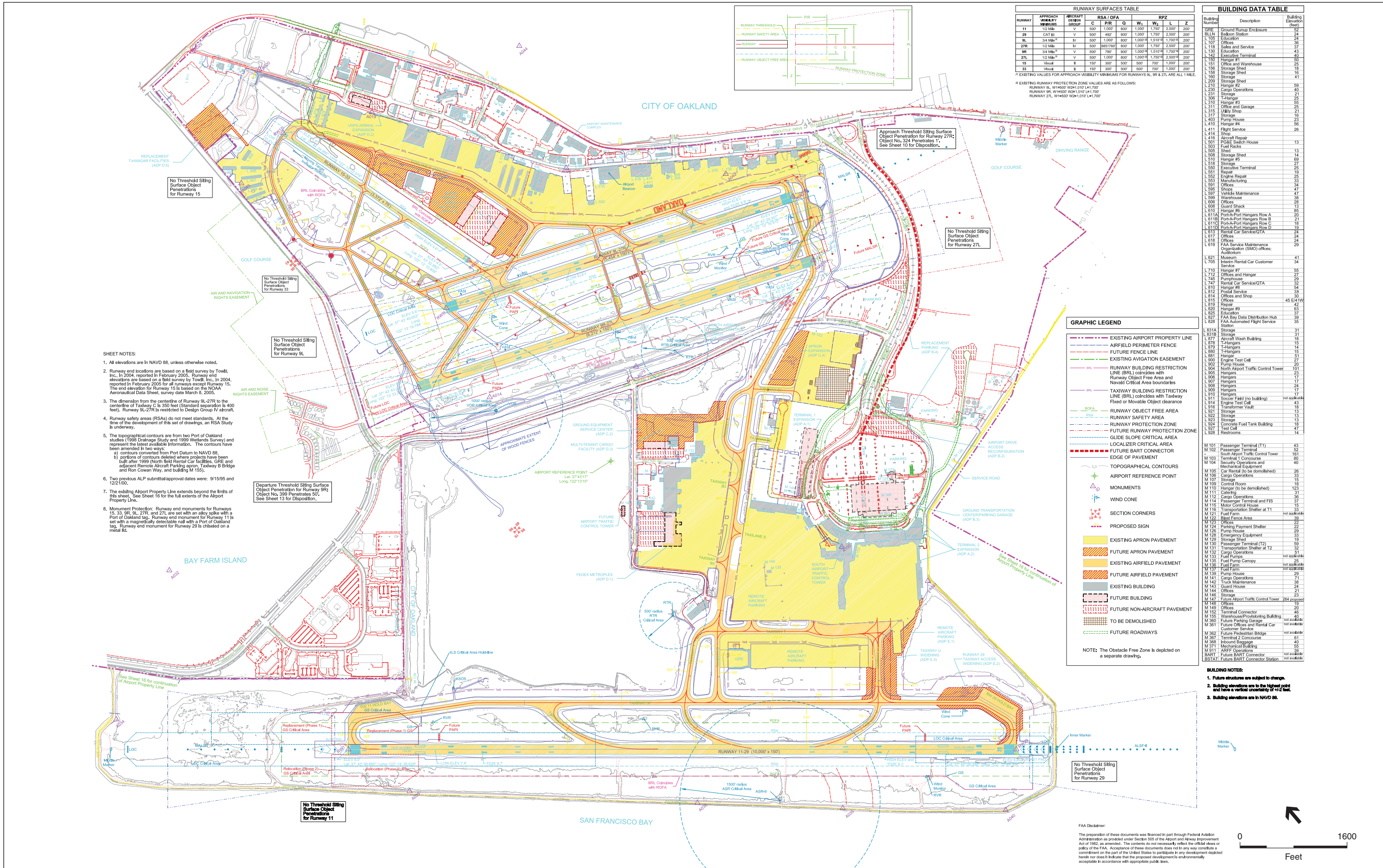
Runways 27R and 27L. Aircraft should only depart Runways 27R and 27L by making a right crosswind turn over San Leandro Bay until reaching I-880 freeway and continue per ATC instructions. Straight out departures are not recommended. At night, runway 27R is one of two preferred departure runways. Runway 27L is the preferred nighttime arrival runway.

Runways 09R and 09L. There are no daytime departure restrictions for runways 09R and 09L. At night, runway 9R is one of two preferred departure runways, no left turns are allowed from either 09R or 09L, and no straight out departures are allowed from runway 09L.

Runway 11-29. Air traffic controllers do not instruct jet aircraft over the Oakland Hills below 3,000 feet. VFR aircraft that depart Runway 29 and request a right turn are instructed to proceed at least 2 miles west or climb to at least 1,500 feet before turning right. The Quiet Runway 11 departure procedure requires that turbojets turn to the right and further out over the Bay when departing Runway 11. Air traffic controllers assign a left turn heading, or Silent7 departure procedure, to all IFR turbo-jet aircraft departing Runway 29 from 10:00 P.M. to 7:00 A.M. daily.

Oakland International Airport mandates that aircraft performing training touch-and-go procedures on the North Field use Runway 27L as the preferred runway for these procedures and fly the standard traffic pattern to avoid flying over residential areas as much as possible. Touch-and-go operations are prohibited between the hours of 10:00 p.m. and 6:00 a.m. Turbojet aircraft practicing instrument approaches south of OAK are to remain over the Bay when using Runway 29.

In addition to the procedures listed above, OAK recommends that pilots avoid overflying residential neighborhoods, gaining as much altitude as quickly as practical, and adjusting the propeller angle and engine speed to reduce engine and propeller noise.



RUNWAY SURFACES TABLE										
RUNWAY	APPROACH CATEGORY	VISIBILITY MINIMUMS	ASPHALT SURFACE GROUP	RSA / OFA			RPZ			
				C	P	Q	W ₁	W ₂	L	Z
11	12	1/2 Mile	V	500'	1,000'	800'	1,000'	1,750'	2,500'	200'
29	CAT III	1/2 Mile	IV	500'	1,000'	800'	1,000'	1,750'	2,500'	200'
27L	12	1/2 Mile	IV	500'	1,000'	800'	1,000'	1,750'	2,500'	200'
27R	12	1/2 Mile	IV	500'	1,000'	800'	1,000'	1,750'	2,500'	200'
15	Visual	1/2 Mile	II	150'	300'	500'	500'	700'	1,000'	200'

* EXISTING VALUES FOR APPROACH VISIBILITY MINIMUMS FOR RUNWAYS 27L, 27R & 29 ARE ALL 1 MILE.

** EXISTING RUNWAY PROTECTION ZONE VALUES ARE AS FOLLOWS:
 RUNWAY 11, W1=500' W2=1,010' L=1,700'
 RUNWAY 15, W1=300' W2=1,010' L=1,700'
 RUNWAY 27L, W1=500' W2=1,010' L=1,700'

BUILDING DATA TABLE		
Building Number	Description	Building Elevation (feet)
101	Ground Support Enclosure	52
102	Balloon Station	24
103	Education	24
104	Education	24
105	Sales and Service	37
106	Education	43
107	Education	40
108	Education	25
109	Storage Shed	16
110	Storage	41
111	Storage	28
112	Hangar #1	59
113	Cargo Operations	40
114	Storage	21
115	T-Hangar	21
116	Hangar #2	55
117	Office and Garage	25
118	Utility Shop	21
119	Storage	21
120	Pump House	23
121	Hangar #3	56
122	Flight Service	28
123	Shop	13
124	Aircraft Repair	13
125	POAE Switch House	13
126	Shed	13
127	Storage Shed	14
128	Hangar #4	69
129	Storage	27
130	Executive Terminal	25
131	Repair	19
132	Engine Repair	25
133	Manufacturing	33
134	Office	24
135	Shops	47
136	Vehicle Maintenance	47
137	Warehouse	28
138	Guard Shack	13
139	Hangar #5	85
140	Port-A-Port Hangars Row A	20
141	Port-A-Port Hangars Row B	21
142	Port-A-Port Hangars Row C	18
143	Port-A-Port Hangars Row D	19
144	Rental Car Service/OTA	24
145	Office	24
146	FAA Service Maintenance Organization (SMO) offices	29
147	Auditorium	41
148	Museum	34
149	Hangar #6	55
150	Offices and Hangar	27
151	Pump House	27
152	Rental Car Service/OTA	32
153	Hangar #7	54
154	Postal Service	20
155	Offices and Shop	20
156	Offices	45 EAV
157	Repair	42
158	Hangar #8	63
159	Education	37
160	FAA Bay Data Distribution Hub	35
161	FAA Automated Flight Service Station	35
162	Storage	31
163	Aircraft Wash Building	18
164	T-Hangars	15
165	T-Hangars	14
166	T-Hangars	15
167	Hangar	27
168	Engine Test Cell	20
169	Pump House	101
170	North Airport Traffic Control Tower	101
171	Hangars	23
172	Hangars	17
173	Hangars	17
174	Hangars	17
175	Hangars	17
176	Hangars	17
177	Soccer Field (no building)	not applicable
178	Engine Test Cell	43
179	Transformer Vault	18
180	Storage	13
181	Storage	13
182	Storage	13
183	Concrete Fuel Tank Building	18
184	Test Cell	47
185	Restrooms	14
186	Passenger Terminal (T1)	43
187	Passenger Terminal	62
188	South Airport Traffic Control Tower	61
189	Terminal 1 Concourse	60
190	Security Operations and Mechanical Equipment	40
191	Car Rental (to be demolished)	26
192	Storage	33
193	Cargo Operations	15
194	Control Room	123
195	Control Room	123
196	Caterer	31
197	Cargo Operations	37
198	Passenger Terminal and FIS	37
199	Motor Control House	33
200	Transportation Shelter at T1	33
201	Fuel Farm	not applicable
202	East Fence Area	not applicable
203	Offices	22
204	Parking Payment Shelter	22
205	Pump House	29
206	Emergency Equipment	33
207	Storage Shed	19
208	Passenger Terminal (T2)	59
209	Transportation Shelter at T2	32
210	Fuel Pumps	61
211	Fuel Pump Canopy	25
212	Fuel Farm	not applicable
213	Fuel Farm	not applicable
214	Pump House	28
215	Cargo Operations	71
216	Truck Maintenance	38
217	Guard House	24
218	Offices	21
219	Storage	23
220	Future Airport Traffic Control Tower	264 proposed
221	Offices	19
222	Offices	20
223	Terminal Connector	48
224	Warehouse/Provisioning Building	40
225	Future Parking Garage	not available
226	Future Offices and Rental Car Customer Service	not available
227	Future Pedestrian Bridge	not available
228	Terminal 2 Concourse	61
229	Inbound Baggage	40
230	Mechanical Building	55
231	ARFF Operations	39
232	Future BART Connector	not available
233	Future BART Connector Station	not available

GRAPHIC LEGEND	
[Symbol]	EXISTING AIRPORT PROPERTY LINE
[Symbol]	AIRFIELD PERIMETER FENCE
[Symbol]	EXISTING FENCE LINE
[Symbol]	FUTURE AVIGATION EASEMENT
[Symbol]	RUNWAY BUILDING RESTRICTION LINE (BRL) coincides with Runway Object Free Area and NavAid Critical Area boundaries
[Symbol]	TAXIWAY BUILDING RESTRICTION LINE (TBL) coincides with Taxiway Flood or Movable Object clearance
[Symbol]	ROFA
[Symbol]	RSA
[Symbol]	RUNWAY SAFETY AREA
[Symbol]	RUNWAY PROTECTION ZONE
[Symbol]	FUTURE RUNWAY PROTECTION ZONE
[Symbol]	GLIDE SLOPE CRITICAL AREA
[Symbol]	LOCALIZER CRITICAL AREA
[Symbol]	FUTURE BART CONNECTOR
[Symbol]	EDGE OF PAVEMENT
[Symbol]	TOPOGRAPHICAL CONTOURS
[Symbol]	AIRPORT REFERENCE POINT
[Symbol]	MONUMENTS
[Symbol]	WIND CONE
[Symbol]	SECTION CORNERS
[Symbol]	PROPOSED SIGN
[Symbol]	EXISTING APRON PAVEMENT
[Symbol]	FUTURE APRON PAVEMENT
[Symbol]	EXISTING AIRFIELD PAVEMENT
[Symbol]	FUTURE AIRFIELD PAVEMENT
[Symbol]	EXISTING BUILDING
[Symbol]	FUTURE BUILDING
[Symbol]	FUTURE NON-AIRCRAFT PAVEMENT
[Symbol]	TO BE DEMOLISHED
[Symbol]	FUTURE ROADWAYS

NOTE: The Obstacle Free Zone is depicted on a separate drawing.

- SHEET NOTES:**
- All elevations are in NAVD 88, unless otherwise noted.
 - Runway end locations are based on a field survey by Towle, Inc. in 2004, reported in February 2005. Runway end elevations are based on a field survey by Towle, Inc. in 2004, reported in February 2005 for all runways except Runway 11. The end elevation for Runway 15 is based on the NOAA Aeronautical Data Sheet, survey date March 8, 2005.
 - The dimension from the centerline of Runway 9L-27R to the centerline of Taxiway C is 350 feet (Standard separation is 400 feet). Runway 9L-27R is restricted to Design Group IV aircraft.
 - Runway safety areas (RSAs) do not meet standards. The final design of this set of drawings, an RSA Study is underway.
 - The topographical contours are from two Port of Oakland studies (1998 Drainage Study and 1999 Wetlands Survey) and represent the latest available information. The contours have been amended in two ways:
 - contours converted from Port Datum to NAVD 88.
 - portions of contours deleted where projects have been built after 1999 (North Field Rental Car facilities, GRE and adjacent Remote Aircraft Parking apron, Taxiway B Bridge and Ron Cowen Way, and building M 150).
 - Two previous ALP submittal/approval dates were: 9/15/95 and 12/2/100.
 - The existing Airport Property Line extends beyond the limits of this sheet. See Sheet 16 for the full extent of the Airport Property Line.
 - Monument Protection: Runway end monuments for Runways 15, 33, 9L, 27R, and 27L are set with an alloy spike with a Port of Oakland tag. Runway end monument for Runway 11 is set with a magnetically detectable nail with a Port of Oakland tag. Runway end monument for Runway 29 is chiseled on a metal tag.

- BUILDING NOTES:**
- Future structures are subject to change.
 - Building elevations are to the highest point and have a vertical uncertainty of +/-2 feet.
 - Building elevations are in NAVD 88.

FAA Disclaimer:
 The preparation of these documents was financed in part through Federal Aviation Administration as provided under Section 505 of the Airport and Airway Improvement Act of 1982, as amended. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with applicable public laws.

0 1600 Feet

4.5 Proposed Airport Facility Improvements²

4.5.1 Airfield

The *Oakland International Airport Master Plan* makes several recommendations for improving the airfield at OAK. In order to improve safety by minimizing the number of runway crossings required for an aircraft that lands on runway 27L, the *Master Plan* recommends constructing a new taxiway to run parallel with runway 9R-27L. The *Master Plan* also suggests adding a parallel North Field-South Field taxiway connection that would be designed to alleviate taxi times and delays. The *Master Plan* also estimates the demand for future remote (off-gate, on-Airport) remote overnight aircraft parking shall grow in the coming years, requiring an additional 23 to 46 acres of parking apron.

4.5.2 Building Area

The *Oakland International Master Plan* estimates that by the year 2025 approximately 30 million annual passengers will pass through OAK. In order to accommodate this growth, the *Master Plan* proposes that a total of 46 to 50 aircraft gates will be need to be built on the South Field, and that additional gates would require approximately 33 to 55 acres. Multiple terminal development scenarios were also proposed in the *Master Plan*, with a recommendation being made to develop future terminals on Airport property near the existing passenger facilities. According to OAK staff, the economic recession of 2008 – 2009 resulted in a significant decline in passengers and operations at OAK; therefore, additional terminal capacity may be required later than originally forecasted by the *Master Plan*.

Anticipation for the growth of air cargo operations at OAK is modest, and this is reflected in the *Master Plan*. Conservative recommendations are made for the expansion of existing FedEx facilities, south of Ron Conway Parkway and north of the existing FedEx Metroplex. Additional expansion is also considered for the existing air cargo area at South Field and the Oakland Maintenance Center site.

The *Master Plan* estimates that by 2025, and additional 14 to 29 acres of land would be required to base jets and turboprops at OAK. Projections, however, do not anticipate the need for additional land for piston aircraft and helicopters beyond 2010. Several recommendations for the development of general aviation facilities (i.e., large hangars for jets and turboprops, T-hangars for piston aircraft, and associated ramp area) are made by the *Master Plan*, with an emphasis focusing on constructing facilities in the northwest corner of the Airport, and in two areas parallel to Runway 15-33.

All development concepts proposed in the *Master Plan* occur within existing Airport boundaries. While these recommendations are made in the anticipation of future increased operations at OAK, they would not require the expansion of airport property.

² Airport facility improvements are described in greater detail in the *Oakland International Airport Master Plan*.

4.6 Airport Planning Documents

4.6.1 Oakland International Airport Master Plan

The *Oakland International Airport Master Plan* was adopted by the Port of Oakland’s Board of Port Commissioners in March 2006. The plan includes an inventory of existing facilities and activity at the airport, forecasts of future airport activity, a projection of aviation facility needs, a presentation of development alternatives, a financial plan, and environmental considerations.

4.7 Existing and Future Airport Activity

The *Oakland International Airport Master Plan* has a 20-year forecasting horizon (2005 – 2025), but for the purpose of development recommendations, much of the analysis in the Master Plan is “near-term” (2010 and 2012).

4.7.1 Fleet Mix

Approximately 175 general aviation aircraft park in hangars at the North Field, and approximately 102 general aviation aircraft tie-down on the North Field ramps. The Master Plan offers an “unconstrained” forecast of future number of the based fleet mix at North Field, leaving out any assumptions in regards to the availability of existing and/or future facilities (see Table 4-1).

**TABLE 4-1
EXISTING AND FORECAST BASED GENERAL AVIATION FLEET MIX**

	Existing (2004)	2010	2025
General Aviation Aircraft Type			
Helicopter	6	14	14
Jet	29	36	58
Piston	228	320	320
Turboprop	14	14	14
Total	277	384	406

Source: *Oakland International Airport Master Plan*, 2006.

4.7.2 Operations

In terms of General Aviation activity, the OAK Master Plan projects that piston aircraft operations will decrease by one percent each year, while jet and helicopter operations are expected to increase in the near term due to the opening of a helicopter school, and then level off. The number of turboprop operations is not expected to change over the planning horizon (see Table 4-2).

**TABLE 4-2
PROJECTED OPERATIONS BY AIRCRAFT TYPE**

	2004 Operations	2010 Operations
General Aviation Aircraft Type		
Helicopter	2,704	35,507
Jet	16,574	19,937
Piston	103,542	97,238
Turboprop	5,822	5,822
Total	128,642	158,504

Source: *Oakland International Airport Master Plan, 2006.*

Table 4-3 presents forecasted airline passenger and air cargo activity.

**TABLE 4-3
AIRLINE PASSENGER AND AIR CARGO FORECASTED OPERATIONS**

	2004 Operations	2010 Operations
Airline Passengers		
Million Airline Passengers	14.1	18
Planning Day Passengers (Average Day, Peak Month)	43,745	56,047
Daily Operations	430	542
Percent of Daily Total Operations	45.8%	47.5%
Air Cargo		
Million Annual Tons	0.74	0.9
Daily Operations	156	164
Percent of Total Daily Operations	16.6%	14.4%

Source: *Oakland International Airport Master Plan, 2006.*

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