4980

RESOLUTION NO. 179-03 (CM)

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF WATSONVILLE APPROVING THE FINAL WATSONVILLE MUNICIPAL AIRPORT MASTER PLAN 2001-2020

REVISIONS MADE TO FINAL MASTER PLAN RESO 74-05 (CM)

WHEREAS, in March 1998, the City commenced work on the Watsonville Municipal Airport Master Plan; and

WHEREAS, the purpose of the Watsonville Airport Master Plan is to facilitate the orderly, flexible, and environmentally sensitive expansion and development of the Watsonville Municipal Airport.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WATSONVILLE, CALIFORNIA, AS FOLLOWS:

That the Final Watsonville Municipal Airport Master Plan 2001-2020, a copy of which is on file in the Office of the City Clerk is accurate, comprehensive, and complete and is hereby approved.

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The foregoing resolution was introduced at a regular meeting of the City Council of the City of Watsonville, held on the 24th day of June, 2003, by Council Member Gomez, who moved its adoption, which motion being duly seconded by Council Member de la Paz, was upon roll call carried and the resolution adopted by the following vote:

AYES:	COUNCIL MEMBERS:	**de la Paz, Gomez, Phares, Rivas, Skillicorn, Doering-Nielsen**
NOES:	COUNCIL MEMBERS:	**Bersamin**
ABSENT:	COUNCIL MEMBERS:	**None**

Judy Doering-Nielsen, Mayor Pro Tempore

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

WATSONVILLE MUNICIPAL AIRPORT MASTER PLAN

2001-2020

The preparation of this document was financed in part through an Airport Improvement Program grant from the Federal Aviation Administration (FAA) as provided under Section 505 of the Airport and Airway Improvement Act of 1982. The contents of this report reflect the views of the City of Watsonville, which is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with Public Laws 91-190, 91-258, 94-353, and/or 90-495.

Adopted
June 24, 2003

Prepared by:
Watsonville Municipal Airport
Graphics by City of Watsonville GIS

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1. SUMMARY

In 1994, the City of Watsonville, California, contracted with Wadell Engineering Corporation to prepare with City staff an update to the City's 1986 general aviation airport master plan utilizing a 90 percent Federal Aviation Administration grant under the Airport Improvement Program. The basic intent of the study was to evaluate existing airport facilities, to assess airport demand, and to prepare an airport master plan to accommodate the demand for a 1990-2010 planning period. However, because of the environmental issues related to implementation of the 1994 master plan, preparation of an Environmental Impact Report (EIR) began but was not completed due to unresolved issues related to endangered plant species and wetlands. Consequently, the corresponding master plan update was not adopted.

Work commenced in March 1998 to complete the master plan and prepare a new environmental impact report. This master plan study consists of information from the 1994 study updated to 2001, and similarly establishes a planning period of 2001-2020. This summary presents the objectives of the master plan, the approach utilized in the master planning process, the results of the analyses performed, and the recommendations for prudent and proper protection and development of the Watsonville Municipal Airport. This report is intended to be a useful technical document to allow elected city officials, city staff, FAA, and Caltrans Aeronautics Division to properly develop and protect the airport while enhancing its usefulness.

MASTER PLAN OBJECTIVES

The purpose of the Watsonville Municipal Airport Master Plan is to facilitate the orderly, flexible, and environmentally sensitive expansion and development of Watsonville Municipal Airport. It is the mission of the City of Watsonville, which manages the Watsonville Municipal Airport, to improve economic vitality, safety and living environment for the culturally rich Watsonville community by providing leadership for the achievement of community goals and high-quality, responsive public service.

The following are the City's planning objectives for the Watsonville Municipal Airport that are addressed in this Master Plan.

- Support the development of an efficient public use airport as set forth in the Airport Plans of Chapter 5. This will be accomplished by:

    - ✓ Remedying existing operational deficiencies by lengthening and improving the primary runway to more fully accommodate turbine-powered aircraft (75 percent fleet with 60 percent load).
    - ✓ Remedying existing operational and safety deficiencies by installing a precision instrument landing system (ILS) to increase the number of hours each day that aircraft may operate in foggy conditions and to increase the overall safety of landings in all conditions.
    - ✓ Remedying existing space deficiencies by providing for the expansion and enhancement of the terminal and hangar facilities, plus providing new and improved access to accommodate new facilities.
    - ✓ Maintaining and enhancing natural resources on the site.
    - ✓ Facilitating the development of complementary light industrial and general commercial uses for affiliates of the airport.
    - ✓ Providing a fiscally responsible financial plan that will provide suitable facilities and generate revenues necessary for proper operation, management and development of the airport.

- Provide for the development of the Watsonville Municipal Airport consistent with the Master Plan while minimizing adverse effects on the natural physical setting. This will be accomplished by:

    - ✓ Providing for development consistent with the resource protection regulations administered by the United States Army Corps of Engineers, United States Fish and Wildlife Service, the California Coastal Commission and other agencies.
    - ✓ Protecting and enhancing wetlands and sensitive habitat areas.

- Provide for the development of the Watsonville Municipal Airport consistent with the Master Plan while minimizing adverse effects on adjacent land uses, the local community and the region. This will be accomplished by:

    - ✓ Providing the basis for creation of a noise mitigation plan that ensures neighboring properties are not significantly affected by airport-generated noise.
    - ✓ Developing ancillary uses on the site that are designed to be compatible with existing and planned development in the area.

MASTER PLAN APPROACH

This Master Plan covers the planning period of 2001-2020 and includes the following major components:

- Inventory of area planning efforts and background data;
- Forecasts of aviation demand, including the number of operations, aircraft types, and aircraft mix;
- Evaluation of basic aviation requirements;
- Airport plans; and
- Implementation plans.

The plan has been designed to accommodate changes in community goals and aviation trends as they develop, imparting flexibility into the planning process. Community participation has been invited during all planning phases by the consultant and by the city. Agencies contacted during the course of the study include representatives of Santa Cruz County, the Santa Cruz County Regional Transportation Commission, Caltrans Aeronautics Program, the Association of Monterey Bay Area Governments (AMBAG), and the Federal Aviation Administration. Valuable points of view regarding the future of aviation in the area were generated through these contacts and are reflected in the master plan.

SUMMARY

The Watsonville Municipal Airport is the only public use airport in Santa Cruz County. It is located on the northwest boundary of the city of Watsonville, three miles from the city center. It is a well-constructed, general aviation facility occupying 291 acres with two runways serving single and twin-engine aircraft and helicopters, as well as turboprops and turbine-powered business jets. The Airport has an additional 53 non-contiguous acres of land for clear-zone protection. Total Airport acreage is approximately 344 acres.

Three non-precision instrument approaches serve the airport. A terminal building with offices and a restaurant is located in the terminal area. The airport has various services including fixed based operators (FBOs) and fueling.

Approximately 92 percent of all aircraft owners at the Watsonville Municipal Airport are from Santa Cruz County. The remaining 8 percent are primarily from Santa Clara County and other California locations. Presently, 326 aircraft are based at the airport. The total is expected to increase to 381 by the year 2020. Growth will occur in all categories of aircraft, especially turboprop and turbine-powered business jets. Runway operations (landings and takeoffs) will increase to 144,503 by the year 2020, most of which will be general aviation.

To meet aviation demand, additional facilities and reconstruction of existing facilities will be necessary throughout the planning period. The existing 4,501-foot runway handles light based and transient business jets. A runway extension to 5,300 feet total length will be needed to safely accommodate turbine powered business jet aircraft with increased fuel and cargo loads, and for safety of landing IFR (Instrument Flight Rules) aircraft in the often foggy conditions. This extended runway will allow for utilization of 75 percent of business jets with 60 percent useful load. Increases in aircraft parking facilities will be necessary; the development of covered parking for the storage of based aircraft will handle the increased need.

This master plan document includes an Airspace Protection Plan (Exhibit 5), Terminal Building Site and Plan Concepts (Exhibits 6 and 7), an Access Plan (Exhibit 8), a Land Use Plan (Exhibit 9), and a Stage Development Plan (Exhibit 14). Also included are an Airport Layout Drawing (Appendix A foldout map) and an Airport Obstruction Map (Appendix B foldout map).

Planned Improvements

Four phases of capital improvements are planned for the Watsonville Municipal Airport. Table 1 lists improvements plans over the next 20 years.

TABLE 1: PLANNED IMPROVEMENT PROJECTS
Watsonville Municipal Airport

No.*	Improvement Name/Description
Stage I – 0 to 5 years (2001 to 2006)	
1	Complete instrument landing system (ILS)
2	Runway extension 800' to Runway 2-20 w/ taxiway extensions and lights (RW-1; TW-2)
3	Relocated access road (Aviation Way) and construct main apron for automobile parking lot
4	Construct airport maintenance shelter (east of 2-20 taxiway)
5	Install underground utilities, top trees, and relocate threshold of Runway 2-20
7	Security lighting at existing hangars south of Runway 8-26
8	New airport access road to commercial hangars from Airport Boulevard
10	Terminal expansion
12	Install traffic light (Aviation Way and Airport Boulevard)
14	Construct access road with underground utilities connecting Manfre Rd. on south and Buena Vista/Bradford Road on north to provide access to commercial/industrial area (Industrial Area A; TE-A)
15A	Construct aviation-compatible commercial/industrial development west of Runway 8-26 (Industrial Area A; TE-A)
15B	Construct aviation-compatible commercial/industrial development south of Aviation Way (Industrial Area B)
16	[Reserved]
19	Tarplant mitigation program
Stage II – 6 to 10 years (2007 to 2011)	
6	New airport access (Burchell Ave. northeast of Runway 8-26)
9A	Pave runway blast pads (both ends of Runway 2-20) (SZ-1/SZ-2)
11	Hangar expansion plus taxiways (60 to 70 new hangars and ramp area north of Runway 8-26) (TE-B);
13	Construct north parallel taxiway (north of Runway 8-26) (TW-1)
19	Tarplant mitigation program
Stage III – 11 to 15 years (2012 to 2016)	
9B	Pave runway blast pads (both ends of Runway 8-26) (SZ-3/SZ-4)
15C	Construct aviation-compatible commercial/industrial development north of Runway 8-26 (Industrial Area C; TE-C)
15D	Construct aviation-compatible commercial/industrial development west of Runway 2-20 (Industrial Area D)
19	Tarplant mitigation program
Stage IV – 16 to 20 years (2017 to 2020)	
15E	Construct aviation-compatible commercial/industrial development west of Runway 2-20 (Industrial Area E; TE-A1)
17	New hangars in Area TE-D
18	Construct parallel taxiway west of Runway 2-20 (TW-3)
19	Tarplant mitigation program

Note: *Numbers correspond to projects listed in Land Use Plan (beginning on page 55 of this document)
Source: Watsonville Municipal Airport

The capital improvement program cost summary associated with the four stages of development is shown in Table 2.

TABLE 2: CAPITAL IMPROVEMENT PROGRAM COST SUMMARY
Watsonville Municipal Airport
(In 000's 2000 $)

Development Stage	Estimated Cost
Stage I (2001-2006)	$5,670,000
Stage II (2007-2011)	4,410,500
Stage III (2012-2016)	334,500
Stage IV (2017-2020)	3,150,000
Total	$13,565,000
FAA/State Funds	$ 5,313,750
Local Funds	8,251,250
Total	$13,565,000

Note: Stage II development cost assumes a cost of $2,485,000 for Tee Hangar Expansion plus Taxiways (Item No. 11); this cost is listed as $652,000 in the *Capital Improvement Program*, which mistakenly covered only the cost of taxiway construction.
Source: *Watsonville Airport Capital Improvement Program*, January 2001; Coastplans.com

The FAA grant program provides 90 percent grant funding for eligible projects with Caltrans picking up five percent of the remainder. The projects that are not eligible are auto parking, and private facilities such as fixed base operators, hangars, and fueling systems.

2. INVENTORY

The inventory is prepared to provide a description of the airport location and setting, the climatic and geographic features of the area, and the history of the airport. The on-airport and off-airport land use and facility development is described, including the airfield area, terminal area, and airspace. Pertinent information collected as part of the master plan questionnaires is presented to identify the type and nature of aviation use and to present the needs and concerns of the airport tenants.

LOCATION AND SETTING

Watsonville is located at the southern end of Santa Cruz County in the Pajaro Valley between the Santa Cruz Mountains and the Pacific Ocean. The Pajaro Valley is primarily agricultural with generally flat to rolling topography. The city is four miles east of Monterey Bay, approximately 16 miles southeast of Santa Cruz, the county seat, and approximately 45 road miles south of San Jose. The city occupies an area of 4,121 acres (6.44 square miles) and has a population of over 44,265 (Census 2000). The Watsonville sphere of influence area, which includes adjoining unincorporated areas, is projected by AMBAG (1997 estimates) to be 50,500 in 2005. Exhibit 1 shows the regional location of Watsonville.

Watsonville Municipal Airport is the only public use airport in Santa Cruz County. It is located in the northwestern portion of the city, approximately three miles from the central business district. The unincorporated community of Freedom is located north and east of the airport. Residential land use occurs north and east of the airport around Freedom and in narrow strips along Manfre Road and Buena Vista Drive west and north of the airport, respectively. A more extensive residential area is located to the east, and light industrial development is located south east of the airport. Except for the bands of residential development described above, most of the land uses along the runway approaches to the north, west, and south are agricultural.

The Watsonville 2005 General Plan controls land use and density, and limits high occupancy structures such as schools, hotels, and hospitals in the area of the airport. The General Plan designates the existing agricultural land west of the airport for future residential development. It shows the area of Freedom around the airport eligible for annexation, and it also shows the

agricultural land west of Freedom eligible for annexation. A projected population of 2,850 is shown for this area west of Freedom by the year 2005. A specific plan is proposed to control land use in this "Northwest" area. Land north of Freedom Boulevard and generally south of Highway 1 is not indicated for annexation or residential development in the General Plan. They would remain in the jurisdiction of the County, although they are within the Watsonville Area Planning Boundary.

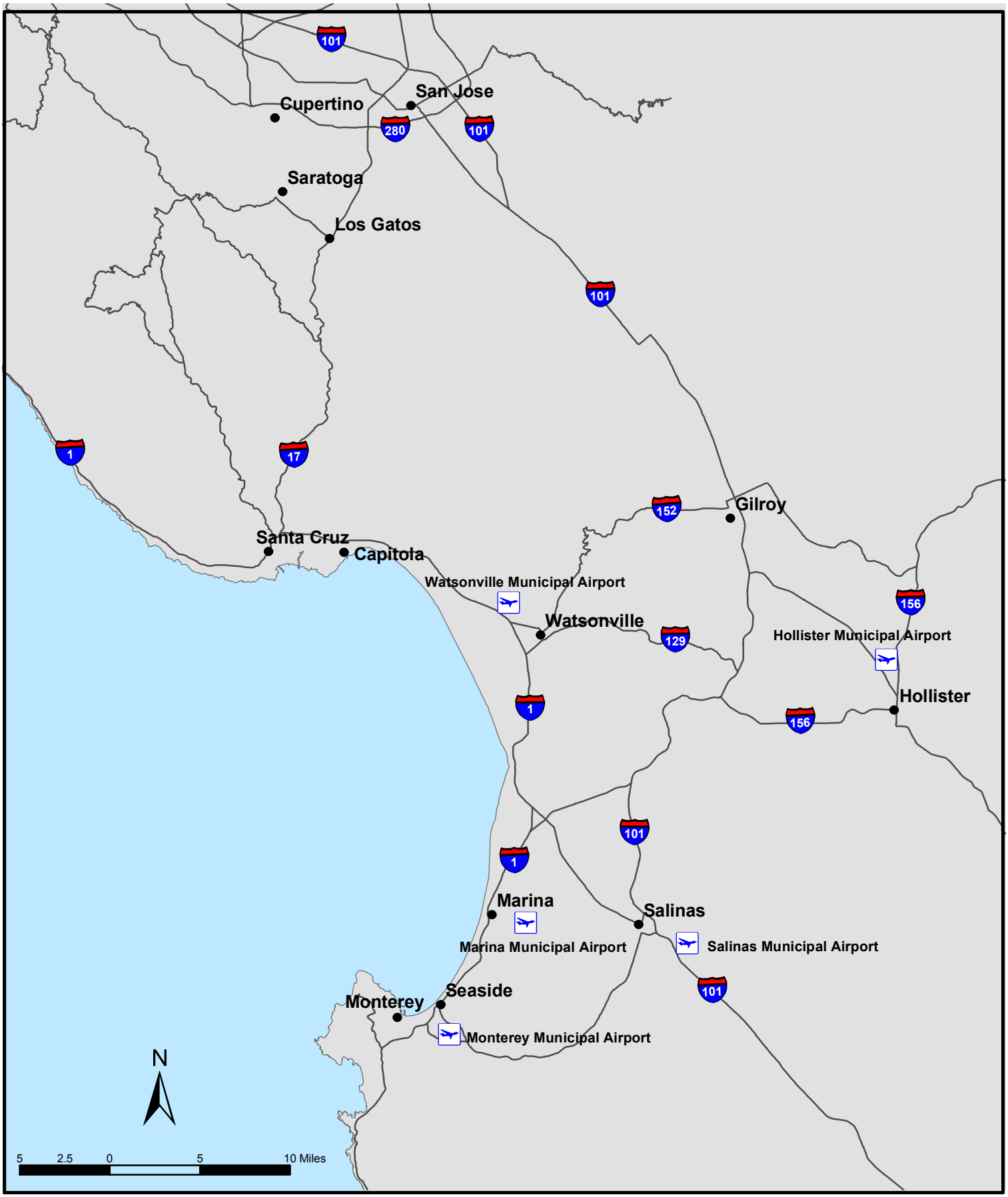


Exhibit 1

Location Map

Watsonville Municipal Airport Master Plan

CLIMATE

Influenced by the proximity of the Pacific Ocean, Watsonville's climate is mild year round. Mean maximum temperatures range from 60°F in January to 73°F in September. Mean minimums for January and September are 37°F and 49°F, respectively. The year-round mean temperature is 56°F. Precipitation averages 20.7 inches annually. The rainy season is from November to April. Other months average less than one inch of rain.

Fog and low stratus is a common occurrence in the area during the summer months between May and September. It is a typical marine fog, rolling in from the ocean during the evening and generally dissipating by mid-morning. Ground fog, a winter phenomenon in other parts of the state, occasionally forms in the Watsonville area.

GEOGRAPHY

Topography in the vicinity of Watsonville generally varies from level farmlands to gently rolling range lands. Five small lakes are located near the city's northern and eastern borders. The city is bordered by Corralitos Creek to the north, and Salsipuedes Creek to the east. The Pajaro River forms the city's southern edge as well as the boundary between Santa Cruz and Monterey Counties. Much of the older part of the city is in the river's flat alluvial valley. The newer part of the city, stretching to the northwest, is on higher, more irregular terrain crossed by a series of sloughs.

The airport is sited on relatively level terrain sloping generally to the southeast. The official airport elevation is 160 feet above mean sea level. Other than low hills to the west, surrounding land is lower than the airport.

SOILS AND GEOLOGY

The Pajaro Valley is an alluvial basin formed by a structural depression and the erosion process. The San Andreas Fault is located approximately 4.5 miles northeast of Watsonville, and a concealed portion of the Zayante-Vergeles fault is 1.5 miles northeast of the City. The region is an area of moderate to high seismic risk. The soils in the Pajaro Valley are characterized by low and moderate permeability and moderate to high shrink-swell potential.

GROUND ACCESS

Watsonville is accessed via three state highways: State Highway 1, which provides north-south access and Highways 152 and 129, which provide access to the east. Refer to Exhibit 1.

State Route 1 forms the airport's southwestern boundary and Airport Boulevard, the principal access road to the airport, forms its southeastern boundary. Access into the airport's main building area is via Aviation Way.

Railroad service to Watsonville is provided by Union Pacific Railroad. The main north-south coastal line passes just south of town and a branch line extends from Watsonville Junction northwestward to Santa Cruz.

AIRPORT HISTORY

Development of Watsonville Municipal Airport began in 1942 with the passage of a local bond issue of $125,000, of which $93,000 was used, and receipt of a grant from the Civil Aeronautics Authority. The site was acquired and construction of two runways with parallel taxiways was started. During World War ll, the airport was leased to the United States for one dollar and became a military field and was named the Naval Auxiliary Air Station Watsonville. During this time the runways were completed and the Navy acquired additional property and constructed various improvements, including a large apron area and numerous buildings.

After the war the airport reopened for public use in 1946 and formally reverted to the City in accordance with an Instrument of Transfer in July 1948. A portion of the principal military building area (35 acres) was deleted from the airport and became city school property.

In December 1946 commercial air service commenced with the landing of a Southwest Airways DC-3. Service continued until 1956. Southwest Airways became Pacific Airlines, then Air West, Hughes Air West, Republic, and finally Northwest Orient.

New airport construction undertaken during the 1950s and 1960s developed T-hangars, runway and taxiway lighting, a midfield exit taxiway, and new fencing. Airport Boulevard was built in stages on a new alignment along the airport's east side, and many of the military buildings were removed during this period.

The Watsonville Antique Fly-In and Airshow began at Watsonville Airport in 1964. This annual event continues to be one of the largest of its type on the west coast.

Development at the airport since 1970 has included apron lighting installed in 1971, a terminal building constructed in 1974, VASI (Visual Approach Slope Indicator) installed on Runways 2 and 20, expansion of the apron area in 1980, and additional T-hangar space was added incrementally. A Localizer installed in 1976 enabled establishment of a non-precision instrument approach and a Marker Beacon added in 1980 improved the procedure. A city fire station, Station No. 2, was established at the airport in 1978 to serve the airport and surrounding areas. The south parallel taxiway was realigned in 1985 and the main apron extended for additional aircraft parking. In 1991, Runway 2-20 lighting was reconstructed, and various pavement and drainage reconstruction projects were undertaken. Additional T-hangars, along with 12 corporate hangars, were constructed in 97-99.

The airport is owned and operated by the City of Watsonville and administered by the Administrative Services Department. An airport manager and several line staff conduct day-to-day operations. The City Council is responsible for major policy decisions, including budgeting and capital improvements.

AVIATION FACILITIES

Aviation facilities inventoried include the airfield area, the terminal area, and the airspace/ navigational facilities.

Airfield Area

The existing Watsonville Airport airfield area is comprised of 291 acres of land with two paved runways. The runways and the runway approaches are described below. See Exhibit 2: Airport Photomap.

Runways

The airport contains two runways, described in Table 3.

TABLE 3: RUNWAY CHARACTERISTICS
Watsonville Municipal Airport

Runway	Orientation	Dimensions	Effective Gradient	Surface Composition
2-20 (Primary)	N-S	4501' x 150'	0.40%	Asphalt
8-26 (Crosswind)	E-W	3999' x 100'	0.70%	Asphalt

Source: FAA Airport Master Record #5010 for the Watsonville Municipal Airport, July 1990.

The two runways remain in the configuration and length originally constructed. The terminal and hangar areas, are located in the southeast quadrant of the intersecting runways.

Runway 2-20 has pilot-controlled (PCL) medium intensity edge lights (MIEL). Runway end identifier lights (REIL) are installed on Runway 2. Runways 2 and 20 have Visual Approach Slope Indicators (VASI). Runway 8 has a Precision Approach Path Indicator (PAPI).

According to the FAA Master Record, the runway, taxiway, and apron pavements are rated "good". Master plan analysis resulted in the estimated runway pavement gross weight strengths for aircraft with various landing gear configurations as shown in Table 4.

TABLE 4: PAVEMENT STRENGTH
Watsonville Municipal Airport

Runway	Single Wheel	Dual Wheel
2-20	75,000 lbs	107,000 lbs
8-26	75,000 lbs	107,000 lbs

Source: Wadell Engineering Corporation

Exhibit 2

Airport Photomap

Photo 8-9-02
Jeremy Lezin

Watsonville Municipal Airport Master Plan

Runway Approaches and Obstructions

The approach slope ratios (horizontal:vertical) for each runway end are shown in Table 5.

TABLE 5: RUNWAY APPROACH SLOPES
Watsonville Municipal Airport

Runway End	Approach Slope
2	38:1
20	17:1*
8	20:1
26	20:1

Note: * Runway 20 has a 590' displaced threshold, resulting in a 46:1 approach slope.
Source: FAA Airport Master Record #5010 for the Watsonville Municipal Airport, July 1990.

Terminal Area

The general aviation area, located in the southeast quadrant of the airport between the two runways, consists of the terminal building and support areas including aprons, hangars, fueling facilities, and related activities. See Exhibit 3: Terminal Area Photomap.

In the terminal area, there are 223 hangar spaces. The 4,500 square foot terminal and administration building houses offices and a restaurant.

Approximately nine acres of aircraft parking apron accommodating 202 tiedown spaces are located in the terminal area. Table 6 summarizes Watsonville Airport's building inventory.

Exhibit 3

Terminal Area Photomap

Photo 8-9-02
Jeremy Lezin

Watsonville Municipal Airport Master Plan

TABLE 6: BUILDING INVENTORY
Watsonville Municipal Airport

Building	Size	Construction	Condition
Terminal Bldg	50'x90'	Concrete Block	Very Good (Built 1974)
City Fire Station No. 2	50'x85' structure 20'x25' shelter	Steel	Very Good (Built 1978)
East T-Hangars	5 structures; 50 units	Steel	Fair to Good (Built 55, 65, and 84)
	2 structures; 47 units	Steel	Very Good (Built 1997)
	4 structures; 69 unit	Steel	Very Good (Built 1999)
South T-Hangars	4 structures; 40 units	Steel	Good-Excellent (Built 1970 and 1984)
Corporate Hangars	2 structures; 12 units		Very Good (Built 1997, 1998)
Hangar	50'x50'	Steel	Very Good
Hangars (3) (2 structures)	50'x45'	Steel	Very Good (Built 1999)
Shop Bldg.	85'x100'	Steel	Very Good
Hangar	50'x115'	Steel	Excellent
Shop Bldg.	50'x180'	Wood Frame	Fair (Built WWII)
Shop Bldg.	75'x100'	Wood Frame	Fair (Built WWII)
Armory	70'x150'	Wood Frame	Good
Industrial Bldgs.	3-80'x120'	Tilt Slab	Very Good
Office Bldg.	30'x45'	Wood Frame	Fair
Power Vault	12'x30'	Concrete	Adequate

Source: Watsonville Municipal Airport

Airspace/Navigational Facilities

For visual approaches, the airport utilizes a standard left-hand pattern to all runway ends. The patterns altitude is set at 1,200 MSL (1,040 feet AGL).

The airport has three established non-precision instrument approach procedures. The navaids installed include the Pajar Nondirectional Beacon located on the final approach path 1.1 nautical miles southwest of the Runway 2 threshold and the on-field Localizer near the end of Runway 20. The Localizer approach enables landings, either straight-in to Runway 2 or circling to land on Runway 20 and 26, with visibility as low as 1 mile and a Minimum Descent Altitude (MDA) of 680 feet MSL. The Nondirectional Beacon approach has an MDA of 900 feet MSL with one-mile visibility. The third approach is "VOR DME-A", which utilizes the Salinas VOR. Although this approach has the highest minimums of the three approaches—1,300 feet MSL MDA with 1-1/4 mile visibility--it is the only approach usable during local power failures. Instrument approaches to Watsonville Municipal are handled by FAA Approach Control facilities at Monterey and Oakland. The Oakland facility handles approaches and departures from 11:01 p.m. to 5:59 am.

3. AVIATION FORECASTS

The aviation forecasts are prepared by first selecting and identifying the airport service area and its associated socioeconomic data, followed by analyzing aviation trends including aircraft activity and based aircraft. The activities commonly forecast for airport planning include passengers, aircraft operations, and based aircraft. In this plan, forecasts are projected through the year 2020. These forecast are based on the FAA Long-Range Aviation Forecasts Fiscal Years 1998-2009 and 2010, 2015 and 2020

AIRPORT SERVICE AREA

The area served by Watsonville Municipal Airport is designated in this report as the airport service area. Geographical boundaries for airport service areas consist of a city, county, or other governmental subdivision because relevant population and economic data are readily available. Trends in aviation demand correspond with local growth trends in the governmental entity containing the main concentration of population served by an airport. Watsonville Municipal Airport is strategically located to serve general aviation demand in metropolitan Watsonville and the surrounding parts of Santa Cruz County and Monterey County, including the cities of Capitola, Santa Cruz, and Scotts Valley. This area represents the airport service area for Watsonville Municipal Airport and is supported by information on population and economic data in that area, as well as the information on business and home locations of airport users.

SOCIOECONOMIC DATA

Since its incorporation in 1868, Watsonville grew to a population of 47,700 in 2001. As indicated in Table 7, the city's growth has increased dramatically in the last 20 years. From 1960 to 1970 population growth was 1,270. Between 1970 and 1980 it was 8,970. Between 1980 and 1990 it was 7,560; from 1990 to 2000 it was 14,000.

The population of Watsonville is projected to increase to approximately 50,495 by the year 2005. This projection includes the unincorporated community of Freedom. The Watsonville City Council directed that the Watsonville 2005 General Plan provide for a future population of 50,500 by 2005, including Freedom and other adjacent areas. This represents an average

annual growth rate of 1.8 percent per year between 1990 and 2005. This rate is appreciably less than the 2.8 percent per year growth, which occurred between 1980 and 1990. The 1.8 percent rate strikes a balance among agricultural, environmental, infrastructure, social and fiscal constraints. By 2010, the City of Watsonville is projected to have a population of 51,881, which includes Freedom and other adjacent areas.

The population of Santa Cruz County has increased from 83,200 in 1960 to 255,602 in 2000. By the year 2005, the county is expected to have a population of 270,060 and by 2020 the population is expected to be 303,646.

The *Watsonville 2005 General Plan* has, as one of its primary goals, the development of a healthy economy that will provide employment opportunities. The plan projects the need for 7,500 jobs by year 2005. Improvement of the Watsonville Municipal Airport would help in attracting business and jobs to the Watsonville area.

TABLE 7: HISTORICAL AND PROJECTED POPULATION TRENDS
City of Watsonville and Santa Cruz County

Year	Watsonville	Santa Cruz County	Percent of Santa Cruz County
Historical			
1960	13,300	83,200	16.0%
1970	14,570	123,600	11.8%
1980	23,540	188,100	12.5%
1990	31,100	229,700	13.5%
1995	33,425	240,000	13.9%
2000	45,100	255,602	17.6%
Forecast			
2005*	50,495	270,060	18.7%
2010*	51,881	281,714	18.4%
2015*	53,816	292,988	18.4%
2020*	55,875	303,646	18.4%

Notes: *Includes Freedom
Source: Census 2000, California Department of Finance Demographics Research Unit; Association of Monterey Bay Area Governments; City of Watsonville

AVIATION TRENDS

General aviation flying can be divided into four major categories:

Business: The use of an aircraft for executive or business transportation. This category includes (1) aircraft used by a corporation or other organization and operated by professional pilots to transport its employees/property (not for compensation or hire) and (2) aircraft used by an individual for transportation required by a business in which he/she is engaged.

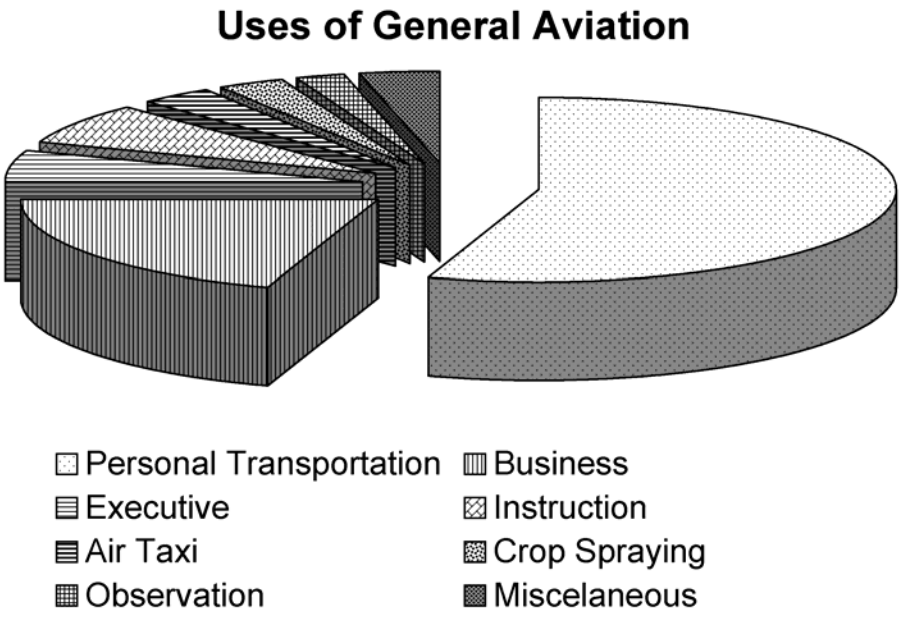
Commercial: The use of an aircraft for commercial purposes (other than the certificated air carriers) in three types of activity: (1) air taxi, involving any use of an aircraft by the holder of an air taxi operating certificate; (2) aerial application, such as the distribution of chemicals (crop dusting); and (3) industrial special, such as pipeline patrol survey advertising, and photography.

Instructional: The use of an aircraft for flight training under an instructor's supervision.

Personal: The use of an aircraft for personal reasons similar to the utilization of an automobile.

At the outset of the forecasting process, it is important to recognize the overall impact of general aviation on the nation's economy as well as anticipated growth in general aviation through future years. FAA statistics of current activity as well as forecasts through 2020 identify an increasing trend in general aviation growth. In 2000, there were 195,500 general aviation aircraft. Of these 141,200 are single engine, 16,000 are multi-engine, 5,500 are turboprop, 4,900 are turbo jet, 6,500 rotorcraft, 17,100 experimental and the 4,300 listed as other.

General aviation includes a multitude of diverse and growing uses of aircraft, ranging from personal flying to transportation of personnel by business firms in privately owned aircraft to highly specialized uses such as crop dusting, patrol, and aerial photography. Based on owner reports nationwide, approximately half of general aviation is for personal transportation, approximately 20 percent is for business travel, and the remainder is for miscellaneous uses including such things as instruction, crop spraying, and air taxis. Without a doubt, the network of general aviation airports around the United States is the backbone of the nation's air transportation system.



Historical and forecast growth of the national general aviation aircraft fleet by type of aircraft, as developed by the FAA, is set forth in Table 8. According to the FAA forecasts, the national general aviation fleet is expected to increase from 195,500 aircraft in 2000 to 233,700 aircraft by 2020, an increase of approximately 2 percent. Of these forecast aircraft, 79.3 percent are piston-powered aircraft, 6.3 percent are turbine-powered aircraft, and 3.6 percent are

categorized as "other," which are not fixed or rotary wing. Of the piston aircraft, 9.1 percent are twin engine.

TABLE 8: NATIONAL ACTIVE GENERAL AVIATION AIRCRAFT
Type of Aircraft FY 2000-FY 2020
(In Thousands)

	2000	2005	2010	2015	2020
Fixed					
Piston					
Single Engine	141.2	148.1	155.1	160.7	168.1
Multi-Engine	16.0	16.2	16.7	17.5	18.3
Subtotal	157.2	164.3	171.8	178.2	186.4
Turbine					
Turboprop	5.5	6.0	6.6	6.9	7.2
Turbojet	4.9	5.7	6.3	6.6	6.9
Subtotal	10.4	11.7	12.9	13.5	14.1
Rotary Wing					
Piston	2.3	2.2	2.1	2.2	2.3
Turbine	4.2	4.5	4.7	4.9	5.1
Subtotal	6.5	6.7	6.8	7.1	7.4
Experimental					
Subtotal	17.1	18.0	19.0	19.8	20.7
Other					
Subtotal	4.3	4.5	4.7	4.9	5.1
Total	**195.5**	**205.2**	**215.2**	**223.5**	**233.7**

Source: FAA Forecasts, Fiscal Years 1995-2006; *FAA Forecast, Fiscal Years 2010-2020

Aircraft Activity

Aircraft operations data for 1977 through 2000 at Watsonville Municipal Airport are presented in Table 9. During this period, the number of operations increased from 82,000 to 122,890 a net increase of 40,890.

General observation of the activity at Watsonville Municipal indicates that it is a busy airport, particularly on summer weekends. The annual Antique Aircraft Fly-In generates much activity. However, as with most non-towered airports, aircraft operations have not been counted on any continuing basis.

TABLE 9: HISTORICAL AIRCRAFT OPERATIONS
Watsonville Municipal Airport

Year	Local	Itinerant	Total
1977	33,000	49,000	82,000
1985	38,000	57,000	95,000
1990	48,000	73,200	122,000
2000	49,156	73,734	122,890

Source: Airport Manager Records; AMBAG

It was estimated that 60 percent of operations were itinerant and 40 percent local. Of these, approximately 7 percent of all operations were estimated to be by twin-engine aircraft and 1 percent by business jets. Thus, the vast majority of operations are by single-engine aircraft at Watsonville Municipal Airport.

Based Aircraft

The number of aircraft based at Watsonville Municipal Airport has shown an increase over the years. The growth has more than doubled for based aircraft from 145 in 1977, when data was assembled for a previous Master Plan, to some 326 in 2000 (i.e., number of aircraft assessed by Santa Cruz County as of January 1, 2000). An increase of about 80 aircraft occurred in 1982, following closure of Santa Cruz Sky Park, which had been the only other public-use airport in Santa Cruz County.

Watsonville Municipal Airport serves a countywide area. This is demonstrated by the geographic distribution of the airport's based aircraft owners (determined by a list of their mailing addresses), as illustrated in Table 10. Some 21 percent of Watsonville aircraft owners (including fixed base operators) had Watsonville vicinity addresses. Approximately 63 percent were from the City of Santa Cruz and vicinity. Overall, 84 percent of Watsonville based aircraft were registered to owners with Santa Cruz County addresses. Table 10 shows aircraft owners by location.

TABLE 10: AIRCRAFT OWNERS BY LOCATION
Watsonville Municipal Airport

Owner Jurisdiction	Percent
Santa Cruz Vicinity	63
Watsonville Vicinity	21
Santa Clara County	7
Other Northern California	4
Monterey County	2
Out of State	2
Southern California	1
Total	**100**

Source: Wadell Engineering Corporation Analysis of Airport Manager Records, 2000

An airport plan is primarily developed from aviation demand forecasts. The forecasts contained in this plan are based on projected growth rates contained in the 1995 AMBAG Regional Airport System Plan (RASP). According to that report, the growth rate for single- and multi-engine aircraft is essentially flat between 2000 and 2005 and then increases to one percent for ensuing years. The growth rate for helicopters, turboprops, and turbine aircraft is essentially two percent for all projection years. When these growth rates are applied to base year estimates (2000), the result is an increase of 55 aircraft between 2000 and 2020. Table 11 shows a forecast of based aircraft derived by applying AMBAG projected growth rates to base year information from the Santa Cruz County Assessor's Office.

TABLE 11: FORECAST OF BASED AIRCRAFT
Watsonville Municipal Airport

	2000	2005	2010	2015	2020
Single engine	291	291	306	321	338
Multi engine	24	24	26	27	28
Helicopter	1	1	1	1	1
Turboprop	5	5	6	7	7
Turbine	5	6	6	7	7
Total	**326**	**327**	**345**	**363**	**381**

Sources: AMBAG 1995 RASP; Santa Cruz County Assessor's Office

In forecasting, it is the number of based aircraft that "drives" a demand model. Factors that influence an aircraft owner's decision to base his aircraft are the location of the airport, the accessibility of the site, and the availability of facilities for the user. Recognizing the character and nature of aviation facilities within Santa Cruz County, the following developments should result with time:

- The growth of population in Santa Cruz County will increase aviation demand;
- The need for general aviation training, aircraft basing, and the impact of increased commercial traffic at the Monterey Airport will result in increasing demand for airport facilities in the Watsonville area.

- The opening of the small airport in Marina (formerly Fritzsche Army Airfield) did not have an impact on business jet aircraft, since the facilities are much smaller and less desirable than those at Watsonville Municipal Airport, and the user demand generated south of Watsonville is negligible.

Future events that could greatly increase the based aircraft would be (1) the reduction of based aircraft at San Jose International Airport, or (2) the closure of Reid-Hillview Airport in San Jose. Yet the impact of those two scenarios could be voided if NASA Moffett is opened to general aviation use. The impact will likely be small, since the geographic centroid of the Watsonville aircraft owners is toward Santa Cruz.

Forecasting general aviation activity in the study area cannot be separated from other general aviation issues in the area. Activity at any airport is dependent upon development at other airports as well as capacity constraints and limitations. Watsonville Municipal Airport is oriented toward general aviation operations including business, personal, and industry travel.

There is no scheduled air cargo service in operation at Watsonville, although bank courier cargo, personal, and business/industry cargo is moved in general aviation aircraft. Rail and truck transportation remain the primary means of transporting commodities. Airfreight movement exists at Monterey, but remains at a low level. There are no plans for major cargo shipments from Watsonville Airport. The attractiveness for cargo service is limited due to lack of backhaul loads on the return trip and the existing runway strength, which limits the payload of cargo and business aircraft.

AVIATION FORECASTS

For purposes of this master plan, forecasts were prepared for annual operations from 2000 through the year 2020. The forecast, as presented in Table 12, provides detailed information concerning the number of instrument operations for determination of instrument approach capabilities and needs and the aircraft operations by type for use in the airport noise analyses. Information on the number and types of based aircraft, which is calculated in Table 11 is also shown here in Table 12. This information is used for runway capacity analyses and estimates of future apron and hangar parking requirements,

Single engine, multiple engine, and helicopter aircraft operation forecasts are identified in Table 12. It is expected that additional business jet and turboprop aircraft would be based at Watsonville due to increasing business and industrial development. The forecast of aircraft operations is by type of operation, type of aircraft, and type of user. The local aircraft movements include touch-and-go training activity as well as flights in the immediate airport environs. The remaining aircraft movements are classified as itinerant, which includes flights that have origins and/or destinations away from the airport.

The instrument operations noted in Table 12 include instrument approaches (when aircraft arrive at the airport under instrument conditions using navigational aids) and instrument departures, which are the primary portion of the instrument operations. Typically there are more instrument departures than instrument approaches at general aviation airports since the instrument approach is a more precise operation and usually occurs when arriving at a destination where it is necessary to let down to the airfield through cloud conditions or fog. Instrument departures most often involve a climb-out from the airport during instrument

conditions when visual flight rule conditions exist on top of the clouds. The airport experiences a significant level of instrument training flights, including many aircraft from other airports.

TABLE 12: AIRCRAFT & OPERATIONS FORECAST
Watsonville Municipal Airport

Based Aircraft:	2000	2005	2010	2015	[2]2020
Single Engine	291	291	306	321	338
Multi Engine	24	24	26	27	28
Helicopter	1	1	1	1	1
Turboprop	5	5	6	7	7
Turbine	5	6	6	7	7
Total	326	327	345	363	381
Annual Aircraft Operations					
By Type of Operation					
Local	49,156	49,556	52,270	55,140	58,092
Itinerant	73,734	74,334	77,920	82,020	86,411
Total[1]	122,890	123,890	130,190	137,160	144,503
By Type of Aircraft					
Single--engine prop.	106,430	106,880	113,180	119,600	126,003
Multi--engine prop.	12,140	12,690	12,690	13,240	13,949
Helicopter	0	0	0	0	0
Turboprop	2,820	2,820	2,820	2,820	2,971
Turbine	1,500	1,500	1,500	1,500	1,580
Total	122,890	123,890	130,190	137,160	144,503
Aircraft Operations Distribution					
Peak Month	11,675	11,770	12,368	13,030	13,728
Peak Week	2,923	2,947	3,097	3,264	3,439
Average Day of Peak Month	390	394	413	435	458
Peak Hour of Average Day of Peak Month	59	60	63	66	70
Instrument Operations	3,685	3,715	3,893	4,101	4,320
Approaches	733	739	774	815	859

Notes: [1]This data is from the AMBAG 1995 RASP (or in the case of the 2020 project, based on trends derived form the 1995 AMBAG RASP). Members of the public have raised questions about the accuracy of this data, arguing that these estimates/projections significantly overstate current and future operations at Watsonville Airport. While the AMBAG 1995 RASP is dated and its accuracy open to question, there is no better data available to use in its place. AMBAG is currently (August 2001) working to prepare a revised RASP, and this work is expected to be complete in early 2002. These new projections will be worked into the master plan when available, and if the projections are lowered or remain approximately the same, they are not expected to change planned improvements or the analysis of environmental impacts associated with the master plan. The rationale for lengthening the main runway would be unaffected (i.e., increasing the number of planes that can depart with 90 percent loads and thereby increasing facility efficiency), and the environmental analysis, which is based on earlier projections, will, if anything, overstate potential impacts.

[2]Projections for 2020 are based on trends derived from data in the 1995 RASP.

Source: AMBAG 1995 RASP; Watsonville Airport Manager

4. AVIATION REQUIREMENTS

Demand/capacity analysis and facility requirements are based on guidelines established in FAA Advisory Circulars, FAA Regulations, and good planning and engineering judgment. Facility requirements are matched with the forecast of aviation demand to provide for the safe, efficient, and convenient utilization of the airport without unreasonable delays. This chapter identifies items and quantities that are used in Chapter 5, Airport Plans. Actual recommended development is identified in Chapter 6, Implementation Plans, where all of the physical and financial aspects of the proposed development are brought together.

AIRCRAFT/AIRPORT CLASSIFICATIONS

Airports are planned and developed to serve certain categories of existing and future user aircraft. In order to select appropriate dimensional standards, it is necessary to identify the various categories and design groups and type of aircraft, and airfield capacity that the airport serves or intends to serve.

Aircraft Approach Category

An aircraft approach category is a grouping of aircraft based on an approach speed of 1.3 V_{SO}. V_{SO} is the aircraft stall speed in landing configuration at the maximum certificated landing weight. V_{SO} and the maximum certificated landing weight are established for the aircraft by the certificating authority of the country of registry. The aircraft approach categories are presented in Table 13.

TABLE 13: AIRCRAFT APPROACH CATEGORIES

Category	Approach Speed
A	Less than 91 knots
B	91 knots or more but less than 121 knots
C	121 knots or more but less than 141 knots
D	141 knots or more but less than 166 knots
E	166 knots or more

Source: FAA Advisory Circular 150/5300-13.

Airplane Design Groups

The airplane design groups table categorizes airplanes by wingspan and is presented below in Table 14.

TABLE 14: AIRPLANE DESIGN GROUPS

Group	Wingspan
I	Up to but not including 49 feet (15 m)
II	49 feet (15 m) up to but not including 79 feet (24 m)
III	79 feet (24 m) up to but not including 118 feet (36 m)
IV	118 feet (36 m) up to but not including 171 feet (52 m)
V	171 feet (52 m) up to but not including 214 feet (65 m)
VI	214 feet (65 m) up to but not including 262 feet (80 m)

Source: FAA Advisory Circular 150/5300-13.

Airport Types

Airport types describe the operational and physical characteristics of the airplanes intended to operate at an airport. The airport reference code (ARC) is a system developed by the FAA which utilizes aircraft approach category and airplane design group components to assist in the design of critical airport elements meeting the requirements of the airplanes anticipated to use the aviation facilities.

Transport airports are designed, constructed, and maintained to serve airplanes in aircraft approach categories C and D, while utility airports serve the smaller airplanes in aircraft approach categories A and B. The latter airplanes are commonly used for personal and business transportation, and for commuter and air taxi operations. The airport types are presented below.

Basic Utility--Stage I. This type of airport serves about 75 percent of the single-engine and small twin-engine airplanes used for personal and business purposes. Precision approach

operations are not usually anticipated. This airport is designed for small airplanes in airport reference code B-I.

Basic Utility--Stage II. This type of airport serves all the airplanes of Stage 1, plus some small business and air taxi-type twin-engine airplanes. Precision approach operations are not usually anticipated. This airport is also designed for small airplanes in airport reference code B-I.

General Utility--Stage I. This type of airport serves all small airplanes. Precision approach operations are not usually anticipated. This airport is also designed for airplanes in airport reference code B-II.

General Utility--Stage II. This type of airport serves large airplanes in aircraft approach category A and B and usually has the capability for precision approach operations. This airport is normally designed for airplanes in airport reference code B-III.

Transport. This type of airport serves all large airplanes in aircraft approach categories C and D.

AIRPORT SERVICE ROLE

Watsonville Municipal Airport is classified in the National Plan of Integrated Airports System (NPIAS) as a General Utility Stage II Airport, serving aircraft with approach speeds up to but not including 121 knots (Category B). There are two business jets in the B-II classification based at Watsonville. On occasion the airport receives transient business jet aircraft with approach speeds up to but not including 141 knots (Category C). The airport should be developed as a General Utility Stage II Airport handling B-II aircraft.

AIRFIELD CAPACITY

Airfield facilities were evaluated for their ability to satisfy forecast aviation demand at the airport. Hourly runway capacities and annual service volume were estimated. Hourly runway capacity is defined as the maximum number of aircraft operations that can take place in one hour for given conditions. Annual service volume is a measure of annual aircraft operations that can be used as a reference in preliminary airfield planning.

The aviation forecasts along with the 1990 operations levels were evaluated. The airfield layout and operational use was determined from the Airport Layout Drawing and observations of airfield operations.

Runway Use

Runway use encompasses the number, location, and orientation of active runways, as well as the directions and types of operations using each runway. Runway use depends primarily on wind direction and wind speed, but also depends on other factors such as air traffic control rules and noise abatement procedures, stratus location, runway instrumentation, taxiing distance, and runway length. The percent use of each runway at Watsonville Municipal Airport is shown below in Table 15. The annual use percentages were calculated based upon conversations with Airport management, available wind analysis, and observations of airfield use.

TABLE 15: EXISTING RUNWAY USE
Watsonville Municipal Airport

Runway	Annual Use (Percent)
2	3%
20	85%
8	5%
26	7%
	100%

Source: Wadell Engineering Corporation, 1994

Airspace and Air Traffic Control

Watsonville Municipal Airport is presently equipped with a localizer navaid used for a straight-in approach to Runway 2 and circling approaches to other runways. Current minima for straight-in landing are one-mile visibility and 680 feet MSL decision height. Monterey approach control has been delegated responsibility for control of instrument flight rules (IFR) aircraft within this area. The overall airspace of Watsonville Municipal Airport and its neighboring airports is generally unrestricted. Located at the nearby Salinas Municipal Airport is a VORTAC providing a juncture point for as many as six Victor airways serving lower altitude enroute traffic.

It is assumed that current air traffic control procedures will continue throughout the planning period to 2020. Ongoing FAA research may lead to new standards in the future. The benefits from this research will be realized primarily under IFR conditions, which is an important factor at Watsonville Municipal Airport. The Watsonville Municipal Airport should be planned for a precision approach system by adding a glide slope antenna for instrument descent enhancements. Watsonville Airport does not expect to commission an FAA-funded air traffic control tower during the planning period, since entry-level traffic demand criteria must be over 200,000 annual operations.

Ceiling and Visibility Conditions

Ceiling and visibility have an important impact on airfield operations and runway capacity because spacing between aircraft is often less with high ceilings and good visibility than when conditions are less favorable. The two types of flight rules for specific weather conditions are visual flight rules (VFR) and instrument flight rules (IFR).

There is no weather data to establish the percentage of VFR versus IFR conditions. It is assumed that VFR conditions occur approximately 90 percent of the time and IFR conditions occur approximately 10 percent of the time. Occasionally IFR conditions continue throughout a full day; however, low ceilings and fog usually dissipate by mid-day. During the summer, IFR conditions typically exist part of every day.

Aircraft Mix

Aircraft mix is composed of four aircraft classifications: A, B, C, and D. Class A includes small single-engine aircraft (weighing 12,500 pounds or less); Class B includes small twin-engine aircraft (weighing 12,500 pounds or less); Class C includes large aircraft weighing more than 12,500 pounds and up to 300,000 pounds; and Class D includes heavy aircraft weighing more than 300,000 pounds. Few Class C and no class D aircraft utilize Watsonville Municipal Airport.

The following aircraft mix at the airport shown in Table 16 was derived from the aviation demand forecasts presented in Table 12. It was assumed that all helicopters are within Class A. All turboprop and turbine aircraft and 20 percent of the multi-engine piston aircraft are assumed to be Class B. For this study, it is assumed that 50 percent of the Class A aircraft do not operate in IFR weather conditions and that all Class B aircraft will operate during IFR conditions.

TABLE 16: AIRCRAFT MIX
Watsonville Municipal Airport

Aircraft Class (VFR Conditions)	1990	2000	2010
A	95.5%	95.4%	94.6%
B	4.1	4.6	5.3
C	<1.0	<1.0	<1.0
Aircraft Class (IFR Conditions)			
A	47.9%	47.7%	47.3%
B	52.1	52.3	52.7
C	<1.0	<1.0	<1.0

Source: Wadell Engineering Corporation

Hourly Runway Capacity

Hourly runway capacity is the maximum number of aircraft operations that can take place in one hour for given conditions. Factors that affect hourly runway capacity include:

- Runway use
- Airspace and air traffic control
- Ceiling and visibility conditions
- Aircraft mix

VFR peak hourly capacities at Watsonville Municipal Airport are dependent on runway-use configuration actually utilized. Most IFR operations at Watsonville Municipal Airport occur under a single runway-use configuration. Estimated hourly runway capacities, together with peak hour demand for the planning period, are shown in Table 17.

TABLE 17: HOURLY RUNWAY CAPACITY
Watsonville Municipal Airport

	Planning Period			
	1990	2000	2010	2020
VFR peak hourly demand	62	77	95	119
VFR peak hourly capacities	97-148	97-148	97-148	97-148
IFR peak hourly demand	15	19	24	30
IFR peak hourly capacities	30	30	30	30

Source: Wadell Engineering Corporation; City of Watsonville

Under VFR conditions, the hourly runway capacities have a range depending on airfield operations. Under IFR conditions, the hourly runway capacities are slightly above peak hour demand through the 20-year-planning period. The fact that IFR departures climb and turn to the Pajar NDB, which is also on the localizer final approach results in reduced IFR capacity. It is estimated that IFR conditions occur approximately 10 percent of the year and do not continue over a long period of time.

Annual Service Volume

Annual service volume is based on hourly capacities for the airfield operating conditions that occur throughout the year and on monthly, daily, and hourly variations in aircraft operations.

The estimated annual service volume of aircraft operations and the forecast annual aircraft operational demand levels are listed in Table 18, below.

TABLE 18: ANNUAL SERVICE VOLUME
Watsonville Municipal Airport

Year	Annual Service Volume	Annual Demand
1990	215,000	129,050
2000	215,000	122,890
2010	215,000	130,190
2020	215,000	144,503

Source: Wadell Engineering Corporation; AMBAG Regional Airport System Plan (RASP), 1995

On the basis of the analyses of the existing airfield, it is concluded that Watsonville Municipal Airport capacity exceeds aviation demand throughout the planning period. The addition of an air traffic control tower would increase capacity by improving utilization of the intersecting runway system.

FACILITY REQUIREMENTS

An airport is composed of three major elements, which contribute to its overall size and shape. The principal components include:

- AIRFIELD
  Airfield Design
  Ruways
  Taxiways
  Visual Aids/Lighting

- TERMINAL AREA
  Airplane Parking and Tiedown
  Buildings and Hangars
  Roads and Auto Parking
  Support Facilities

- AIRSPACE/NAVIGATIONAL AIDS (NAVAIDS)

This section discusses the facilities required to accommodate the forecast aviation demand. Each of the major facility requirement categories noted above is described separately. The facility requirements are summarized in tabular form at the end of this chapter.

Airfield Analysis

The airfield requirements analysis is prepared to determine future needs for the airfield design, runways, taxiways, and visual aids/lighting systems. These requirements relate the extent and type of development necessary to accommodate the forecast demand and the capacity required of the airfield system.

Airfield Design

The existing runway system consists of two runways. The main runway, 2-20, is 4,501 feet long and 150 feet wide. The crosswind runway, 8-26, is 3,999 feet long and 100 feet wide. The existing 50-foot wide parallel taxiways to Runways 2-20 and 8-26 are more than adequate for utility type aircraft in both width and lateral distance from the runway. Upon extension of Runway 2-20, the parallel taxiway should be extended.

Holding aprons constructed at the north end of the runway will provide an area clear of taxiway traffic for aircraft to park while the "before-takeoff-check" is performed and IFR departure clearance is obtained. The construction of holding aprons will minimize delays to departing aircraft by providing bypass capability.

The airfield lighting at Watsonville consists of runway edge lighting, taxiway edge lighting, apron flood lighting, visual approach slope indicators (VASI), runway end identifier lights (REIL), precision approach path indicator (PAPI) and a beacon. The runway lights are medium-intensity (MIRL) on Runway 2-20. Runway 8-26 will not require lighting because night-time capacity does not require the use of the runway. The Runway 2-20 edge lighting system should be extended when the runway is extended to the south. Apron flood lighting is installed on the aircraft-parking apron in front of the terminal building, which adequately illuminates the apron area. There is also floodlighting in the T-hangar area. Additional floodlighting will be necessary as new areas are developed.

A medium intensity approach lighting system with runway alignment indicators (MALSR) will be located in the approach to Runway 2 when an Instrument Landing System (ILS) is installed. VASIs are located near both ends of Runway 2-20. When Runway 2-20 is extended, the VASI should be relocated near the 2 end. Runway 2 has REILs. A rotating beacon is located next to the terminal. A standby generator is used during power outages, which allows access to aircraft fuel and allow for nighttime operations.

Table 24 indicates the runway separation standards for aircraft in approach categories A and B. As discussed previously, runways 2-20 and 8-26 are category B runways. Runway 2-20, when extended in the future, will remain a category B runway, since the extension is merely for safer operations of the same aircraft that currently use the airport. Table 25 and Table 26 indicate design standards for runways serving aircraft in approach categories A and B for precision and non-precision visual runways, respectively.

TABLE 24: RUNWAY SEPARATION STANDARDS FOR AIRCRAFT APPROACH Categories A & B

ITEM	AIRPLANE DESIGN GROUP				
	I*	I	II	III	IV
Non-precision Instrument and Visual Runway Centerline to:					
Parallel Runway Centerline			Varies from 700' VFR up to 4300' + IFR		
Hold Line*	125'	200'	200'	200'	250'
Taxiway/Taxilane Centerline**	150'	225'	240'	300'	400'
Aircraft Parking Area	125'	200'	250'	400'	500'
Precision Instrument Runway Centerline to:					
Parallel Runway Centerline			Varies from 1000' up to 4300' +		
Hold Line**	175'	250'	250'	250'	250'
Taxiway/Taxilane Centerline**	200'	250'	300'	350'	400'
Aircraft Parking Area	400'	400'	400'	400'	500'

Notes: * Facilities for only small airplanes.
** No part of an aircraft (tail tip, wing tip) at a holding location or on a taxiway centerline can be within the runway safety area or penetrate the obstacle free zone (OFZ). An increase to these separation distances may be needed at higher elevations.
Source: FAA Advisory Circular 150/5300-13

TABLE 25: PRECISION INSTRUMENT RUNWAY DESIGN STANDARDS FOR AIRCRAFT APPROACH Categories A & B

ITEM	AIRPLANE DESIGN GROUP				
	I*	I	II	III	IV
Runway Length	(Varies--See Aircraft Flight Manuals)				
Runway Width	75'	100'	100'	100'	150'
Runway Shoulder Width	10'	10'	10'	20'	25'
Runway Blast Pad Width	95'	120'	120'	140'	200'
Runway Blast Pad Length	60'	100'	150'	200'	200'
Runway Safety Area Width	300'	300'	300'	400'	500'
Runway Safety Area Length Beyond RW End**	600'	600'	600'	800'	1,000'
Runway Object Free Area Width	800'	800'	800'	800'	800'
Runway Object Free Area Length Beyond RW End**	1,000'	1,000'	1,000'	1,000'	1,000'
Runway Obstacle Free Zone Width and Length	(length = runway length + 400'; width varies from 120' to 400')				

Notes: * These dimensional standards pertain to facilities for only small airplanes.
** The runway safety area and runway object free area lengths begin at each runway end. With the declared distance concept, the lengths begin at the stop end of each ASDA and both ends of each LDA, whichever is greater.
Source: FAA Advisory Circular 150/5300-13

TABLE 26: NON-PRECISION INSTRUMENT AND VISUAL RUNWAY DESIGN STANDARDS FOR AIRCRAFT Approach Categories A & B

ITEM	AIRPLANE DESIGN GROUP				
	I*	I	II	III	IV
Runway Length	(Varies--See Aircraft Flight Manuals)				
Runway Width	60'	60'	75'	100'	150'
Runway Shoulder Width	10'	10'	10'	20'	25'
Runway Blast Pad Width	80'	80'	95'	140'	200'
Runway Blast Pad Length	60'	100'	150'	200'	200
Runway Safety Area Width	120'	120'	150'	300'	500'
Runway Safety Area Length Beyond RW End**	240'	240'	300'	600'	1,000'
Runway Object Free Area Width	250'	400'	500'	800'	800'
Runway Object Free Area Length Beyond RW End**	300'	500'	600'	1,000'	1,000'
Runway Obstacle Free Zone Width and Length	(length = runway length + 400'; width varies from 120' to 400')				

Notes: *Facilities for only small airplanes.
** The runway safety area and runway object free area lengths begin at each runway end. With the declared distance concept, these lengths begin at the stop end of each ASDA and both ends of each LDA, whichever is greater.
Source: Wadell Engineering Corporation, based on FAA Advisory Circular 150/5300-13

Based on the FAA standards presented in Tables 25 and 26, the runway setback requirements shown in Table 27 were selected and are in use for the Watsonville Municipal Airport. These requirements have been adjusted to properly accommodate the layout and development of the runway and taxiway system and adjacent aircraft parking and building areas. The criteria identified in Table 26 meet or exceed the FAA standards presented in the previous tables. Runway setback requirements are indicated on the Airport Layout Drawing presented in Chapter 5. For Watsonville Municipal Airport, the runway safety area (RSA) is centered on each runway and has a width of 300 feet for Runway 2-20 and 150 feet for Runway 8-26. In this area, no object may penetrate the volume of space above this zone except for necessary lighting and frangible-mounted navaids.

The building restriction line (BRL) defines the closest point to the runway that any building may be constructed. The BRL is 500 feet each side of Runway 2-20 and 250 feet each side of Runway 8-26. In practice, a building's height must also be considered before siting its location, and the requirements of Federal Aviation Regulations Part 77 satisfied regarding obstructions to navigable airspace. The BRL is designed to not only meet BRL requirements, but also prevent buildings or permanent objects from being placed inside the ROFA and RVZ. Furthermore, the BRL is set back far enough to prevent aircraft operational aprons from being blocked by unintentional placement of structures.

The runway obstacle free area (ROFA) is also shown. In addition, fixed or permanent objects should be kept outside the runway visibility zone (RVZ). The following table summarizes the setback requirements for the runways.

TABLE 27: RUNWAY SETBACK REQUIREMENTS
Watsonville Municipal Airport

	Lateral Distance from Runway CL		
Runway	**BRL**	**RSA**	**ROFA**
2-20	500'	300'	500'
8-26	250'	150'	250'

Source: Wadell Engineering Corporation

Runways

Analysis of the runway system involves a determination as to necessary runway length, strength, orientation, and markings.

Runway Length

Watsonville Municipal Airport's two runways (Runway 2-20 at 4,501 feet long and 150 feet wide and Runway 8-26 at 3,999 feet long and 100 feet wide) are adequate for general utility use, but do not have sufficient length for small business jets when carrying any significant useful loads. Runway 8-26 cannot be easily extended due to urban development and terrain. Runway 2-20 cannot be extended to the north due to urban development and presence of the localizer antenna. It can be extended 800' feet to the south. An extension of 800 feet to 5,301 feet will enhance noise abatement and help to satisfy take off length requirements of small turbine aircraft. A runway width of 150 feet for the main runway is more than adequate.

Optimum runway length is determined analytically by evaluating the elevation of the airport above mean sea level (MSL) and the design temperature, which is the mean of the maximum temperature during the hottest month of the year. An assumed design elevation of 160' and a critical temperature of 73 degrees F as well as safety requirements was used to prepare the runway length requirements table.

There are several categories of runway length. The transport or business aircraft fleet runway length requirements are based on aircraft size and useful load carried. The 75 percent level of business aircraft fleet includes all business jets weighing up to 30,000 pounds, typically the smaller business aircraft. The 100 percent fleet includes the largest planes up to 69,000 pounds, such as the Gulfstream lll. Table 19 shows runway length and strength requirements.

TABLE 19: RUNWAY LENGTH AND STRENGTH REQUIREMENTS
Watsonville Municipal Airport

Airport Classification	Runway Length (in feet)	Runway Strength*
Existing Airport		
Runway 2-20	4,501	75,000 # S
Runway 8-26	3,999	75,000 # S
Basic Utility Stage I	2,400	8,000 # S
Basic Utility Stage II	2,900	8,000 # S
General Utility Stage I	3,500	12,500 # S
General Utility Stage II	4,000	30,000 # S
Transport**		
75%/60%	5,300	30,000 # S
75%/90%	6,700	30,000 # S
100%/90%	5,500	60,000 # D
100%/90%	7,400	60,000 # D

Notes: *"# S" is pounds of single wheel gear configuration load; "# D" is pounds of dual wheel load.
**First percent is aircraft size within business jet fleet; second percent is amount of useful load carried.
Source: Wadell Engineering Corporation

Discussions with a number of Fixed Base Operators (FBOs) and airport management indicate that the majority of activity involves single-engine aircraft and light twin-engine aircraft; but heavy twin-engine, turboprop, and business jet-aircraft also utilize the airport facilities.

The existing 4,501-foot runway can readily handle most general aviation aircraft, including light business jets. For safety, many general aviation aircraft at Watsonville Municipal Airport are operated at reduced useful loads. A runway safety extension to 5,300 feet total length will be needed to fully accommodate turbine aircraft (75 percent fleet with 60 percent load, or 100 percent fleet with less than 60 percent load).

Runway Strength
The runway strength is determined by the airport runway category and type of aircraft anticipated to operate at the airport. The runway pavement strengths of each runway

adequately meets the standards required for the type of operation expected at the airport as shown in Table 19.

Runway Orientation
The configuration of the airport is determined by the number and orientation of the runways. The primary factors related to the number of runways required are airfield capacity and demand.

One of the primary factors influencing runway orientation is wind. FAA criteria for a utility airport specify that a crosswind runway is required if the primary runway is oriented so that the crosswind on it exceeds 11.5 miles per hour (10 knots) more than 5 percent of the time (thus providing less than 95 percent wind coverage). Where a single runway orientation does not provide this usability factor of at least 95 percent, the airport system should include a crosswind runway. For a business jet or transport type runway, the criterion is 15 miles per hour (13 knots).

The airport wind rose indicates that Runway 8-26 has 98.9 percent wind coverage, and Runway 2-20 has 94.2 percent, less than the required 95 percent. The combined wind coverage of both runways is 99.2 percent. Therefore, both runways are needed for wind coverage purposes.

Runway/Taxiway Markings
For paved runways, white runway numbers and centerline stripes are recommended. Non-precision and precision runways have additional threshold and edge markings. Yellow taxiway markings along the centerline and a transverse holding line a specified distance from the runway centerline are recommended. The proper distances are found in the Airport Plans chapter.

Taxiways
The addition of taxiways increases the airport operational efficiency and the runway capacity potential. Exit taxiways should be located at frequent intervals along a runway to serve each type of aircraft operating under variable landing conditions. They should provide for a free flow of aircraft to a point where the aircraft is clear of the runway, thereby ensuring continuous flow and maximum capacity. The Range in Acceptable Exit Locations (Table 20) shows the range of acceptable exit locations by type of aircraft for various types of exits. Parallel taxiways are recommended to enhance airport operational flexibility efficiency. Based on the taxiway analysis, adequate exit taxiways are available on both runways 8-26 and 2-20.

TABLE 20: RANGE IN ACCEPTABLE EXIT LOCATIONS
Distance from Threshold
Watsonville Municipal Airport

	Existing Exit Locations		
Exit Type	**Runway 20**	**Runway 26**	**Range Usable by General Aviation Aircraft**
Right Angle (90%)	500', 1700', 2850', 3800'	1600',2200', 4000'	1250' -- 4400'
Angle (45%)			1050' -- 3900'
High Speed (30%)			850' -- 2400'

Source: Wadell Engineering Corporation

Visual Aids/Lighting

The following visual aids and lighting are considered to be the minimum necessary at a well-planned, public, general aviation airport:

- Basic runway markings
- Segmented circle
- Lighted wind cone
- Rotating beacon
- Medium Intensity Runway Lights (MIRL)
- Precision Approach Path Indicator (PAPI); or
- Visual Approach Slope Indicator System (VASI)

In addition to the above visual aids and lighting, airports with precision or non-precision approaches and larger aircraft have some of the following:

- Runway End Identifier Lights (REIL)
- High Intensity Runway Lights (HIRL)
- Runway distance marker signs
- Approach light systems with sequence flashing lights
- Non-precision or precision runway markings

The Watsonville Municipal Airport has a non-precision runway with new lighting and signs. Additions for Runway 2-20 include runway distance marker signs, approach light system for Runway 2 when an ILS is installed, and REIL for Runway 20, with baffles to prevent offensive light intrusion of neighboring properties. Runway 8-26 is not lighted, and no request for lights has been made during the master planning process. Additions to the lighting systems will be incorporated in the capital improvement program.

Terminal Area

Terminal area requirements include airplane parking and tiedown aprons, buildings and hangars, roads and auto parking. The Facility Requirements table at the end of this chapter presents the summary of necessary facilities.

Airplane Parking and Tiedown Aprons

The currently available apron tiedown positions are adequate to meet demand through the forecast period. However, continued review of these requirements is necessary to monitor any shifts or changes in demand characteristics. The large apron has primarily "tail-to-tail" parking of based aircraft, and "power-in, power-out" parking of transient aircraft. The apron area and configuration does not provide good parking and spacing for business jets and large multiengine aircraft.

The facility requirements for airplane parking and tiedown aprons were determined by relating existing and planned apron tiedown positions with projected demand by aircraft type. Table 21 identifies the demand for aircraft parking by type. Transient parking space requirements are based on projections of existing demand, recognizing an increase in business and visitor activity. Airplane parking and tiedown requirements have been estimated based on characteristics of local based tiedown demand. A long waiting list for T-hangar parking exists at this airport. Most aircraft are currently parked on aprons, since hangars are not available for all users. Hence, future based aircraft tiedown space requirements reflect the assumption of

hangar demand and the ability to satisfy hangar demands. If adequate hangar facilities are not available, the requirements for tiedown positions are expected to be larger than projected.

TABLE 21: AVAILABLE AIRCRAFT PARKING FACILITIES
Watsonville Municipal Airport

Facility		Available Spaces 2000
Tiedowns		
	Transient	34
	Based Tiedowns	105
	Private Lease Area	63
	Subtotal	202
Hangars		
	Unit Hangars	17
	T-Hangars	206
	Subtotal	223
Total Spaces		**425**

Source: Wadell Engineering Corporation

Buildings and Hangars

The number of hangars depends upon local demand and climate. Presently, the number of hangar spaces available at the airport total 223 (see Table 21). Conversations with local airport representatives and responses from airport users indicate more hangar facilities are needed. The airport manager maintains a hangar waiting list. Currently 154 names are on the list. Hangar demand is estimated to remain the same to the year 2020.

Fixed based operator lease areas, tiedowns, and hangars are revenue producing facilities. Their timely development is essential for the sound financial management of the airport and for the production of revenues to be used for matching funds. The positive revenue-generating benefits of these facilities will be achieved if the facilities are built to meet demand, thereby assuring the success of the building development program.

Airport buildings should be constructed to fulfill specific needs. These needs include fixed based operator buildings providing repair and maintenance, air charter, shops, salesroom and administrative buildings accommodating the public including pilots, passengers, and visitors. The present terminal and administration building maintains offices occupied by the Airport Manager and staff. An active restaurant concession and small lobby/waiting area are also provided in this 4,500 square foot building. The terminal building evaluation and space requirements are discussed in Airport Plans, Section 5, as are development plans for future hangars and FBO sites. The number of pilots and passengers in the terminal area is presented in Table 22.

TABLE 22: GENERAL AVIATION TERMINAL AREA OPERATIONAL FACTORS
Watsonville Municipal Airport

	1990	1995	2000	2005	2010	2015	2020
Busy Hour Operations							
Local	25	25	24	24	25	26	27
Itinerant	37	36	35	36	37	38	39
Total	62	61	59	60	62	64	66
Busy Hour Pilots & Passengers							
Local	44	43	42	42	44	45	46
Itinerant	93	91	89	89	94	95	97
Total	137	134	131	131	138	140	143
Pilots and Passengers Within the Terminal Area*	104	102	99	100	104	106	108

Note: *Assumes use by all itinerant aircraft and 25 percent of local aircraft.
Source: Wadell Engineering Corporation; Watsonville Airport Manager.

Roads and Auto Parking

Access to the airport is important to meet demand levels. Automobile access and parking facilities required to serve projected demand have been based on busy hour pilot and passenger forecasts within the terminal area.

Airport access is provided by Aviation Way, a terminal loop roadway connected to Airport Boulevard. The connection at the east end has poor geometrics due to the flat angle of intersection. Rerouting will be necessary as part of the plan. Airport Boulevard has direct access to Highway 1 just south of the airport. These roadways have sufficient capacity to accommodate airport generated vehicular traffic demands throughout the forecast period.

Presently there are 62 spaces available in the east parking lot adjacent to the terminal building, and 30 unpaved long-term spaces in the west parking lot. Some 60 additional parking spaces are available at the various aviation business properties along Aviation Way. Airport automobile parking totals 152 spaces. Based on the forecasts the available auto parking is adequate to the year 2020 (see Table 23).

Support Facilities

Support facilities for the airport include communications, fuel storage and distribution, electric power, water supplies, wastewater disposal, and storm water collection and disposal. Availability of these facilities is essential to the operation of the airport. Many of the support facilities already existed when the City acquired the facility from the military. The extent and condition of these facilities are described in Chapter Five.

TABLE 23: GENERAL AVIATION FACILITY REQUIREMENTS SUMMARY
Watsonville Municipal Airport

Demand	1995	2000	2005	2010	2015	2020
Based Aircraft	312	326	327	345	363	381
Aircraft Operations	126,530	122,890	123,890	130,190	137,160	144,503
Airfield Facilities						
Runways - Number	2	2	2	2	2	2
Length (Feet)	4,501	4,501	5,300	5,300	5,300	5,300
Width (Feet)	150	150	150	150	150	150
Strength (Lbs)	30,000	30,000	30,000	30,000	30,000	30,000
Terminal Facilities						
Airport Business Tenants	5	5	6	7	7	7
Acres	5.0	5.0	6.0	7.0	7.0	7.0
Auto Parking						
Spaces	137	137	137	137	137	137
Acres	1.1	1.1	1.1	1.1	1.1	1.1
Hangars						
Spaces	150	223	223	323	323	323
Acres	19.5	24.0	24.0	24.0	24.0	24.0
Open Tiedown Spaces						
Based	145	168	168	168	168	168
Transient	34	34	34	34	34	34
Open Tiedown Acres						
Based	7	7	7	7	7	7
Transient	2	2	2	2	2	2
Total Terminal Area Acres	40.6	44.6	44.6	44.6	44.6	44.6
Access Road Lanes	2	2	2	2	2	2
Daily Vehicle Trips	1,275	1,238	1,248	1,311	1,377	1,446
Peak Hour Trips	191	186	187	197	206	217

Note: Acreage requirements will vary depending on specific layout and geometrics.
Source: Watsonville Municipal Airport

Additional support facilities may include an FAA air traffic control tower (ATCT), an FAA Flight Service Station (FSS) for pilot weather briefings, an airport fire station, and airport maintenance building. Watsonville Municipal Airport has most of these additional support facilities, except for an Air Traffic Control tower, and FSS, which is no longer being developed by the FAA. The fire station is located on-airport adjacent to Airport Boulevard.

Airspace/Navigation Aids (Navaids)

Watsonville Municipal Airport is served by Victor airways that radiate from the Salinas VORTAC, including V25, V87, V111, V137, V230, and V248 (see Exhibit 4). These airways serve low altitude enroute traffic. In addition, jet routes J88 and J110, which serve high altitude air traffic, pass over the Salinas VORTAC.

R2513-Hunter Liggett about 60 miles south of the Watsonville Municipal Airport is the only restricted airspace in the Watsonville area. No aircraft is allowed to operate within these designated areas during restricted hours without prior permission. Monterey approach control has responsibility for control of instrument flight rules (IFR) aircraft in the area.

As discussed previously, Watsonville currently has three published instrument approaches that include a localizer approach to Runway 2, a VOR-DME circling approach, and a NDB circling approach. The lowest minimums for instrument approach procedures are available on the Runway 2 localizer approach. The addition of a glide slope antenna thereby establishing a full precision ILS approach system at the airport would enhance control and operation of aircraft, improve safety during instrument operations.

Tables 28 and 29 present FAA standards for approach surface dimensions and runway protection zone dimensions.

TABLE 28: APPROACH SURFACE DIMENSIONS

Item	Runway End		Approach Surface Dimensions			
Airports Serving:	Approach End	Opposite End	Surface Length	Inner Width	Outer Width	Slope (H/V)
Small Airplanes Only	Visual	V	5,000'	250'	1,250'	20:1
		NP	5,000'	500'	1,250'	20:1
		NP 3/4 or P	5,000'	1,000'	1,250'	20:1
	Non-Precision	V or NP	5,000'	500'	2,000'	20:1
		NP 3/4 or P	5,000'	1,000'	2,000'	20:1
Large Airplanes	Visual	NP	5,000'	500'	1,500'	20:1
		NP 3/4 or P	5,000'	1,000'	1,500'	20:1
	Non-Precision	V or NP	10,000'	500'	3,500'	34:1
		NP 3/4 or P	10,000'	1,000'	3,500'	34:1
Large or Small Airplanes	Non-Precision 3/4	V or NP	10,000'	1,000'	4,000'	34:1
		NP 3/4 or P	10,000'	1,000'	4,000'	34:1
	Precision	V or NP	10,000'	1,000'	4,000'	50:1
		NP 3/4 or P	50,000'	1,000'	16,000'	50:1/40:1

V = Visual Approach
NP = Non-precision instrument approach with visibility minimums more than 3/4 statute mile
NP 3/4 = Non-precision instrument approach with visibility minimums as low as 3/4 statute mile
P = Precision instrument approach
Source: Wadell Engineering Corporation, based on FAA Advisory Circular 150/5300-13

TABLE 29: RUNWAY PROTECTION ZONE (RPZ) DIMENSIONS

Item	Runway End		Approach Surface Dimensions			
Airports Serving:	Approach End	Opposite End	Surface Length	Inner Width	Outer Width	RPZ (acres)
Small Airplanes Only	Visual	V	1,000'	250'	450'	8.035
		NP	1,000'	500'	650'	13.200
		NP 3/4 or P	1,000'	1,000'	1,050'	23.542
	Non-Precision	V or NP	1,000'	500'	800'	14.922
		NP 3/4 or P	1,000'	1,000'	1,200'	25.252
Large Airplanes	Visual	NP	1,000'	500'	700'	13.770
		NP 3/4 or P	1,000'	1,000'	1,100'	24.105
	Non-Precision	V or NP	1,700'	500'	1,010'	29.465
		NP 3/4 or P	1,700'	1,000'	1,425'	47.320
Large or Small Airplanes	Non-Precision 3/4	V or NP	1,700'	1,000'	1,510'	48.978
		NP 3/4 or P	1,700'	1,000'	1,510'	48.978
	Precision	V or NP	2,500'	1,000'	1,750'	78.914
		NP 3/4 or P	2,500'	1,000'	1,750'	78.914

V= Visual Approach
NP= Non-precision instrument approach with visibility minimums more than 3/4 statute mile
NP 3/4= Non-precision instrument approach with visibility minimums as low as 3/4 statute mile
P= Precision instrument approach
Source: Wadell Engineering Corporation, based on FAA Advisory Circular 150/5300-13

An analysis of existing navaids serving Watsonville Municipal Airport was undertaken to assess the capability of these facilities to adequately serve future air traffic operations. Currently, the Airport has good navigational facilities. Runway 2 has a non-precision approach system, which includes a localizer for horizontal alignment guidance, but lacks a glide slope facility for vertical descent guidance. There is a non-directional beacon marker for location information. The runway needs distance-measuring equipment added to the localizer, an automated surface observation system (ASOS), and a Runway Visual Range (RVR) transmitter/receiver for visibility information. Lighting aids to Runway 2-20 include medium intensity runway lights (MIRL), visual approach slope indicators (VASI), runway end identifier lights (REIL). When the ILS system is installed, a medium intensity approach lights system with runway alignment indicators (MALSR) on Runway 2 will be included. Runway 8-26 has no lighting, and users have requested none. The night activity is relatively small; therefore Runway 2-20 can accommodate the traffic.

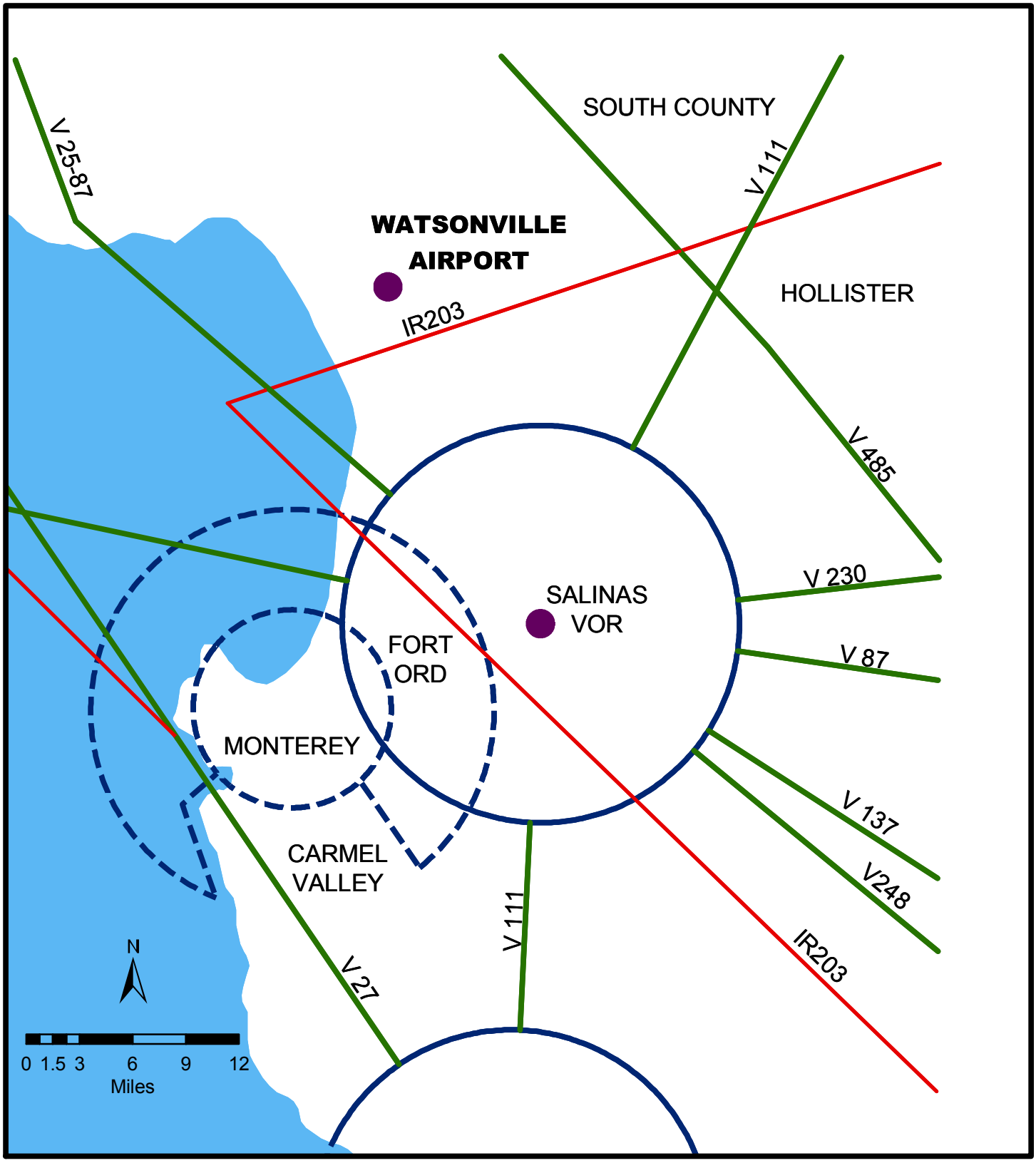


Exhibit 4

Area Airspace

Watsonville Municipal Airport Master Plan

5. AIRPORT PLANS

This chapter presents plans for the continued operation and development of Watsonville Municipal Airport. The first section contains the Land Use Plan, which addresses development and use of airport lands and sets forth a comprehensive list of improvement projects. The second section contains the Airspace Protection Plan, which addresses the design of airspace in the vicinity of the airport. The third section contains the Terminal Area Plan, which addresses specific improvements to the airport terminal area. The fourth section contains the Access Plan, which addresses access, parking, and circulation on airport property. The fifth section contains the Airport Layout Plan, which addresses the technical design and layout of the airport. Finally, the sixth section discusses land used planning for areas adjacent to the airport and contains an analysis of aircraft noise, safety, and land use control strategies.

The specific objectives of the following plans are to provide:

- Support the development of an efficient public use airport as set forth in this chapter. This will be accomplished by:

    - ✓ Remedying existing operational deficiencies by lengthening and improving the primary runway to more fully accommodate turbine-powered aircraft (75 percent fleet with 60 percent load).
    - ✓ Remedying existing operational and safety deficiencies by installing a precision instrument landing system (ILS) to increase the number of hours each day that aircraft may operate in foggy conditions and to increase the overall safety of landings in all conditions.
    - ✓ Remedying existing space deficiencies by providing for the expansion and enhancement of the terminal and hangar facilities, plus providing new and improved access to accommodate new facilities.
    - ✓ Maintaining and enhancing natural resources on the site.
    - ✓ Facilitating the development of complementary light industrial and general commercial uses for affiliates of the airport.

- ✓ Providing a fiscally responsible financial plan that will provide suitable facilities and generate revenues necessary for proper operation, management and development of the airport.

- Provide for the development of the Watsonville Municipal Airport consistent with the Master Plan while minimizing adverse effects on the natural physical setting. This will be accomplished by:

  - ✓ Providing for development consistent with the resource protection regulations administered by the United States Army Corps of Engineers, United States Fish and Wildlife Service, the California Coastal Commission and other agencies.
  - ✓ Protecting and enhancing wetlands and sensitive habitat areas.

- Provide for the development of the Watsonville Municipal Airport consistent with the Master Plan while minimizing adverse effects on adjacent land uses, the local community and the region. This will be accomplished by:

  - ✓ Providing the basis for creation of a noise mitigation plan that ensures neighboring properties are not significantly affected by airport-generated noise.
  - ✓ Developing ancillary uses on the site that are designed to be compatible with existing and planned development in the area.

The Airport Plan for the Watsonville Municipal Airport has been prepared in technical graphic format to meet FAA requirements for processing and approving final master plan drawings (see Appendix A).

LAND USE PLAN

Identifying existing and recommended land uses within the ultimate airport boundary is necessary to provide the adequate control and management of the airport facility. The development of land use plans for an airport can ensure the compatibility among the airport users and the efficient development of airport property. This land use plan is intended to serve as a broad guideline to assist in fulfilling the primary aviation needs of the airport. As future needs arise, an airport can apply the provisions of the master plan and its land use plan to each phase of development. If necessary, consideration should be given to determine the need to revise the master plan and land use plan as more information regarding actual airport use becomes available.

For the purposes of the *Watsonville Municipal Airport Master Plan*, several land use designations have been defined. These land use categories and the improvement projects that fall within them are discussed below.

Airfield

The purpose of this land use designation is to provide area for aircraft arrival and departure, including open space areas needed for safe operations. Typical uses include runways, taxiways, runway protection zones, approach areas, drainage facilities, and open space land within the building restriction lines. There are six (6) "Airfield" improvement projects anticipated for Watsonville Municipal Airport, and these are described below. Project numbers 1 through 13

correspond to the numbering used in the *Airport Capital Improvement Plan* (Bradley, January 2001). Subsequent numbers are a continuation of this numbering scheme.

Project No. 1 – Complete ILS - Glide Slope, MALSR
For instrument approaches to Runway 2, the Watsonville Municipal Airport currently has a localizer only. It is proposed in this project to complete the ILS equipment necessary to allow a full ILS approach to the airport and thus lower airport minimums. The Watsonville Municipal Airport is plagued with fog for significant periods of time due to its proximity to the Pacific Ocean. In order to improve the operation of the airport and decrease minimums it is important that the complete ILS system be available at this airport. The additional equipment installed will include a glide slope and a medium intensity approach lighting system (MALSR).

Project No. 2 – Runway Extension (150' x 800'), Taxiway Extension (50' x 1,100')
Runway 2-20 is currently 4,501 feet long. There are several business jets and large general aviation twin-engine aircraft using this airport. It is proposed to extend this runway to provide safer operation with these larger aircraft. The extension of the runway will be to the south and will be limited by the proximity of the existing highway and frontage road. An 800-foot extension is the maximum extension that can be provided. The runway will be extended 800 feet and the taxiway will be extended approximately 1,100 feet to provide access to the extended runway. The pavement section will consist of scarifying and re-compacting 6 inches of sub-grade and placing 8 inches of aggregate sub-base course, 10 inches of aggregate base course, and 4 inches of bituminous surface course. Allowance is included for drainage, repainting the south half of the runway, which will include removing the existing paint to relocate the threshold, and installation of runway and taxiway lights, VASI, and signs.

Project No. 5 – Underground Utilities, Top Trees, and Relocate Threshold for Runway 2-20
The threshold to Runway 2-20 is displaced at this site because of the power line existing adjacent to Buena Vista Drive. The proposed project is to underground this power line for a distance of approximately 1,000 feet to eliminate the obstruction to the approach to Runway 20. The threshold of Runway 20 will be relocated to provide a minimum clearance of 15 feet above the pavement on Buena Vista Drive. This will require removing the paint from the northern half of Runway 2-20 and re-striping this portion of the runway. There are a few trees in the approach to Runway 2-20 that will be obstructions to the relocated threshold of Runway 20. These trees will be removed or topped in this project so that they are not the controlling obstruction.

Project Nos. 9A and 9B – Pave Runway Blast Pads - 4 Runway Ends (4 @ 150' x 200')
A significant number of business jets and large twin-engine general aviation aircraft use the Watsonville Municipal Airport. The blast from the jets and propellers is causing significant erosion at the ends of each runway. It is proposed in this project to construct a blast pad 150 feet wide by 200 feet long at the ends of each of the four runways. This blast pad will be paved and will provide necessary protection from erosion at each end of the runway. Pavement section will be such that it will not be damaged if aircraft roll into these areas and will consist of 6 inches of aggregate sub-base, 8 inches of aggregate base course, and 3 inches of bituminous surface course. The safety areas will be graded and standard marking will be applied.

This project is divided into two parts – Projects 9A and 9B. Each of these is described below.

Project 9A – Blast pads for both ends of Runway 2-20
Project 9B – Blast pads for both ends of Runway 8-26

Project No. 13 – Construct North Parallel Taxiway (50' x 2,100')
With the development of the tee hangars on the north side of the airport as included in Project No. 11, it will be necessary to provide a taxiway on the north side of Runway 8-26 connecting to Taxiway A. This taxiway will be 50 feet wide and 2,100 feet long. The pavement section will consist of 6 inches of aggregate sub-base course, 8 inches of aggregate base course, and 4 inches of asphalt surface course. The taxiway will be marked with standard airport marking. Adequate drainage will be installed. Taxiway lights and guidance signs will be added.

General Aviation Commercial

The purpose of this land use designation is to provide area for commercial uses that serve the needs of general aviation at the airport. Typical uses include fixed based operator (FBO) facilities involving the sale of general aviation products and services to the general public and limited service commercial facilities, such as avionics sales and repair shops, aircraft paint shops and aircraft maintenance facilities. There is one (1) "General Aviation Commercial" improvement project anticipated for Watsonville Municipal Airport, and this project is described below.

Project No. 8 – New Airport Access Road to Commercial Hangars (32' x 60')
A new access road is proposed to service the commercial hangars in the eastern portion of the airport. This access road will be 32 feet wide by 60 feet long and will tie into Airport Boulevard. The road will be designed to support trucks and cars and the pavement section will consist of 6 inches of aggregate sub-base, 8 inches of aggregate base, and 4 inches of bituminous surface course. Standard roadway marking and curb and gutters will be added to this road.

General Aviation Non-Commercial

The purpose of this land use designation is to provide area for non-commercial aircraft operators to store and service their aircraft. Typical uses include facilities for the basing and servicing of aircraft, which are used solely for the benefit of the private aircraft owner. There are four (4) "General Aviation Non-Commercial" improvement projects anticipated for Watsonville Municipal Airport, and these projects are described below.

Project No. 6 – New Airport Access (32' x 100')
New access is required for the new fuel tank and future hangars to be located on the north side of Runway 8-26. This access can be obtained by extending Burchell Avenue. An extension of approximately 100 feet by 32 feet is required. Pavement section will consist of scarifying and re-compacting 6 inches of sub-grade and placing 6 inches of aggregate sub-base course, 8 inches of aggregate base course, and 4 inches of bituminous surface course. Standard roadway marking will be added.

Project No. 7 – Security Lighting for Existing Hangars
There is a series of four hangars that have been constructed adjacent to the base tie down area. Conduit and cable for lighting of this area have been installed. In order to provide new lights for the area it will only be necessary to add the poles and luminaries at the ends of the hangar buildings. It is proposed to add four new poles with luminaries to light this area.

Project No. 11 – Storage Hangar Expansion plus Taxiways (1 @ 35' x 1,000', 9 @ 25' x 400')
It is proposed to construct a storage hangar area on the north side of Runway 8-26. This area will accommodate eight buildings and will provide room for 60 to 70 hangar units. It is proposed in this project to grade and drain the entire hangar area and to construct the connector taxiway

and service taxiways. The connector taxiway will be 35 feet wide by 1,000 feet long and there will be nine service taxiways 25 feet wide by approximately 400 feet long. The pavement section will be such as to support the single engine aircraft and light twins that will utilize this area and will consist of 6 inches of aggregate sub-base course, 8 inches of aggregate base course, and 3 inches of bituminous surface course. Standard marking will be applied to the taxiways and an allowance has been made for normal drainage.

Project 17 – New Hangars in Area TE-D
This project involves the construction of approximately 30 new hangars north of Runway 8-26 and immediately east of Runway 2-20 (Area TE-D). This area will be one of the last areas released for development in accordance with the Tarplant Mitigation Program.

Project 18 – New Taxiway West of Runway 2-20
This project involves the construction of a taxiway that runs parallel and west of Runway 2-20 (TW-3).

Airport Support

The purpose of this land use designation is to provide area for airport operations. Typical uses include facilities that provide airport-related services, such as airport administration, airport maintenance, aviation fuel facilities, pilot lounge and general services facilities, and aircraft rescue and fire-fighting facilities (ARFF). There are five (5) "Airport Support" improvement projects anticipated for Watsonville Municipal Airport, and these projects are described below.

Project No. 3 – Relocate Access Road and Construct Apron for Automobile Parking
The existing access road to the airport, designated as Aviation Way, needs to be relocated toward the airport in that portion of the road located in front of the terminal and FBO operators. The pavement section will consist of scarifying and re-compacting sub-grade and placing 6 inches of aggregate sub-base course consisting of pulverized asphalt and existing base from the existing road, 8 inches of aggregate base course, and 4 inches of bituminous surface course. Standard roadway marking will be included. Curb and gutter will be installed on the road. Street lighting and normal drainage will be added to the project.

Project No. 4 – Construct Airport Maintenance Shelter
A shelter is required to protect existing airport maintenance equipment from the weather and to provide a place for maintaining this equipment. This shelter will be approximately 2,000 square feet.

Project No. 10 – Terminal Expansion
It is proposed to construct an expansion to the existing terminal to provide space for offices, pilot lounges and other facilities. It is proposed to add a second floor to the existing building and expand the existing building somewhat. A total of approximately 7,000 square feet additional space is proposed in this project.

Project No. 12 – Install Traffic Light
A new traffic light will be installed at the easterly intersection of Aviation Way and Airport Boulevard. There is significant traffic on Airport Boulevard and without this light adequate control and protection of traffic will not be possible.

Aviation-Compatible

The purpose of this land use designation is to provide area for non-aviation uses that support airport operations. Typical uses include land that may accommodate aviation-related or aviation-compatible uses such as automobile rental agencies, airport restaurant, motel, or other commercial use to produce revenues for the airport. Such use must be compatible with and not interfere with the existing aviation uses at the airport. There are six (6) "Aviation-Related" improvement projects anticipated for Watsonville Municipal Airport, and these projects are described below.

Project No. 14 – Construct Access Road with Underground Utilities for Western Industrial Area
Development of Commercial Areas A and E is contingent upon constructing an access road from Buena Vista Drive and/or Manfre Road. The new access road would be designed as a standard local commercial street with 58 feet of right-of-way (two 14-foot travel lanes with parking both sides and landscape strips between sidewalk and curb). If the new access road connects to Manfre Road, which is in unincorporated county jurisdiction, Manfre Road (between the new access road and Larkin Valley Road) will be improved to be a standard local commercial street to the degree feasible. A riparian corridor exists on one side of Manfre Road in this area, and a steep slope exists on the other side. Also, there are a couple of residences along this section of Manfre Road, which could be affected by improvements to Manfre Road. Accordingly, improvements to Manfre Road should be designed to minimize impacts to the riparian corridor and residential uses. Also, install utilities from Buena Vista Road south into Industrial Area B (TE-A) west of Runway 2-20.

Project Nos. 15A through 15E – Develop Airport Research and Development Park
Watsonville Municipal Airport has approximately 28.6 acres of land located in five areas (designated A through E), that is developable for industrial and/or commercial use. Each of these areas is described below.

Project 15A –The first area (Area A) is approximately 11.2 acres in size and is located west of Runway 2-20 immediately south of Runway 8-26. This area corresponds to TE-A in the Tarplant Mitigation Program.

Project 15B – The second area (Area B) is approximately 3.4 acres and is located immediately south of Aviation Way. The Tarplant Mitigation Program does not affect this area.

Project 15C – The third area (Area C) is approximately 9.2 acres in size and is located north of Runway 8-26 adjacent to Buena Vista Drive. This area corresponds to TE-C in the Tarplant Mitigation Program.

Project 15D – The fourth area (Area D) is approximately 2.3 acres and is located west of Runway 2-20 adjacent to Manfre Road. The Tarplant Mitigation Program does not affect this area.

Project 15E – The fifth area (Area E) is approximately 2.5 acres and is located west of Runway 2-20 immediately south of Runway 8-26. This area corresponds to TE-A1 of the Tarplant Mitigation Program.

Watsonville 2005, General Plan designates all of these areas as "Transportation, Communications & Utilities" and allows development intensity for these areas to be determined "based on the appropriateness of the location, accessibility, traffic impacts, existing site conditions, design compatibility with adjacent land uses, natural and built constraints, and community impacts." The *City of Watsonville Zoning Ordinanc*e zones these same areas "TCU, Transportation, Communication, and Utilities District." Uses allowed in the development areas include light industry, office, and research and development that can be demonstrated to be compatible with on-going airport operations.

The typical development intensity for these commercial areas is 0.25 square feet of floor area per each one (1) square foot of net lot area (i.e., floor area ratio = .25). Maximum height allowed in these areas is 42 feet. This plan assumes than 80 percent of the available area will be built out in the planning horizon (i.e., 2001 to 2020). Table 30 summarizes typical potential industrial/commercial development at Watsonville Municipal Airport.

TABLE 30: TYPICAL INDUSTRIAL/COMMERCIAL DEVELOPMENT POTENTIAL
Watsonville Municipal Airport

No.	Development Area	Net Area (Acres)	Net Area* (Square Feet)	Typical Floor Area Ratio	Typical Floor Area Potential
15A	Area A (TE-A)	11.2 ac.	490,000 s.f.	.25	122,500 s.f.
15B	Area B	3.4 ac.	150,000 s.f.	.25	37,500 s.f.
15C	Area C (TE-C)	9.2 ac.	400,000 s.f.	.25	100,000 s.f.
15D	Area D	2.3 ac.	100,000 s.f.	.25	25,000 s.f.
15E	Area E (TE-A1)	2.5 ac.	107,000 s.f.	.25	26,750 s.f.
	Total	28.6 ac.	1,247,000 s.f.		311,750 s.f.
Assume 80 percent build out		**22.9 ac.**	**997,000 s.f.**		**249,400 s.f.**

Note: *These numbers are rounded to the nearest 1,000 square feet.
Source: Coastplans.com

Habitat Protection, Open Space

The purpose of this land use designation is to provide area for habitat protection and open space. Typical uses include land that has been set aside for Santa Cruz tarplant protection or acquired by Watsonville Municipal Airport for use as clear zone. Land uses in the clear zone are limited to low-density land uses involving few people, uses that are noisy or are not sensitive to noise, and airport-related uses. Uses that are prohibited in the clear zone include:

- Fuel handling and storage facilities
- Uses that generate smoke and/or dust
- Uses that have misleading lights and/or glare
- Uses that create electrical interference with radio communication between the airport and aircraft
- Uses that attract wildlife
- Residential uses
- Places of public assembly, including churches, schools, hospitals, office buildings, and shopping centers

All other uses are allowed conditionally and must be reviewed on an individual basis to determine their suitability. In some cases, this land use designation applies to areas that are located in the California Coastal Zone south of State Route 1. Where this is the case, the policy and regulations contained in the City of Watsonville Local Coastal Program or the County of Santa Cruz Local Coastal Program also govern land use in these areas and take precedence over policy and regulations contained in this master plan. Designation of these lands for "Habitat Protection, Open Space" in this master plan is intended to overlay the base designations contained in respective Local Coastal Programs. There is one (1) project in this category.

Project No. 19 – Tarplant Mitigation Program
Watsonville Municipal Airport is undertaking a program to mitigate for loss of Santa Cruz tarplant habitat. The tarplant is a federally listed endangered species. The tarplant mitigation program is described in detail in "Mitigation Plan for Santa Cruz Tarplant and Coastal Terrace Prairie at the Watsonville Airport."

Summary of On-Airport Land Use

The designated land uses and their locations are intended to be a broad guideline for future airport development based upon the forecast needs as developed in this Master Plan. Because airport needs can change dramatically over time, this land use plan should be used as a guideline and, if warranted by changes in the aviation demand and character, should be modified to reflect the ongoing needs of the airport. Table 31 summarizes the number of acres in each of the land use categories set forth above. Exhibit 5 shows the Land Use Plan.

TABLE 31: LAND USE SUMMARY
Watsonville Municipal Airport

Land Use Category	Acreage
Airfield	106.36
General Aviation – Commercial	9.78
General Aviation – Non-Commercial	58.93
Airport Support	5.81
Aviation Compatible	36.28
Habitat Protection, Open Space	126.56
Total	**343.72**

Source: Watsonville GIS Department; Coastplans.com

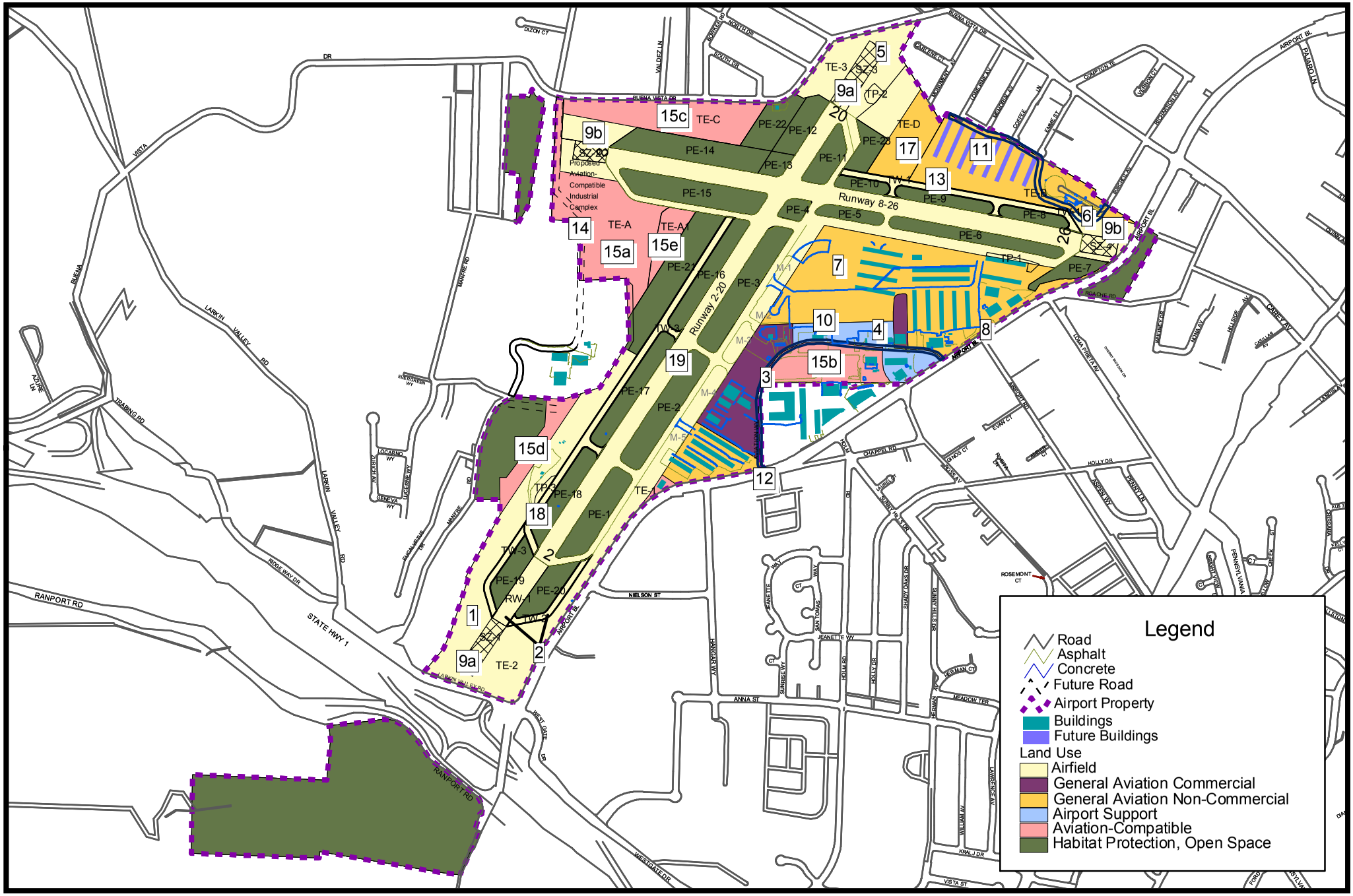


Exhibit 5

On-Airport Land Use Plan

Watsonville Municipal Airport Master Plan

AIRSPACE PROTECTION PLAN

An Airspace Protection Plan in simplified format was prepared for the Watsonville Municipal Airport (see Exhibit 6). This supplements the Airport Layout Drawing and provides plan view information for the runway approach areas. The corresponding technical presentation of the airspace is presented on the Airport Obstruction Map in the Appendix B of this report. A key function of these drawings is (1) to provide a basis for height zoning in the environs, and (2) to identify obstructions in the vicinity of the airport, which may have an impact on the use of the runways and adjacent airspace. The drawings are prepared using criteria contained in Federal Aviation Regulations, Part 77, "Objects Affecting Navigable Airspace." At Watsonville, the FAR Part 77 dimensional standards applied for Runway 2 are those relating to "precision instrument" runways. The standards used for Runway 20 are for "non-precision" instrument runways. The standards used for Runway 8-26 are for "visual" runways.

The proposed Airport Master Plan sets forth one major capital development measure that could affect safety and off-airport land use. This is the southerly extension of Runway 2-20 from 4,501 feet to 5,300 feet, which is depicted in the Airport Layout Drawing. The principal effect of the runway safety extension would be to extend the FAR Part 77 surfaces for Runway 2 by 800 feet to the south. Given that the area over which the Part 77 surfaces would be modified is undeveloped agricultural land, the net effect of the proposed runway safety extension on obstruction clearance and hazards to navigation would be negligible.

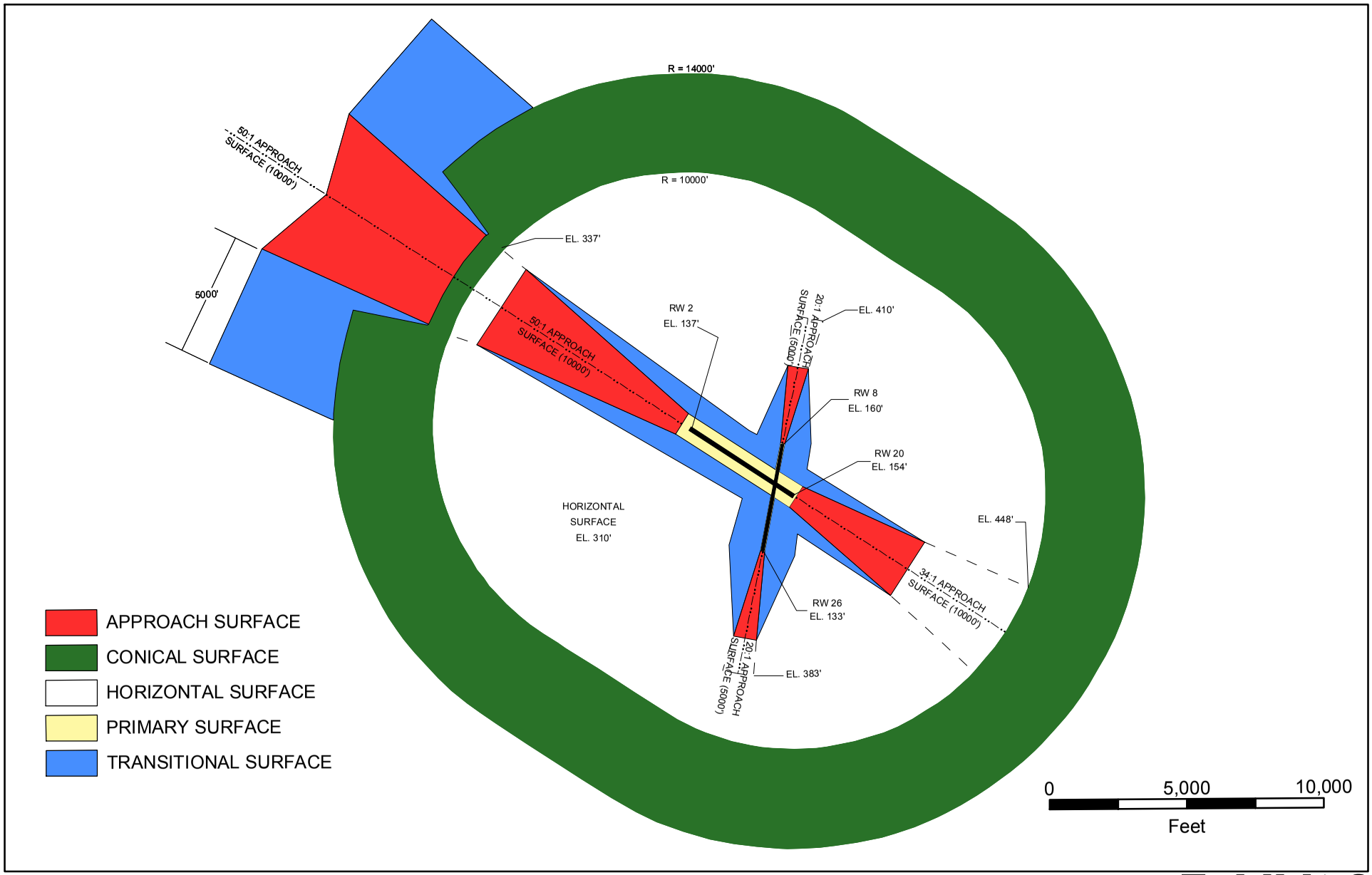


Exhibit 6

Airspace Protection Plan

Watsonville Municipal Airport Master Plan

The Airspace Protection Plan shows imaginary primary, approach, transitional, horizontal, and conical surfaces. The primary surfaces surround the runways and extend 200 feet beyond the thresholds. The width of the primary surface varies from 250 feet on the short runway, to 1,000 feet on Runway 2-20. The elevation of the primary surface is the same as the runway centerline. The approach surfaces rise from the ends of the primary surfaces. The slopes of these surfaces are 20:1, horizontal to vertical, for Runway 8-26 with approach surface lengths of 5,000 feet, and 34:1 for Runway 20 with a length of 10,000 feet. The approach surfaces flare from an inner width equal to the primary surface to an outer width equal to 1,250 feet for Runway 8-26, and 4,000 feet for Runway 20. The precision approach to Runway 2 has a slope of 50:1 for the inner 10,000 feet. At that point, the slope increases to 40:1 for the next 40,000 feet. The outer width of the approach surface is 16,000 feet.

The transitional surfaces are sloped at 7:1 from the primary surfaces and approaches until intersecting the horizontal surface. Transitional surfaces also rise laterally from the precision approach surface past the conical surface for a width of 5,000 feet. The horizontal surface is 150 feet above the airport elevation and extends 10,000 feet from the primary surfaces of Runway 2-20. At the limit of the horizontal surface, a conical surface of 20:1 slope and a 4,000-foot width completes the required protection surfaces for this airport.

The Airport Obstruction Map, see the Appendix B, indicates that the terrain surrounding the airport is sufficiently low so that it does not penetrate the imaginary surfaces. Obstruction trees in the approach to Runway 8 have been topped.

The Airport Obstruction Map indicates approach surface slopes and existing and future runway protection zone (RPZ) dimensions. The required precision approach surface for Runway 2 is 50:1. The non-precision approach surfaces for Runway 20 are 34:1. The visual approaches for Runway 8-26 are 20:1. Upon southerly extension of Runway 2-20, approximately 50 acres of runway protection zone land must be acquired in the approach to Runway 2. For remaining land in the runway protection zone of extended Runway 2, navigation easements will be satisfactory for proper control.

The County of Santa Cruz passed an Airport Height Limiting Zoning Ordinance No. 13.06 based on the FAR Part 77 standards. This ordinance should continue to be strictly enforced to ensure that no additional obstructions are allowed to penetrate the imaginary surfaces for either the existing or future runway system.

TERMINAL AREA PLAN

The terminal area includes the aircraft parking aprons, hangar areas, FBO areas, terminal, air traffic control tower, fueling facilities, and other aviation-related facilities and services.

The existing terminal area apron at Watsonville consists of approximately 40 acres of pavement with a capacity of 202 tiedown spaces. A breakdown of this apron area shows that 139 spaces are located on the ramp in front of the terminal. Sixty-three additional aircraft parking spaces are available away from the terminal area around the FBO hangars. The existing 202 aircraft parking spaces are adequate to serve the existing terminal area through the year 2020.

The present pattern for aircraft parking is for transient aircraft to park in areas nearest the terminal building. The aircraft parking is of the "power-in, power-out" type to provide convenient

and efficient maneuvering of aircraft. Spaces for large transient planes are not adequate. Based aircraft parking is "tail-to-tail" to allow optimum spacing commensurate with apron size and construction costs.

There were 131 new hangars constructed between 1997 and 1999 for a total of 223 hangars at Watsonville Municipal Airport. There will be a continuing need for hangar space at Watsonville Municipal Airport in the long term, and future T-hangars are proposed for the area north of Runway 8-26.

There will not be a need for new FBO facilities throughout the planning period. FBOs are presently located in several terminal area hangars along Aviation Way. The services provided by the FBOs often include repair and maintenance, air charter, aircraft painting, shops, and sales. As the airport and the surrounding community grow, the need for these and other services will also increase. Therefore, sites have been preserved for future FBOs or other aviation related businesses that wish to locate at Watsonville. These sites are located west of the present terminal area.

The present terminal building with its lobby area, restaurant, and administrative facilities is not adequate to satisfy the immediate needs of the airport. The functions to be served by this building include the airport administrative offices and a public waiting area for general aviation pilots and passengers, and restaurant with bar. The FBO lobbies and lounges will accommodate some of the passengers and pilots, partially relieving the terminal building of a portion of the peak hour volumes.

It is recommended that terminal building expansion occur west of the existing building. The building should be an attractive focal point for visitors to the Watsonville area and flexible enough to handle changes, which occur in the character of the airport operations. The building should include a pilot waiting lounge, meeting room, and flight planning area. The building design should provide for an optimum expenditure of funds from the standpoints of capital investment and maintenance and operating costs. Flexibility of design and costs required for future expansions of the terminal area should be analyzed.

A site concept for terminal building expansion is presented in Exhibit 7. The concept depicts the westerly building expansion with passenger access driveway and sidewalks in front of the building. Landscaping will provide an attractive accent and screen parked automobiles.

The plan concept, Exhibit 8, illustrates the plan view of the remodeled existing building and the proposed expansion. All of the existing building would be remodeled as revenue-producing restaurant and bar. A new kitchen would be developed, and restrooms would be expanded. The plan concept also illustrates counter and table seating plus meeting/banquet room. Patio seating is possible during good weather.

The proposed new construction has two separate entrances from the street and apron, with lobby space and two retail areas. Office space for airport administration is at the west end. The new construction is approximately 2,300 square feet.

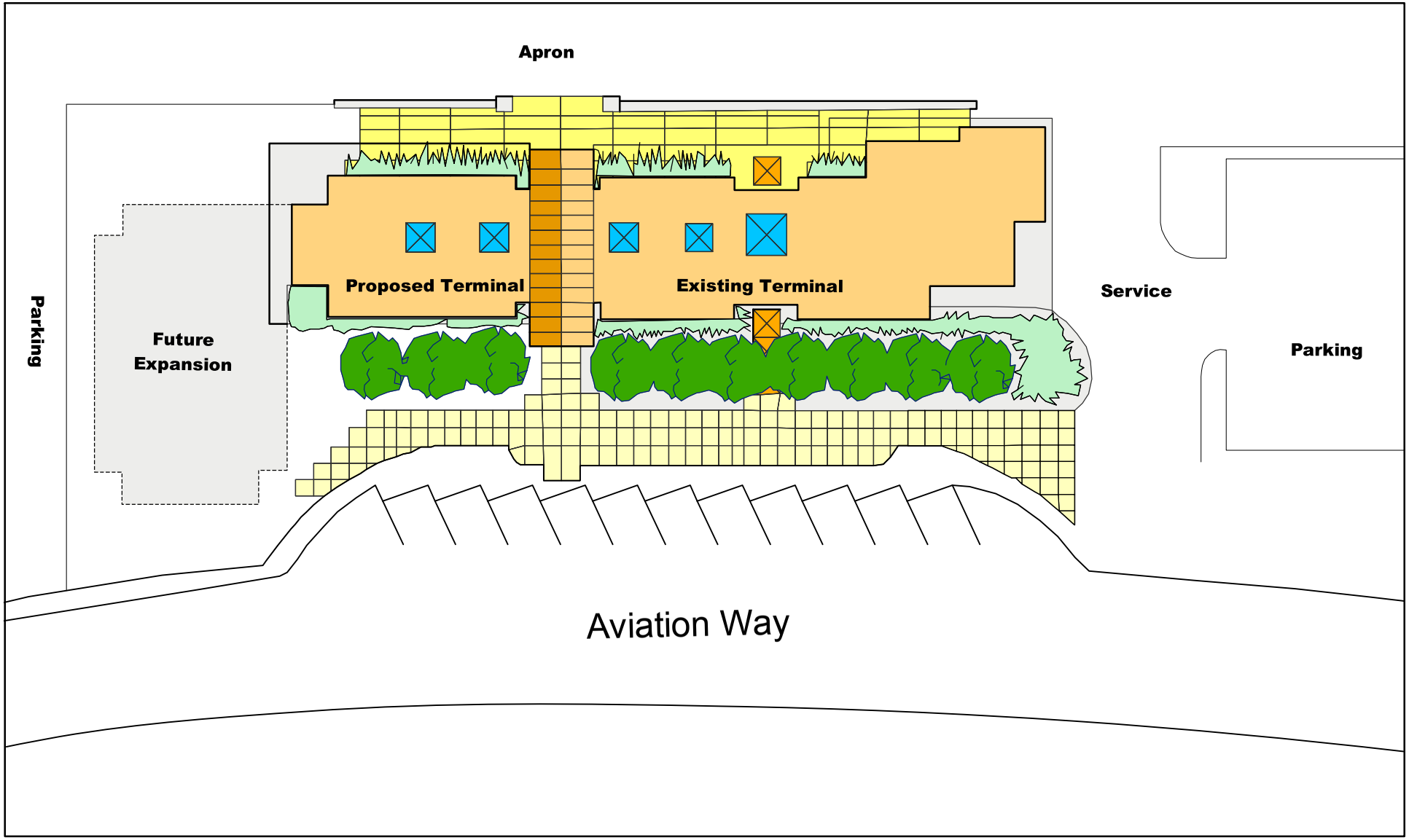


Exhibit 7

Terminal Building Site Concept

Watsonville Municipal Airport Master Plan

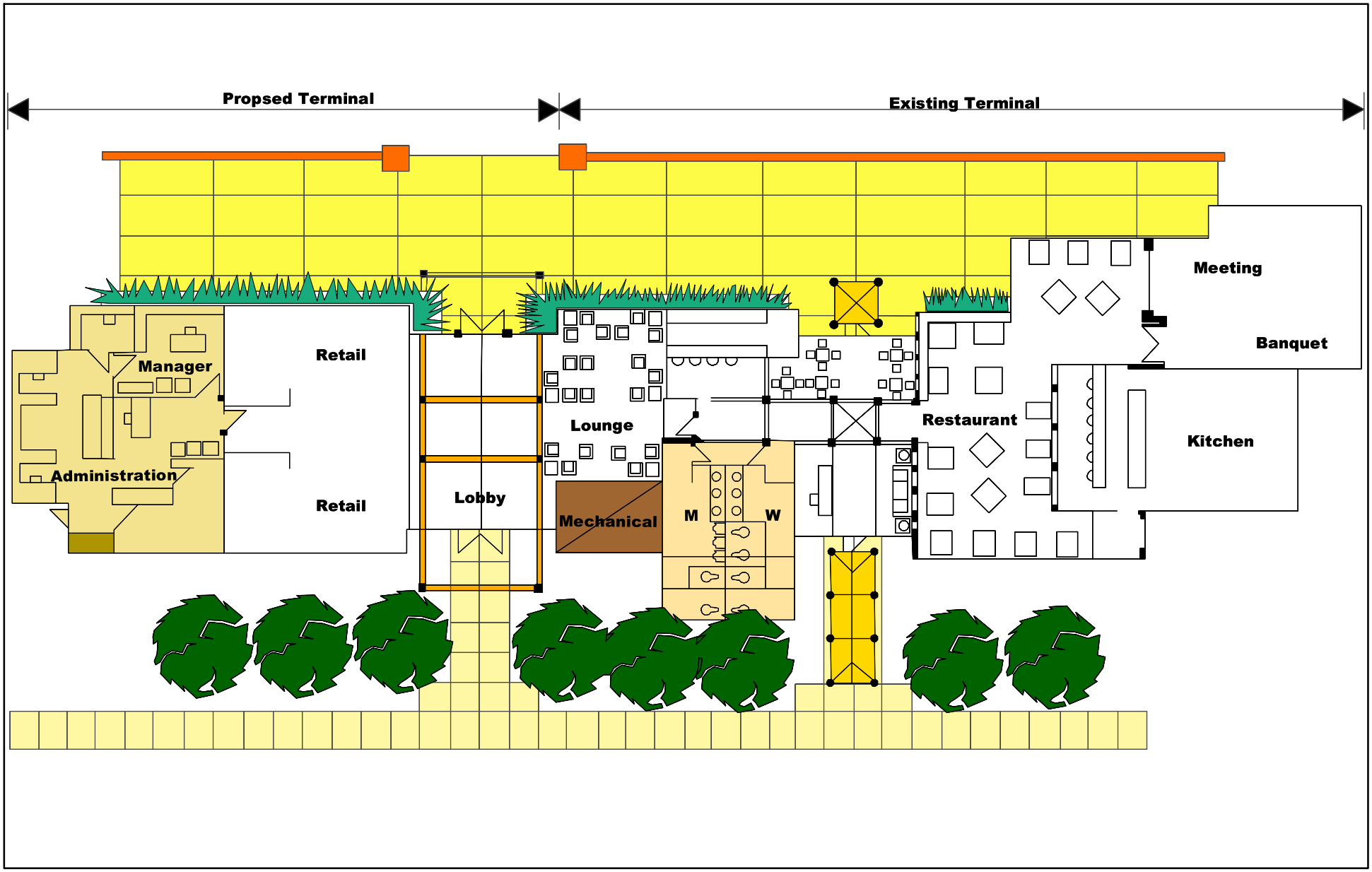


Exhibit 8

Terminal Building Plan Concept

Watsonville Municipal Airport Master Plan

A new large corporate hangar is planned south of the existing southeast T-hangars, and east of the fuel storage facility. The existing Granite Construction hangar should be converted to a city airport maintenance and equipment facility. Some of the space may be used for nonprofit organizations, such as the Civil Air Patrol with a current need for up to 1,800 square feet of classroom/office space.

The Watsonville Municipal Airport has on-site fire protection equipment. The airport's fire protection needs are served by the City's fire department, which operates a station located approximately 800 feet east of the terminal building along Airport Boulevard. The City's water system supports a network of fire hydrants in the terminal area.

The fire protection, which is now available for the airport, is adequate throughout the planning period. Since no air carrier activities are expected, it is not required that the City provide an aircraft rescue and fire fighting facility (ARFF). The City should continue to maintain the nearby fire station and equip it with all facilities necessary to combat an aircraft fire. The City has an on-airport pickup truck loaded with a purple K fire system as an added measure of safety. This on-airport vehicle is used for daily inspections and security patrol.

ACCESS PLAN

The location of Watsonville Municipal Airport near Highway 1 provides convenient access to most areas in Santa Cruz County. Access, from Highway 1 is via Airport Boulevard, a two-lane collector, and Aviation Way, a two-lane local street. Airport Boulevard connects to Freedom Boulevard to the east of the airport. Aviation Way is planned for realignment to bring the facility closer to the airport terminal buildings. This realignment will create a larger vacant industrial lot south of Aviation Way than currently exists and facilitate a greater degree of industrial development in the airport area.

Manfre Road will be improved to allow access to future industrial development areas northwest of Runway 2-20. This road will be designed as a two-lane local commercial street, which connects to Buena Vista Road on the north end.

There are two automatic controlled access gates to the terminal facilities, one near the southeast T-hangar area, and the other near the fuel farm. Only authorized parties have access. An additional two gates are recommended for future access, one for the northeast hangar area, and one for the east hangar area near the National Guard. Only authorized parties will have access to these areas. Monthly permits and computerized codes will allow for proper revenue collection and immediate termination if necessary.

Presently, there are approximately 92 spaces for auto parking in the terminal area. This includes 62 spaces in a lot adjacent east of the terminal building and an additional 30 unpaved spaces west of the building. There are 60 additional spaces serving various aviation businesses. The forecast need for future auto parking is a total of 183 spaces. There is ample area for additional auto parking, both in the existing and new terminal and FBO areas. Aircraft owners should be allowed to park their vehicles in their assigned aircraft tiedown spaces to provide convenient access, allow security for their parked vehicle while out of town, and to reduce the need to construct additional perimeter parking areas. The construction of additional parking should be planned to coincide with demand as it occurs. The Watsonville Municipal Airport Access Plan is shown in Exhibit 9.

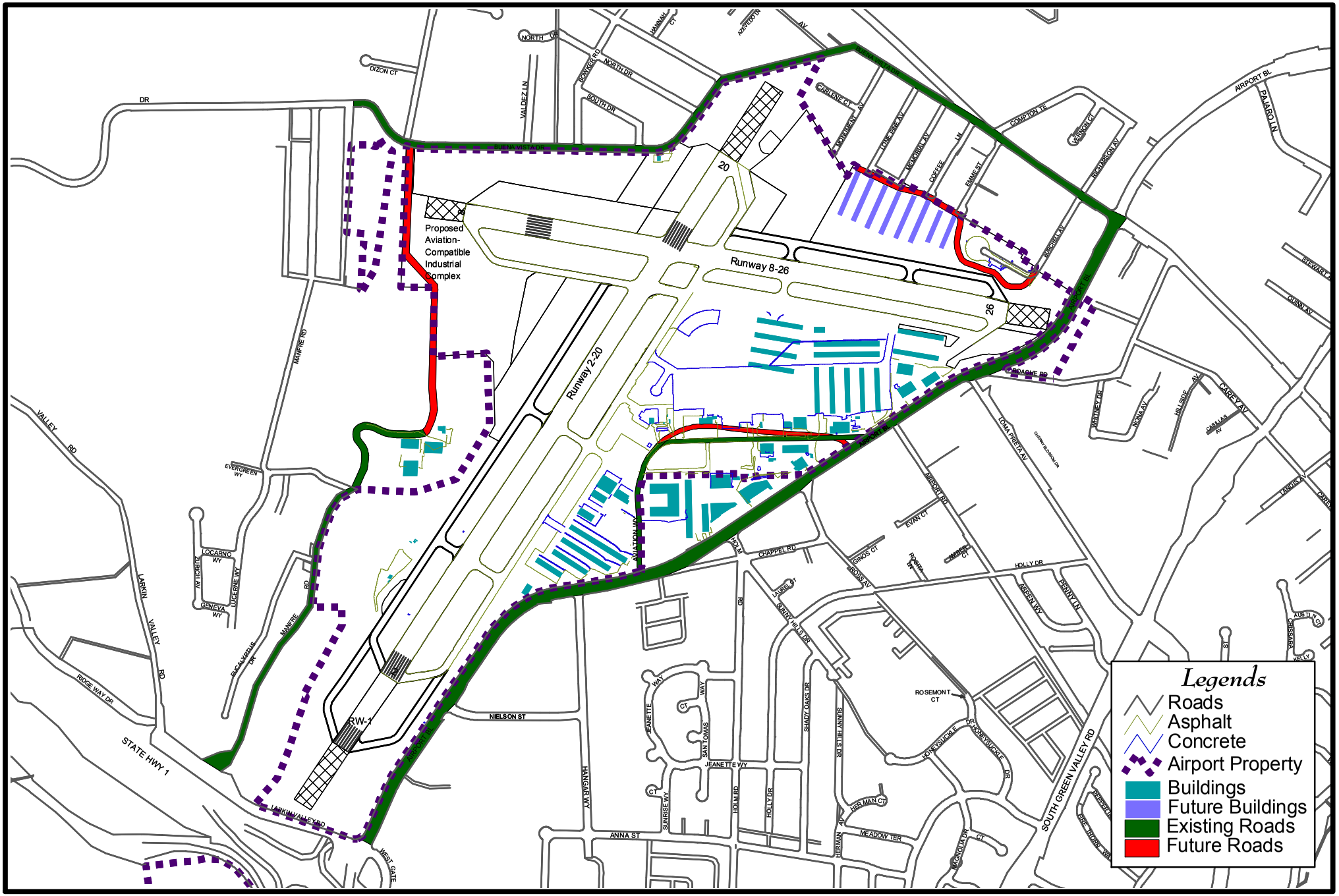


Exhibit 9

Access Plan

Watsonville Municipal Airport Master Plan

AIRPORT LAYOUT PLAN

The Airport Layout Plan sets forth the technical design parameters for Watsonville Municipal Airport and includes pertinent program elements from the Land Use Plan, the Airspace Protection Plan, the Terminal Area Plan, and the Access Plan. The Airport Layout Plan is contained in Appendix A.

OFF-AIRPORT LAND USE PLANNING

The basic responsibility for off-airport land use planning is with the City of Watsonville and the County of Santa Cruz. The objective of off-airport land use planning is to guide safe, compatible land uses around airports. Aviation-related factors to be considered and evaluated when planning land uses or redeveloping lands adjacent to airports include:

- Aviation noise and its effects on people,
- Safety of persons on the ground, and
- Safety of pilots and passengers.

Many forms of urban development can cause conflict with aircraft operations. Airspace obstructions such as buildings and transmission lines can significantly decrease airport safety and capacity. Electrical interference can restrict the use of communications and navigation equipment. Off-site lighting can make it difficult for pilots to distinguish between airport lights and others. Developments such as garbage dumps, sewage lagoons, and certain vegetation, which attract birds, can create bird-strike hazards. In addition, smoke, odors, and intensive noise each have separate and negative impacts on airport operations. The accumulation of these and other factors can reduce and sometimes eliminate the usefulness of an airport.

Since an airport can attract a variety of land uses, planning for the airport environment attempts to encourage activities best able to take advantage of a location near an airport. This involves two approaches: (1) the prohibition of uses negatively related to the airport, and (2) the encouragement of uses benefited by an airport location. Those uses most attracted to the airport are generally those least bothered by noise and other annoyances. The presence of these attracted uses acts as a buffer to uses, which are negatively affected. Compatible land uses near airports typically have one or more of the following characteristics: they are (1) land uses involving few people, such as natural or open areas, (2) uses which are noisy, such as industries, (3) indoor uses, especially commercial and industrial use, which can be protected from noise by sound reduction construction, and (4) airport-related uses.

The area affected by airport operations is normally termed the airport's "environs." Generally, aircraft noise is the principal consideration in determining an airport's area of influence, but other factors such as safety of pilots and persons on the ground, local circulation systems, area development plans, and terrain are often included in the formulation of the influence area. Within the airport environs, planning and zoning authority provide the ability to preserve opportunities for airport development and minimize off-airport land use incompatibility. With a clear policy established regarding land use in proximity to an airport and with the regulatory mechanisms to assure implementation of that policy, off-airport development decisions can be made easily and rapidly.

Aircraft Noise

Brown-Buntin Associates, Inc. (BBA) completed an analysis of aircraft/airport operations and related noise levels for the Watsonville Municipal Airport to prepare Day-Night Level (CNEL) noise exposure maps for existing (2000) and projected future (Years 2010 and 2020) airport traffic volumes with the existing and proposed future runway configurations.

The Federal Aviation Administration's (FAA) Integrated Noise Model (INM) Version 6.0c was used to prepare CNEL noise exposure maps for the Watsonville Municipal Airport, based upon the FAA aircraft noise level data base and airport operational factors as described below. The INM was developed for the FAA, and represents the federally sanctioned and preferred method for analyzing aircraft/airport noise exposure. Version 6.0c is the currently available version of the INM, incorporating an updated database of aircraft performance parameters and noise levels.

Projected data for aircraft activity, aircraft fleet mix and airport configuration used in the noise modeling process were obtained from Shutt Moen Associates and Coastplans.com. Flight track and runway use assumptions were derived from data provided by Shutt Moen Associates and the Airport operator. The following report summarizes the data, methods and assumptions used in preparing the CNEL noise exposure maps.

The CNEL descriptor is a method of combining single event noise levels over an annual average 24-hour day, applying a 4.8 decibel (dB) penalty to noise events occurring during evening (7 p.m. to 10 p.m.) hours, and a 10 dB penalty to noise events occurring during the nighttime (10 p.m. to 7 a.m.) hours. CNEL is defined in terms of average annual conditions, so that the CNEL measured on a given day may be either less than or greater than the annual average. The State of California uses the CNEL descriptor to describe land use compatibility with respect to aircraft noise exposures. The California airport noise compatibility criterion for residential land uses is 65 dB CNEL.

Airport Operations

Airport operational factors, which can significantly affect overall noise levels, as described by CNEL include the aircraft fleet mix, the number of daily operations and the time of day when aircraft operations occur. Runway use factors also significantly influence CNEL values. Trip length can affect aircraft single event noise levels, as an aircraft that is prepared for a long flight may carry more fuel and passengers than for a short flight, and will thus require higher power settings or a lower flight profile. The INM applies corrections to air carrier aircraft takeoff profiles to account for these differences, but makes no corrections to general aviation aircraft takeoff profiles.

Aircraft operational assumptions for Watsonville Municipal Airport were based upon analyses of airport activity provided by Shutt Moen Associates and Coastplans.com. These assumptions are summarized in Table 32.

TABLE 32: ASSUMED AIRCRAFT OPERATIONS
Watsonville Municipal Airport

	Year		
Aircraft Type	**2000**	**2010**	**2020**
Single engine propeller	106,430	113,180	126,003
Multi-engine propeller	12,140	12,690	13,949
Helicopter	0	0	0
Turboprop	2,820	2,820	2,971
Turbine (Jet)	1,500	1,500	1,580
Total	**122,890**	**130,190**	**144,503**

Source: Brown-Buntin Associates

The INM aircraft types which were assumed for Watsonville Municipal Airport include the GASEPV and GASEPF (for variable- and fixed-pitch single propeller aircraft, respectively), BEC58P (for twin propeller-driven aircraft), CNA441 (for turboprop aircraft), and the LEAR35 (for turbine-powered aircraft).

The distribution of aircraft operations to the runways and flight tracks was based upon information provided by Shutt Moen Associates, as shown in Table 33.

TABLE 33: RUNWAY USE ASSUMPTIONS
Watsonville Municipal Airport

Runway	Aircraft Type	Time of Day	Use Factor Takeoffs	Use Factor Landings
02		Day	1%	1%
	Single Engine	Evening	1%	1%
		Night	1%	1%
		Day	1%	1%
	Multi-Engine and Jet	Evening	2%	2%
		Night	2%	2%
20		Day	92%	92%
	Single Engine	Evening	98%	98%
		Night	99%	99%
		Day	92%	92%
	Multi-Engine and Jet	Evening	97%	97%
		Night	98%	98%
08		Day	1%	1%
	Single Engine	Evening	0	0
		Night	0	0
		Day	1%	1%
	Multi-Engine and Jet	Evening	0	0
		Night	0	0
26		Day	6%	6%
	Single Engine	Evening	1%	1%
		Night	0	0
		Day	6%	6%
	Multi-Engine and Jet	Evening	1%	1%
		Night	0	0

Source: Brown-Buntin Associates

The distribution of aircraft operations by time of day was derived from assumptions prepared by Shutt Moen Associates, and is shown by Table 34.

TABLE 34: TIME OF DAY ASSUMPTIONS – TAKEOFFS AND LANDINGS
Watsonville Municipal Airport

Aircraft Type	Time of Day		
	Day	Evening	Night
Single Engine	94%	4%	2%
Multi-Engine Propeller	97%	2%	1%
Turbine (Jet)	100%	0	0

Source: Brown-Buntin Associates

Descriptions of aircraft flight tracks were developed by BBA from the data provided by Shutt Moen Associates and the Airport operator. Based upon these data, generalized flight tracks were prepared for use in the noise modeling process to describe areas with a concentration of aircraft overflights. The assumed distribution of aircraft to these tracks is shown in Table 35.

TABLE 35: ASSUMED FLIGHT TRACK USE
Watsonville Municipal Airport

Runway	Track	Aircraft Type	Use Factor
Takeoffs			
02	02D1	Single Engine	70%
		Multi-Engine and Jet	0
	02D2	Single Engine	30%
		Multi-Engine and Jet	100%
20	20D1	Single Engine	8%
		Multi-Engine and Jet	0
	20D2	Single Engine	7%
		Multi-Engine and Jet	50%
	20D3	Single Engine	15%
		Multi-Engine and Jet	0
	20D4	Single Engine	70%
		Multi-Engine and Jet	50%
08	08D1	Single Engine	100%
		Multi-Engine and Jet	100%
26	26D1	Single Engine	100%
		Multi-Engine and Jet	100%
Landings			
02	02A1	Single Engine	70%
		Multi-Engine and Jet	0
	02A2	Single Engine	30%
		Multi-Engine and Jet	100%
20	20A1	Single Engine	100%
		Multi-Engine and Jet	0
	20A2	Single Engine	0
		Multi-Engine and Jet	100%
08	08A1	Single Engine	100%
		Multi-Engine and Jet	100%
26	26A1	Single Engine	100%
		Multi-Engine and Jet	100%

Source: Brown-Buntin Associates

Preparation of Cnel Noise Exposure Maps

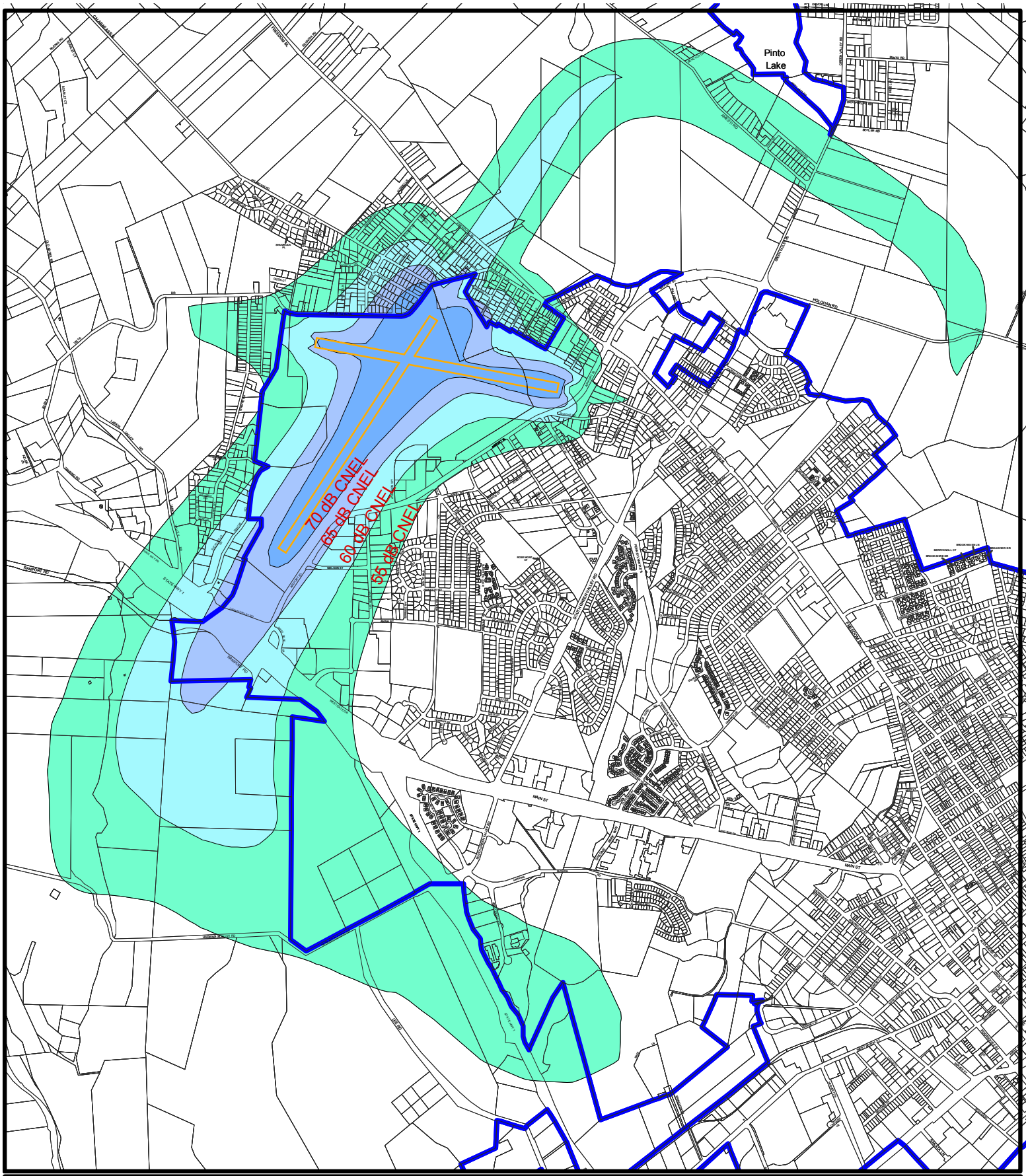
The Integrated Noise Model (INM) Version 6.0c was used to prepare CNEL noise exposure maps for the airport based upon the aircraft noise level and airport operational factors described in the previous sections. The INM was developed for the FAA, and represents the federally sanctioned and preferred method for analyzing aircraft/airport noise exposure. Version 6.0c is the most recent version of the INM, incorporating an updated database of aircraft performance parameters and noise levels.

The INM calculates aircraft noise exposure by mathematically combining aircraft noise levels and airport operational factors at a series of points within a Cartesian coordinate system which defines the location of airport runways and aircraft flight tracks. User inputs to the INM include the following:

- Airport altitude and mean temperature
- Runway configuration
- Aircraft flight track definition
- Aircraft stage length (not pertinent for this airport)
- Aircraft departure and approach profiles
- Aircraft traffic volume and fleet mix
- Flight track utilization by aircraft types

The INM data base includes aircraft performance parameters and noise level data for numerous commercial, military and general aviation aircraft classes. When the user specifies a particular aircraft class from the INM data base, the model automatically provides the necessary inputs concerning aircraft power settings, speed, departure profile and noise levels. INM default values were used for general aviation aircraft types.

After the model had been prepared for the aircraft classes described above, BBA created INM input files containing the number of operations by aircraft class, time of day and flight track for annual average day aircraft operations for existing and future operations. The airport configurations for existing and future conditions are different. In the future conditions, beginning in 2010, it was assumed that Runway 02-20 would be extended 800 feet to the southwest. The INM was used with the above operational assumptions and airfield configurations to prepare 55, 60, 65, and 70 dB CNEL contours, which have been plotted on Exhibits 10 through 12.



Legend

Parcel

Airport Runway

Watsonville City Limit

Noise Contours

55 dB CNEL

60 dB CNEL

65 dB CNEL

70 dB CNEL

Watsonville Municipal Airport
2000 Noise Contours

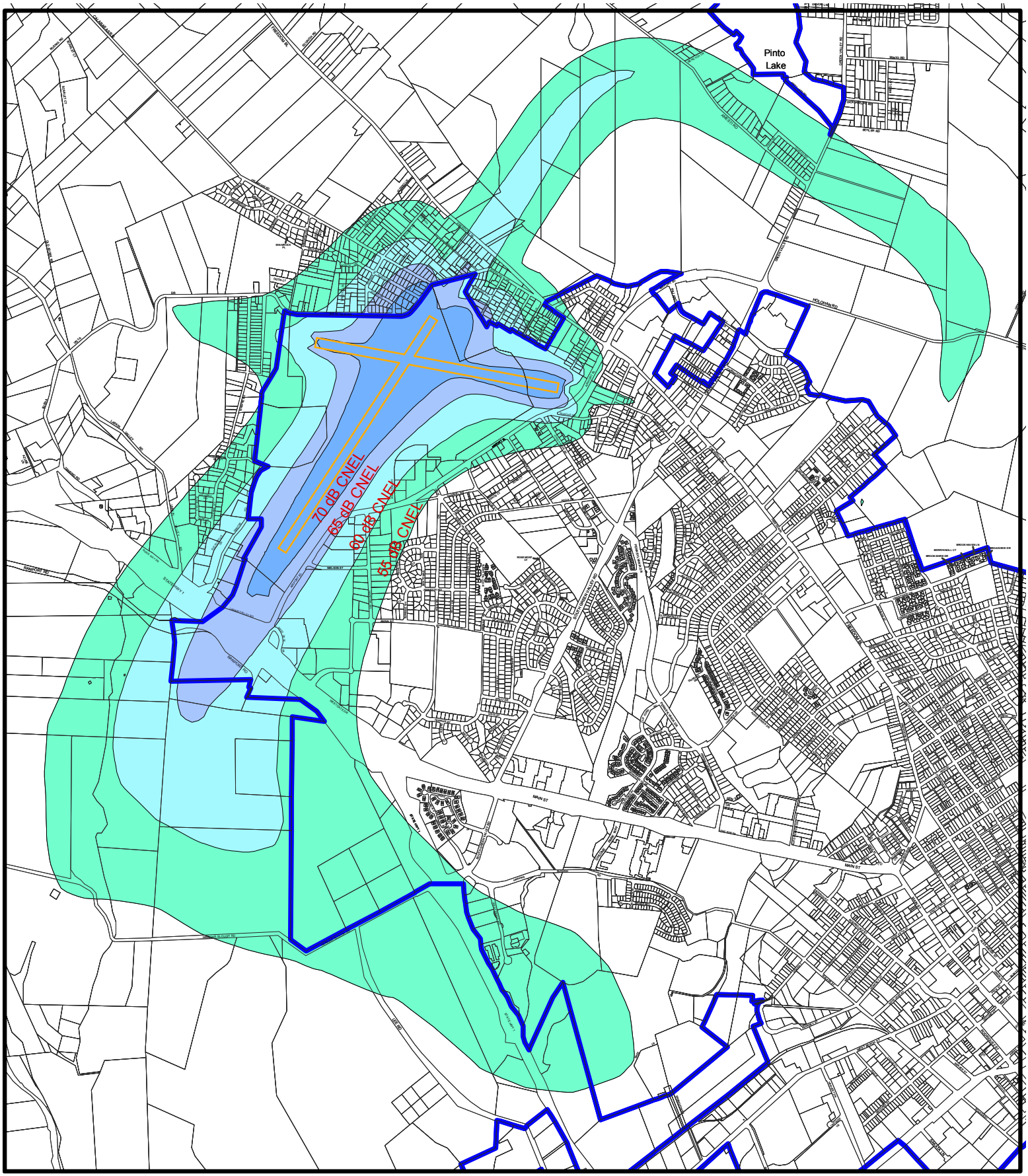
N

W E

S

Exhibit 10

Prepared By Watsonville GIS Center 11-7-01.



Legend

Parcel

Airport Runway

Watsonville City Limit

Noise Contours

55 dB CNEL

60 dB CNEL

65 dB CNEL

70 dB CNEL

Watsonville Municipal Airport
2010 Noise Contours

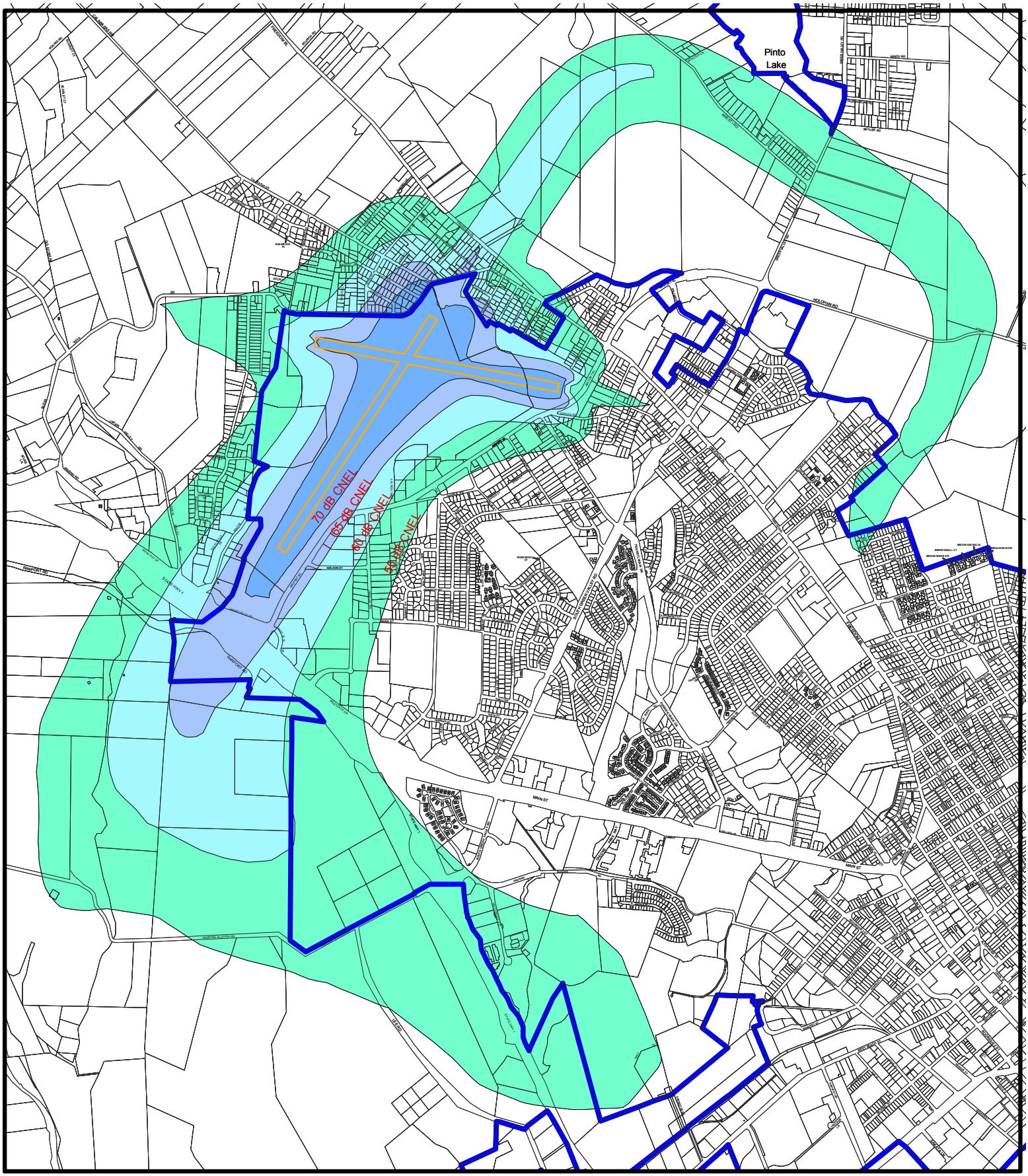
N

W E

S

Exhibit 11

Prepared By Watsonville GIS Center 11-7-01.



Legend

Parcel

Airport Runway

Watsonville City Limit

Noise Contours

55 dB CNEL

60 dB CNEL

65 dB CNEL

70 dB CNEL

Watsonville Municipal Airport
2020 Noise Contours

N

W E

S

Exhibit 12

Prepared By Watsonville GIS Center 11-7-01.

Table 36 shows general land use designations along with guidelines on compatibility with specific aircraft noise levels. The designations contained in this table do not constitute a determination that any use of land covered by the table is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. Land uses determined to be appropriate by local authorities in response to locally determined needs and values may be inconsistent with the guidelines in this table.

TABLE 36: LAND USE NOISE COMPATIBILITY GUIDELINES
Watsonville Municipal Airport

Land Use	Below CNEL 65	CNEL 65-75	CNEL 70-75	CNEL 75-80	CNEL 80-85	Over CNEL 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail--building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade --general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	N	N	N	N
Golf courses, riding stables and water recreation		Y	25	30	N	N

Legend:
CNEL = Community Noise Equivalent Level
Y (Yes) = Land Use and related structures compatible without restrictions
N (No) = Land Use and related structures are not compatible and should be prohibited
NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35 = Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Notes for Land Use Compatibility Guidelines Table:
(1) Where the community determine, that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR or 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(5) Land use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25.
(7) Residential buildings require an NLR of 30.
(8) Residential buildings not permitted.

Source: Wadell Engineering Corporation, based on FAA Regulations Part 150, "Airport Noise Compatibility Planning," Revised January 18, 1985.

To the south of the airport, the 65 CNEL contour will extend approximately 800 feet farther south over the highway. The 60 CNEL contour will extend approximately 1,000 feet farther to the south along Harkins Slough. There are currently a few residences in the 60 CNEL contour south of the highway and another one or two may be within the 2010 contour. The proposed Pajaro Valley Inn appears to be located within the current and future 60 CNEL contour.

North of the highway, the 65 CNEL contour will extend approximately 750 feet farther to the west in 2010 in the vicinity of the runway extension. A few residences are located here, which may fall within the 65 CNEL noise contour.

Noise Conclusions

Brown-Buntin Associates, Inc. (BBA) has prepared noise exposure contours in terms of the Community Noise Equivalent Level (CNEL) for different levels of existing and future aircraft activity at the Watsonville Municipal Airport, using the FAA's Integrated Noise Model, Version 6.0c. The noise predictions were based upon operational data provided by Shutt Moen Associates. The noise contour maps prepared for this study may be used to describe the potential effects of changes in noise exposures, and to plan for compatible land uses in the potentially affected areas.

Land Use Control Strategies

The primary mechanism for ensuring that the land uses surrounding Watsonville Municipal Airport remain compatible with airport operations is the promulgation of land use compatibility criteria to agencies responsible for regulating land use in the airport environs. The City of Watsonville and the County of Santa Cruz, through their respective general plans and zoning ordinances, have adopted specific development standards that regulate and restrict the height of structures and objects and regulate the use of airspace in the vicinity of the airport in accordance with Federal Aviation Regulations Part 77. In addition, the Pajaro Valley Unified School District,

which is responsible for the development and operation of educational facilities in the area, adheres to standards upheld by the Office of the State Architect.

Six safety compatibility zones are incorporated into this Master Plan to regulate land use at Watsonville Municipal Airport and to provide guidance to local jurisdictions and the school district for land use decision in the airport environs. These zones are as follows:

- 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 Zone, and
- Zone 6: Traffic Pattern Zone.

Table 37 sets forth basic compatibility standards for each safety compatibility zone, and Table 38 sets forth maximum development intensities for residential and non-residential use. Exhibit 13 depicts the location of the six safety compatibility zones for Watsonville Municipal Airport.

TABLE 37: BASIC COMPATIBILITY STANDARDS
Safety Compatibility Zones

Zone 1: Runway Protection Zone
➢ Airport ownership of property encouraged
➢ All new structures prohibited
➢ Residential land uses prohibited
➢ Avoid nonresidential uses except if very low intensity in character and confined to the sides and outer end of the area
Zone 2: Inner Approach/Departure Zone
➢ Residential uses, except on large agricultural parcels, prohibited
➢ Nonresidential uses limited to activities which attract few people (uses such as shopping centers, most eating establishments, theaters, meeting halls, multi-story office buildings, and labor-intensive manufacturing plants unacceptable)
➢ Children's schools, day care centers, hospitals, and nursing homes prohibited
➢ Hazardous uses (e.g. aboveground bulk fuel storage) prohibited
Zone 3: Inner Turning Zone
➢ Residential uses limited to very low densities (if not deemed unacceptable because of noise)
➢ Avoid nonresidential uses having moderate or higher usage intensities (e.g., major shopping centers, fast food restaurants, theaters, meeting halls, buildings with more than three aboveground habitable floors are generally unacceptable)
➢ Children's schools, large day care centers, hospitals, nursing homes prohibited
➢ Avoid hazardous uses (e.g. aboveground bulk fuel storage)

Zone 4: Outer Approach/Departure Zone

- In undeveloped areas, residential uses limited to very low densities (if not deemed unacceptable because of noise); if alternative uses are impractical, higher densities allowed as infill in urban areas
- Nonresidential uses limited as in Zone 3
- Children's schools, large day care centers, hospitals, and nursing homes prohibited

Zone 5: Sideline Zone

- Avoid residential uses unless airport related (noise usually also a factor)
- All common aviation-related activities allowed provided that height-limit criteria are met
- Other nonresidential uses limited similarly to Zone 3, but with slightly higher usage intensities
- Children's schools, large day care centers, hospitals, and nursing homes prohibited

Zone 6: Traffic Pattern Zone

- Residential uses allowed
- Most nonresidential uses allowed; prohibit outdoor stadiums and similar uses with very high intensities
- Avoid children's schools, large day care centers, hospitals, and nursing homes

Definitions: As used in this table, the follow meanings are intended:

- Allowed: Use is acceptable
- Limited: Use is acceptable only if density/intensity restrictions are met
- Avoid: Use generally should not be permitted unless no feasible alternative is available
- Prohibited: Use will not be permitted under any circumstances
- Children's Schools: Through grade 12
- Large Day Care Centers: Commercial facilities as defined in accordance with state law; for the purposes here, family day care homes and noncommercial facilities ancillary to a place of business are generally allowed.
- Aboveground Bulk Storage of Fuel: Tank size greater than 6,000 gallons (this suggested criterion is based on Uniform Fire Code criteria which are more stringent for larger tank sizes)

Source: California Airport Land Use Planning Handbook (January 2002)

TABLE 38: MAXIMUM DEVELOPMENT INTENSITIES
Safety Compatibility Zones

Current Setting	(1) Runway Protection Zone	(2) Inner Approach/ Departure Zone	(3) Inner Turning Zone	(4) Outer Approach/ Departure Zone	(5) Sideline Zone	(6) Traffic Pattern Zone
Residential Uses – Average number of dwelling units per gross acre						
Rural Farmland / Open Space (Minimal Development)	0	Maintain current zoning if less than density criteria for rural / suburban setting				No limit
Rural / Suburban (Mostly to Partially Undeveloped)	0	1 du per 10 - 20 ac	1 du per 2 - 5 ac	1 du per 2 - 5 ac	1 du per 1 - 2 ac	No limit
Urban (Heavily Developed)	0	0	Allow infill at up to average of surrounding residential area[b]			No limit
Non-Residential Use – Average number of people per gross acre[c]						
Rural Farmland / Open Space (Minimal Development)	0[d]	10 - 25	60 - 80	60 - 80	80 - 100	150
Rural / Suburban (Mostly to Partially Undeveloped)	0[d]	25 - 40	60 - 80	60 - 80	80 - 100	150
Urban (Heavily Developed)	0[d]	40 - 60	80 - 100	80 - 100	100 - 150	No limit[e]
	Multipliers for above numbers[f]					
Maximum Number of People per Single Acre	x 1.0	x 2.0	x 2.0	x 3.0	x 2.0	x 3.0
Bonus for Special Risk-Reduction Building Design	x 1.0	x 1.5	x 2.0	x 2.0	x 2.0	x 2.0

Notes:
[a] Clustering to preserve open land encouraged in all zones.
[b] See California Airport Land Use Planning Handbook (January 2002), Chapter 3, for discussion of infill development criteria; infill is appropriate only if nonresidential uses are not feasible.
[c] Also see Table 37 for guidelines regarding uses which should be prohibited regardless of usage intensity
[d] Exceptions can be permitted for agricultural activities, roads, and automobile parking provided that FAA criteria are satisfied.
[e] Large stadiums and similar uses should be prohibited.
[f] Multipliers are cumulative (e.g., maximum intensity per single acre in inner safety zone is 2.0 times the average intensity for the site, but with risk-reduction building design is 2.0 x 1.5 = 3.0 times the average intensity).

Source: California Airport Land Use Planning Handbook (January 2002)

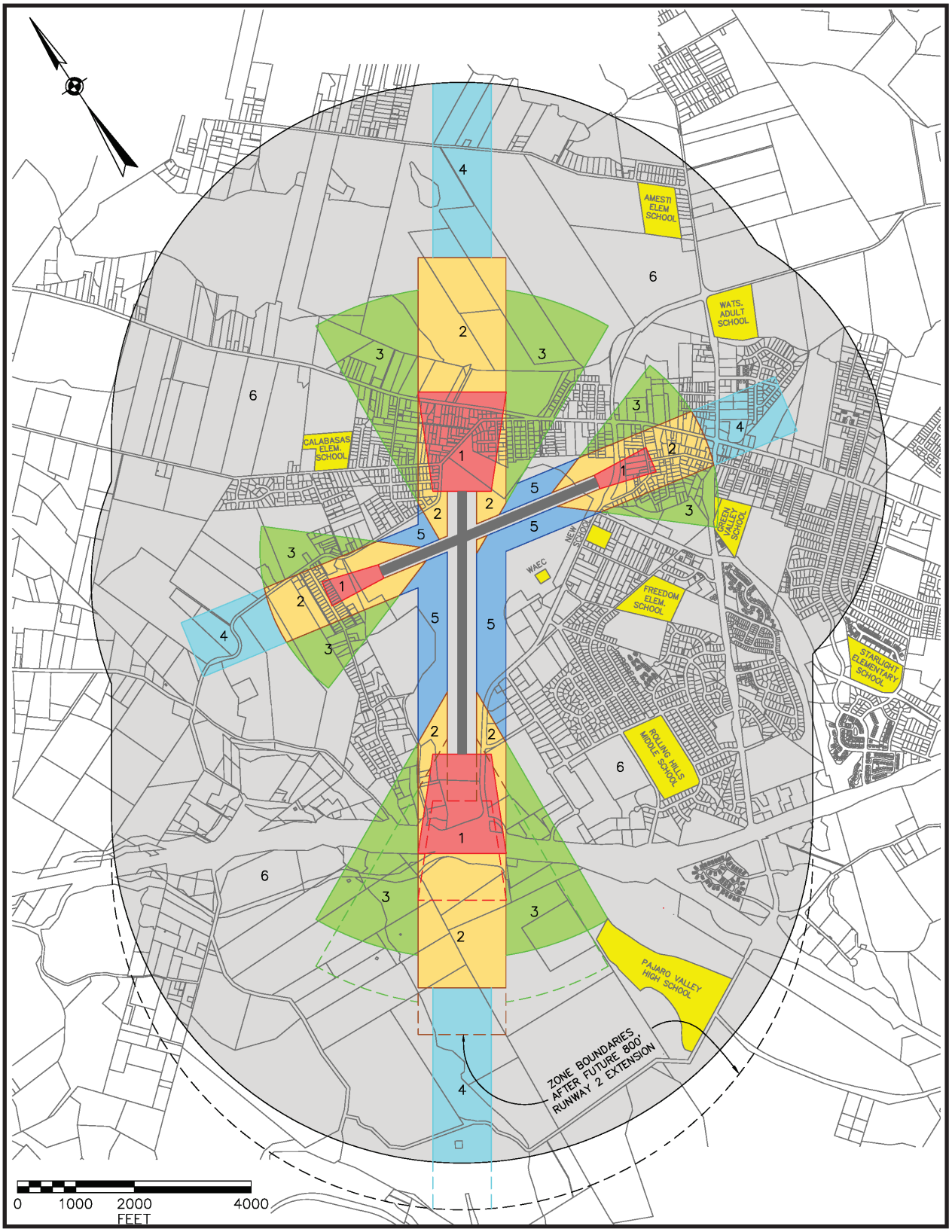


Exhibit 13

Safety Compatibility Zones

Watsonville Municipal Airport Master Plan

It should be pointed out that much of the area surrounding the airport is not within the boundaries of the City of Watsonville, although it is within the Watsonville Planning Area and is shown in the General Plan. Land to the west and north is under the jurisdiction of the County of Santa Cruz.

The General Plan designates an area northwest of the airport along Calabasas Road, and Buena Vista Drive as a Specific Plan area which would accommodate new housing units (Implementation Measure 4.A.5 of the General Plan). New units are indicated in the area along Manfre Road west of the southern end of Runway 2. Careful attention to airport land use compatibility must be given in the development of these areas.

In addition, the land south of State Highway 1 is within the coastal zone and is subject to the jurisdiction of the California Coastal Commission. The coastal plan for the area provides for a combination of agricultural, institutional, and visitor serving commercial uses. A new 100-unit motel and conference center, The Pajaro Valley Inn, is being proposed south of the airport across Highway 1, and the Pajaro Valley Unified School District is building a new high school on Buena Vista Road immediately west of Highway 1. Careful attention must be given to the compatibility of these uses with airport operations.

It should also be noted that Santa Cruz County does not have an Airport Land Use Commission (ALUC), which is the usual vehicle for reconciling the overlapping interests of city agencies and land use designations with those of the county. No formal Airport Land Use Plan (ALUP) has been formulated for Watsonville Municipal Airport. Because Watsonville is the only public use airport in the county, it is not required to formally establish an ALUC.

6. IMPLEMENTATION PLANS

The Implementation Plans chapter contains information concerning the capital improvement program, the financial program, and the implementation schedule. The Implementation Plans are prepared based upon the facilities required to accommodate forecast demand and the development of those facilities as discussed in Chapter 5, Airport Plans.

CAPITAL IMPROVEMENT PROGRAM

The Capital Improvement Program is comprised of stages of development and cost estimates of improvements proposed in this Master Plan study. The development program is presented in three stages so that all projects can be undertaken when demand justifies development. The cost estimates are prepared in current dollars, and are to be used for planning purposes only.

Stage Development

The long-range development program for Watsonville Municipal Airport is divided into four development phases. Table 39 shows improvements associated with each development phase and Exhibit 14 shows the location of each improvement by development stage.

TABLE 39: PHASING PROGRAM
Watsonville Municipal Airport

No.*	Improvement Name/Description
Phase I – 0 to 5 years (2001 to 2006)	
1	Complete instrument landing system (ILS)
2	Runway extension 800' to Runway 2-20 w/ taxiway extensions and lights (RW-1; TW-2)
3	Relocated access road (Aviation Way) and construct main apron for automobile parking lot
4	Construct airport maintenance shelter (east of 2-20 taxiway)
5	Install underground utilities, top trees, and relocate threshold of Runway 2-20
7	Security lighting at existing hangars south of Runway 8-26
8	New airport access road to commercial hangars from Airport Boulevard
10	Terminal expansion
12	Install traffic light (Aviation Way and Airport Boulevard)
14	Construct access road with underground utilities connecting Manfre Rd. on south and Buena Vista/Bradford Road on north to provide access to commercial/industrial area (Industrial Area A; TE-A)
15A	Construct airport-related commercial/industrial development west of Runway 8-26 (Industrial Area A; TE-A)
15B	Construct airport-related commercial/industrial development south of Aviation Way (Industrial Area B)
16	Acquire additional clear zone property (west of State Route 1)
19	Tarplant mitigation program
Phase II – 6 to 10 years (2007 to 2011)	
6	New airport access (Burchell Ave. northeast of Runway 8-26)
9A	Pave runway blast pads (both ends of Runway 2-20) (SZ-1/SZ-2)
11	Hangar expansion plus taxiways (60 to 70 new hangars and ramp area north of Runway 8-26) (TE-B);
13	Construct north parallel taxiway (north of Runway 8-26) (TW-1)
19	Tarplant mitigation program
Phase III – 11 to 15 years (2012 to 2016)	
9B	Pave runway blast pads (both ends of Runway 8-26) (SZ-3/SZ-4)
15C	Construct airport-related commercial/industrial development north of Runway 8-26 (Industrial Area C; TE-C)
15D	Construct airport-related commercial/industrial development west of Runway 2-20 (Industrial Area D)
19	Tarplant mitigation program
Phase IV – 16 to 20 years (2017 to 2020)	
15E	Construct airport-related commercial/industrial development west of Runway 2-20 (Industrial Area E; TE-A1)
17	New hangars in Area TE-D
18	Construct parallel taxiway west of Runway 2-20 (TW-3)
19	Tarplant mitigation program

Note: *Numbers correspond to projects listed in Land Use Plan (beginning on page 55 of this document)
Source: Watsonville Municipal Airport

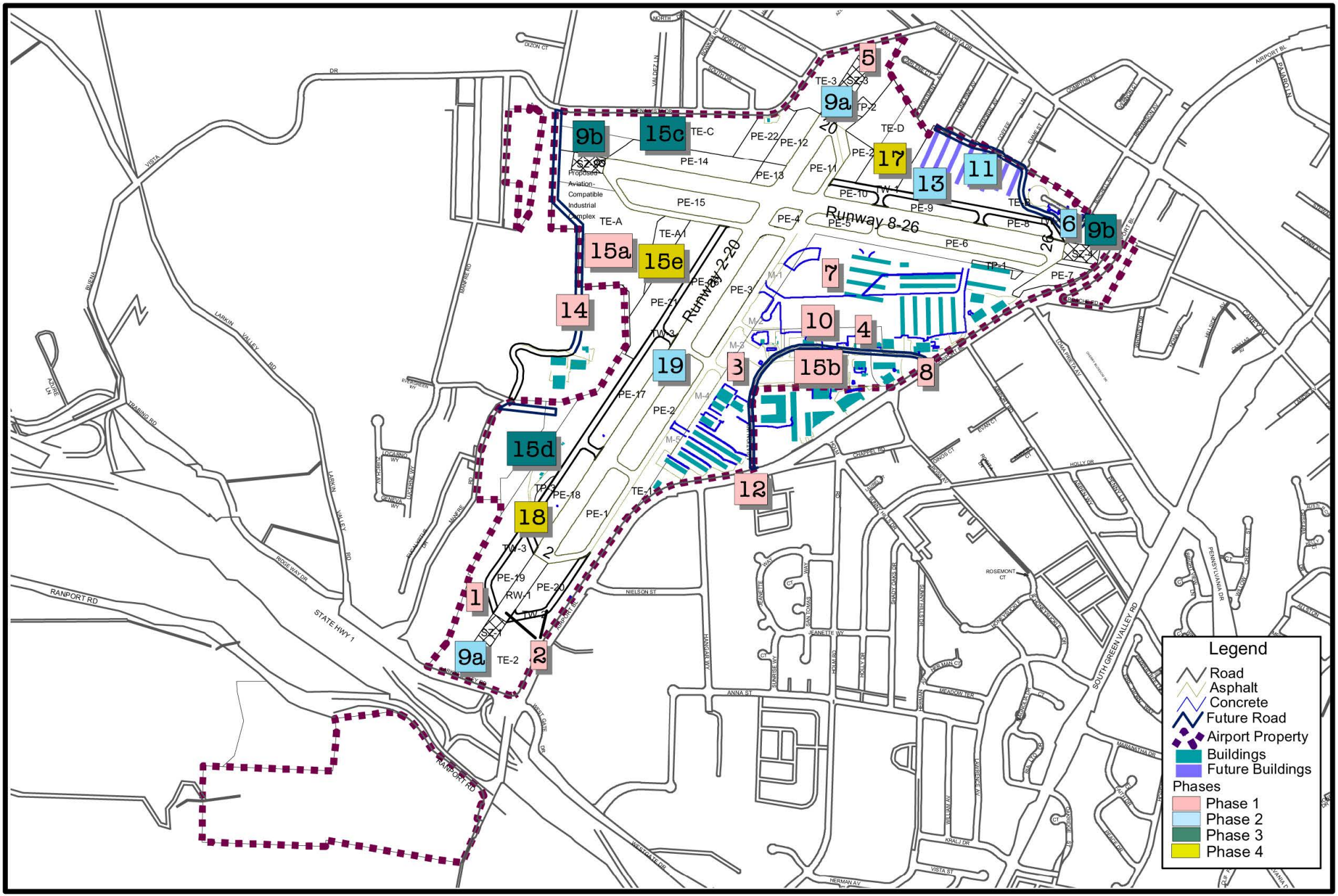


Exhibit 14

Stage Development Plan

Watsonville Municipal Airport Master Plan

Cost Estimates

The following Capital Improvement Program Cost Summary, Table 40, indicates the costs for each stage of development for the airport. Order of magnitude costs are indicated for planning purposes only. The project costs are separated as to FAA share and local share. The FAA portion is based on 90 percent funding. It is possible that certain items in the plan, such as the instrument landing system, may be eligible for 100 percent funding through the FAA Facilities and Equipment (F&E) Program. The local share is normally 10 percent of eligible projects, and 100 percent of non-eligible projects. Items presently not eligible for FAA funds include auto parking, hangar and FBO buildings, fueling systems, and utilities serving ineligible facilities. All eligibility is subject to FAA review and the outcome of future legislation.

For the purpose of this cost estimate, it is assumed that the FBO's will construct their own auto parking and maintenance aprons in conjunction with their new buildings, and the City will develop all T-hangars, executive hangars, and fueling systems.

Definitions of capacity in planning manuals incorporate a reasonable amount of maximum delay. The timing of development indicated provides airfield development benefits commensurate with costs. Each improvement is timed with respect to safety to users and with the goal of commencing facility development, preferably two to three years before demand exceeds capacity. Construction prior to the operational dates may occur depending upon the availability of funds, changes in demand, and other opportunities.

The airport land acquisition program should take place before the need for the land occurs, and therefore is identified as occurring in 1994. The acquisition program includes purchase of land for the Runway 2 protection zone and approach protection for other runway ends. The land values in Watsonville are subject to escalation and change. Values may escalate at an increasing rate as the area becomes more urbanized.

There are many uncertainties with respect to forecasting costs, especially in long-range plans. The airport owner should incorporate adequate contingencies to cover changes in costs, sophistication of equipment, environmental protection requirements, and special studies or programs.

Cost estimates are order of magnitude costs for planning and programming purposes only. Detailed topographic mapping, soil investigations, and field investigation during the design process will result in more accurate estimates of future development costs.

Grant applications should be made for development of portions of the improvement program to complete specific sub-areas of the airport. Improvement programs must be realistic and comply with FAA and local funding limitations; therefore, some projects may have to shift to subsequent time periods, if funding is not available. Table 40 summarizes capital improvement costs.

TABLE 40: CAPITAL IMPROVEMENT PROGRAM COST SUMMARY
Watsonville Municipal Airport
(In 000's 2000 $)

Development Stage	Estimated Cost
Stage I (2001-2006)	$4,755,000
Stage II (2007-2011)	1,847,000
Stage III (2012-2016)	(unknown)
Stage IV (2017-2020)	(unknown)
Total	$6,702,000
FAA/State Funds	$ 6,333,390
Local Funds	368,610
Total	$6,702,000

Source: *Watsonville Airport Capital Improvement Program*, January 2001

All construction and land acquisition costs are based on 2000 dollar values. Quantities are for minimum acquisition and improvements necessary to provide acceptable facilities to meet forecast demands. For planning purposes, the multipliers shown in Table 41, below, may be applied to estimate future construction costs, although the future economy cannot be exactly projected. These escalations are based on an extrapolated average annual increase at 5 percent compound interest.

TABLE 41: MULTIPLIERS FOR FUTURE CONSTRUCTION COSTS

Period	Range in Multiplier of 2000 Costs
2000-2005	1.0 to 1.4
2006-2010	1.5 to 1.8
2011-2015	1.9 to 2.3
2016-2020	2.4 to 2.9

Source: Watsonville Municipal Airport

FINANCIAL PROGRAM

The following section describes the financial program for Watsonville Municipal Airport through 2020.

Local Benefits Assessment

General aviation airports contribute significantly to the prosperity of a community and are crucial elements in the economic well-being and safety of a city, county, and region. Today, general aviation is the largest, most far reaching, and a most significant segment of America's air transportation system.

The role and function of a general aviation airport differs from one location to another. Business and personal travel is only one use of a general aviation airport. Aircraft are used for firefighting and monitoring weather conditions and air quality levels. General aviation airports play an important role in medical evacuations, law enforcement, and mail delivery.

The advantages and benefits of air carrier service to a community are readily apparent. But direct and indirect benefits of general aviation and other airport-related services may be more difficult to assess. General aviation airports such as the Watsonville Municipal Airport generate employment, sales taxes, personal property taxes, and increased consumer spending within the area. A recurring consequence of an airport's development or facility enhancement is an increase in the number of local jobs and stimulated economic activity.

Indirect employment results from services and businesses supporting the airport and its employees if business potential is developed. Development of the airport means more dollars spent locally.

An economic impact study of the City of Watsonville and Santa Cruz County was conducted in 1991 by study members appointed by the Watsonville City Council in conjunction with AMBAG's Airport Economic Study for the Region, Santa Cruz/Monterey Counties, directed by the consulting firm of Koert and Associates. The study is based on FY 1990. The bottom line economic impact for the Watsonville Airport region for 1990 was estimated at $19,069,330.

- Estimated jobs generated by the airport: 61 on airport, and 188 indirect and induced by the airport. Total 249.
- Estimated total taxes generated from all airport activity: $1,435,670 of which $1,091,872 (76 percent) was estimated to be retained locally.
- The estimated return on Watsonville's equity in the airport is $19,069,330 / $58,000,000 x 100 = 33 percent at today's minimum estimated land value.
- Percentage estimated of General Aviation visitor passengers traveling for business purposes was 40 percent, with 40 percent for tourism. Estimated local expenditures of $2,305,670.
- There are 325 aircraft based at the airport with an estimated 120,000 operations per year.
- The Watsonville Airport is an Enterprise Fund and does not receive funding from the City's General Fund. The airport operated $33,054 in the "black" during 1990.
- Watsonville Airport proved to be a major factor in Watsonville's regional economy during 1990.

Airport total estimated impact:$19,069,330
Airport total estimated taxes:$1,435,670
Percent of Watsonville Airport Regional Economic Impact vs. Watsonville Income:
$17,633,660/$29,380,211 x 100 = 60 percent

General aviation aircraft operating expenses are indicative of money being spent at an airport that eventually finds its way into the community. For each based aircraft there are dollars spent annually for fuel, oil, insurance, hangars/tiedowns, and routine maintenance. Table 42 shows the potential for aviation businesses in the area if the airport has adequate space and facilities available.

TABLE 42: POTENTIAL GENERAL AVIATION AIRCRAFT EXPENDITURES
Watsonville Municipal Airport

Aircraft Type	Cost per Hour	Ave Hours Flown	Dollars per Based Aircraft	Total Expenditures (in 000's$)				
				2000	2005	2010	2015	2020
Single	$35	133.4	$4,670	$1,300	1,310	1,400	1,430	1,475
Multi	125	181.1	22,640	500	520	520	540	565
Helicopter	250	423.3	105,825	0	0	0	0	0
Turboprop	350	447.9	156,765	470	470	470	470	470
Turbine	$700	405.0	$283,500	850	850	850	850	850
Estimated Total Amount Spent by Aircraft Owners				$3,120	$3,150	$3,240	$3,290	$3,360

Source: Wadell Engineering Corporation

An airport interacts with and enhances the economic life of the community. Traditionally, a community's well-being has been tied to either transportation or communications. In the growth of the United States, those towns and cities located along railways grew and prospered while others without access to good transportation routes faltered and died. The same case can be made for aviation.

Everyone is aware of the time-saving value of aircraft travel. Not everyone realizes the indirect economic values produced by air travel. In the fast-moving business world, travel by corporate aircraft to close business deals can take only a few hours, with departure back to the home office on the same day without ever drawing the attention of anyone in particular. Yet, the consummation of that business deal, which might not have occurred without the local airport, will have a vital effect on the area's economy.

Today, there are approximately 12,000 airports in the United States. Of that number, roughly a third are publicly owned, with the rest in private hands. These airports represent an investment of $10 billion, and the majority of these facilities, like any other business, provide a return on the investment. With expected future investments of $17 billion to be added to the existing system within the next decade, one can see that capital flow generated by these airports is substantial.

General aviation activity represents almost 50 percent of the aircraft miles flown annually. General aviation transports one-quarter of the people traveling by air who conduct business and provide industrial and agricultural services. A full spectrum of general aviation services and facilities at a local airport encourages visitors and acts as an incentive for business and industry to locate in the area.

Financing Considerations

A sound financial program is instrumental to the successful development of the airport. Proper planning, design, and feasibility studies are efforts spent in vain unless an adequate financing program can be developed to accomplish the improvements indicated. The goals of airport financial planning are to (1) achieve a sound economic operation, (2) provide an adequate level of public facilities, and (3) avoid taxpayer burdens by developing a reasonable financial return

from the airport facility. The desirability of future airport development depends on the ability of an airport to achieve a self-supporting status and, within a reasonable time, to cover local development costs. Estimated revenues must be sufficient to help offset annual cost of capital investment and operations.

While the primary responsibility for financing proposed facility development rests with the sponsor, there are many ways that airport development funds can be supplemented. Money for capital improvements may come from a number of sources and may be used singly or in combination to accomplish airport development. Sources available during recent years for financing airport facilities include the FAA's Airport Improvement Program (AIP), Federal revenue sharing funds, the State of California Department of Transportation, private donations, leasebacks, direct revenue loans, certificates of participation, and revenue and general obligation bonds. Also, capital improvements can be financed from general funds that are provided by annual operating and tax revenues.

FAA funds for airport development are derived from user taxes and are available for land acquisition, construction, alteration, fire fighting, and rescue vehicles and facilities, as well as for establishing and improving air navigation facilities. Both publicly-owned and privately owned public use airports are eligible for such aid provided the proposed project is included in the National Plan of Integrated Airport Systems (NPIAS). The airport is in the NPIAS. Presently, the Federal share of these projects in California is 90 percent of eligible costs. In recent years, the annual general aviation funding in California by the FAA has been approximately $12 million, yet funding requests greatly exceed the available funds, even though the FAA has a $8 billion unspent trust fund surplus.

The California State Aeronautics Division provides funds for airport development, also collected from aviation users. The primary areas of assistance are for maintenance of runways, taxiways, aprons, lighting, and other aircraft operational areas. The state aid is usually 90 percent of eligible project costs. Currently, the California Division of Aeronautics provides approximately three million dollars annually for the entire state. The state has a loan fund for development of hangars, fueling systems, etc. The interest rates are below commercial markets -- approximately 6 percent per year.

A non-profit corporation could lease portions of the airport, construct facilities, and then lease the entire improvement back for a fixed period of years, calculated to recoup the investment plus interest. Rates will be high, but no initial public capital is required for this form of financing. Private enterprise is not eligible for Federal/State grants. The rate of return to the airport is relatively low.

Certificate of Participation (COP) is a long-term financing technique using either a lease purchase or installment sale arrangement. While usually used for long-term financing of major facilities such as city or county administration, public safety, courthouse, jail, and parking garage buildings, it has also been used to finance equipment over a 3 to 10 year period. The parties of the transaction include (1) the lessee, which is the public body; (2) the lessor, which can be a non-profit or private leasing corporation or a public agency; (3) the trustee, who holds the security for the payments of the lease; (4) the paying agent (who may be the same as the trustee), who disburses the lease payments to (5) the investors, who purchase the COPs. The funds to meet the lease payments are raised on an annual appropriation basis and non-appropriation may mean the return of the asset financed or action at law or in equity. As

further security for the lease payments, insurance or a third-party guarantee may be used or project revenues may be used to make lease payments if the facility is revenue-producing.

Municipal Lease Purchase Financing (tax-exempt leasing) is an alternative method for financing public use and acquisition of equipment or facilities otherwise too expensive to be included in annual budgets. Leasing permits political subdivisions to enter into installment sale or lease purchase contracts with principal and tax-free interest increments payable over time. Tax-exempt lease contracts have two requirements: the governmental body must pay the purchase price plus interest over a period of years, and it must have the right to purchase the property for a nominal price at the end of the contract term. The funds to pay the contract installments can come from any source available to the public body. The appropriation is put in the annual budget. Should the appropriation not take place, the balance due on the contract is accelerated and the investor either receives back the asset for which the funds were spent or otherwise seeks relief.

Revenue bonds are sold with repayment based on income from anticipated revenues. Adequate earning capability of the project must be convincingly demonstrated. Earnings from the airport must go first toward retirement of the bonds, and future financing may be inhibited while bond debt is outstanding. Interest rates are usually higher than for general obligation bonds. Revenue bonds are an excellent form of financing for air carrier runways, terminal buildings, and industrial parks, but are not frequently used for most general aviation development. For general law cities and counties in California, an election is required to authorize the issuance of revenue bonds. A majority vote is required.

General obligation bonds are backed by the taxing power of the community and are generally the most economical bonding method to finance airport development. Proceeds from the sale of general obligation bonds are usually not available to finance private or exclusive operation facilities such as FBO facilities, T-hangars, and exclusive-use aprons. General obligation bonds are useful in financing public use facilities whether revenue producing or not, such as runways, taxiways, terminal buildings, and auto parking. An election is required to authorize the issuance of general obligation bonds. A two-thirds majority vote is required.

Financing airport improvements directly from the airport enterprise fund is the most economical method of all, since there are no interest payments. Airport improvements financed by this approach could place constraints on money available from the airport fund to meet normal operating and other expenses.

An airport authority is commonly developed when one public agency is burdened with total airport costs, while other communities have the benefits and even taxation, but not the costs. A new district or authority could not create new taxes, but could sell lease-revenue bonds.

Cash Flow Analysis

Pricing of airport services and facilities is a sensitive issue and subject to controversy. Each party may have a different perspective and motivation. While a public entity may seek a yearly return equal to yearly expenditures, private business may seek to maximize profits, and some airport users feel that a facility supported by public funds should be willing to charge less and operate at a deficit. Local governments have to be sure of covering costs, or must accept a deficit with the view that other community revenues are increased adequately to warrant a deficit.

Watsonville Municipal Airports is one of few self-supported airports in the area. Many airports seek to attain a high degree of self-sufficiency and have rates and charges commensurate with the operating costs and capital improvement expenses. At other airports, local conditions and circumstances preclude charging full actual costs and a public entity may choose to absorb some of the financial burden and not pass it on to the user.

The preceding section on financing considerations indicates some of the mechanisms typically used for financing the local share for airport projects. An early determination should be made by the airport owner as to the most desirable and feasible approach to initiate implementation. The only long-term satisfactory way to resolve concerns regarding financing is through a strong statement of airport financial policy and aggressive implementation of that policy. For this reason, it is essential that a financial policy and program be established and monitored regularly. It should be recognized that the fees and charges levied would be less than the private facilities because the airport owner can receive Federal funding for facility development.

The estimated Watsonville Municipal Airport Financial Analyses, presented on the Cash Flow Analysis, are key elements of the feasibility study. Through this analysis, the capital improvement program and the projection of annual operating income and expenses are brought together to establish an estimate of the future financial condition over the twenty-year planning period for the airport.

The Cash Flow Analysis is stated in terms of constant 2000 dollars and is based on several components:

- Operating income
- Operating expense
- Operating profit/loss
- Capital requirements
- Annual cash flow Accumulative cash flow

A philosophy and fee schedule must be established in order to assure that adequate operating income is collected. It is necessary to generate significant revenue at the airports to provide for matching of FAA and state grants in order to implement the capital improvement program. The underlying assumption for the income schedule is that the local pilots and other users sincerely desire development of new airfield and terminal facilities, and are willing to pay appropriate fees.

The Watsonville Municipal Airport competes with other airports in the region for receiving Federal and State aid. Only airports with available grant matching funds can receive grants. Revenue must be generated on the airports with the intent that it will be returned to local users in the form of grants for land acquisition and capital improvements.

The Watsonville Municipal Airport is a major asset to the City and the region. In order to achieve full potential, the airport needs to generate revenues. Sound lease policies and rate structures must be established with the goal of providing sufficient revenues so that the airport can meet its house-keeping responsibilities and develop a reserve for future improvement. Table 43 shows revenue assumptions for Watsonville Airport.

TABLE 43: MAJOR REVENUE ASSUMPTIONS
Watsonville Municipal Airport

Item	Cost
Tiedowns:	
Based	$45/month single, $60/month twin
Transient	$5/night (average)
Hangars:	
New	$190/Month
Standard	$140/Month
Executive	$450/Month
Large	$900/Month

Source: Watsonville Municipal Airport

The operating income is comprised of apron tiedowns, transient aircraft parking fees, new T-hangars, old T-hangars (standard and executive), fuel sales, and airport leases (land and buildings). The income from land and building leases was established by analyzing each active lease on the airport and identifying its renewal period and any designated changes in rates and charges. New prevailing rates and charges were assumed to be established based on lease rates currently in effect.

New hangar construction is planned for the airport throughout the planning period. New hangar revenue will be a major source of income for the City through the collection of hangar rental fees. Lease rates on these hangars should be set so that the revenue produced will help offset the cost of construction.

The City currently has income from a variety of other types of hangars including older T-hangars and executive hangars. Hangar fees are $140 to $190 for small hangars, $190 for larger hangars, and $450 for the new rectangular hangars. Aircraft tiedown fees are $45 to $65 per month for based aircraft parked on the main apron. Transient overnight parking fees and fuel revenue are expected to increase proportionately to aircraft activity.

In summary, the major sources of airport income as described in the Major Revenue Assumptions table are tiedown fees, hangar rentals, land leases, and fuel revenue. These rates will help provide the airport with the income necessary to provide required services and to develop new facilities as they are needed.

The operating expenses for the airport are comprised primarily of salaries, maintenance labor and supplies, insurance, utilities, and miscellaneous. The greatest single expense is salaries for day-to-day operation and management of the airport. It is assumed that salaries will remain constant in 2000 dollars, there will be staff reductions due to self-fueling and consolidation of positions so that staffing will be constant after 1995. Maintenance related costs would remain constant. While it might be expected that maintenance costs would increase rapidly due to aging facilities, the capital improvement program provides for reconstruction of eligible airport paving and lighting systems thereby precluding the expense of major maintenance programs.

Insurance, utilities and miscellaneous expenditures are expected to increase gradually as the activity of the airport may increase with time. The primary increase in utilities will be for electricity related to additional lighting at the airport. Miscellaneous costs include attendance by airport management at conferences, special programs initiated by the airport, and other professional and community related activities. Fuel expenses increase, as does income from fuel sales. Table 44 shows expense assumptions for Watsonville Airport.

TABLE 44: MAJOR EXPENSE ASSUMPTIONS
Watsonville Municipal Airport

Expense Item	Amount
Salaries	$291,160 per year
Airport Maintenance	$66,796 per year
Supplies	$22,148 per year
Insurance	$31,659 per year
Utilities (excludes tenants)	$44,554 per year
Miscellaneous Expenses	$5,925 per year

Source: Watsonville Municipal Airport

For the purpose of the Financial Analysis, the specific assumptions were made for income and expenditures. However, there are also a series of generalized assumptions underlying the entire analysis.

- The forecast activity levels will occur as projected in this report.
- No capital improvement expenditures in addition to those presented in the report will be required.
- Improvements will be financed to the extent possible with Federal and State funds (assumed to be 90 percent of eligible items).
- All 2000 dollars are used for income, expenses, capital improvements, and land acquisition costs during the 20-year period.
- Specific analysis will be made prior to major commitments, and the airport cost accounting system and development plan will be monitored and updated as necessary.

Based on the revenue and expense assumptions, the annual income and expenses were combined to determine the operating profit (loss). When the operating profit (loss) is coupled with the local share of new capital requirements, the cash flow results. It is apparent that the new revenues and the collection of current revenues generate an operating profit continuing for each year through the year 2020. When combined with the City share of new capital to match grants for land acquisition and capital improvements, there is a positive annual cash flow for almost every year. The cash flow remains positive on an accumulative basis after 2000, since funds are expended to match grants for development and construct hangars.

The cash flow analysis utilizes current dollars and airport operations on a "cash basis." Sources of financing have not been applied, such as state loans for hangar development and other facilities. Therefore, by the dates mentioned above, the airport has been reconstructed, expanded, and new revenue-producing City hangars developed and paid for out of operating profit. After the planning period, there would not be any significant FAA/State and local capital requirements other than maintenance and repair of facilities as they age. The years beyond the

planning period, under the Master Plan assumptions, would yield annual operating profits of the magnitude indicated in the Cash Flow Analysis tables.

Two vital assumptions used in the Cash Flow Analysis tables are (1) the willingness and cooperation of the based aircraft owners to pay new fees to the airport fund and (2) the FAA and state funding will occur and will be 90 percent of all eligible items.

The financial program for the continued development of the Watsonville Municipal Airport should allow operation of the airport in order to obtain reasonable revenue from airport users and to recover operating expenses, financial expenses, and depreciation; to maintain adequate reserves for protection against unpredictable contingencies; and to provide for future improvements and capital equipment.

Based on review of the Cash Flow Analysis tables, it is necessary to obtain maximum FAA and State funding and to meet cash flow requirements on a yearly basis, otherwise projects will be delayed. The estimated amount of annual funds would be that amount shown as "annual cash flow." Short-term bonds or municipal loans could be used to average high and low annual local funding requirements. State loans for hangar development can provide sufficient funds at a relatively low interest rate. Table 45 shows the cash flow analysis for Watsonville Municipal Airport.

TABLE 45: CASH FLOW ANALYSIS
Watsonville Municipal Airport
2000 dollars

	2000	2005	2010	2015	2020
INCOME					
Leases - Terminal Building	39,311	39,311	39,311	39,311	39,311
Restaurant					
- Auto Parking	18,470	18,470	18,470	18,470	18,470
- Commercial Leases (1)	261,302	275,759	275,077	309,846	436,881
- Agriculture Land	16,448	13,424	13,424	13,424	13,424
Subtotal	335,531	346,964	346,282	381,051	508,086
Hangars - Existing	641,416	641,416	641,416	641,416	641,416
- New (2)	0	357,912	357,912	357,912	357,912
Subtotal	641,416	999,328	999,328	999,328	999,328
Fuel Sales	607,857	607,857	607,857	607,857	607,857
Miscellaneous (3)	1,423	1,800	1,800	1,800	1,800
Golf Range Fees	0	50,000	50,000	50,000	50,000
Subtotal	609,280	659,657	659,657	659,657	659,657
Annual State Allocation	10,000	10,000	10,000	10,000	10,000
TOTAL INCOME	1,596,227	2,015,949	2,015,267	2,050,036	2,177,071
EXPENSES					
Salaries- Airport Staff (4)	251,223	291,160	291,160	291,160	291,160
Maintenance	78,451	66,796	66,796	66,796	66,796
Supplies/Other	20,080	22,148	22,148	22,148	22,148
Insurance	26,643	31,659	31,659	31,659	31,659
Utilities	42,230	44,554	44,554	44,554	44,554
Fuel Cost	446,892	446,892	446,892	446,892	446,892
Misc.	5,925	5,925	5,925	5,925	5,925
City Support Services	66,194	66,194	66,194	66,194	66,194
Permits and Fees (2)	3,025	125,000	1,000	1,000	1,000
Interest Expense	215,286	307,273	198,216	60,875	0

Professional Engineering Services	21,155	35,000	35,000	35,000	35,000
Depreciation Expense (2)	266,721	319,407	313,175	294,029	137,577
Materials	62,378	50,000	50,000	50,000	50,000
TOTAL EXPENSES	1,506,204	1,812,009	1,572,720	1,416,233	1,198,906
OPERATING PROFIT/(LOSS)	90,023	203,940	442,547	633,803	978,165
OTHER CASH REQUIREMENTS					
Principal Payments on Debt	182,411	365,081	474,138	275,302	0
Local Capital	86,427	52,285	52,285	52,285	52,285
NET INCOME	-178,815	-213,425	-83,875	306,217	925,881
Less Depreciation	266,721	319,407	313,175	294,029	137,577
ANNUAL CASH FLOW	87,906	105,982	229,300	600,246	1,063,458
ACCUMULATED CASH FLOW	22,578	665,155	1,749,082	3,334,231	7,122,743

Notes:

1. Commerical Lease payments vary due to increase lease revenues in later years for Caltube project
2. Increase in permits/fees of $124,000, principal payments, interest payments and new hangar revenue due to new construction of hangars in year 2005-New debt issuance would be in the amount of approximately - $2,827,000
3. In 1998 unusual deferred revenue of $103,652 recognized
4. Salaries Expense increase in 2002 due to a new part-time maintenance staff person

Source: City of Watsonville