

## **SHIFTING GENERAL AVIATION ACTIVITY AWAY FROM SFO**

This section discusses the issues involved with accommodating general aviation activity at airports other than SFO. General aviation activity includes all aircraft and cargo operations other than commercial passenger service and military operations. The potential to shift cargo operations from SFO to other facilities has already been discussed above. But the other general aviation activities remain to be addressed.

General aviation operations use up airport capacity just like large commercial service operations. This section considers the feasibility of shifting general aviation operations to nearby airports and the possible capacity benefits to SFO.

Many recreational pilots prefer to fly into airports where commercial air carrier service will not conflict with their operations. They seek out the smaller, less congested airports where costs are lower and the operations are more convenient. The FAA considers such “reliever” airports as essential elements in the airport system of a large metropolitan area because they provide traffic relief to a commercial service airport in the area.

A good deal of general aviation activity has moved away from SFO over the years. In the 1980s there were 62,000 general aviation operations at SFO. As of 1999 this figure had dropped 55 percent to some 28,000 operations (San Francisco International Airport, SFO Runway Reconfiguration Program EIR/EIS, Alternatives Considered and Eliminated from Detailed Study (Preliminary Report), November 2000, p. 26). The general aviation activity that remains at SFO consists primarily of operations by business aircraft. Those aircraft have business-driven reasons to be at SFO. They may be based at SFO for several reasons: SFO provides the needed runway lengths, all weather instrument landing systems, and 24 hour operations; SFO is near the firm’s offices; and/or SFO provides connecting flights or is a venue for business meetings. Proximity to SFO obviously has some value for the users of these aircraft. However, compared with other general aviation aircraft, such business aircraft are relatively insensitive to costs. Higher fees, more expensive hangars, and so on are just costs of doing business. If available nearby, high-quality facilities tailored to the needs of the business aircraft might attract business aircraft away from SFO.

There are three nearby airports that could serve general aviation aircraft as alternatives to SFO. In San Mateo County, the County maintains airports at Half Moon Bay and San Carlos. Both Half Moon Bay and San Carlos are designated by the FAA as reliever airports for SFO. Further down the Peninsula is the Palo Alto airport, run by Santa Clara County. All other small airports in the Bay Area are too far away from SFO to be attractive to customers as alternatives for the business-aircraft now using SFO.



# SITE-SPECIFIC ANALYSIS FOR SHIFTING GENERAL AVIATION AIRCRAFT AWAY FROM SFO

## Methodology

This part of the report examines the three specific alternative airports that are reasonably close to SFO. An outright ban against general aviation activity at SFO is out of the question because it would violate SFO's grant assurances to the FAA. But some form of action to entice general aviation operations away from SFO is presumably possible. The following analysis considers the potential for the three airports to attract business aircraft by offering high-quality facilities and services that can compete with SFO.

## San Carlos Airport

### *History and Current Uses*

San Mateo County's San Carlos Airport is classified by the FAA as a reliever airport for SFO. The airport is located on 160 acres next to US 101 in San Carlos, east of the freeway and south of Redwood Shores. The original airport at the site, Cooley Field, was built in 1932. It was located just northwest of the present airport. The original San Carlos Airport was located west of US 101 near Redwood City. In 1950 it was relocated to the present site.



*The San Carlos Airport is constrained by wetlands, urban development and crowded airspace.*

The Airport has a single 2,600' runway, a control tower, a terminal building, aviation businesses, hangars, and tiedowns. The runway has a weight capacity of 12,500 pounds. The Airport hosts over 500 aircraft, three flight training facilities, and three maintenance facilities (<http://www.co.sanmateo.ca.us/dpw.dir/pap01b01.htm>).

The airspace around San Carlos Airport is a complex maze of restricted flight corridors involving not only SFO but at least a dozen other busy airports in the San Francisco Bay Area. The existing San Carlos traffic pattern, noise abatement procedure, and approach/departure paths are complicated. The airport is situated adjacent to the San Francisco Bay National Wildlife Refuge and numerous residences. Bird migrations and the potential for noise complaints can greatly influence operations.

### *Suitability as an alternative airport for business-driven general aviation*

The runway is too short for larger general aviation aircraft. The Airport's Master Plan acknowledges this. The Airport Master Plan calls for the runway to be lengthened to 3,400' to accommodate takeoff requirements for all small aircraft with less than ten passenger seats (Coffman Associates, Inc., Airport Master Plan for San Carlos Airport, May 20, 1997. p. 4-4). There will also be improvements to the terminal building and the hangar capacity for based aircraft. There is no plan to add an instrument lighting system. The Airport cannot meet FAA standards for runway-taxiway separation, the landside structures may affect navigable airspace, and the complex airspace pattern in the vicinity would be further complicated by an instrument landing procedure (Ibid, pp. 4-5).

### *Summary*

With approximately 150,000 annual operations and a convenient location just five miles from SFO, the San Carlos Airport is well suited to relieve some general aviation demand that would otherwise go to SFO. But the runway is short and not designed for heavy aircraft. These factors plus the lack of an instrument landing system discourage use of business jets. With the added issues of noise abatement, complicated airspace, and wildlife habitat/hazards, it is clear that the San Carlos Airport will not be able to lure the remaining general aviation aircraft away from SFO.

## **Half Moon Bay Airport**

### *History and Current Uses*

The Half Moon Bay Airport is also a designated reliever airport for SFO. It was constructed by the California Highway Department in 1942 for the U.S. Army Air Corps to use for coastal protection during World War II. The Airport was deeded to San Mateo County in 1950 and has been in use as a general aviation airport since then. During 1958-1971 it was also used by some airlines as an alternative to SFO during periods of bad weather at SFO. By the 1970s, instrument technology had advanced, which allowed SFO to expand its inclement weather capacity. Today, the Half Moon Bay airport is a popular destination for fly-in visitors to the spectacularly scenic coastal region of San Mateo County.

The Airport is located on 345 acres adjacent to Pillar Point Harbor. The city of Half Moon Bay is four miles to the south. Highway 1 runs north from Half Moon Bay to Pacifica and parallels the eastern side of the property. The site is within the jurisdictional area of the California Coastal Commission. The Fitzgerald Marine Reserve and the Monterey Bay National Marine Sanctuary lie just offshore.

The Airport has a 5,000' by 150' runway. It is an uncontrolled landing facility (i.e., there is no tower). The Airport has a small terminal building. On site are several hangars, two aviation businesses, approximately 70 based aircraft, and a number of non-aviation uses. The Airport currently supports about 165 operations per day. Weather is a factor, with fog present approximately 25 percent of the time. Noise abatement procedures are applied due to land use conflicts with adjacent residential areas (San Mateo Comprehensive Land Use Plan, December 1996. p. III-6).

*Suitability as an alternative airport for business-driven general aviation*

The Airport's Master Plan was accepted by the County Board of Supervisors in 1997. The Plan calls for a number of improvements to be implemented over a 20-year period (Coffman Associates, Inc., Airport Master Plan for Half Moon Bay Airport, 1997, pp. 6-4). The improvements include modifications to the taxiways, improvements to hangars, field and taxiway lighting enhancements, and pavement maintenance. There is no consideration given to addition of features that would be demanded by corporate jets and other business-driven aircraft as an incentive to leave SFO, such as a control tower or the installation of instrument landing systems. As with San Carlos, the Airport has a 12,500 pound limit that will remain unchanged into the future. The Airport has carved out a market niche for itself that is based on smaller aircraft.



*The uncontrolled Half Moon Bay airport is a popular destination for pilots who want to enjoy a visit to the coast.*

Even if the airport were to re-invent itself as an attractive facility for general aviation business aircraft, it would be unlikely to make much of an impact on the general aviation operations at SFO. The Half Moon Bay Airport is physically close to SFO, but the ground routes between the two airports present significant challenges. SR 92 is the primary link between the coastside and eastern San Mateo County. It is a winding, two-lane road that is often congested to the point of miles-long traffic jams. Highway 1 to Pacifica is also a two-lane, winding, somewhat congested roadway. It has the added constraint of being subject to extended closures at the Devil's Slide. A replacement tunnel is planned for the route, but the tunnel will only have two lanes, per the desires of coastside residents who fear massive urbanization of their semi-rural area if greater capacity is added for automobile traffic. Travel times between the two airports at present can be inordinately high because of the traffic congestion. Yet as more and more people discover the coastside's attractions, there is little prospect that the traffic jams will lessen in the foreseeable future.

Finally, there is the core competency of the Half Moon Bay Airport, which prides itself on being a comfortable facility for coastal residents and visitors. Visitors who fly to the airport can get out of the plane, walk to the harbor for a meal, stay in a bed and breakfast inn, and enjoy the unspoiled nature of the California coast (<http://www.co.sanmateo.ca.us/dpw.dir/pap02a04.htm>). This kind of relaxed ambiance that is the very essence of the Half Moon Bay Airport would be at serious risk if the airport were to change its emphasis to accommodate the business jets of Silicon Valley companies. Besides, the neighbors already insist on noise abatement procedures. A

proposal to shift SFO's general aviation operations to Half Moon Bay would be certain to generate strong protests over the noise and the growth-inducing impacts that would accompany the move.

### *Summary*

It is highly unlikely that the Half Moon Bay airport would want to attract SFO's business aircraft. Indeed, nothing in the Master Plan indicates movement in that direction. The uncontrolled nature of the field, the weight limitation, and the lack of an instrument landing system discourage use of business jets. With the added issues of noise abatement, corrosive sea air, and weather hazards, it is clear that the Half Moon Bay Airport will not be able to lure the remaining general aviation aircraft away from SFO.

## **Palo Alto Airport**

### *History and Current Uses*

The Palo Alto Airport was moved from Stanford to the Palo Alto Baylands complex in 1935. It occupies 182 acres adjacent to San Francisco Bay and the complex of marsh lands that form the San Francisco Bay National Wildlife Refuge. The Airport has a control tower and a 2,443' by 65' runway. Classified by the FAA as a Basic Utility II facility, the Airport can handle about 75 percent of the single-engine and small twin-engine airplanes. It can also serve some small business aircraft and air-taxi services. In 1990 there were over 240,000 operations at the airport (Airport Land Use Commission, Land Use Plan for Areas Surrounding Santa Clara Airports, September 1992, pp. 7). Currently, the Airport serves just over 200,000 operations per year. Of the based aircraft, 91 percent are single-engine aircraft (<http://www.airnav.com/airport/PAO>.)

The airport is clearly popular with pilots. It is home to flight instruction clubs and training institutions, aircraft maintenance firms, and related aviation businesses. The Airport's Master Plan identified a need for additional aircraft parking to accommodate the demand. It also noted that the site could be reconfigured for additional efficiency in its utilization of space. Currently, there are 521 based aircraft, with the capacity being just 533 aircraft (Personal Communication, Derek Farmer, Santa Clara County Planning and Development, March 2001).

### *Suitability as an alternative airport for business-driven general aviation*

The Airport is a small, heavily used local service facility. The pavement has a 12,500 pound limit, which restricts use by heavier aircraft. There is no instrument landing system and the location is in immediate airspace conflict with Moffett Federal Airfield, San Carlos Airport, SJC, and SFO. Noise sensitive land uses run from the southeast to the west (<http://www.airnav.com/airport/PAO>).

The facility is close to the Bayshore Freeway, which is congested most of the time. It is much closer in distance and driving time to SJC than SFO, which makes SJC the airport of choice for connecting flights. SJC maintains a general aviation facility that can serve the business-driven customer.

June



<sup>7ε</sup> *The Palo Alto Airport is popular with single-engine aircraft enthusiasts.*

## *Summary*

The Palo Alto Airport cannot reasonably be regarded as a general aviation reliever airport for SFO. It is a small, crowded facility with few amenities for the corporate aircraft that prefer to be at SFO.

### **Summary of Site-Specific Findings**

None of the three Peninsula general aviation airports have sufficient runway length or pavement strength to accommodate many of the high performance business jets that comprise the majority of general aviation operations at SFO. With the exception of Half Moon Bay, there is insufficient space for aircraft hangars at the general aviation airports, and all three airports claim to need more hangars. The tie down space at Half Moon Bay is inadequate in that the coastal location increases the chances for corrosion. Instrument landing systems are lacking at all three airports. Land use conflicts, ground access problems, and wildlife habitat issues impact all three airports. Significantly, none of the three airports wants to take on the general aviation business of SFO. Each airport has identified a specific market segment to serve and the capital improvements necessary to provide them. In general, they have decided to emphasize service to single-engine and small twin-engine recreational aircraft. At this point the market has already sorted itself out, with each of the three general aviation airports and SFO pursuing their own customer base.

Finally, general aviation operations average about two to four flights per hour at SFO. The Regional Airport System Plan process has projected that commercial aviation at SFO would grow on average by about one to two arrivals per hour per year. This means any delay reduction that would flow from the redirection of general aviation flights at SFO could be consumed in one to two years by commercial aviation growth.



## **CONCLUSION**

This report has looked at two primary alternatives to providing “upland” regional airport capacity for the Bay Area’s anticipated needs for the planning horizon of the MTC Regional Airport System Plan Update 2000 process. The report first examined the idea of developing a new international airport to replace SFO, OAK, and SJC. Based on a review of regional databases, it appears that there are no practical, feasible sites for such a replacement airport. The report reached the same conclusion about the siting of a new, somewhat smaller supplemental airport.

The report then looked at twelve locations that have been suggested as possible components of the Bay Area’s system of passenger or cargo airports that could reduce the pressure on the existing core regional airports. Of the sites considered, only those far away from Bay Area markets had some mix of favorable land, facilities, and institutional factors, but these positive factors were offset by their remoteness. Clearly, there is room at some of the larger general aviation airports in the Bay Area to accept higher levels of operations, but there appear to be no alternatives that would be suitable for the scale of a supplemental airport to reduce the need for runway reconfiguration at SFO.

The report also considered the feasibility of relocating SFO’s general aviation activity to three general aviation airports near SFO. None of the three airports, however, is capable of providing significant relief for SFO for the general aviation segment of market demand.

The existing core airports of SFO, OAK, and SJC are close to their markets and have good ground access. They have major facilities in place with ongoing commitments from the airlines and expectations for a continued flow of customers. It is unlikely that the markets would shift away from those airports to more remote or more constrained locations.



## BIBLIOGRAPHY

“Airport Beacon, The.” April 2001. Volume XXI, No. 4.

Airport Land Use Commission. September 1992. Land Use Plan for Areas Surrounding Santa Clara Airports.

Association of Bay Area Governments. 1997. Bay Area Futures Map of Potentially Available Land for Development. Oakland, CA.  
<http://www.abag.ca.gov/planning/bayareafutures/bafb.html>

Association of Bay Area Governments. December 1999. Projections 2000. Forecasts for the San Francisco Bay Area to the Year 2020.

Association of Bay Area Governments. 2000. Bay Area Counties. Oakland, CA.  
<http://www.abag.ca.gov/abag/overview/datacenter/maps/region2.gif>

Berry, William. August 30, 1999. Letter. NASA Ames to Regional Airport Planning Committee.

California Air Resources Board. 1999.

California Department of Finance. 1999. Revised Population Projections. Sacramento, CA.

California High-Speed Rail Authority. Sacramento, CA June 2000. Building a High-Speed Train System for California—Final Business Plan.

California, State of. Governor’s Office of Planning and Research. April 1999. 1999 Edition of the California Planners’ Book of Lists. Sacramento, CA.

California, State of. Public Utility Code. Section 21670 et seq. State of California. Sacramento, CA.

Calerdine, Lyn. Personal Communication. San Francisco International Airport.

Chicago O’Hare International Airport. Size and Scope.  
<http://www.ohare.com/ohare>

Coffman Associates Inc. May 20, 1997. Airport Master Plan for San Carlos Airport.

Coffman Associates, Inc. 1997. Airport Master Plan for Half Moon Bay Airport.

“Commercial Carriers Wait for Take Off From Concord.” Contra Costa Times, March 12, 2000.

Compton, August W. & Associates. December 1975. Master Plan—Livermore Municipal Airport. City of Livermore. Livermore, CA.

Contra Costa County Airports. Buchanan Field Airport.  
<http://www.ccnnet.com/buchanon>

Contra Costa County General Plan 1995-2001. 1996. Contra Costa County.

“Contra Coasta County Panel Backs off on Plan for Homeowner Disclosure of Airport Noise.”  
December 15, 2000.

<http://www.netvista.net/~hpb/hnews/dec-15.html>

Contra Costa Times. March 12, 2000. “Commercial Carriers Wait for Take off from Concord.”

Contra Costa Times. July 8, 2000. “World’s Largest (and Noisiest) Helicopter Pilot School leaves Concord Airport.”

Dallas/Fort Worth International Airport. Frequently Asked Questions.

<http://www.dfwairport.com/press/faqs/htm>

Department of Defense. July 1998. Record of Decision for the Disposal and Reuse of the Department of Defense Housing Facility Novato, California. 63 FR 37866. Federal Register Vol. 63, No. 134. U. S. Navy. Washington, D.C.

Denver International Airport. Fact Sheets.

<http://www.flydenver.com/z401-3.html>

Fairfield, City of. June 1992 as amended April 2000. City of Fairfield General Plan. Fairfield, CA.

Fairfield, City of. June 5, 2001. Personal Communication, Eve Somjen. Department of Planning and Development.

Farmer, Derek. March 2001. Personal Communication. Santa Clara County Planning and Development.

Federal Aviation Administration. March 1985. Aviation Noise Effects.

Federal Aviation Administration. 1995. Sea-Tac Airport Master Plan Update.

Fluck, David. April 16, 2001. Personal Communication. NASA Ames.

Hamilton Army Airfield Reuse Plan. October 1995, Revised November 1996. Hamilton Reuse Planning Authority.

Helicopter Adventures Newsletter. “Downwash.” November 2000.

<http://www.heli.com/news/1100newsletter.pdf>

Hodges & Shutt. May 1991. Napa County Airport Master Plan Report. County of Napa. Napa, CA.

Jantz, Richard. August 10, 2000. Personal Communication. Stanislaus County.

Kardos, Tom. Deputy Director. Personal Communication. Bureau of Design and Construction. San Francisco International Airport.

Kent, Frank. Regional Manager. Personal Communication. United Airlines.

Kreines & Kreines. August 1992. Stanislaus County Air Cargo Feasibility Study Report. Stanislaus County and Stanislaus County Economic Development Corporation. Modesto, CA.

Lange, Catherine M. Director. Personal Communication. FAA Office of Airport Planning and Programming.

“Livermore City Council Turns Down Airline’s Overtures for Commuter Service at City’s Airport.” San Francisco Chronicle. July 12, 2000.

Livermore Municipal Airport. City of Livermore.  
<http://www.ci.livermore.ca.us/airport.html>

Los Angeles County. Air Service Market Study for Palmdale Airport.

Los Angeles International Airport. Airport Facts.  
<http://www.lawa.org/lax/html/chrono.htm>

Loya, Mario. Personal Communication. Buchanan Field.

Marin County Community Development Agency. 1973 as amended 1994. Marin County Countywide Plan. County of Marin. San Rafael, CA.  
<http://www.marin.org/mc/comdev/advamce/cwp/index.html>

Marin County Community Development Agency. May 2000. Aircraft Overflight and Airspace Issues Report. San Rafael, CA. <http://www.co.marin.ca.us/bos/agdpcs/airover-000516.pdf>

Mather Airport. Northern California’s New Air Cargo Center.  
<http://www.sacairports.org/mhr/index.html>

Metropolitan Transportation Commission. November 1994. Regional Airport System Plan Update. Metropolitan Transportation Commission. Oakland, CA.

Metropolitan Transportation Commission. October 1998, as amended May, 1999. 1998 Regional Transportation Plan. Oakland, CA. <http://www.mtc.ca.gov/publications/RTP/rtpindex.htm>

Metropolitan Transportation Commission. 1998. Regional Transportation Plan. Map of Rail Improvements. Oakland, CA.

Metropolitan Transportation Commission. 1998. Regional Transportation Plan. Maps of Transportation Network by Subarea. Oakland, CA.  
<http://www.mtc.ca.gov/publications/RTP/rtpindex.htm>

Metropolitan Transportation Commission. 1998, as amended June 2000. Regional Transportation Plan: North Bay East-West Corridor. Napa Valley. Golden Gate Corridor.

Metropolitan Transportation Commission. May 2000. Draft Regional Airport System Plan Update 2000. Regional Airport Planning Committee, Metropolitan Transportation Commission. Oakland, CA.

Metropolitan Transportation Commission. May 2000. Draft Regional Airport System Plan Update 2000, Attachment B, New North Bay Airport. Regional Airport Planning Committee, Metropolitan Transportation Commission. Oakland, CA.  
[http://www.mtc.ca.gov/projects/air\\_plan/attachment\\_b.htm](http://www.mtc.ca.gov/projects/air_plan/attachment_b.htm)

Metropolitan Transportation Commission. May 2000. Transportation Blueprint for the 21st Century.  
[http://www.mtc.ca.gov/projects/blueprint/blueprint\\_index.htm](http://www.mtc.ca.gov/projects/blueprint/blueprint_index.htm)

Metropolitan Transportation Commission, R2A, Keiser and Associates, and Malone, Vince. May 2000. Draft Regional Airport System Plan Update 2000, draft Sensitivity Analysis of Factors Affecting Airport Demand and Capacity. Regional Airport Planning Committee, Metropolitan Transportation Commission. Oakland, CA.

Monroe, Michael and Olofson, Peggy, et al. 1999. Baylands Ecosystem Habitat Goals. U.S. Environmental Protection Agency. San Francisco, CA. San Francisco Bay Regional Water Quality Control Board. Oakland, CA.

Mountain View, City of. 1992 General Plan. Mountain View, CA.

NTSB Aviation Accident/Incident Database Report number LAX86MA074.

National Transportation Safety Board. Aviation Accident/Incident Database Report. Report Number LAX86MA074.

Napa, City of. December 1998. City of Napa General Plan. Napa, CA.

Napa County. May 1991. Napa County Airport Master Plan.

Napa County. June 1983 as amended January 1984. Napa County General Plan. Napa, CA.

Nicholson, Scott. April 2000. Skaggs Island Restoration, Sonoma County, California. U.S. Army Corps of Engineers, San Francisco District. San Francisco, CA.  
<http://www.spn.usace.army.mil/projects/skaggsisland.html>

Novato, City of. 1996 as amended February 2000. Novato General Plan. Novato, CA.  
<http://ci.novato.ca.us/cd/gp/gpmenu.html>

PB Aviation. March 8, 2001. Sacramento International Airport Master Plan Study.

P&D Aviation. March 1999. Final Report: Analysis of SFIA Runway Reconfiguration Impact on Regional Air Transportation Systems. San Francisco International Airport. San Francisco, CA.

Patterson, City of. June 1992. City of Patterson General Plan Policy Document. Patterson, CA.

Patterson, City of. June 1992. City of Patterson General Plan Background Document. Patterson, CA.

Pike, John. November 1997. NAVSECGRU Naval Security Group Activity Skaggs Island, CA. Federation of American Scientists. Washington, D.C.  
[http://www.fas.org/irp/agency/navsecgru/skaggs\\_island/index.html](http://www.fas.org/irp/agency/navsecgru/skaggs_island/index.html)

People Over Plans, Inc. of Contra Costa County, California.  
<http://www.geocities.com/CollegePark/Center/6680>

Randell, Annette. March 2000. Moffett Field History Tour. Moffett Field Historical Society. Mountain View, CA.  
<http://george.arc.nasa.gov/jf/mfa/history.html>

Research Program in Environmental Planning and Geographic Information Systems (REGIS). 1995. National Wetlands Inventory's Delta Wetlands Map.  
<http://www.regis.berkeley.edu/rhome/baydelta.html>

Robert, Bein, William, Frost and Associates. November 1996. Hamilton Army Airfield Reuse Plan, Final Reuse Plan. Hamilton Local Reuse Authority. City of Novato. Novato, CA.  
<http://www.rbf.com/novato/reuse.htm>

Robert, Bein, William, Frost and Associates. Environmental Impact Report for Hamilton Field Redevelopment Project. June 1999. Redevelopment Agency of the City of Novato. Novato, CA.

Sacramento County Airport System. April 12, 2000. News Release.

Sacramento County Airport System. June 16, 2000. News Release.

Sacramento Business Journal. June 9, 2000. "Sacramento International Airport Plans Five-Story Garage."

San Francisco Area. Wetlands Ecosystem Goals Project. Baylands Ecosystem Habitat Goals.

San Francisco Bay Conservation and Development Commission. January 1969 as amended July, 2000. The San Francisco Bay Plan. San Francisco, CA.  
<http://ceres.ca.gov/bcdc/ftppdf/bp/bayplan.pdf>

San Francisco Bay Conservation and Development Commission. January 1969. San Francisco Bay Plan Supplement. San Francisco, CA.

San Francisco Bay Conservation and Development Commission. December 1976. Suisun Marsh Protection Plan. San Francisco, CA.

San Francisco Bay Conservation and Development Commission. September 1966. Airports on the Bay.

San Francisco Bay Conservation and Development Commission. Bay Plan. Plan Map 14.

San Francisco International Airport. SFO Runway Reconfiguration Program EIR/EIS. Alternatives Considered and Eliminated from Detailed Study (Preliminary Report). November 2000.

San Francisco International Airport. February 2001. Final Report. Airfield Development Planning (Interim Draft).

San Joaquin County. July 1992. San Joaquin County General Plan 2010. Stockton, CA.

San Joaquin County. December 1977. Master Plan for Stockton Metropolitan Airport.

San Mateo County. December 1996. Comprehensive Land Use Plan.

Santa Clara County General Plan. as amended through 1994.

Santa Clara County Management Audit Division. October 1999. Management Audit of the Airports Division of the Roads & Airports Department of the County of Santa Clara. San Jose, CA.

<http://countyroads.org/news,htm#AirportAudit>

Santa Clara County Planning Office. 1997. Annual Report. County of Santa Clara. San Jose, CA.

<http://www.sccplanning.org/pdf/97annrpt.pdf>

“San Jose Airport Under Pressure to Expand.” The Business Journal of San Jose. June 19, 2000.

San Jose International Airport Master Plan Update, Final Environmental Impact Statement.

Skaggs Island Foundation. 1997. Skaggs Island Reuse Plan.

<http://www.sonic.net/~skaggs/reuseplan.html>

Solano County. December 1980 as amended July 1995. Solano County Land Use and Circulation Element. Fairfield, CA.

Sonoma County. June 16, 1988. Sonoma County General Plan Air Transportation Element.

Sonoma County. March 1989. Sonoma County General Plan. Santa Rosa, CA.

Sonoma County. 1998. Sonoma County Airport Master Plan.

Sonoma County. December 1998. Permit and Resource Management Department. 1998

Sonoma County Airport Master Plan. Sonoma County Airport.

Sonoma County Agricultural Preservation and Open Space District. June 2000. Acquisition Plan 2000 for Sonoma County. Santa Rosa, CA.

<http://www.openspaceplan.org/plan/Default.htm>

Sonoma County Permit and Resource Management Department. December 1998. Sonoma County Airport Master Plan. Santa Rosa, CA.

Sorensen, A.A., Greene, R.P., and Russ, K. March 1997. Farming on the Edge. American Farmland Trust. DeKalb

[http://farmlandinfo.org/cae/foe2/report/foe\\_exec.html](http://farmlandinfo.org/cae/foe2/report/foe_exec.html)

Speas, R. Dixon Associates. December 1977. Master Plan for Stockton Metropolitan Airport. County of San Joaquin. Stockton, CA.

Starr, Chuck, MSgt. USAF 60th Air Mobility Wing Historian. Travis Air Force Base History. U.S. Air Force, 60th Air Mobility Wing. Travis Air Force Base, CA.  
[http://www.travis.af.mil/60amw/travis\\_history.html](http://www.travis.af.mil/60amw/travis_history.html)

Stanislaus County. June 1987 as revised December 1990. Stanislaus County General Plan Support Documentation. Modesto, CA.

Stanislaus County. October 1994. Stanislaus County General Plan. Modesto, CA.

Stockton Metropolitan Airport. August 1999. Welcome to the Stockton Metropolitan Airport.  
<http://www.stocktonet.com/community/airport>

Stockton, City of. January 1990. City of Stockton General Plan Background Report. Stockton, CA.

Stockton, City of. January 1990. City of Stockton General Plan Policy Document. January 1990 as amended December 1993. Stockton, CA.

Stockton, City of. January 1992. General Plan Background Report.

Suisun City, City of. May 1992. City of Suisun City General Plan Update Suisun City, CA.

Travis AFB. June 12, 2000. Personal Communication. Department of Defense. Media Relations Officer.

U.S. Army Corps of Engineers. U.S. Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control, Jones & Stokes Associates, Inc. December, 1998. Hamilton Wetland Restoration Plan, Volume II: Final EIR/EIS. California State Coastal Conservancy. Oakland, CA. U.S. Army Corps of Engineers, Environmental Planning Section. San Francisco, CA.

U.S. Army Corps of Engineers. February 1996. Environmental Impact Statement Hamilton Army Airfield Disposal and Reuse. Sacramento, CA.

U.S. Army Corps of Engineers. San Francisco District. "Skaggs Island Restoration."  
<http://www.spn.usace.army.mil/projects/skaggsisland.html>

U. S. Department of Transportation. Federal Aviation Administration. December 1999. Federal Aviation Administration Order 5100.38A CHG. 1: Procedures for the Administration of the Airport Improvement Program. Washington, D.C.

U. S. Geological Survey. 1999. San Francisco Bay Area Faults Map.  
<http://quake.wr.usgs.gov/study/wg99/media/>

Western Aeronautical Test Range, Dryden Flight Research Center. May 1995. WATR Historical Background. National Aeronautics and Space Administration, Dryden Flight Research Center. Edwards Air Force Base, CA. <http://www.dfrc.nasa.gov/Facility/WATR/background.html>

Williams, Jeff. "Throttling passenger service – Packed Livermore Airport meeting generates loud objections." Pleasanton Weekly. June 30, 2000. Pleasanton, CA.  
[http://www.pleasantonweekly.com/morgue/2000\\_06\\_30.airport30.html](http://www.pleasantonweekly.com/morgue/2000_06_30.airport30.html)

Woodyard, Chris. April 17, 2001 . "Some runways have room to spare." USA Today.

# **APPENDIX A: PLANNED IMPROVEMENTS TO BAY AREA TRANSPORTATION NETWORK BY SUBAREA**

## **GOLDEN GATE CORRIDOR (Figure 9)**

### **TRACK 1 PROJECTS**

1. US 101 HOV lanes from Santa Rosa to Windsor
2. US 101 HOV lanes from Novato to Petaluma\*
3. US 101 HOV lanes from Lakeville Highway (Route 116 East) to Old Redwood Highway North in Petaluma
4. US 101 interchange improvements:
  - Steele Lane (Sonoma Co.)
  - Greenbrae (Marin Co.)
  - Tiburon (Marin Co.)
  - River Road (Sonoma Co.)
  - East Washington (Sonoma Co.)
  - Rainier (Sonoma Co.)
  - Old Redwood Highway (Sonoma Co.)
5. US 101 reversible HOV lane in San Rafael\*
6. Doyle Drive replacement\*
7. Partially fund seismic retrofit of the Golden Gate Bridge (Phases 2 and 3)

\*Project funding assumes a contribution from the State's discretionary funds (Interregional Improvement Program)

## **NORTH BAY EAST-WEST CORRIDOR (Figure 10)**

### **TRACK 1 PROJECTS**

1. Route 12 Jamison Canyon widening between Highway 29 and I-80\*
2. Routes 37/121 intersection improvements
3. Priority intersection and safety/operational projects on Routes 12/116/121:
  - Routes 121/12
  - Route 116/Adobe Rd.
  - Routes 116/121
  - Route 121 shoulder widening
4. Traveler information system on Route 37
5. Park-and-ride lot at Routes 37/29

\*Project funding assumes a contribution from the State's discretionary funds (Interregional Improvement Program)

## **INTERSTATE 80 CORRIDOR (Figure 11)**

### **TRACK 1 PROJECTS**

1. Extend I-80 HOV lanes from Route 4 to the Carquinez Bridge\*
2. I-80 HOV lanes from Fairfield to Vacaville\* I-80 interchange and arterial improvements (not mapped)
3. Station/other improvements to Capitol Corridor Intercity rail service\*
4. San Pablo Ave. quality bus service
5. I-80 reliever route (Solano Co.)
6. Purchase buses:
  - I-80 express service
  - Solano Co. intercity service (not mapped)
7. Widen Appian Way to I-80

\*Project funding assumes a contribution from the State's discretionary funds (Interregional Improvement Program)

## **INTERSTATE 680 CORRIDOR (Figure 12)**

### **TRACK 1 PROJECTS**

1. I-680 auxiliary lanes
2. Route 24 auxiliary lanes in Orinda
3. I-680/Alcosta interchange improvements
4. Various arterial improvements including:
  - Alhambra Ave.
  - Pacheco Blvd.

## **INTERSTATE 580 CORRIDOR (Figure 13)**

### **TRACK 1 PROJECTS**

1. I-238 eastbound widening between I-580 and I-880
2. I-580 eastbound auxiliary lane, ramp meters (Tri-Valley)

## **SANTA CLARA VALLEY SUBAREA (Figure 14)**

### **TRACK 1 PROJECTS**

1. Tasman East light-rail extension
2. Vasona and Capitol light-rail extensions
3. HOV system additions
  - Central Expressway
  - Route 87
4. US 101 auxiliary lanes from Route 87 to Trimble Rd.
5. Montague Expressway widening from I-680 to US 101 with improved HOV lanes
6. Altamont Commuter Express (ACE)/Capitol rail corridor improvements
7. Expressway and SMART corridor signal synchronization

8. Rapid bus corridor for VTA bus line 22 Transit centers and park-and-ride lots (Not mapped)
9. Widen US 101 to six lanes from South San Jose to Morgan Hill\*
10. Routes 85/87 interchange improvements
11. Routes 85/101 interchange improvements
12. Widen and improve Highway 17 between Los Gatos and San Jose
13. Added Caltrain service to South County
14. Route 152 safety improvements

\*Project funding assumes a contribution from the State's discretionary funds (Interregional Improvement Program)

