

Moraga Flight Track Survey

May 31, 2006

Summary

An aircraft overflight survey was performed for an area in Moraga, California, located in Contra Costa County for five; one week periods in Calendar Year (CY) 2002, CY2003, CY2004, CY2005, and CY2006. Aircraft that passed through a 1.9-mile radius and 15,000 feet in height, Point of Closest Approach (PCA) cylinder, depicted by an orange colored circle – centered on the intersection of Berkshire Street and Augusta Drive, were identified and evaluated. During typical operating conditions, Oakland International Airport (OAK) arrivals and departures will pass through this area, San Francisco International Airport (SFO) departures will pass through this area and aircraft from other General Aviation airports will pass through this area.

For the five periods surveyed, there were on average 2,430 arrivals and 2,514 departures from OAK and 3,175 arrivals and 3,093 departures from SFO. On average 33 arrivals and 50 departures from OAK flew through the PCA cylinder and had an average altitude of 3,854 feet and 7,472 feet above mean sea level (MSL) respectively. SFO had on average 21 arrivals and 105 departures with an average altitude of 5,671 and 10,533 feet MSL respectively.

The following date ranges were used:

1. Sunday, March 31, 2002 through Saturday, April 6, 2002
2. Sunday, March 30, 2003 through Saturday, April 5, 2003
3. Sunday, March 28, 2004 through Saturday, April 3, 2004
4. Sunday, March 27, 2005 through Saturday, April 2, 2005
5. Sunday, March 26, 2006 through Saturday, April 1, 2006

Background

Air traffic patterns in the Moraga area of Contra Costa County are associated with both OAK and SFO. During typical west flow airport operations there are three dominate air traffic patterns over Moraga. They include OAK arrivals and departures and SFO departures. Three Federal Aviation Administration (FAA) ground navigational aids; Oakland VORTAC, Sacramento VORTAC, and Linden VORTAC, with a ground location at OAK, Sacramento (California), and Linden (California), respectively, allow for these air traffic patterns.

Attached are seven maps. The base maps depict the locations of the ground navigation aids; navigation intersection and fix, SFO, OAK and PCA survey location. The four flight track maps provide the typical operational patterns for OAK and SFO in one 24-hour period (Sunday, March 31, 2002) and flight tracks that penetrated the PCA from March 31, 2002 through April 6, 2002.

Moraga Overflights and Point of Closest Approach Summary

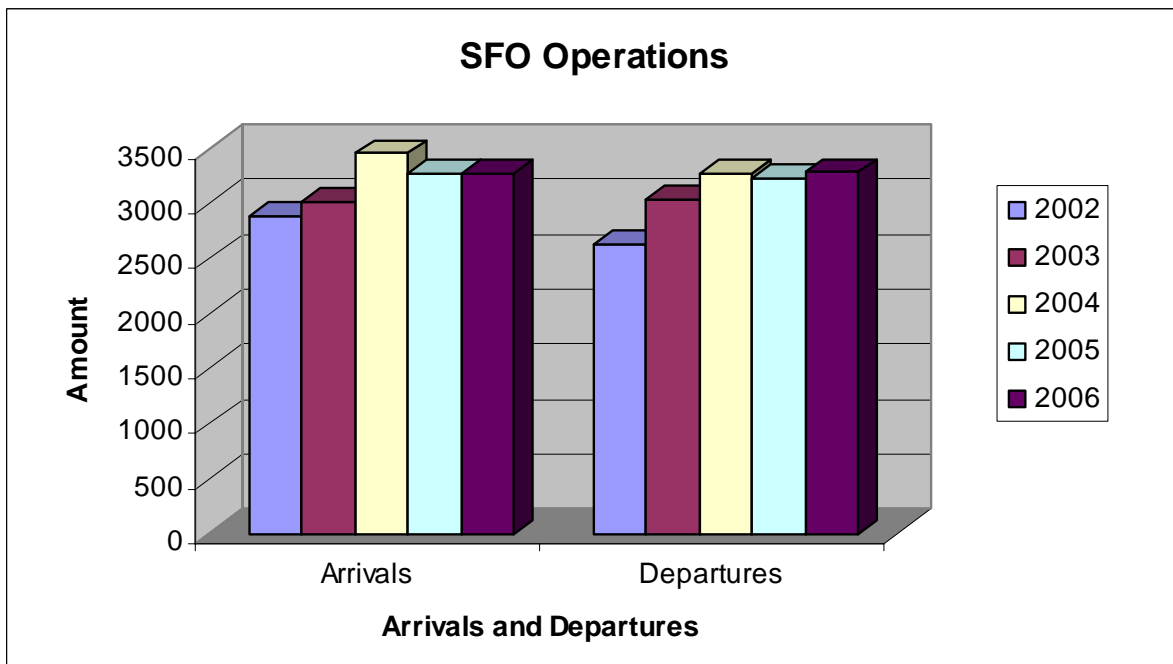
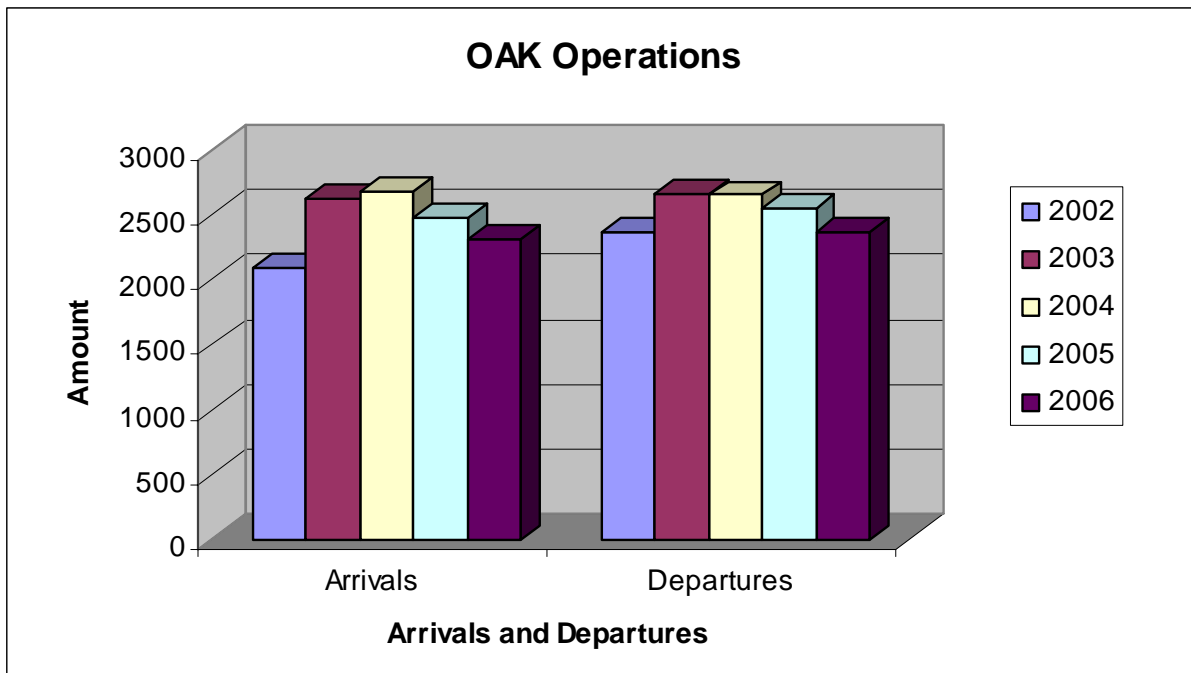
CY2002											
Oakland International Airport	PCA Arrivals	% of All Arrivals	Average PCA Altitude	PCA Departures	% of All Departures	Average PCA Altitude	PCA Total	% of Total	Arrivals	Departures	Total
Day ¹	51	3.6%	3788	101	5.9%	6997	152	4.8%	1425	1716	3141
Evening ²	14	3.6%	4156	16	5.4%	8216	30	4.4%	385	299	684
Night ³	8	2.9%	3942	11	3.2%	5566	19	3.1%	272	343	615
									2082	2358	4440
San Francisco International Airport											
Day	1	0.0%	4098	147	7.6%	10410	148	3.7%	2049	1925	3974
Evening	0	0.0%	N/A	9	3.1%	10892	9	1.1%	533	291	824
Night	0	0.0%	N/A	3	0.7%	8582	3	0.4%	300	420	720
									2882	2636	5518
CY2003											
Oakland International Airport	PCA Arrivals	% of All Arrivals	Average PCA Altitude	PCA Departures	% of All Departures	Average PCA Altitude	PCA Total	% of Total	Arrivals	Departures	Total
Day	96	5.4%	3845	121	6.3%	7653	217	5.8%	1793	1925	3718
Evening	19	4.1%	4058	17	6.2%	8557	36	4.9%	458	273	731
Night	27	7.3%	4264	27	5.8%	4849	54	6.5%	370	465	835
									2621	2663	5284
San Francisco International Airport											
Day	1	0.0%	5486	281	12.5%	10797	282	6.3%	2205	2255	4460
Evening	0	0.0%	N/A	20	6.9%	10335	20	2.5%	497	289	786
Night	2	0.6%	4564	13	2.6%	11363	15	1.8%	313	498	811
									3015	3042	6057
CY2004											
Oakland International Airport	PCA Arrivals	% of All Arrivals	Average PCA Altitude	PCA Departures	% of All Departures	Average PCA Altitude	PCA Total	% of Total	Arrivals	Departures	Total
Day	50	2.8%	3577	135	7.2%	7147	185	5.1%	1790	1864	3654
Evening	11	2.3%	3526	16	4.9%	6655	27	3.4%	478	326	804
Night	12	3.0%	4019	18	3.9%	6187	30	3.5%	405	457	862
									2673	2647	5320
San Francisco International Airport											
Day	4	0.2%	8812	428	17.4%	10399	432	8.7%	2506	2465	4971
Evening	1	0.2%	5597	25	8.9%	10942	26	2.9%	628	282	910
Night	0	0.0%	N/A	11	2.1%	8727	11	1.3%	317	526	843
									3451	3273	6724
CY2005											
Oakland International Airport	PCA Arrivals	% of All Arrivals	Average PCA Altitude	PCA Departures	% of All Departures	Average PCA Altitude	PCA Total	% of Total	Arrivals	Departures	Total
Day	56	3.5%	3383	132	7.3%	7810	188	5.5%	1621	1804	3425
Evening	5	1.1%	3519	32	10.2%	8196	37	4.9%	436	314	750
Night	17	4.1%	3685	20	4.7%	6914	37	4.4%	411	428	839
									2468	2546	5014
San Francisco International Airport											
Day	20	0.9%	5608	326	14.0%	10691	346	7.5%	2269	2322	4591
Evening	2	0.4%	5566	39	10.7%	10991	41	4.4%	570	364	934
Night	0	0.0%	N/A	14	2.6%	10210	14	1.4%	423	548	971
									3262	3234	6496
CY2006											
Oakland International Airport	PCA Arrivals	% of All Arrivals	Average PCA Altitude	PCA Departures	% of All Departures	Average PCA Altitude	PCA Total	% of Total	Arrivals	Departures	Total
Day	99	6.5%	3874	77	4.7%	8315	176	5.6%	1521	1642	3163
Evening	12	2.8%	4259	22	6.9%	9905	34	4.5%	433	319	752
Night	18	5.1%	3916	9	2.3%	9114	27	3.6%	353	397	750
									2307	2358	4665
San Francisco International Airport											
Day	206	9.3%	5891	204	8.8%	11071	410	9.1%	2218	2308	4526
Evening	29	4.9%	5771	38	9.6%	10976	67	6.8%	589	395	984
Night	45	9.8%	5315	24	4.2%	11605	69	6.7%	459	578	1037
									3266	3281	6547
									12151		
										12572	
									24723		
									15876		
										15466	
									31342		

¹ Flights between 7:00 a.m. and 6:59 p.m.

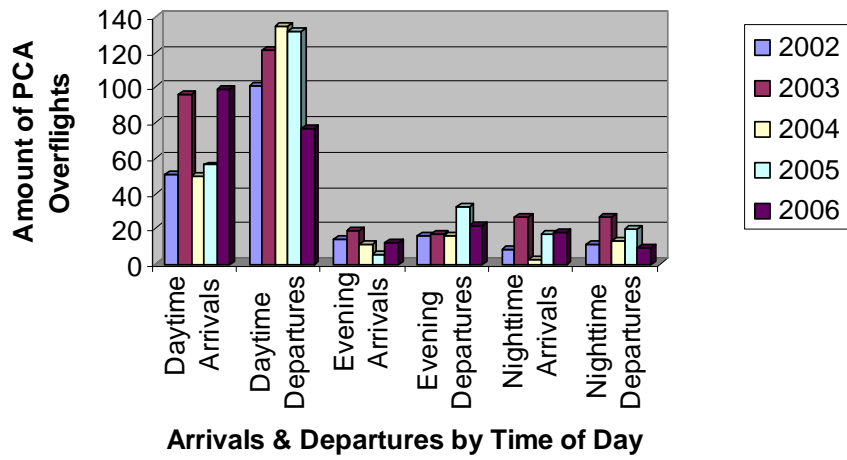
² Flights between 7:00 p.m. and 9:59 p.m.

³ Flights between 10:00 p.m. and 6:59 p.m.

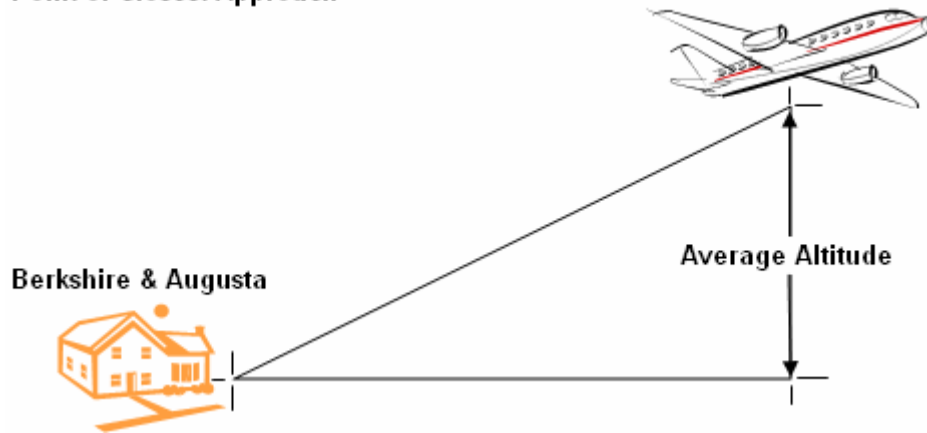
Amount of Arrivals and Departures by OAK and SFO during the five week survey periods.



OAK - Point of Closest Approach

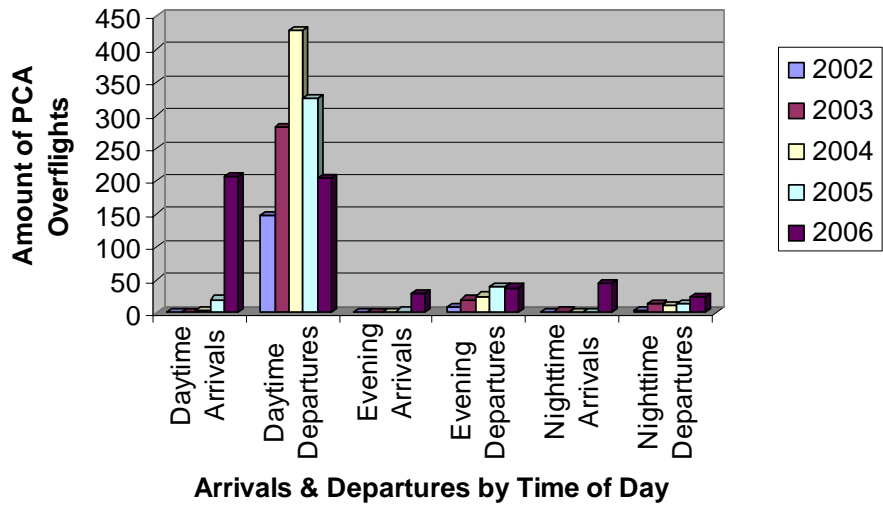


Point of Closest Approach

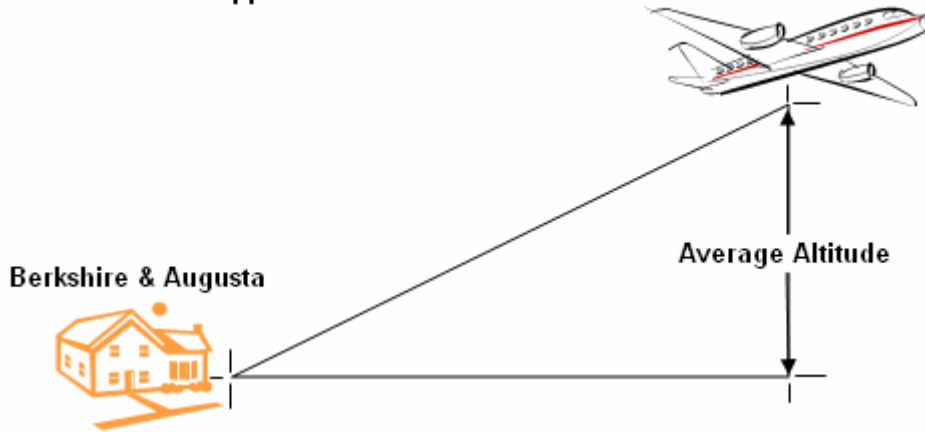


OAK	Average PCA Altitude - Daytime		Average PCA Altitude - Evening		Average PCA Altitude - Nighttime	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
2002	3,788	6,997	4,156	8,216	3,942	5,566
2003	3,845	7,653	4,058	8,557	4,264	4,849
2004	3,577	7,147	3,526	6,655	4,019	6,187
2005	3,383	7,810	3,519	8,196	3,685	6,914
2006	3,874	8,315	4,259	9,905	3,916	9,114

SFO - Point of Closest Approach

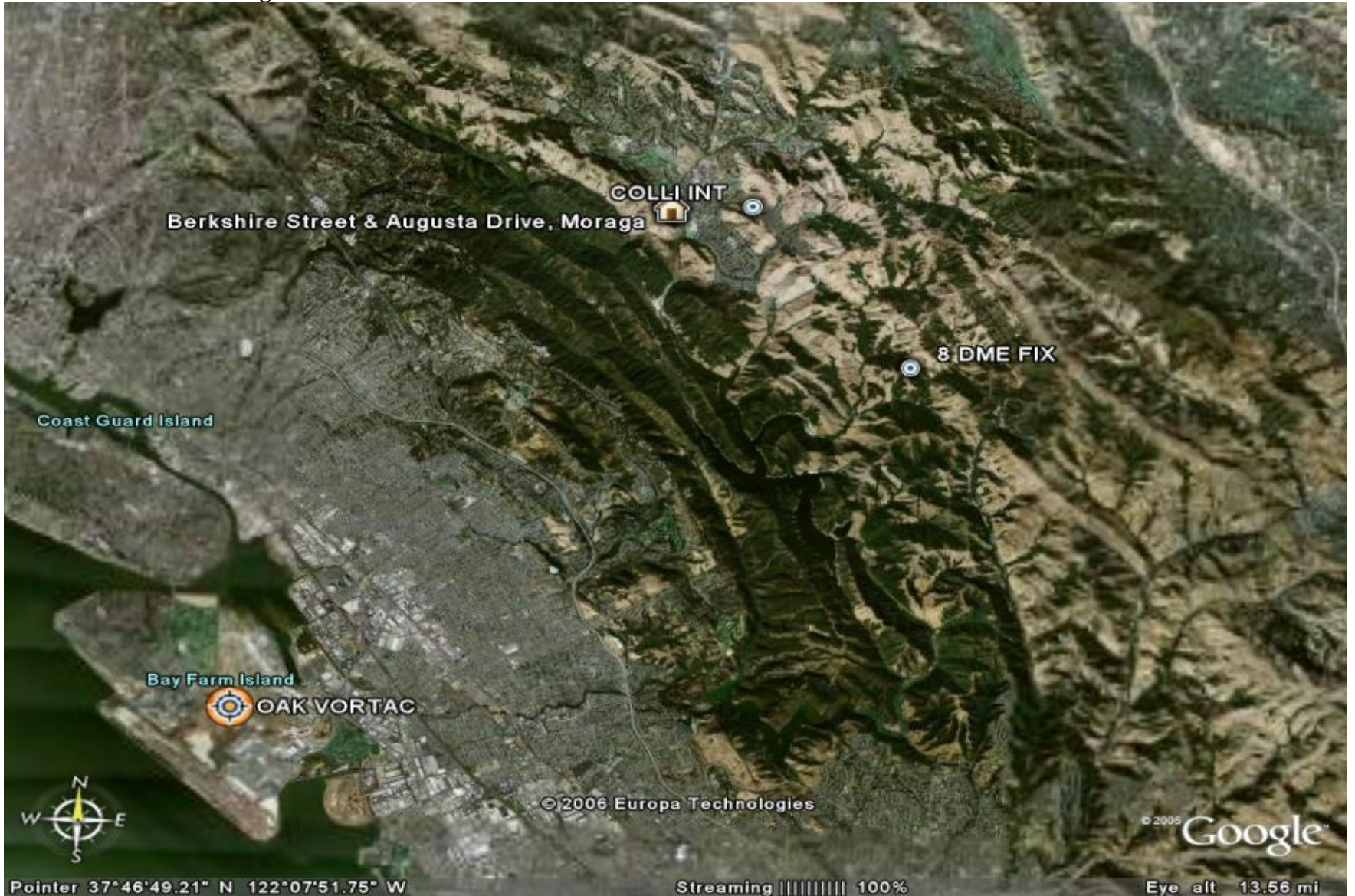


Point of Closest Approach

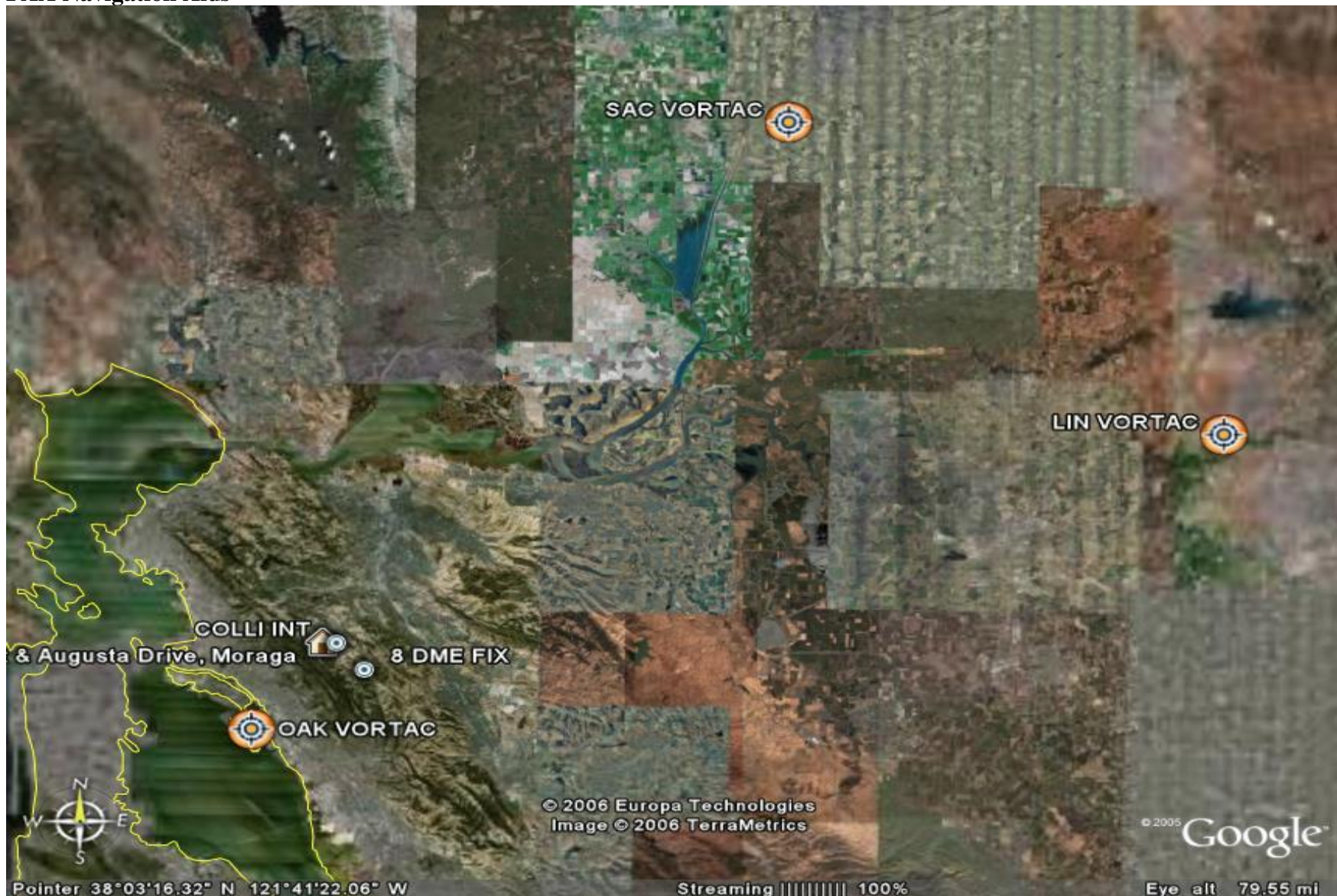


SFO	Average PCA Altitude - Daytime		Average PCA Altitude - Evening		Average PCA Altitude - Nighttime	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
2002	4,098	10,410	none	10,892	none	8,582
2003	5,486	10,797	none	10,335	4,564	11,363
2004	8,812	10,399	5,597	10,942	none	8,727
2005	5,608	10,691	5,566	10,991	none	10,210
2006	5,891	11,071	5,771	10,976	5,315	11,605

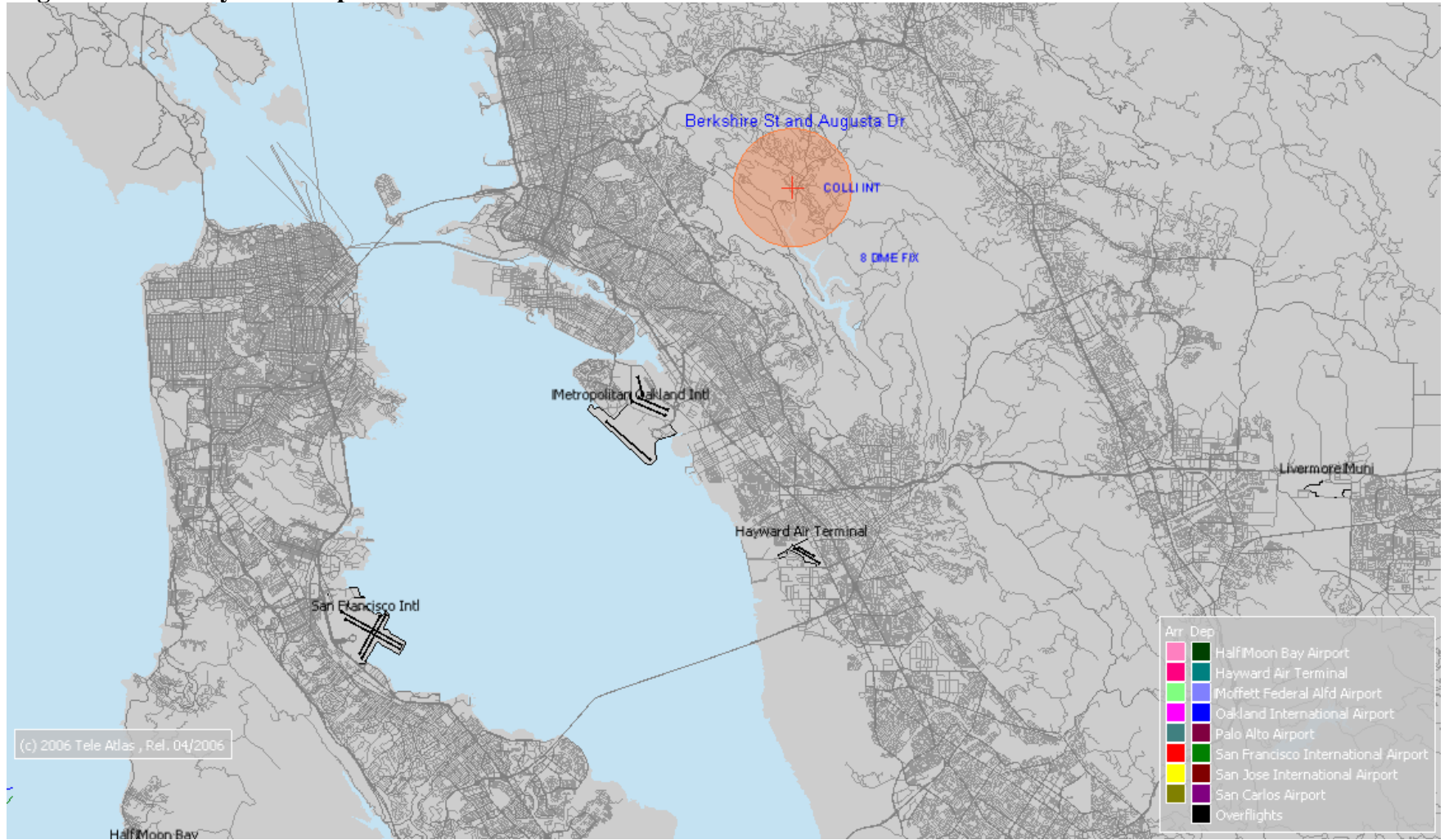
Berkshire Street and Augusta Drive



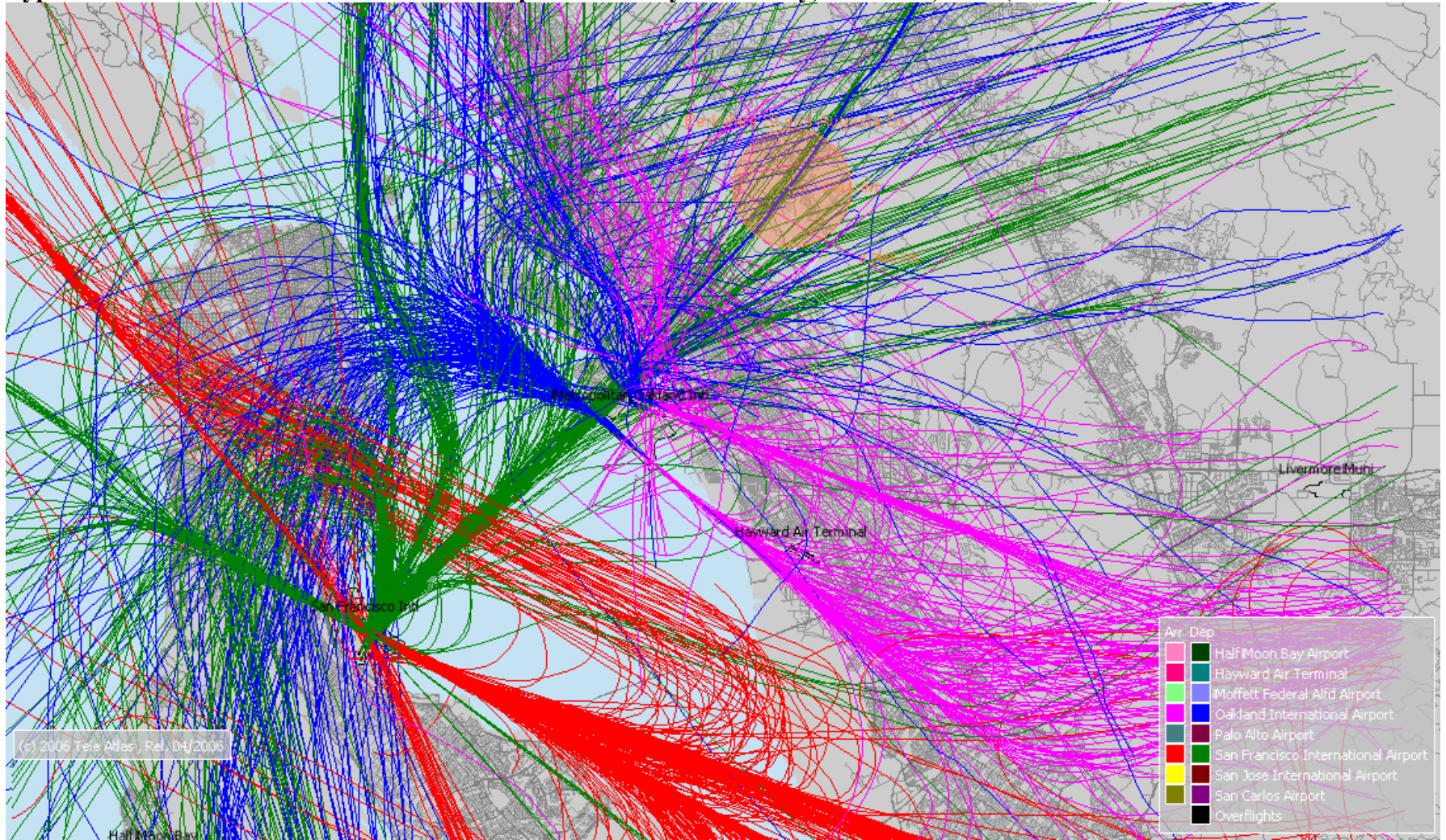
FAA Navigation Aids



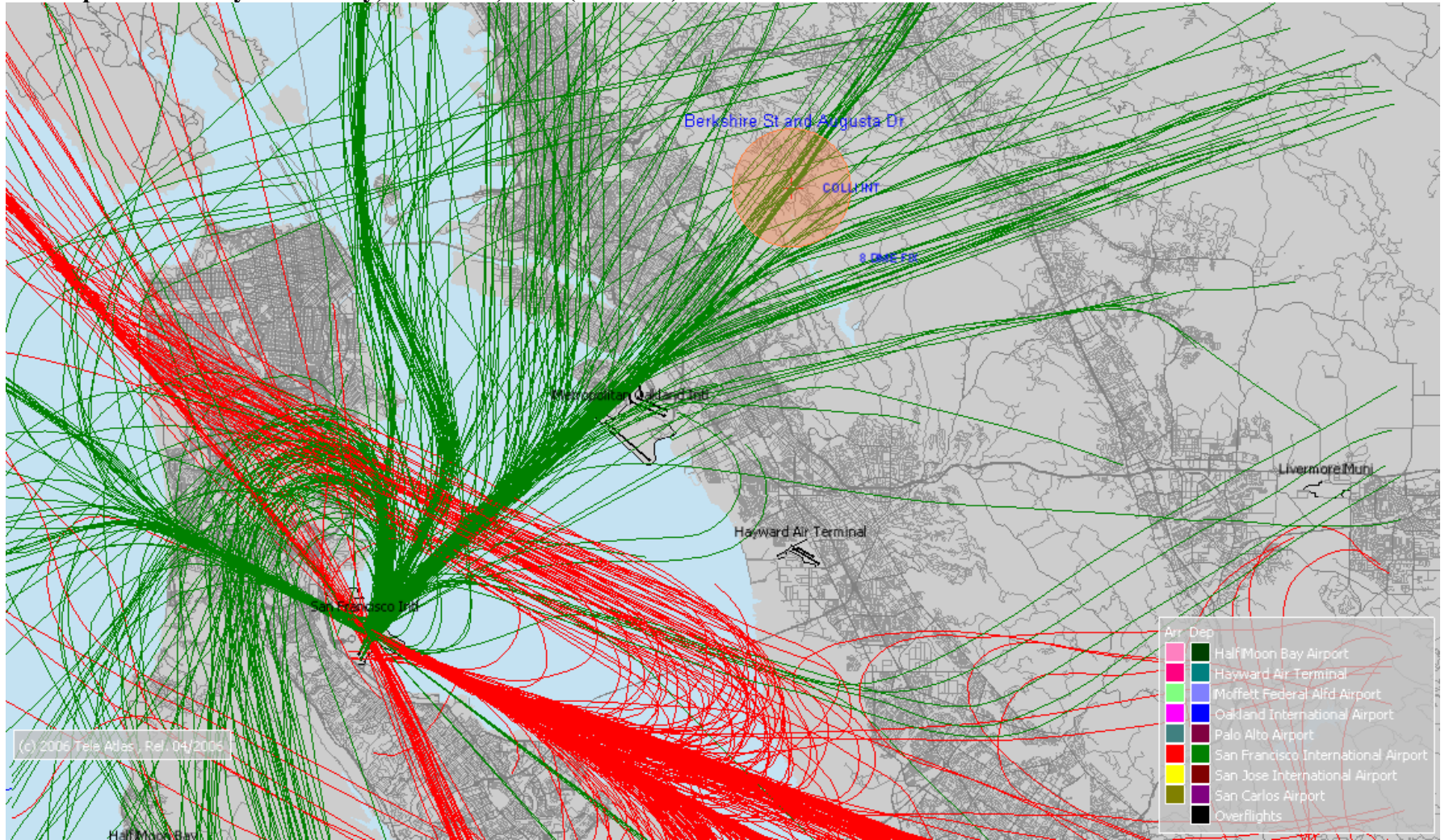
Flight Track Survey Base Map



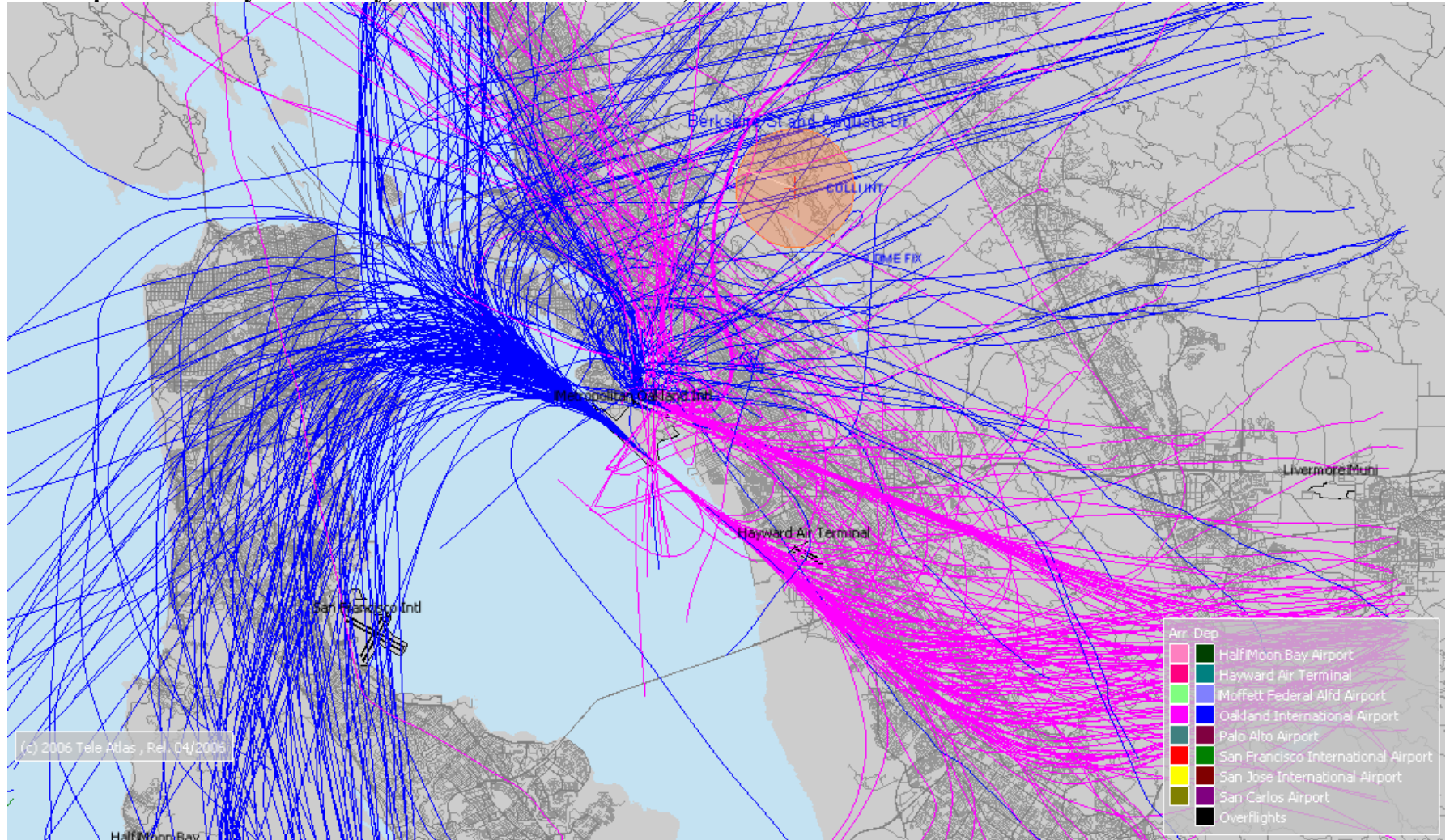
Typical West Flow Pattern – OAK and SFO Operations Only for Sunday, March 31, 2002 (24 hours)



SFO Operations Only for Sunday, March 31, 2002 (24 hours)



OAK Operations Only for Sunday, March 31, 2002 (24 hours)



PCA Selected Flight Activities from Sunday, March 31, 2002 through Saturday, April 6, 2002

