CHAPTER 4
AVIATION ACTIVITY TRENDS

4.1 PURPOSE

This Chapter addresses the following questions:

- What is the regional aviation growth picture over the next 20 years?
- What is the current mix of aviation activity at Renton airport and how much of it is generated by local activity as opposed to flights from other airports in the region or beyond?
- What is the growth picture at Renton itself and what mix of activity is likely to be included?
- What are the impacts of projected new airport usage on airport services?

The chapter begins with a review and update of aviation forecasts produced by the Puget Sound Regional Council (PSRC) for the four-county PSRC region (i.e., King, Pierce, Snohomish, and Kitsap Counties), and then applies these forecasts to Renton. Existing reports used in this analysis include the Regional Airport System Plan, or "RASP" (Puget Sound Regional Council, 2001), as well as relevant documents from the FAA, WSDOT Aviation, and the City of Renton.

4.2 CONCLUSIONS

- Renton Municipal Airport and the Will Rogers–Wiley Post Memorial Seaplane Base are part of the regional airport system and, through their location close to population centers, fulfill a critical role in the system.
- While the number of pilots in the U.S. has slightly decreased in recent years, in the west, and in particular in the Puget Sound region, the number of pilots per 100,000 population is more than 50% higher than in average across the country, contributing to demand for airport facilities.
- The number of based aircraft in King County is expected to increase by 190 aircraft, or 13%, by 2021. Renton's share of this increase is with 24 aircraft, or 8% of the current aircraft based at Renton, lower than the average, due to the space constraints at the airport. Should space now occupied by Boeing become available during the planning time frame, it can be expected that Renton will become home to a larger share of new aircraft in the region due to its proximity to population centers. There will be pressure to increase the number of jets and multi-engine aircraft based at the airport, although they are expected to account for no more than 13% of all based aircraft at the airport by 2021.

- In the region, the number of operations is projected to grow faster than the number of based aircraft. Renton is expected to maintain its current share of operations in the region over the planning timeframe. Operations in King County are projected to increase by 21% over the timeframe, and 15% at Renton.

- Since the demand for services such as fueling and aircraft maintenance is reasonably proportionate to the number of aircraft based at the airport and the number of operations, demand for these services at Renton can be expected to increase only moderately.

- There is currently a significant gap between demand and supply for hangar space for aircraft storage in the region. The gap is expected to remain in place over the planning timeframe. The Boeing company's decision to return a portion of its leasehold on Apron C permanently to the City, allows for construction of additional hangar space and could provide a revenue source for the City.

- Since Renton is the only seaplane base in the region with any potential for growth, the number of aircraft based at the airport may increase more than projected if additional facilities and storage capacity for seaplanes were provided.

4.3 FINDINGS

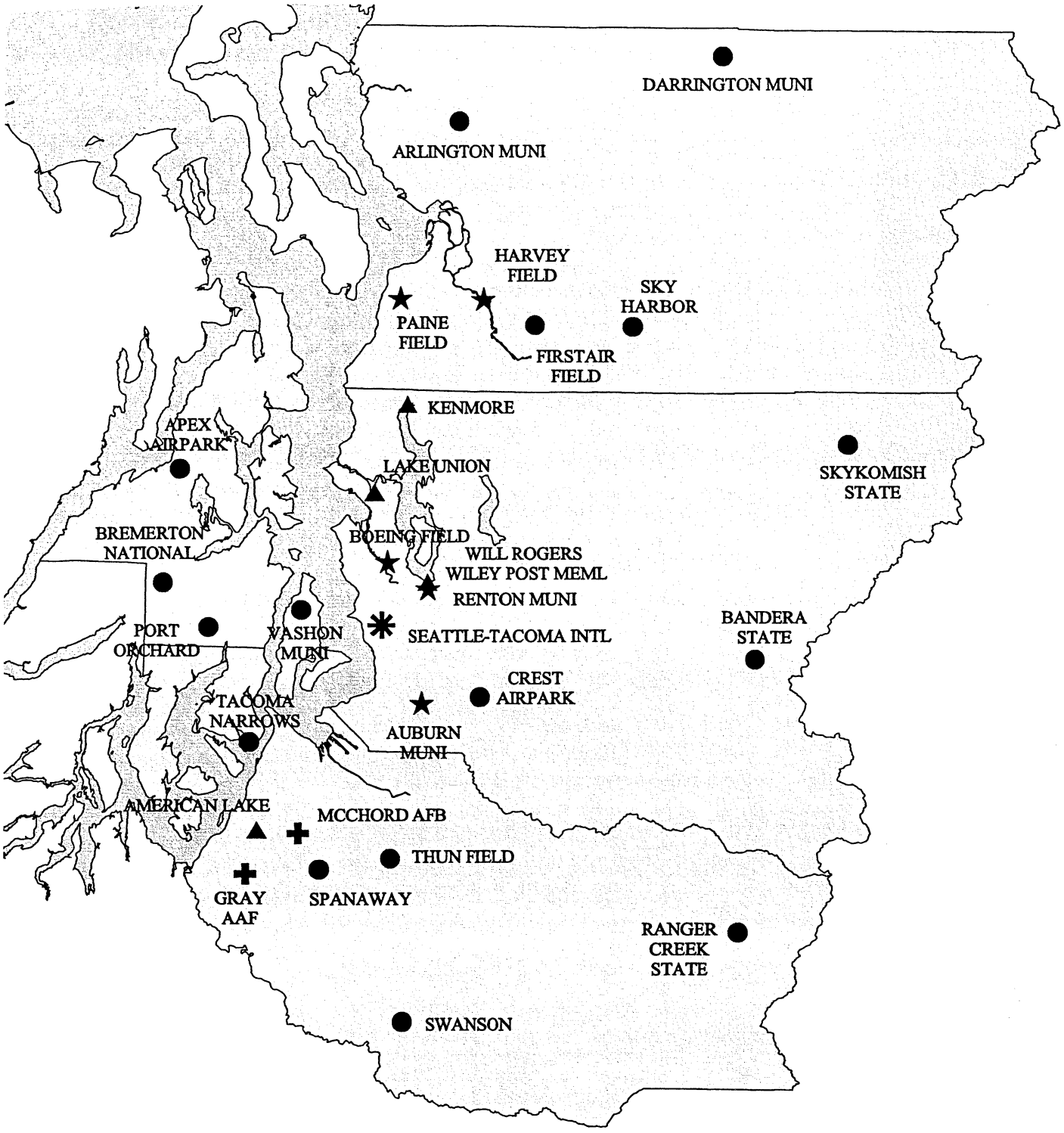
The following section provides a brief overview of the regional airport system and analyzes the current status and forecasts for general aviation for the planning timeframe, with an emphasis on the Puget Sound region and Renton Municipal Airport. Three individual measures are used, including statistics on the number of licensed pilots, records of based aircraft, and estimates of aircraft usage. Where possible, the most recent data has been added to the information provided in the existing documents in order to bring them up to date.

4.3.1 The Regional Airport System

Renton Municipal Airport is part of Central Puget Sound's system of 28 airports. Figure 4-1, on the following page, provides a map of all airports currently in use in the region. Within the region, the number of airports within each county is fairly consistent with the population in each county. The Regional Airport System Plan indicates that King County, with 53% of population, is home to 39% of the region's airports, while Kitsap County with 7% of the population of the region also provides 7% of the airports in the region.

Renton is one of 11 airports in King County. It is one of 11 airports that are part of the National Plan of Airport Systems (NPIAS), one of five general aviation reliever airports, and of a total of 18 general aviation airports in the region.

Regional Airport System



Airports

- ✱ Primary
- ★ Reliever
- ● General Aviation
- ✚ Military
- ▲ Sea Plane

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Land use encroachment, economic issues and environmental considerations have in recent years led to a significant loss in the number of airports in the region. The RASP indicates that, since 1969, 10 public-use airports have permanently closed, including Bellevue, Campell, Cedar Grove, Duvall, Enumclaw, Green Valley, Issaquah, Martha Lake, and Wax Orchard. The closure of these airports has further increased pressure on the remaining airports and makes their continued operation even more important.

Renton Municipal Airport actually counts as two airports in the regional system; one is the Will Rogers–Wiley Post Memorial Seaplane Base and the other is the airport itself. Both are operated as a single entity by the City of Renton through its Planning, Building & Public Works Department.

The seaplane facility is unique in the region as the other nearby seaplane bases are privately owned and not open to all users. It also has historic significance. It is so named to commemorate the great flier Wiley Post and his companion, the part-Oklahoma, part Cherokee and famous humorist and journalist, Will Rogers. Wiley Post twice, in 1931 and 1933, set the record for flying around the world, the second time in 7 days and 19 hours. Post and Rogers departed from the Renton seaplane facility to make the last, fatal trip, to Barrow, Alaska in 1935.

The Will Rogers–Wiley Post Memorial Seaplane Base is the only publicly owned seaplane facility in the region and serves a role in taking passengers to the San Juan Islands and to Canada's Gulf Islands and Vancouver Island.

4.3.2 Pilot Licenses

4.3.2.1 Recent Trends in Pilot Licenses

The number of active U.S. pilot certificates declined slowly over the past decade. In 1990, there were a total of 702,659 pilot certificates in the United States. By 1998, this total had fallen to 618,298, an average annual loss of 1.6%.

This decline in the number of active pilot certificates reflects a number of factors, including the recession in the early part of the decade, the aging of the pilot population, and the increasing expense of flying. Figure 4-2, below, outlines the changes in pilot certificates during the 1990s.

Figure 4-2: Growth Trends in Pilot Certificates

Certificate Type	1990	1998	Annual Decline
Pilot—Total	702,659	618,298	-1.6%
Student	128,663	97,736	-3.4%
Recreational	87	305	17.0%
Private	299,111	247,226	-2.4%
Commercial	149,666	122,053	-2.5%
Airline Transport	107,732	134,612	2.8%
Other	17,400	16,366	-0.8%

Source: FAA.

While the number of pilots may be declining nationally, in the West there is a significantly higher prevalence of pilots than in the nation as a whole. As shown in Figure 4-3, the national average is 229.5 license pilots per 100,000 population. However, in the West, the average is more than 50% higher. In the FAA Northwest Mountain Region (Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming), the average is 357.1 pilots per 100,000 population. In Washington State, the average is yet higher, at 366.3 per 100,000. The average in the PSRC region is higher still, with 372.8 licensed pilots per 100,000 population.

Figure 4-3: Licensed Pilots per Capita

	Nation	FAA NW Mt. Region*	State of Washington	PSRC Region
Population	269,429,000	17,632,010	5,685,300	3,149,700
Active Pilots	618,298	62,969	20,841	11,743
Active Pilots per 100,000	229.5	357.1	366.3	372.8

Sources: FAA, PSRC.

There are a number of possible explanations for the high numbers of pilots in the Northwest Mountain Region. For one, population density in the Northwest Mountain Region is lower than in other parts of the country: the distances between populations tend to be much greater, and flying is the fastest way to travel.

The high prevalence of pilots in the Puget Sound region is interesting, because the population density in the four-county area is much higher than in the rest of the Northwest Mountain Region. It is possible that the historic ties between Puget Sound and aviation (i.e., the number of people tied to Boeing) create more of an awareness of aviation, and people choose flying as an avocation.

4.3.2.2 FAA Forecast of Active Pilots

According to the RASP, the population of active pilots in the United States is forecast to increase at an average annual growth rate of 1.5% between 1999 and 2010, with a total increase of nearly 117,000 pilots for the period. For the entire long-range forecast period (1998-2025) the FAA predicts annual growth of 1.2%. This forecast reflects the industry view that current initiatives will foster the growth of student starts.

Increased student starts are expected to lead to larger numbers of pilots in other categories, particularly private pilots, over the course of the forecast period. The FAA's forecasts show the following annual growth rates for the four major pilot groups:

Figure 4-4: FAA Forecast 1999-2010

Pilot Group	Annual Growth Rate
Student	2.3%
Private	1.6%
Commercial	0.5%
Airline transport	1.5%

Source: FAA.

4.3.3 Based Aircraft

4.3.3.1 Recent Trends in Based Aircraft

Between 1989 and 1994 the number of general aviation aircraft in the United States declined, falling from just over 205,000 aircraft in 1988 to 170,600 in 1994. Following 1994, however, the industry executed a major turnaround. By 1999, the number of general aviation aircraft had regained all the losses of the previous five years, reaching a high of 206,530 aircraft in 1999.

Figure 4-5: General Aviation Fleet Growth

	1989	1994	1999	% Change from 1989
Active General Aviation Aircraft	205,000	170,600	206,530	0.7

Source: FAA.

A primary reason for this turnaround was the tort reform law passed by Congress in the early part of the decade. Before the enactment of this law, general aviation manufacturers were liable for defects in aircraft for the life of the aircraft. The problem with this was that a major share of the fleet was more than 20 years old, and manufacturers were being sued for millions of dollars of damages any time an airplane crashed. The resulting cost of insurance led many manufacturers into bankruptcy, and the production of new single-engine airplanes ground to a halt. Tort reform limited the liability to 18 years, which was enough to re-invigorate the industry, and bring new aircraft to the market.

In Washington State, there are substantially more aircraft per capita than there are in the rest of the country. The national average is 72.3 aircraft per 100,000 people, but in Washington the average is over 50% higher than that, with 112.1 aircraft per 100,000 people. In the four-county PSRC region, this ratio is even higher, with 114.9 aircraft per 100,000 people.

Figure 4-6: Aircraft per Capita

1998 Activity Levels	Nation	FAA NW Mt. Region*	State of Washington	PSRC Region
Population	269,429,000	17,632,010	5,685,300	3,149,700
Active Aircraft	194,826	21,190	6,379	3,620
Active Aircraft per 100,000	72.3	120.2	112.1	114.9

Source: FAA, PSRC

The number of aircraft based in the four-county PSRC region increased slowly over the period of 1979 through 1998. Over this entire period the number of aircraft in the region grew by an average of 0.9% per year. Within this 19-year timeframe, however, there were a number of shifts that occurred. For instance, the number of aircraft based in the region increased 2.1% per year from 1979 through 1985. From 1985 through 1990, mirroring national trends, the number of aircraft actually dropped, and then from 1990 through 1998 the number increased again, although at a much slower rate than before.

Within the PSRC region, there were differences in the rates of growth of based aircraft at the county level. King County was the only one of the four that saw a decrease in the number of based aircraft. From 1979 through 1985 the number of aircraft based in King County grew by nearly 10%, but from 1985 through 1998 all of this growth and more was lost. This loss of based aircraft in King County, along with some of the growth in adjacent counties, was likely due to the closure of the Bellevue Airport in 1983, Issaquah Skyport in 1987, and Cedar Grove in the 1980s.

Figure 4-7: Trends in Regional Distribution of Based Aircraft

	1979	1985	1990	1998
Aircraft				
King County	1,565	1,702	1,514	1,498
Kitsap County	154	213	183	181
Pierce County	490	483	371	526
Snohomish County	925	1,153	1,382	1,476
PSRC Total	3,134	3,551	3,450	3,681
Percent of region				
King County	50.00%	47.90%	43.90%	40.70%
Kitsap County	4.90%	6.00%	5.30%	4.90%
Pierce County	15.60%	13.60%	10.70%	14.30%
Snohomish County	29.50%	32.50%	40.10%	40.10%
Average Annual Growth Rate	**1979-1985**	**1985-1990**	**1990-1998**	**1979-1998**
King County	1.4%	-2.3%	-0.1%	-0.2%
Kitsap County	5.6%	-3.0%	-0.1%	0.9%
Pierce County	-0.2%	-5.1%	4.5%	0.4%
Snohomish County	3.7%	3.7%	0.8%	2.5%
PSRC Total	2.1%	-0.6%	0.8%	0.9%

Sources: FAA, PSRC.

Most of the aircraft based in King County are located at one of four airports: Boeing Field, Crest Airpark, Auburn Municipal, and Renton Municipal. In addition to these, Kenmore Air Harbor is home to 100 aircraft, and Vashon Island is home to 31, while the Weyerhaeuser corporate fleet accounts for the six aircraft based at Sea-Tac. The two state airfields in King County (Bandera and Skykomish) do not have any based aircraft, and there are also no aircraft reported as based at Lake Union Chrysler Air.

Most of the aircraft based in King County are single-engine models. Singles account for 84% of all aircraft in King County, while multi-engine aircraft account for 10%, jets 3%, and helicopters 3%. Auburn, Boeing Field, Crest, and Renton are the only GA[1] airports in King with multi-engine aircraft or "multis". At all but Boeing Field, multis account for less than 10% the based fleet, and the same is true for jets and helicopters.

At Renton Municipal, single-engine aircraft make up 90.4% of all based aircraft, multis 7.6%, helicopters 1.1%, and jets 0.8%. The fleet breakdown is similar at Auburn and Crest, although neither of these facilities is home to any jets. At Boeing Field, on the other hand, singles make up only 60.4% of the based fleet, while multis account for 22.9%, jets 9.3%, and helicopters 7.4%.

Most of the multi-engine aircraft, jets, and helicopters in King County are based at Boeing Field. Boeing Field is home base to 68.2% of the multi-engine aircraft, 92.9% of the jets, and 81.4% of the helicopters in the county.

Figure 4-8: Aircraft Based In King County – Year 2000

King County Airports	Single	Multi	Jet	Helicopter	Other	Total
Based Aircraft						
Auburn Municipal	261	14	-	1	-	276
Bandera State	-	-	-	-	-	-
Boeing Field	273	103	42	33	-	452
Crest Airpark	325	10	-	2	-	337
Kenmore Air Harbor	100	-	-	-	-	100
Lake Union Chrysler Air	-	-	-	-	-	-
Sea-Tac International	-	2	3	1	-	6
Skykomish State	-	-	-	-	-	-
Vashon Island	30	-	-	-	1	31
Renton Municipal*	263	22	2	3	-	290
Total	1,252	152	48	41	1	1,493
Renton Share of King County	21.0%	14.5%	5.1%	8.1%	0.0%	19.4%
Boeing Field Share of King County	21.8%	68.2%	92.9%	81.4%	0.0%	30.3%

[1] GA: General Aviation, which includes all flight operations except for those of the military and scheduled airlines.

Figure 4-8, cont.

King County Airports	Single	Multi	Jet	Helicopter	Other	Total
Share of Based Aircraft Fleet						
Auburn Municipal	94.6%	5.1%	0.0%	0.4%	0.0%	100.0%
Bandera State	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Boeing Field	60.4%	22.9%	9.3%	7.4%	0.0%	100.0%
Crest Airpark	96.4%	3.0%	0.0%	0.6%	0.0%	100.0%
Kenmore Air Harbor	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Lake Union Chrysler Air	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Sea-Tac International	0.0%	31.8%	50.9%	17.3%	0.0%	100.0%
Skykomish State	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Vashon Island	96.8%	0.0%	0.0%	0.0%	3.2%	100.0%
Renton Municipal*	90.4%	7.6%	0.8%	1.1%	0.0%	100.0%

*Renton Municipal includes Will Rogers–Wiley Post Memorial Seaplane Base
Source: PSRC, BST Associates.

4.3.3.2 Forecasts of Based Aircraft

The RASP contains aviation forecasts through the year 2020, which have been extended through 2021 for this study. As shown in Figure 4-9, aviation is projected to grow steadily over the next 20 years, as measured in numbers of based aircraft and numbers of operations. Only airports in the four-county PSRC region are included in these forecasts (i.e., Snohomish, King, Pierce, and Kitsap Counties). All public-use airports are included, including those privately owned such as Crest Airpark and Harvey Field.

Snohomish County is projected to continue leading the region in the number of based aircraft, growing from an estimated 1,543 aircraft in 2001 to 1,929 aircraft in 2021. This translates into a total of 385 additional aircraft, or 52.3% of the regional total. The number of airplanes based in King County is also projected to grow, from 1,494 in 2001 to 1,680 aircraft in 2021, an increase of 186 aircraft.

Figure 4-9: Forecast of Based Aircraft

	2001	2006	2011	2016	2021
Based Aircraft Forecast					
King	1,494	1,563	1,605	1,647	1,680
Kitsap	188	200	211	223	232
Pierce	545	573	605	632	666
Snohomish	1,543	1,637	1,735	1,828	1,929
Total	3,770	3,973	4,156	4,329	4,506
Forecast Distribution of Based Aircraft					
King	39.6%	39.3%	38.6%	38.0%	37.3%
Kitsap	5.0%	5.0%	5.1%	5.1%	5.1%
Pierce	14.5%	14.4%	14.6%	14.6%	14.8%
Snohomish	40.9%	41.2%	41.7%	42.2%	42.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: PSRC, BST Associates.

According to the RASP, these projected shifts in the distribution of aircraft across the region reflect the continued impacts of several forces, which have historically caused shifts in activity. These include continued higher population and employment growth in Kitsap, Pierce, and Snohomish counties than in King County; increasing airspace complexity and landside congestion in the central portion of the region; pricing differentials; landside access issues; and airports' relative ability to accommodate increasing demand.

Locally, factors that support an increase in activity at Renton Municipal Airport include a population growth rate for the Seattle-Tacoma area that is higher than the national average, the traditional presence of the aerospace industry in the region, the significant use of helicopters and seaplanes in the region, and the continued use of Renton Municipal Airport as not only a reliever for Seattle-Tacoma International Airport, but as a lower cost and less congested alternative to King County International Airport/Boeing Field.

4.3.3.3 Based Aircraft Fleet Mix Forecast

The aircraft fleet based in the PSRC region is projected to grow by a total of 768 aircraft between the years 2000 and 2021. As shown in Figure 4-10, the majority of this growth will be in single-engine aircraft, which will account for an additional 430 aircraft. Multi-engine aircraft will account for an additional 36 aircraft, and helicopters 58 aircraft. The most dramatic growth will be in jet aircraft, however. The number of jets based in the PSRC region is projected to more than double by the year 2021, growing from 83 in 2000 to 180 in 2021.

The greatest share of additional single-engine aircraft is projected to locate in Snohomish County, while the largest share of multi-engine aircraft, helicopters, and jets and expected to locate in King County.

Figure 4-10: Current and Forecast Aircraft Mix, by County

	King	Kitsap	Pierce	Snohomish	Total
2000 Based Aircraft Fleet Mix by County					
Single engine	1,252	180	490	1,262	3,184
Multi-engine	152	5	42	79	278
Jet	48	-	8	27	83
Helicopter	41	-	-	35	76
Other	1	-	-	122	123
Total	1,493	185	540	1,525	3,743
2021 Based Aircraft Fleet Mix by County					
Single engine	1,350	224	595	1,445	3,614
Multi-engine	163	6	52	93	314
Jet	99	1	18	62	180
Helicopter	69	1	1	63	134
Other	1	-	-	268	269
	1,682	232	666	1,931	4,511

Figure 4-10, cont.

	King	Kitsap	Pierce	Snohomish	Total
Additional Aircraft Demand by County 2000-2021					
Single engine	98	44	105	183	430
Multi-engine	11	1	10	14	36
Jet	51	1	10	35	97
Helicopter	28	1	1	28	58
Other	0	-	-	146	146
	189	47	126	406	768

Sources: PSRC, BST Associates.

The RASP estimates that total aircraft storage capacity in the region (i.e., hangars and tie-downs) is 4,329 aircraft. Given the forecast of 4,511 based aircraft, demand will exceed supply by 182 in the year 2021. In Snohomish, Pierce, and Kitsap Counties, undeveloped land exists for expansion. However, some of these facilities would also need runway upgrades to meet FAA standards. In King County, Crest Airpark and Auburn Municipal have room for expansion, but may be limited by urban growth encroaching on the airports. Neither Boeing Field nor Renton Municipal has any undeveloped land for expansion, although aircraft storage capacity might be expanded at Renton through re-use or reconfiguration of existing facilities.

The different types of aircraft will tend to locate at different airports, depending on how the aircraft are used and the type of facilities they require. For example, the jet aircraft will be based at airports with hard-surface runways, instrument approaches, and relatively long runways. As shown in Figure 4-11, in King County there are only two general aviation airports that meet these criteria: Boeing Field and Renton Municipal. Therefore, all of the additional jets in King County will locate at these two airports.

Figure 4-11: Airports in King County

Airport	Length of Longest Runway	ILS[1] Approach	NDB[2] Approach	GPS[3] Approach	Runway Surface
Auburn Municipal	3,400				Asphalt
Bandera State	2,342				Turf
Boeing Field	10,001	X	X		Asphalt
Crest Airpark	3,267				Asphalt
Kenmore Air Harbor	10,000				Water
Lake Union Chrysler Air	9,500				Water
Renton Municipal	5,379		X	X	Asphalt/Concrete
Sea-Tac International	11,900	X	X	X	Asphalt/Concrete
Skykomish State	2,050				Turf
Vashon Municipal	1,940				Turf/Gravel
Will Rogers–Wiley Post	5,000				Water

Sources: PSRC, FAA.

[1]ILS - Instrument Landing System: A ground-based radio-navigation system which provides aircraft with horizontal and vertical guidance just before and during landing and, at certain fixed points, indicates the distance to the reference point of landing. [2]NDB approaches are approach procedures which use NDBs (Non-Directional Beacons) as the primary navigational aid. These are the least precise type of instrument approach. [3]GPS approaches are based on based on the Global Positioning System satellites.

Forecasts are presented in Figure 4-12 of the number of aircraft that will be based at airports in King County in the year 2021. These forecasts are based on the projections in the Regional Airport System Plan, along with more recent projections from various airports. Because data from more recent master plans were used, these projections are slightly higher than those in the *RASP*. Factors that were used to modify the PSRC forecasts include the following:

- Three airports do not currently have any based aircraft and are projected to continue having no based aircraft (i.e., Bandera State, Skykomish State, and Lake Union Chrysler Air).

- The new draft Master Plan for Boeing Field projects a total of 489 based aircraft in the year 2015. This is the approximate capacity of Boeing Field, so this number is held constant through the year 2021.

- The mix of aircraft at Boeing Field was modified. Most of the projected growth in jets will be located at Boeing Field, displacing smaller aircraft.

- Seattle-Tacoma International is currently home to six aircraft, and this is projected not to change.

- Kenmore Air Harbor is at capacity now with 100 aircraft, and will not grow.

- The fleet size and mix at Renton, Crest, and Vashon is projected to grow at the rates projected in the RASP. In addition, Renton is projected to serve as base for a small share of the additional jets.

Figure 4-12: Forecast of Based Aircraft by Airport in 2021

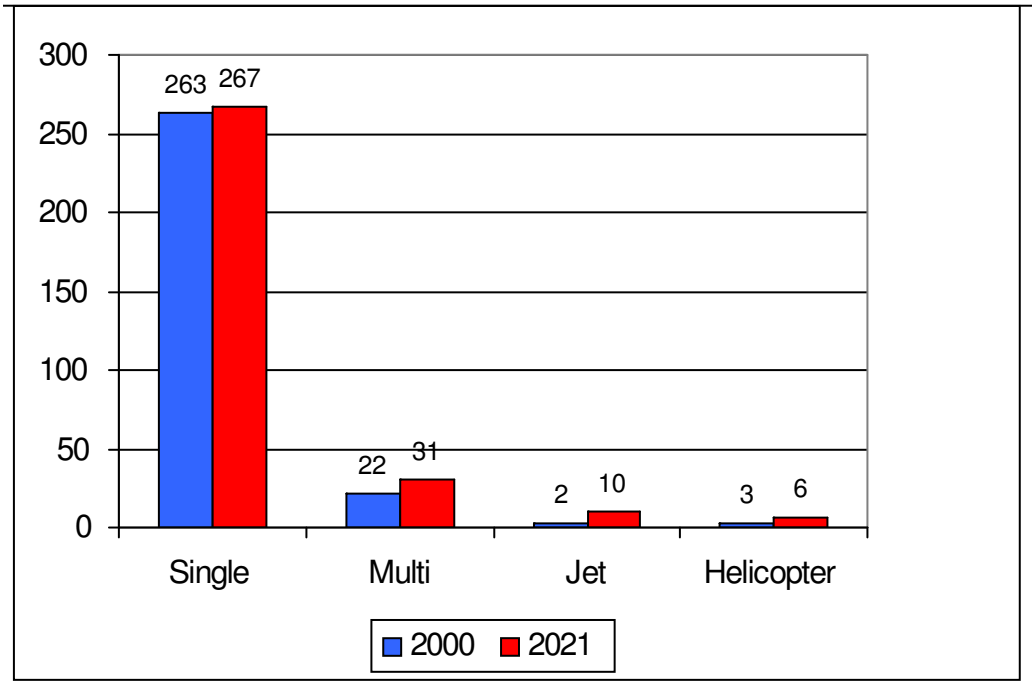
King County Airports	Single	Multi	Jet	Helicopter	Other	Total
Auburn Municipal	354	21	-	2	-	377
Bandera State	-	-	-	-	-	-
Boeing Field	250	100	84	55	-	489
Crest Airpark	347	11	-	4	-	362
Kenmore Air Harbor	100	-	-	-	-	100
Lake Union Chrysler Air		-	-	-	-	-
Sea-Tac International	-	-	5	2	-	7
Skykomish State	-	-	-	-	-	-
Vashon Island	33	-	-	-	1	34
Renton Municipal*	267	31	10	6	-	314
Total	1,350	163	99	69	1	1,682

* Includes aircraft at Will Rogers–Wiley Post Memorial Seaplane Base.
Sources: BST Associates, PSRC.

Trends in based aircraft and related operations for the Puget Sound region, and in particular King County, indicate that there will be only moderate growth over the planning period for the Business Plan at Renton. Projections indicate that there will be

24, or eight percent, more aircraft at Renton in 2021 than in 2000. With this increase, the share of aircraft in King County that are based at Renton will remain at about 19% for the planning period. Figure 4-13 illustrates the changes expected at Renton.

Figure 4-13: Aircraft Based at Renton by Type, 2000 and 2021



Sources: PSRC, BST.

Renton's neighbor, Auburn, on the other hand, is expected to increase its fleet of based aircraft by 101 aircraft, an increase of 37%. This is in part due to the fact that Renton Airport was fully occupied, while Auburn has room for expansion. However, since Boeing has relinquished part of its leasehold on Apron C, there is now be additional space available at Renton. Since Renton is closer to Puget Sound population centers than Auburn, it is reasonable to assume that a portion of the increase in based aircraft now projected for Auburn would instead occur at Renton if the area is used for hangar construction. Due to the unique situation of the Wiley-Post Seaplane Base the number of based aircraft at Renton may also increase more than currently projected if the airport improves facilities and storage for seaplanes.

Due to the capacity constraints at Boeing Field, and the fact that Renton is the only other GA airport with a tower and non-directional beacon and GPS approaches, there will be some pressure to accommodate more multi-engine piston and jet aircraft. However, with an increase from 22 to 31 multi-engine piston and two to ten jet aircraft, the total number of these aircraft is expected to remain a small percentage—13%—of the fleet of aircraft based at Renton.

4.3.4 Aircraft Usage

4.3.4.1 Recent Trends in Aircraft Usage in the U.S.

Between 1987 and 1998 total U.S. general aviation operations cycled between periods of growth and decline. From 1987 through 1990 General Aviation (GA) operations grew to a high of 40 million. Between 1990 and 1996, operations dropped to a low of 35.3 million. The industry then turned around, with GA operations climbing to more than 38 million in 1998.

Airport operations are typically categorized as being local or itinerant. Local operations are generally those that take off and land at the same airport and stay within the vicinity of the airport. Itinerant operations are those flights that arrive at the subject airport from another airport, or that depart the subject airport for another airport. From 1996 to 1998 both local and itinerant GA operations increased. Total local operations in the U.S. grew from 14,475,000 to 15,976,700, while itinerant operations increased from 20,823,000 to 22,086,400.

A third category of airport operations is instrument operations. Similar to total GA operations, instrument operations grew strongly from 1987 until 1989, and then declined sharply for four years to a low point in 1993. Since then, instrument operations have increased four of the past five years. Between 1993 and 1998 total U.S. GA instrument operations grew by nearly 12%. This trend is especially important for Renton Municipal Airport, because it is one of the few airports in the PSRC region with instrument approaches.

4.3.4.2 Current Aircraft Operations at Renton

As discussed above, airport operations are categorized as being local or itinerant. Local operations are generally those that take off and land at the same airport and stay within the vicinity of the airport, while itinerant operations are those flights that arrive at the subject airport from another airport, or that depart the subject airport for another airport.

One of the goals of this report is to estimate what share of operations at Renton Municipal Airport are produced by aircraft based at Renton, and what share are produced by aircraft based at other airports. The operations produced by Renton-based aircraft could either be local or itinerant. Examples of local flights by Renton-based aircraft might be a pilot performing a local sightseeing flight, or practicing take-offs and landings. An itinerant flight by a Renton-based aircraft would be one that departs Renton Municipal for a distant airport. Itinerant flights by non-Renton-based aircraft are flights that originate at a distant airport and terminate at Renton.

A number of sources of data were used to estimate the share of operations at Renton that are produced by Renton-based aircraft, including Renton Airport statistics,

FAA statistics, and tenant interviews. Renton Airport management provided the total number of aircraft based on the field and the FAA provided operational statistics. Interviews with airport tenants were used to gather information on the number of aircraft operated and the number of operations produced by these tenants.

According to management there are a total of 288 aircraft currently based at Renton Municipal Airport, including those based at the Will Rogers–Wiley Post Memorial Seaplane Base. The tenants interviewed for this project operate a total of 116 aircraft, while other owners account for another 172 aircraft.

Based on data gathered by the Tower, there were 136,972 operations at Renton in 2000. According to the interviews, the tenants produce an estimated 44,397 operations. The average aircraft is flown 100 hours per year, and each flight averages 1.25 hours. Each flight accounts for two operations (i.e., one take-off and one landing). Therefore, each aircraft averages 160 operations per year. Applying this average to the 172 aircraft not covered in the interviews results in an additional 27,520 operations. In total, Renton-based aircraft produce a total of 71,917 operations per year. The remaining 65,055 operations would thus be produced by aircraft not based at Renton.

Figure 4-14: Renton Airport Operations, by Aircraft Base - 2000[2]

Description	Aircraft	Operations	Share of Operations
Commercial Tenants	116	44,397	
Non-Commercial Tenants	172	27,520	
Aircraft Based at Renton	288	71,917	52.50%
Aircraft Not Based at Renton		65,055	47.50%
Total Operations		136,972	100.00%

Source: BST Associates, FAA.

The aircraft based at Renton are used for a variety of commercial and non-commercial purposes. These commercial operations include flight instruction, charter flights, scheduled flights, aircraft repair, flight-seeing, pipeline patrol, and others. The majority of the aircraft based at Renton are privately owned and are not flown for hire. The interviews conducted with Renton Airport tenants showed that approximately 25% of the aircraft based at Renton are owned by these firms and are used for commercial purposes. Those interviewed included, among others, a number of commercial floatplane operators, a helicopter charter outfit, aircraft repair businesses, flight instruction businesses and clubs, and charter operators.

The 75% of the aircraft based at Renton that are not flown for hire still play a variety of roles. Privately owned aircraft, like privately owned cars, carry people for work

[2] Note: Aircraft operations figures are available only for the time periods in which the Tower is in operation, thus a tendency to undercount certain types of traffic may occur.

as well as for play. Many of these privately owned aircraft are used strictly for recreational purposes, such as leisure travel and flight-seeing. But many others are used as a means of traveling for work, as an airplane allows a pilot to cover a much wider territory in a day of work than could be done by car.

Renton Municipal Airport is ideally suited for this type of use. It is in the middle of a large population base, it has a long runway, and it has instrument approaches. Few other airports in the Puget Sound region have all of these attributes. In King County, the only other general aviation field with these attributes is Boeing Field. The central location of the airport, combined with the large runway and instrument approaches, make Renton Municipal an ideal destination for business flyers traveling to the Seattle area on business. The airport is especially well located for people traveling to the Eastside and the Kent Valley.

The purposes for which non-Renton-based aircraft conduct operations at Renton are also varied. One of the more important roles the airport plays for this fleet is in flight training. Out of a total of 25 general aviation airports in the PSRC region, only four have air traffic control (ATC) towers (i.e., Boeing Field, Renton, Tacoma Narrows, and Paine Field). Part of the flight training curriculum deals with communicating with ATC and operating at tower-controlled airports. Because flight training occurs at all of the general aviation airports, when learning this part of the curriculum, students from non-towered airports must fly to one of the towered airports. Flight school operators from other Puget Sound-area airports were interviewed for this study, and were asked if they conduct training at Renton. The unanimous answer was that Renton is a critical facility for these operations.

Renton is also equipped with two different types of instrument approaches: a non-directional beacon (NDB) approach and a GPS approach. Instrument approaches allow aircraft to take-off and land when the weather is "below minimums" for visual flight. In King County, the only other NDB-equipped airports are Sea-Tac and Boeing Field, and the only other GPS-equipped airport is Sea-Tac. Because of these instrument approaches, Renton is often used by students training for the instrument rating. Again, this fact was confirmed through the interviews with flight schools.

Instrument approaches are also very important to non-training operations, especially those of a commercial nature. In order for an airplane to serve as a reliable alternative to travel by automobile, it must be able to operate in most weather conditions. Instrument landing approaches are a critical component of this reliability. Without instrument approaches, the conditions under which an airport can be used are much more limited. This is especially true in Western Washington, where low clouds and poor visibility are the norm for much of the year.

Finally, the FAA has designated Renton Municipal as a reliever for Seattle-Tacoma International Airport. The purpose of a reliever airport is to relieve congestion at a Commercial Service Airport, such as Sea-Tac, and to provide more general aviation access to the overall community. In short, by providing separate facilities for general

aviation traffic and commercial airline traffic, the availability of Renton Municipal serves to increase capacity at Sea-Tac.

4.3.4.3 Forecast of Regional Aircraft Operations

In the Puget Sound Region, the largest share of general aviation aircraft operations are conducted at airports in King County, and this is expected to still be the case in 2021. However, even though the number of operations will increase, the share of operations conducted in King County is expected to decrease due to faster rates of growth in the other counties.

Figure 4-15: Forecast of Regional Aviation Operations

	2001	2006	2011	2016	2021
Aircraft Operations Forecast					
King	816,037	866,607	905,648	947,219	990,975
Kitsap	150,929	157,549	163,317	169,520	175,439
Pierce	212,619	220,775	229,931	239,795	249,231
Snohomish	540,858	558,233	577,346	596,338	614,406
Total	1,720,792	1,803,189	1,876,269	1,954,621	2,030,050
Forecast Distribution of Aircraft Operations					
King	47.4%	48.1%	48.3%	48.5%	48.8%
Kitsap	8.8%	8.7%	8.7%	8.7%	8.6%
Pierce	12.4%	12.2%	12.3%	12.3%	12.3%
Snohomish	31.4%	31.0%	30.8%	30.5%	30.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: PSRC, BST Associates.

The projections of general aviation operations at the airport level are based on the projections in the RASP, and are updated with new information from Boeing Field and Auburn. The forecasts for Renton are based on the assumption that there are no significant changes at the field. Most notably, the forecasts assume that: 1) Boeing will continue to operate at Renton the same way it does now, and 2) the mix of uses and aircraft types at Renton does not change significantly over the forecast period.

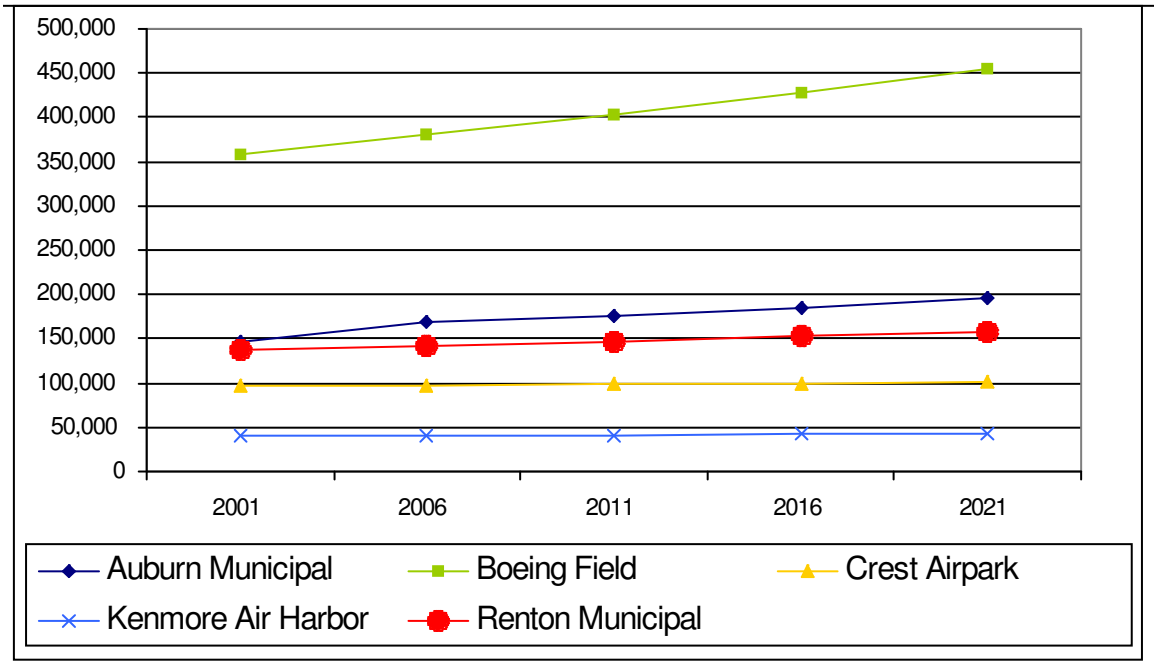
Figure 4-16: Forecast of Operations by Airport in King County

King County Airports	2001	2006	2011	2016	2021
Auburn Municipal	145,750	168,067	176,640	185,651	195,121
Bandera State	303	307	310	315	319
Boeing Field	358,928	380,560	403,679	428,385	454,604
Crest Airpark	96,022	97,331	98,541	99,926	101,321
Kenmore Air Harbor	40,336	40,886	41,394	41,976	42,562
Lake Union Chrysler Air	30,756	31,176	31,563	32,007	32,454
Renton Municipal	137,589	141,841	147,000	152,348	157,889
Skykomish State	303	307	310	315	319
Vashon Island	6,050	6,133	6,209	6,296	6,384
Total	816,037	866,607	905,648	947,219	990,975

Sources: PSRC, BST Associates.

The number of operations at Renton is expected to grow from 137,589 to 157,889, by 20,300 or 15 %. This is somewhat less than the 21 % increase in operations—from 816,037 to 990,975, or by 174,938—projected for King County between 2000 and 2021. Its share of operations is with 16 % smaller than its share of based aircraft, indicating that the number of operations will grow more slowly at Renton than on average in King County. Figure 4-17 illustrates the increase in operations at major GA airports in King County over the planning period.

Figure 4-17: Operations at Major GA Airports in King County, 2000-2021



Sources: PSRC, BST.

4.3.4.4 Forecast of Operations at Renton Airport

As described earlier in this document, approximately 52.5% of the current operations at Renton Municipal are conducted by aircraft based on the field, and 47.5% are conducted by aircraft based at other fields. These factors were combined with the forecast of total operations at Renton to produce estimates of the future numbers of operations conducted by Renton-based and non-Renton-based aircraft. As illustrated in Figure 4-18, the total number of operation at Renton is projected to grow from 137,589 in 2001 to 157,889 in 2021, or an increase of 20,300 operations. The number of operations conducted by Renton-based aircraft is projected to grow by 10,658, and those by non-Renton-based aircraft by 9,643. This forecast is based on current availability of hangar space. Should the number of aircraft based at Renton increase due to additional hangar construction, operations are likely to increase proportionately.

Figure 4-18: Forecast of Renton Operations by Aircraft Base[3]

Year	Total Operations	Renton-Based	Renton %	Non-Renton Based	Non-Renton %
2001	137,589	72,234	52.50%	65,355	47.50%
2006	141,841	74,467	52.50%	67,374	47.50%
2011	147,000	77,175	52.50%	69,825	47.50%
2016	152,348	79,983	52.50%	72,365	47.50%
2021	157,889	82,892	52.50%	74,997	47.50%

Sources: BST Associates, FAA.

4.3.5 Airport Vision Alternatives

The Renton Airport Advisory Committee reviewed a broad range of hypothetical options to develop a vision for the future fleet and operations mix at the airport and help frame the goals of the Business Plan. Figure 4-19 outlines this range of options. Based on a review of the current and projected fleet mix and number of operations for Renton Airport and broader community goals, the Committee recommended that a subset of the universe of recommendations be considered in the development of the Business Plan. These recommendations can be found in the last column of Figure 4-19.

The Committee suggested that the Business Plan options contain a focus on fleet mix similar to what it is today, a focus on large-scale aviation manufacturing, a focus on seaplane operations and a focus on private pilots. The Business Plan recommendations outlined in Chapter 9 are based on the activity and fleet mix recommended by the Committee.

[3] Note: Aircraft operations figures are available only for the time periods in which the Tower is in operation, thus a tendency to undercount certain types of traffic may occur.

Figure 4-19: Airport Vision Alternatives

Activity Focus	Description	RAAC Recommendations /Comments
• *Total Recreational Emphasis*	• Elements could include: Glider towing, parachute jumping, Ultralights (these are lightweight recreational aircraft requiring a different, less onerous, pilot license), ballooning and aerobatics. (Example: Harvey Field near Snohomish, WA) • Incompatible with Boeing activity and the region's aviation needs. • Would not accommodate the airport's existing corporate and charter and air taxi tenants.	Not feasible because of Sea-Tac/Boeing Field airspace restrictions.
• *Residential Airpark Emphasis*	• Nationwide, some airports, usually privately developed, are focused on private general aviation flying. The analogy is a golf course community. The runway is owned by all members and each has a house site and personal aircraft hangar on the field. Examples locally include Crest Airpark in Kent, and the airport in Spanaway. • Incompatible with Boeing activity and the region's aviation needs. • Such an emphasis would gradually phase out all commercial and business activity. • The airport deed and grant assurances would make such an approach difficult if not impossible.	Rule out.
• *Cargo Emphasis*	• The region is extremely short of cargo facilities at its airports. Sea-Tac is running out of space; Boeing Field likewise. • Cargo operators might seek to utilize Renton as they did in the aftermath of the earthquake when Boeing Field was closed. • Limiting factors are runway length, airspace constraints and (unless the Boeing property east of the Cedar River becomes available) the lack of space for the construction of warehouse and parcel sorting facilities. • This scenario would increase the number of large (and noisy) jet operations and likely lead to a dramatic increase in night and early morning flights. • Forgoing this scenario does not preclude occasional air cargo deliveries to Renton, similar to what occur now.	Rule out; the existing runway is short for cargo operations and there would be a significant noise impact in particular during the night.

Activity Focus	Description	RAAC Recommendations /Comments
• *Commercial Service Emphasis*	Scheduled flights are unlikely at Renton for the following reasons: • It is only 4 miles from Sea-Tac and could not house the same variety of destination as the airlines based at sea-Tac; • Most scheduled flights require longer runway lengths; • Airspace constraints; • Lack of passenger terminal or passenger amenities; • There is little or no suitable land area for the development of passenger facilities or parking; and • Airlines do not like "split operations". Ruling out a Commercial Service emphasis does not preclude air taxi operations and charters; it just discourages scheduled services.	Rule out.
• *Same as Today: Mix n' Match*	• Boeing continues to be the major tenant occupying over 50% of the available land area, although its flight operations are very few as a percentage of all activity. • The remaining airport use is a mix of general aviation activities, including business and instructional/recreational flying. Most aircraft using the airport are small single and twin-piston aircraft, with only a small number of business jets and helicopters in the mix. Apart from Boeing, there are no large jets using the airport. The aviation-related businesses on the airport minimally provide services that support the existing mix of aircraft. • Renton has been noted as having very poor public and customer services as compared with other west coast airports in its size range. Better services and amenities could increase airport revenues. Facilities that have been identified as needed include: Briefing rooms; Customs building, easily accessed public bathrooms, rental car site, Fixed Base Operator (FBO) / pilot lounges, longer hours of fuel and FBO availability; full-service FBOs. • There is a concern that higher aesthetic and visual standards should be a goal for the airport as today it presents a rundown appearance. • The recreational component is also served by the seaplane base at the northern end of the field, technically a separate airport but also run by the City.	Consider, together with improved amenities and aesthetics as long as these do not unduly increase aviation traffic.

Activity Focus	Description	RAAC Recommendations /Comments
• *Large-scale Aviation Manufacturing Emphasis*	• Boeing is deciding where to build the Sonic Cruiser and Renton is a possible location. Boeing is also exploring new lines of business that will need siting. • Thus, it is assumed under this scenario that Boeing will seek to continue their lease after 2010 and to increase their leasehold on the field. • The question would remain open as to whether Boeing should move to the west side of the field as was depicted in the Master Plan. • Such a trend would enhance the airport's existing mission and continue to support a sound base for manufacturing jobs in Renton. • Having Boeing continue could mean Boeing utilities provision continues as at present. • Increased Boeing land usage at the field would reduce the space available for general aviation.	Consider.
• *Seaplane Base Emphasis*	• The public seaplane base at Renton is one of the few seaplane bases—and the only major publicly operated one—in the region and serves a growing market. • While only the northern end of the field lends itself best to seaplane operations, the availability of tow-vehicles means that any site on the field could be a seaplane operation. • Seaplane operations are daylight hours only, reducing the duration of noisy flights. [Note: Most seaplane noise complaints are not from Renton residents]. Volumes of activity may vary with costs, insurance availability and other factors. • Increased emphasis on seaplane operations would require improvements to the launching ramp area and the development of a seaplane-oriented FBO with a customs facility on the restaurant parcel. • Increased seaplane operations are not incompatible with the existing activity focus.	Consider.
• *Private Pilot Emphasis*	• The focus is more on accommodating private flying than on business and commercial operations. • This would likely entail an increase in the number of T-hangars on the airport as opposed to tie-downs.	Consider.

Source: Hanson Professional Services, Inc.

4.3.6 Aircraft Services

A wide variety of aviation services at Renton Municipal Airport supports the aircraft operations described above. These include: fueling, maintenance and repair, hangar and tie-down rental, floatplane launching and retrieval, and float storage. In general, the rate of growth in each of these services can be expected to track closely with the rate of growth in airport operations. At a minimum, services provided to aircraft at Renton should increase at a rate similar to that for aircraft operations at Renton. Additional details for these services are provided below.

4.3.6.1 Fueling

Fueling service is currently provided by two FBOs at Renton Municipal: Action Aviation, Inc. sells both jet fuel and piston-engine fuel, while Pro-Flight provides piston-engine fuel (avgas).

The relative lack of competition in fuel sales, especially for jet fuel, is seen as a substantial problem for many of the tenants interviewed. In order to increase the availability of fuel, current tenants have proposed investing their own money on expansion plans, such as installing underground storage tanks and constructing new full-service FBO facilities.

Another problem with fuel availability at Renton is the lack of a self-service fuel pump. Many airports, especially smaller ones, have elected to install self-serve fuel pumps that are open to pilots 24 hours a day. Renton does not have a self-service pump, and the two fuel operators on the field generally operate only during daylight hours. This can present an operational problem to pilots, especially during winter months when there is limited daylight.

As mentioned above, fuel sales can be expected to increase at the same rate as aircraft operations, or approximately 15% over the next 20 years. This assumes that no changes are made in the availability of fuel. If changes were made to the availability of fuel, such as by installing self-service fuel pumps or allowing another jet-fuel provider, fuel sales could grow substantially faster.

4.3.6.2 Maintenance and Repair

The amount of maintenance and repair service performed at Renton is tied to both the number of based aircraft and the number of operations. All aircraft are required to meet certain minimum inspection requirements, which range from annual inspections for privately operated aircraft to 100-hour or more frequent inspections for commercial aircraft. Because Renton has a number of good maintenance and repair shops on the field, a large share of this inspection work is likely to be performed at Renton.

Based on the projected growth in the number of based aircraft and the number of operations at Renton, a conservative growth of 15% in the amount of maintenance and repair operations conducted at Renton can be expected.

This growth forecast is considered conservative, because it is based on no change in facilities on the field at Renton. It does not take into account the expansion plans of Renton-based repair shops. A number of the shops interviewed for this study shared their plans for constructing larger a better facilities at Renton. If one or more of these expansions occurs, the shops will likely be able to draw more customers from other nearby airports, and the overall growth will be more than the 15% forecast.

4.3.6.3 Hangar and Tie-down Rental

General aviation aircraft represent significant investments. Basic aircraft 30 years old can sell for $20,000 or more; new trainer aircraft cost $100,000 or more and advanced types sell for anywhere between $150,000 and millions of dollars. Because of this, most aircraft owners would prefer to keep their aircraft in a hangar than tied down on the parking ramp.

The problems associated with not using a hangar include: exposure to weather, exposure to sunlight, and risk of theft.

Exposure to weather causes a number of different problems for aircraft. Door and window seals can leak, allowing water into the cabin. Varying temperatures wreak havoc on paint and interiors. In winter, ice and snow can accumulate on aircraft, and these have to be removed before flight. High winds are another risk; tied-down airplanes have been known to break their lines in high winds and slam into other nearby aircraft, and have even flipped while tied down.

Sunlight presents its own problems. Even minimally-equipped aircraft have many hundreds of dollars worth of radios. For many GA aircraft, the radios and electronics can account for one-third of the total value of the plane with avionics stacks worth $100,000 or more. Exposure to sunlight can cause cabin temperatures to swing between extremes and these electronics are easily damaged by fluctuating temperatures and moisture levels.

Theft is another problem. Dark airports at night present inviting targets for aircraft thieves, and theft has been a problem in this region for a number of years. Thefts of entire aircraft are less rare than theft of electronics. As described above, aircraft electronics are extremely valuable; aircraft door locks, on the other hand, are not very strong.

For all of these reasons, hangars represent a valued commodity.

4.3.6.3.1 Current Conditions In the Puget Sound Region

According to the Regional Airport System Plan, the total aircraft storage capacity at Puget Sound airports was 4,329, as of 1999. This included 2,002 tie-down spots and

2,327 hangars. With 3,620 aircraft based in the region, there remained capacity for 709 additional aircraft.

However, all of the hangars in the region are full, and the remaining unused capacity is entirely in tie-downs.

A comparison of the RASP forecast of based aircraft (for the year 2020) with the existing supply of aircraft storage shows that by the year 2020 there will be demand for an additional 736 hangars and 83 tie-down spaces. Because there were approximately 709 unused tie-down spaces as of 1999, the additional demand for tie-downs can be met with the existing supply. For hangars, however, there is no unused supply, and all of the additional demand will need to be met with new construction often at the site of existing tie-down areas.

4.3.6.3.2 Current Conditions at Renton

Renton Municipal Airport currently has approximately 110 hangar spaces and 150 tie-down spaces. The majority of hangars and tie-downs are associated with ground leases: individual spaces are sub-leased by the primary tenants. Many of the tenants interviewed stated their interest in building additional hangar space or improving existing space.

Figure 4-20: Aircraft Storage Capacity and Utilization in the Puget Sound Region

	Existing			Based Aircraft			Forecast Additional Demand		
Airport	**Tie-Downs**	**Hangars**	**Total**	**1998**	**2020**	**Change**	**Tie-Downs**	**Hangars**	**Total**
American Lake	15	4	19	15	19	4	-	4	4
Apex Airpark	5	45	50	50	50	-	-	-	-
Arlington Municipal	114	463	577	510	674	164	16	148	164
Auburn Municipal	225	105	330	238	276	38	4	34	38
Bandera State	-	-	-	-	-	-	-	-	-
Boeing Field	350	200	550	443	514	71	7	64	71
Bremerton National	78	116	194	116	158	42	4	38	42
Crest Airpark	180	176	356	334	387	53	5	48	53
Darrington	15	-	15	4	5	1	-	1	1
FirstAir Field	25	62	87	78	103	25	3	23	26
Harvey Field	53	362	415	360	476	116	12	104	116
Kenmore Air Harbor	77	2	79	79	92	13	1	11	12
Lake Union SPB			-	-	-	-	-	-	-
Martha Lake	32	20	52	51	-	(51)	(5)	(46)	(51)
Thun Field	110	138	248	229	285	56	6	51	57
Port Orchard	12	16	28	15	21	6	1	5	6
Ranger Creek State	-	-	-	-	-	-	-	-	-
Renton Municipal	170	85	255	240	278	38	4	35	39
Sea-Tac International	4	2	6	6	7	1	-	1	1
Sky Harbor	12	-	12	8	11	3	-	2	2
Skykomish State	-	-	-	-	-	-	-	-	-
Paine Field	208	356	564	483	639	156	16	140	156
Spanaway	20	57	77	63	78	15	2	14	16
Swanson	12	14	26	22	27	5	1	5	6
Tacoma Narrows	200	82	282	200	249	49	5	44	49
Vashon Island	10	22	32	31	36	5	-	4	4
Will Rogers–Wiley Post	45	-	45	45	52	7	1	6	7
Total	1,972	2,327	4,299	3,620	4,437	817	83	736	819

Source: PSRC.

4.3.6.3.3 Survey of Nearby Airports

In order to better understand the market for hangar and tie-down space, airports near Renton were surveyed regarding their facilities. The general findings were that hangars are in short supply and tie-down space is not, which confirms the findings in the RASP. The wait for hangar space in this region ranges from one to ten years, with an average wait of two or three years. It is longer closer to the center of population: at Boeing Field the wait for hangar space is 10 years, and has also a wait for tie-down space.

The average time spent on the waiting list runs from one to three years, with two being the average. Details for individual airports are presented below.

Boeing Field

Boeing Field is the only surveyed airport that has a waiting list for tie-down space. This is largely due to the airport's excellent location, and the fact that the waiting list for hangar space is longer than that for tie-down space. Boeing Field currently has 183 tie-down spaces, with a waiting list of 50 names.

Boeing Field has only 62 hangars, which is an extremely low number for such a large General Aviation field in such a large metropolitan area. The waiting list for hangars has 150 names, and the estimated wait is 10 years.

The shortage of tie-down and hangar space at Boeing Field will likely not change, because the field is essentially built-out – there is no additional room for aircraft parking. Because of the nearness of Renton Municipal to Boeing Field, these two airports compete for the same customer, and the shortage of space at Boeing Field represents a real opportunity for Renton.

Paine Field

Paine Field (in Everett) currently has a total of 400 hangars; of which 256 are leased directly by the county and the remainder are FBO-leased. The waiting list for hangar space at Paine Field currently contains 150 names, and the approximate wait is 3 years. A wait list for tie-down space is just starting to develop.

Paine Field is currently taking deposits on a new hangar development. This project will include a series of T-hangar, built in phases. These hangars will represent a substantial upgrade from the current facilities. The current, old T-hangars rent for $205 per month. The hangars in the new project will rent for $350 per month, and will include amenities not found in the old ones, including: fire sprinklers, windows, 20-amp power, and an H-5 occupancy rating. This rating will allow aircraft owners to work on their aircraft in the hangars, which is not permitted in the old hangars. The wait list for these new hangars requires a two-month non-refundable deposit; nonetheless, the space is quickly filling.

Auburn Municipal

Auburn currently has 130 hangars and a waiting list of approximately one year. The field also has 150 tie-down spaces, with no waiting list. The hangars are in nine separate buildings, two of which were completed in recent years. In addition, a developer has signed a 50-year lease with the city of build new condominium hangars. Ground should be broken soon on this project.

Open hangars rent for $155 to $200 per month, and closed hangars rent for $215 to $340 per month.

Crest Airpark

Crest Airpark, in Kent, has 75 hangars and approximately 75 tie-down spaces. There is a two-year wait for hangar space, with approximately 40 names on the list. There is no waiting list for tie-down space, and had there been, there is room to add more parking spots on the field.

Hangar rent ranges from $175 to $210 per month.

Tacoma Narrows

Tacoma Narrows has hangars leased directly by the airport, as well some leased by the three FBOs on the field. The airport itself leases 35 hangars and there is a wait of approximately 2 years. In addition, there is a mixture of corporate hangars, commercial hangars, and other type, for a total of 92 hangars on the field.

Rent for hangars at Tacoma Narrows ranges from $192 to $275 per month.

4.3.6.3.4 Outlook

As indicated above, the demand for hangar space dramatically exceeds supply. This is especially true for the type of aircraft most prevalent at Renton, small single-engine piston aircraft, currently already . According to the RASP, in 1998 there were 365 aircraft on waiting lists for airports in King County. This situation is not expected to improve significantly over the planning period. However, recommendations and needs figures for the number of aircraft hangar storage spaces to be developed during the planning timeframe vary. RASP recommends 150 aircraft hangar spaces by the year 2020. The 1997 Airport Master Plan indicates a need for about 200 hangar spaces by 2013. Considering the latent demand in King County it appears that there is enough demand to fill whatever additional hangar capacity can be established at Renton. This includes any space vacated by Boeing. This is a reasonable assumption since the demand for hangar space is most pressing close to the population center, and any capacity developed close to the population center will have an advantage over other airports that are further away.

Because Renton Municipal and Boeing Field are so near each other, they compete for many of the same customers. Boeing Field does not have room to add any more hangars. As a result, hangars present a strong opportunity for the City of Renton.

4.3.7 Floatplane Launching and Retrieval, Float Storage

Seaplanes are a vital part of the transportation system in the Pacific Northwest: because water separates so many of the communities in the region, seaplanes are often the fastest mode of travel between the Seattle metropolitan area and outlying communities.

Seaplane operators provide scheduled service to the San Juan Islands and Victoria, B.C., among other destinations, as well as charter service to nearly any location on water in Washington, British Columbia, and even Southeast Alaska.

In the Seattle area there are four facilities providing services to seaplanes: Kenmore Air Harbor and Seattle Seaplanes are on Lake Union in Seattle; Kenmore Air Harbor's main base is located on the north end of Lake Washington in Kenmore; and Will Rogers–Wiley Post Memorial Seaplane Base is located at the south end of Lake Washington in Renton. In addition, American Lake Seaplane Base offers similar services in Tacoma.

Will Rogers–Wiley Post Memorial Seaplane Base and Kenmore Air Harbor in Kenmore are the main service locations near Seattle. Both locations provide aircraft storage, launch and retrieval service, aircraft service and repair, and float storage, among other services. Float storage is an important service because most seaplanes can be converted to landplanes by removing the float equipment and installing wheels. The advantage of having this service performed at Will Rogers–Wiley Post is that this seaplane base is adjacent to Renton Municipal Airport, and airplanes can use the land runway when they are equipped with wheels. At Kenmore there is no land runway, so aircraft converted between wheels and floats in Kenmore are barged to Renton for take-offs and landings on land.

The two facilities on Lake Union, Seattle Seaplanes and Kenmore Air Harbor, are used primarily for loading and unloading passengers and for selling fuel. Seattle Seaplanes does provide repair services as well as flight instruction and aircraft rental, but they do not provide launch and retrieval service. Kenmore Air Harbor Lake Union is strictly a passenger terminal, with fuel available only for Kenmore's own aircraft.

Will Rogers–Wiley Post is the only seaplane facility in the Seattle area with room for growth. The two facilities on Lake Union are located in a dense urban setting, with no vacant or affordable land available for expansion. Noise has also been an issue on Lake Union, with voluntary noise abatement procedures limiting the number of operations on the lake. Kenmore Air Harbor in Kenmore is at capacity, with little or no room for expansion or additional aircraft.

The precise number of seaplanes in the region served by these seaplane service facilities is difficult to identify. With the exception of amphibious-hulled aircraft, FAA registration statistics do not specify if an aircraft is equipped with floats. Also, because most float-equipped planes can be converted between floats and wheels, the number of seaplanes can vary over time. It is known that Kenmore Air Harbor in Kenmore is home to approximately 100 aircraft and Will Rogers–Wiley Post is home to approximately 50 seaplanes. In addition to these, a flight over Lake Washington and Lake Sammamish or along Puget Sound reveals many seaplanes moored at private docks along the shoreline.

According to estimates by the Seaplane Pilots Association, there may be at least 250 seaplanes in Washington State, and at least 200 of these based near Seattle. In

addition, seaplanes have been one of the fastest-growing segments of general aviation since regulatory reform was passed.

Figure 4-21 projects the number of seaplanes that will be based in the Seattle area (i.e., King and Snohomish Counties), using the single-engine growth rates from earlier in this document, along with the information from the Seaplane Pilots Association. Overall, the number of seaplanes in the area is projected to increase by between 22 and 34 aircraft, or 10% and 17%. As many as 26 of these aircraft may look to locate at Renton.

Services provided to these aircraft should rise at similar rates (i.e., 10% to 15% over the next twenty years). This includes launching and retrieving aircraft, fuel sales, service work, and float storage.

Figure 4-21: Projected Growth in Seaplanes

Item	Renton	Kenmore	Other Seattle Area	Total
Number at Renton	50	100	50	200
Share of Growth to Renton – Low	50%	0%	50%	100%
Share of Growth to Renton – High	75%	0%	25%	100%
Single-Engine Planes – 2000				2,514
Single-Engine Planes – 2021				2,795
Average Annual Rate of Growth				0.51%
Estimated Seaplane Growth – Low				0.51%
Estimated Seaplane Growth - High*				0.76%
Estimated Seaplanes - 2021 – Low				222
Estimated Seaplanes - 2021 – High				234
Estimated Additional Seaplanes - 2021 – Low	11	-	11	22
Estimated Additional Seaplanes - 2021 – High	26	-	9	34

*Seaplane growth rate is 1.5 times Single-Engine growth rate

Source: BST.