

CHAPTER 13: WHAT DID WE LEARN ABOUT AIR CARGO CAPACITY?

Why is It Important?

When cargo capacity at airport becomes constrained several things may happen including:

- Operating efficiency may decrease while operating costs increase.
- Air cargo processing may move off-airport if off-site alternatives are available.
- Cargo may be diverted to alternate modes of transport such as belly-cargo in passenger aircraft or surface transport if available and feasible.
- Cargo may be diverted to alternate nearby airports if available.
- The net result of constrained air cargo operations can be both increased cost of shipping and reduced air cargo service to the communities served.

Air cargo capacity is expressed as the number of enplaned tons that can be processed through airport facilities in a year. Measuring air cargo capacity at an airport can be difficult since there can be wide variations in the operational characteristics of cargo carriers between airports, or even at the same airport. The types of air cargo handled, the types of aircraft used and whether cargo is processed through on or off-site facilities all contribute to the overall volume air cargo passing through an airport over the course of year.

What Does the Current System Look Like?

Top Ten Air Cargo Airports in Washington State – Statewide Perspective

There are significant variations in the volume, aircraft equipment and processing of cargo from airport to airport makes application of any standardized methodology meaningless. The following reflects the range of facilities and circumstances found to exist at Washington airports.

- Large commercial service airports with dedicated cargo apron and on-site cargo processing facilities. (Sea-Tac International)
- Large commercial service airports with dedicated cargo apron and on-site processing facilities, however an unknown but presumably large percentage of cargo is processed off-site (King County International/Boeing Field).
- Airports with large cargo aprons but little or no on-site processing building capacity (Spokane, Grant County).
- Small airports with small cargo aprons and small processing facilities.
- Small airports with no dedicated cargo apron and no processing facilities.

The Air Cargo Forecast cited 15 Washington airports with cargo activity in 2005 including:

- Anacortes (OTS)
- Boeing Field (BFI)
- Grant County / Moses Lake (MWH)
- Kenmore Air Harbor (KEH)
- Omak (OMK)
- Pangborn Memorial / Wenatchee (EAT)
- Pullman / Moscow (PUW)
- Richland (RLD)
- Seattle-Tacoma International (SEA)
- Skagit / Mount Vernon (BVS)
- Spokane (GEG)
- Tri-Cities / Pasco (PSC)
- Vista Field / Kennewick (ZXX)
- Walla Walla (ALW)

- William R. Fairchild / Port Angeles (CLM)

Of these airports, the top 10 facilities accounted for 99.8 percent of Washington cargo. These top 10 were the focus of the air cargo capacity study.

Figure 182: 2005 Washington State Top 10 Airports in Air Cargo Tonnage

Rank	Airport	Tons	Percent of Total
1	SEA Sea-Tac International	373,233	62.06%
2	BFI Boeing Field/King County	124,620	20.72%
3	GEG Spokane International	93,424	15.53%
4	PSC Tri-Cities	3,377	0.56%
5	YKM Yakima Air Terminal	2,268	0.38%
6	BLI Bellingham International	1,215	0.20%
7	EAT Pangborn Memorial	654	0.11%
8	MWH Grant County International	530	0.09%
9	CLM Wm. R. Fairchild International	519	0.09%
10	BVS Skagit Regional	384	0.06%
	All Others	1,211	0.20%
	Total	601,435	100.0%

Based on the distribution of cargo at Washington airports as presented above, it was determined that the air cargo analysis should focus on the top 10 facilities.

Washington Top Air Cargo Airports by Special Emphasis Region

Four of Washington's ten busiest air cargo airports fall within the Special Emphasis Regions defined by the legislature and identified during LATS Phase I. Two of the airports, Sea-Tac International and King County International/Boeing Field are located within the PSRC Special Emphasis Region and accounted for approximately 83 percent of all Washington State air cargo in 2005. As noted in the figure on the following page, three of the four Special Emphasis Regions accommodated nearly 99 percent of all Washington air cargo in 2005.

Figure 183: 2005 Washington State Top Cargo Airports by Special Emphasis Region

Rank in State	Airport	Tons	Percent of State Total
PSRC Special Emphasis Region			
1	Seattle-Tacoma International	373,233	62.06%
2	Boeing Field/King County Int'l	124,620	20.72%
Subtotal		497,853	82.78%
Spokane Special Emphasis Region			
3	Spokane International	93,424	15.53%
Subtotal		93,424	15.53%
Tri-Cities Special Emphasis Region			
4	Tri-Cities	3,377	0.56%
Subtotal		3,377	0.56%
Southwest Special Emphasis Region			
N/A	None	N/A	0.00%
Subtotal		0	0.00%
Total ESSB Regions		594,654	98.87%

Washington Top Air Cargo Airports by RTPO Area

Sea-Tac and Boeing Field within the PSRC area handled the bulk of Washington air cargo tonnage in 2005.

As noted under the ESSB Special Emphasis Region discussion above, Sea-Tac International and King County International/Boeing Field within the PSRC area handled the bulk of Washington air cargo tonnage in 2005. Air cargo handled at Spokane International Airport within the Spokane RTPO area constituted the second busiest RTPO area for cargo, however lagged the Puget Sound Region by 400,000 tons. The combined air cargo tonnage of these two RTPO areas amounts to 98.3 percent of total Washington air cargo in 2005. The balance of air cargo activity at the remaining airports on the top ten cargo airport list amounts to only fractions of a percent of total state air cargo at each airport. The breakdown of 2005 air cargo by RTPO area is presented in Figure 184 on the following page.

**Figure 184: 2005 Washington State Top Cargo
Airports by RTPO Area**

Rank in State	Airport	Tons	Percent of State Total
PSRC			
1	Seattle-Tacoma International	373,233	62.06%
2	King County Int'l/Boeing Field	124,620	20.72%
	Subtotal	497,853	82.78%
Spokane			
3	Spokane International	93,424	15.53%
	Subtotal	93,424	15.53%
Benton-Franklin-Walla Walla			
4	Tri-Cities	3,377	0.56%
	Subtotal	3,377	0.56%
Yakima Valley			
5	Yakima	2,268	0.38%
	Subtotal	2,268	0.38%
Whatcom			
6	Bellingham International	1,215	0.20%
	Subtotal	1,215	0.20%
Whatcom			
7	Pangborn Memorial	654	0.11%
	Subtotal	654	0.11%
Quad County			
8	Grant County International	530	0.09%
	Subtotal	530	0.09%
Peninsula			
9	Wm. R. Fairchild International	519	0.09%
	Subtotal	519	0.09%
Skagit/Island			
10	Skagit Regional	384	0.06%
	Subtotal	384	0.06%
Total RTPO Areas		600,224	99.80%

What Was the Scope of Our Analysis?

The typical approach to modeling air cargo capacity at an airport is to measure the volume of cargo tonnage processed at an airport against the amount of processing space available in on-airport buildings. The typical ratio used for analysis is one ton of cargo processed per one square foot of cargo processing building. Under the Phase II Scope of Work, it was assumed that a standardized average volume of cargo processed per square foot of facility could be applied to dedicated cargo facilities at each airport to calculate an overall cargo processing capacity. That capacity, when compared to existing and forecast future cargo tonnage, would yield the relative level of utilization at each airport. Existing data revealed circumstances that complicate the analysis: 1) not all airports have both dedicated cargo apron and on-site cargo processing facilities; and 2) airports with off-site cargo processing or direct aircraft-to-delivery operations did not fit well within this modeling approach.

Applying the methodology of annual cargo processing capacity of one ton per square foot of reported on-site cargo building space, capacity utilization calculations for 2005 and 2030 were generated for the top 10 cargo airports. The results of this exercise are presented in Figure 185 below.

Figure 185: Washington Airport Cargo Capacity – 2005 to 2030

Airport	Estimated Capacity (tons)	2005 Total Tons	2005 Capacity Used	Forecast 2030 Total Tons	2030 Capacity Used
Sea-Tac	1,000,000	373,233	37%	853,405	85%
Boeing Field	30,000	124,620	415%	333,574	1112%
Spokane	10,000	93,424	934%	199,473	1995%
Pasco	NR	3,377	Unknown	8,384	Unknown
Yakima	NR	2,268	Unknown	4,535	Unknown
Bellingham	40,000	1,215	3%	3,088	8%
Wenatchee (Pangborn)	24,000	654	3%	1,349	6%
Moses Lake	NR	530	Unknown	1,118	Unknown
Port Angeles	12,000	519	4%	1,272	11%
Mount Vernon/Skagit Reg'l	6,000	384	6%	984	16%

Note: "NR" = None Reported. If an airport does not have a dedicated cargo building or designated cargo apron there is nothing to report in these columns.

In Figure 185, the capacity calculations in bold red text are considered suspect or unreliable for use in the LATS study. The original analysis, based on standard methodology, suggested that airports were currently operating at many times their existing capacity. While these results would suggest crippling congestion at these facilities, it is known that the airports are not experiencing these conditions. Instead, they appear to be operating efficiently.

What is the reason for the discrepancy? One issue is the contribution of off-airport cargo processing activities at King County International/Boeing Field and Spokane International. These activities are known to contribute capacity at these airports, but the effect is difficult to quantify.

A second issue is lack of importance of on-airport cargo buildings for feeder operations at small airports. A measure of cargo processing facilities at these airports is irrelevant, since the type of cargo operations utilizing these airports do not typically use processing buildings.

The analysis produced wide variations in the ratio of "cargo building tons/sq. ft." with King County International/ Boeing Field and Spokane International functioning at four to nine times national averages

respectively. Based on additional information however, we know this is an incorrect conclusion at both airports because of the off-airport cargo processing activities that create the appearance of a higher throughput capacity of the on-airport facilities. For the smaller airports supporting feeder operations, the size of on-airport cargo buildings is irrelevant as there is little, if any, use of these facilities given the nature of the cargo operations there. The following factors impact the accuracy of the analysis.

- Although Boeing Field experiences a large number of cargo operations, cargo is generally unloaded from aircraft parked at Boeing Field International and processed at off-airport locations. So, an evaluation of on-airport cargo processing facilities alone is not an adequate measure of air cargo capacity.
- Spokane has a large cargo apron but a relatively small cargo building. This creates the impression that the airport has limited capacity when the standardized factors are applied, even though the airport does not experience air cargo congestion.
- Pasco, Yakima, Bellingham, Wenatchee, Moses Lake, Port Angeles and Skagit all have small cargo operations that feed into Sea-Tac, Boeing Field International or Spokane International and cargo handling procedures vary from airport to airport.

Key Findings

Cargo aircraft in use at Washington airports range from large wide-body freighters to small single-engine aircraft used by air courier services. At some airports, cargo is transferred directly from the aircraft to the local delivery vehicle with no sorting or local “processing” taking place. Consequently, no cargo building space is required at the airport and measuring capacity by building size is not feasible. However, the following findings and conclusions may be drawn from the air cargo capacity analysis.

General Findings Regarding Air Cargo in Washington State

General findings and conclusions relative to future air cargo capacity in Washington are as follow:

- Air cargo companies build facilities when they are needed.
- Facility expansion occurs as demand grows.

- Excess capacity seldom exists
- Availability of aircraft parking apron is often the key determinant of an airport's ability to serve air cargo.
- Key factors influencing future growth are geographic location and apron/land availability.

Airport Specific Findings

Provided below are additional findings and conclusions relative to air cargo at key airports within the state:

Sea-Tac International Airport

- SEA is the State's top cargo airport.
- Cargo processing expansion is planned.
- Cargo aircraft parking and airfield operations capacity are likely the limiting factors to future growth.
- International cargo likely to continue to be centered at Sea-Tac.

King County International/Boeing Field

- Boeing Field experiences a large number of cargo operations but cargo is generally processed at off-airport locations.
- Key factor influencing future growth is apron/land availability.
- Geographic location is a key factor to potential growth.

Spokane International

- Spokane has a large cargo apron but a relatively small cargo building creating the impression that the airport has limited capacity when standardized factors are applied.
- Spokane's cargo growth is projected to increase and become an important element in the State's system.

Other Small Air Cargo Airports

- Pasco, Yakima, Bellingham, Wenatchee, Moses Lake, Port Angeles and Skagit all have small cargo operations.
- The small air cargo airports feed into operations at Sea-Tac, Boeing Field International or Spokane International.
- Cargo handling procedures vary from airport to airport – most are ramp processed directly onto distribution vehicles.
- On-site capacity is not an issue.
- Access to Sea-Tac, Boeing Field or Spokane International is likely a limiting factor.

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