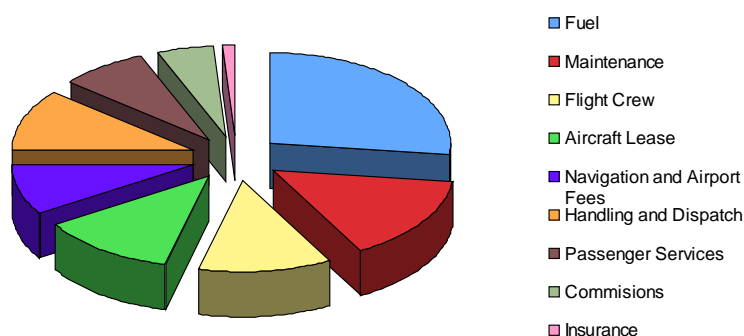


ANNEX D. OPERATING COSTS

Information on operating costs is available in different forms. The two principal sources are the information collected by U.S. DOT on Form 41 from each of the airlines operating in the U.S. and data collected from member airlines by IATA, ATA and ICAO (Table D-1, Figure D-1). The U.S. DOT data are compiled annually, whereas the latter are compiled for occasional reports. An analysis of the direct operating costs per block hour for a variety of aircraft was prepared in 2000 (Table D-2). However, these were passenger aircraft, which implies higher fuel consumption, and additional maintenance costs per block hour because of more frequent takeoffs. It also implies that the capital costs per block hour would be lower than for cargo aircraft because of higher level of utilization. In order to obtain a better approximation of cargo aircraft operation, U.S. DOT data was used

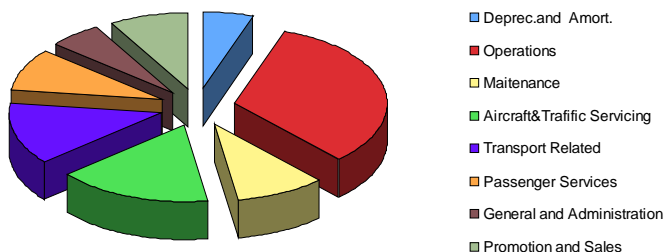
Figure D-1. Direct operating costs, 2001



Source: ICAO

Detailed cost data is reported by the U.S. airlines on Form 41. This includes data on the operating costs for individual aircraft. The data is aggregated by function, including direct operating costs, ground handling, passenger related services (in-flight, sales and reservations, airport processing), administrative and promotional costs as shown in Figure D-2 for 2004. Direct operating costs, including crew, fuel, maintenance and capital costs account for only about half of the total airline costs. Ground operations account for approximately 30 percent and general management and in-flight services accounting for the remainder.

Figure D-2. U.S. airline costs by function, 2004



Source: ATA Annual Report 2005

Information on individual aircraft from 2006 has data in terms of fuel, maintenance, capital and crew. Data is also provided on operating hours and availability in terms of days per year. The database has a number of problems. It is difficult to separate crew costs since they are included in the rentals for wet leases. The same applies for maintenance costs. By combining rentals with costs for depreciation and amortization, there is an overestimate of capital costs. In addition, the database contains numerous inaccuracies. Not only is a significant portion of the data missing, but many of the items are clearly incorrect, due either to the values reported or poor data entry. For example, annual operating hours range in value from 20 to 20,000. The only data that appears robust is the fuel consumption per block hour. On the other hand, the fuel costs have little relationship to the block hours. For this reason, the fuel costs were recalculated using the reported consumption multiplied by an average cost for fuel of \$0.75 per liter. The maintenance costs vary depending on the age of the aircraft with the oldest, B-727, DC-9, DC-10, and B-100 having the highest cost relative to their replacement costs. For the aggregate data, it appears that the average maintenance costs for 4,000–5,000 hours is about 7–10 percent of the replacement cost for an aircraft about 10–20 years. Adding to this a crew cost of \$1.6 million and a capital cost of 8 percent of replacement cost, the estimated operating cost per block hour would be \$3,000, \$6,000 and \$11,000 per block hour for narrow-bodied, medium wide bodies and large widebody aircraft respectively.

Table D-1. Estimated airfreighter operating costs, 2008 (US\$)

	Average Operating Costs per Hour of Operations				Average Operating Hours
	Crew,				
	Fuel	Rentals	Maintenance	Total Direct	
B727-200/231A	4,086	2,739	4,001	12,095	4,420
B737-200C	2,424	995	1,066	5,061	913
B757-200	3,525	2,192	2,113	9,181	5,602
B767-300/300ER	4,747	1,916	1,447	8,815	7,477
DC-9-40	5,045	3,048	2,598	11,484	1,702
A300-600/R/CF/RCF	5,252	5,153	2,013	12,111	5,604
A310-200C/F	5,108	4,166	3,505	14,848	4,079
DC-10-30CF	7,526	2,973	3,487	14,086	4,007
MD-11	7,343	4,261	2,067	15,139	6,607
B747-100	10,983	1,879	2,800	16,406	1,457
B747-200/300	10,076	2,501	1,945	15,295	2,424
B747-400	8,899	3,249	1,050	13,838	3,488
B747F	11,181	1,721	2,687	16,583	5,726

Source: US DOT Form 41 modified based on fuel cost \$0.75 per liter and 5% inflation over 2006

Table D-2. Aircraft average operating costs per block hour, 2000

Aircraft	Fuel Consumption		Direct Operating Costs (US\$)			Fuel %	2006
	liters	tons	Fuel	Other	Total		Total
A300-600	7,100	5.11	1,588	2,002	3,590	44%	
A319	3,121	2.25	698	1,458	2,156	32%	
A320	3,367	2.42	753	1,520	2,273	33%	
A321	3,519	2.53	787	1,736	2,523	31%	
A330-200	6,698	4.82	1,498	2,203	3,701	40%	
A330-300	7,109	5.12	1,590	2,213	3,803	42%	
A340-300	8,263	5.95	1,848	2,225	4,073	45%	
A340-600	9,819	7.07	2,196	2,654	4,850	45%	10,034
ATR-42	760	0.55	140	1,006	1,146	12%	
ATR-72	814	0.59	150	1,353	1,503	10%	
B-727-200	4,045	2.91	745	1,874	2,619	28%	
B-737-200	3,024	2.18	557	1,430	1,987	28%	
B-737-200C	4,316	3.11	795	1,981	2,776	29%	4,127
B-737-300/700	2,622	1.89	483	1,510	1,993	24%	
B-737-400	3,062	2.20	564	1,686	2,250	25%	
B-737-800	2,145	1.54	395	1,188	1,583	25%	
B-737-500	3,057	2.20	563	1,513	2,076	27%	
B747-100	15,235	10.97	2,806	4,950	7,756	36%	12,487
B-747-200	15,289	11.01	2,816	5,608	8,424	33%	11,688
B-747-400	14,225	10.24	2,620	4,141	6,761	39%	10,3636
B-757-200	3,420	2.46	630	2,055	2,685	23%	7,737
B-767-200	4,626	3.33	852	2,365	3,217	26%	
B-767-300	4,930	3.55	908	2,490	3,398	27%	7,039
B-777-200	7,330	5.28	1,350	2,799	4,149	33%	

Source: ICAO - Fourth Meeting of the ALLPIRG/Advisory Group, Appendix ALLPIRG/4-WP/28