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International Airports: Revenues, Costs, and Passenger Traffic

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INTERNATIONAL REVIEW

INTERNATIONAL AIRPORTS: REVENUES, COSTS, AND PASSENGER TRAFFIC

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I. INTRODUCTION

During the ICAO Conference on Charges for Airports and Route Air Navigation Facilities held in Montreal 28 March to 18 April 1967, frequent reference was made to ICAO Document 8490-C/957. This 110-page document had been issued under the title, "Charges for Airport and Route Air Navigation Facilities—Global Position 1963" and subtitled "An Analysis of Replies to a Questionnaire Circulated by the Council of ICAO in April 1963 and of Data Gathered from Other Sources." The purpose of this article is two-fold: (1) To summarize Appendix V and Appendix VI of Doc. 8490-C/957, and (2) to relate international airports' revenues and operating costs to the passenger traffic expressed as a dimensionless ratio in order to make a comparison among the airports of different countries.

A. *Appendix V*

For the years 1960-1963, Appendix V (Appendices V and VI are summarized below) accounts for 108 international airports in the 39 countries that are listed alphabetically. For each airport the main components of the costs and revenues are presented in thousands in United States dollars (the rate of exchange is shown next to the column with the reporting years). For some airports, data are shown only for one year but the majority have the figures for two consecutive years, either calendar or fiscal.

B. *Appendix VI*

Airport traffic data for the years 1960-1963, with a subdivision by number of landings, passengers, and tonnage of freight and mail, are shown in Appendix VI. The number of landings and passengers carry a further subdivision. For the landings, two sets of figures are indicated: Landings with payable charges; and others such as military, training, etc. The passenger traffic data appears under three headings—arriving, departing, and in transit. It should be noted that for 13 airports listed with financial data in Appendix V no corresponding traffic has been shown in Appendix VI. But Appendix VI presents 35 airports with traffic data that

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are not included in Appendix V. Unfortunately, the last category includes two airports with the largest commercial traffic in the world, Chicago (O'Hare International Airport) and New York (John F. Kennedy International Airport).

II. Summary of Appendix V and Appendix VI

A. *Table 1*

Table 1 summarizes financial and traffic data from Appendices V and VI by countries. Before evaluating the results it is necessary to point out numerous qualifying circumstances. First, the table presents the data for only those airports that have been recorded by both Appendix V and Appendix VI. Secondly, when entries had been shown for two years the last year records only are presented in Table 1. Thirdly, in respect to revenues, maintenance and operating costs, capital cost, and passenger traffic, only aggregate figures are shown without any further subdivision. It might be assumed that the totals are more correctly reported, as the criteria for subdivisions differ even among airports operated in the same country if there is no single operating agency.

For the traffic data, it was necessary to limit the presentation to the passenger totals since the number of landings (due to variation of size) are a less homogeneous aggregate. Passenger totals are also a better yardstick for the terminal building operating cost which in many international airports is as high as the airfield operating cost. Relative to passenger figures for United States airports, in Appendix VI the data have reported as total enplanement—the total number of revenue passengers boarding aircraft, including originatings, stopover, and transfer passengers in scheduled and nonscheduled services. In order to make the United States passenger data comparable to other countries' totals, it is necessary to add the number of terminating passengers to the United States data shown in Appendix VI. These figures are not readily available but the number of originating passengers might be taken instead as a good approximation. Therefore, these figures for 1962[1] have been added to the Appendix VI data for the pertinent United States airports. In short, Table 1 for the United States passenger totals is the sum from these two sources.

It might be concluded from Table 1 that out of a total of 92 airports only 47 had revenue that exceeded maintenance and operating costs.[2] In the United States maintenance of the airport air traffic control is not always accounted for in the maintenance costs because the United States airports with few exceptions are operated by the municipalities, whereas the control towers at the airports are operated by the Federal Aviation Agency.

Thus, if we consider in Table 1 the airports where the capital cost includes both depreciation and interest, and the maintenance cost includes

[1] Airport Operations Council, *Economic Service Bulletin*, 8 July 1966, Washington, D.C.

[2] The figure of 92 airports should be adjusted to 88 because the revenue of the three Australian airports is limited to international traffic, and for the Asmara airport in Ethiopia no maintenance expense is shown. Indications remain that 41 international airports (almost 47% out of a total of 88 airports) are not getting enough revenue to cover operating costs.

TABLE 1

INTERNATIONAL AIRPORTS: REVENUES, COSTS AND PASSENGER TRAFFIC ON YEARLY BASIS, 1961 - 1963

SOURCE: ICAO, DOC. 8490—C/957, APPENDIX V AND VI, MAY 1965

				In thousands of U. S. dollars			
Country	*Ser. No.*	*Airports*	*Year*	*Revenues Total*	*Maintenance and Operating (M & O) Costs*	*Capital Costs* (Dep. and Int.)	*Passenger Traffic Total*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Argentina	1	Buenos Aires-—Aeroparque	1962	114	245		741,510
	2	—Ezeiza	1962	338	604	N.A.	405,120
	3	Cordoba	1962	19	166		282,934
	4	Salta	1962	5	58		57,692
Australia	5	Melbourne	1962[1]	354	2011	988	1,196,911
	6	Perth	1962[1]	65	979	522	162,935
	7	Sydney	1962[1]	1070	2569	2172	1,724,992
Canada	8	Edmonton	1962	486	726	1451	409,584
	9	Frobisher Bay	1962	288	1527	194[2]	5,888
	10	Gander	1962	1219	1821	1399	106,089
	11	Halifax	1962	589	876	914	360,362
	12	Montreal	1962	5529	4469	4145	2,258,146
	13	Toronto	1962	2507	1931	1861	2,679,098
	14	Vancouver	1962	971	880	1569	926,724
	15	Winnipeg	1962	752	755	715	653,917
Ceylon	16	Colombo	1962	45	353	61	72,256
	17	Jaffna	1962	18	64	16	25,627
Chad	18	Fort Lamy	1963	199	868	933	65,360
China	19	Taipei	1962	245	63	N.A.	203,677
Colombia	20	Barranquilla	1962	322	146	157[3]	383,824
	21	Bogota	1962	927	400	1806[3]	1,243,643
Dahomey	22	Cotonou	1963	66	186	211	33,813
Denmark	23	Copenhagen	1962	3630	2419	2122	2,151,973
Ethiopia	24	Asmara	1962	159	N.A.	N.A.	51,121
France	25	Bordeaux	1961	365	631	783	143,160
	26	Marseille	1961	1550	1021	1265	912,405
	27	Nice	1961	1302	907	1021	793,528
	28	Le Bourget (Paris)	1961	4570	4052	2500	1,045,932
	29	Orly (Paris)	1961	14430	9510	10174	3,082,558
Germany	30	Berlin	1962	1499	1395	1884	1,957,494
	31	Bremen	1962	448	694	312	141,307
	32	Cologne/Bonn	1962	1376	1520	1828	438,842
	33	Düsseldorf	1962	3183	2476	1429	1,086,220
	34	Frankfurt-Main	1962	10291	7906	5250	3,014,335
	35	Hamburg	1962	2613	2238	2124	1,121,215
	36	Hannover	1962	970	1759	787	728,865
	37	Munich	1962	2415	2320	1418	1,011,713
	38	Nüremberg	1962	443	689	330	148,536
	39	Stuttgart	1962	1390	1620	759	416,071

Country	Ser. No.	Airport	Year	In thousands of U. S. dollars: Revenues Total	Maintenance and Operating (M & O) Costs	Capital Costs (Dep. and Int.)	Passenger Traffic
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ghana	40	Accra	1961	335	144	31[3]	113,462
Ireland	41	Cork	1963	118	336	301	78,583
	42	Dublin	1963	1456	1024	766	1,004,436
	43	Shannon	1963	2309	1179	1285	365,891
Jamaica	44	Kingston and Montego Bay	1962 1963	1029	533	N.A.	533,974
Libya	45	Benghazi	1962	337	472	N.A.	165,000
	46	Tripoli	1962	406	552	N.A.	165,000
Luxembourg	47	Luxembourg	1962	43	106	N.A.	106,345
Malagasy	48	Airvonimamo	1962	154	86	N.A.	41,932
Netherlands	49	Amsterdam	1961	3586	2386	1406[2]	1,564,292
	50	Rotterdam	1961	141	312	254	146,451
New Zealand	51	Auckland	1962	167	75	318	396,676
	52	Christchurch	1962	317	173	336	447,100
	53	Wellington	1962	316	112	917	497,290
Philippines	54	Manila	1962	529	632	N.A.	216,335
Portugal	55	Lisbon	1962	813	680	N.A.	648,000
Senegal	56	Dakar	1962	686	202	N.A.	290,505
Spain	57	Alicante	1962	1	622	86	3,443
	58	Barcelona	1962	362	1102	974	927,689
	59	Bilbao	1962	7	179	332	33,305
	60	El Aaium	1962	5	202	86	38,750
	61	Las Palmas	1962	124	1136	464	300,688
	62	Madrid	1962	841	3347	1682	1,368,657
	63	Malaga	1962	61	1012	597	168,820
	64	Palma de Mallorca	1962	405	1303	460	1,034,125
	65	Santander	1962	0.2	152	155	716
	66	Sevilla	1962	35	615	364	111,650
	67	Valencia	1962	37	590	367	142,707
	68	Villa Cisneros	1962	3	11	4	5,600
Sweden	69	Gothenburg	1962	487	392	144[2]	259,641
	70	Malmö	1962	814	499	133[2]	381,177
	71	Stockholm-Arlanda	1962	745	614	585[2]	550,690
Switzerland	72	Basle-Mulhouse	1961	321	305	257	247,788
	73	Geneva	1961	1585	775	1177	1,052,138
	74	Zürich	1961	2118	1235	1142	1,661,753
Turkey	75	Ankara	1962	177	386	N.A.	178,371
	76	Istanbul	1962	613	487	N.A.	537,027
United Kingdom	77	London (Gatwick)	1961	1179	2517	1674	812,656
	78	London (Heathrow)	1962	24338	14339	5969	6,953,536
	79	Prestwick	1962	3528	2926	985	349,328
	80	Stansted	1962	851	921	202	101,885

Country	Ser. No.	Airport	Year	In thousands of U. S. dollars: Revenues Total	Maintenance and Operating (M & O) Costs	Capital Costs (Dep. and Int.)	Passenger Traffic Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
U.K. Territories							
Bahamas	81	Nassau	1962	705	392	74[2]	559,708
	82	Hong Kong	1962	2503	2199	2617	641,119
	83	Friendship (Maryland)	1963	1500	1318	66[1]	1,362,395
	84	Houston (Texas)	1963	1712[4]	582	1123	1,578,056
	85	Los Angeles (Calif.)	1962	7557	3076	3143	6,292,053
	86	Miami (Florida)	1962	8057[4]	2932	4482	3,363,010
United States	87	New Orleans (La.)	1963	1738	765	729	1,358,725
	88	Portland (Oregon)	1963	1288[4]	1218	343[2]	1,061,953
	89	San Antonio (Texas)	1963	736[4]	297	3474	568,211
	90	Seattle (Washington)	1963	1674	863	540[2]	1,734,669
	91	San Francisco (Calif.)	1963	7736	2818	1812	4,126,148
Viet-Nam	92	Saigon	1962	199	201	N.A.	281,595

[1] Only from the international operations.
[2] Interest only.
[3] Depreciation only.
[4] Cost of the airport air traffic control is not included.

both depreciation and interest and the maintenance cost includes control tower upkeep, the revenue equals or exceeds the inclusive total costs at only four airports: London (Heathrow), Los Angeles, New Orleans, and San Francicso. The New Orleans breakeven on total costs with total passengers of only 1,358,725 is most interesting.[3]

B. *Table 2*

It is a known fact that general trends for airport revenue, costs, and passenger traffic are the same. Furthermore, it might be stated that any

[3] Regarding published financial records of the airports listed in Table 1, the outstanding yearly reporting of the U.K. airports should be underlined. In Trading Accounts and Balance Sheets (available in London from Her Majesty's Stationery office) details about costs and revenues for the four U.K. airports (with the aggregate totals for the remaining airports) are reported every year. The financial details are rarely matched by the annual reports issued by the airlines. Some careful reading is, of course, required. For example, effective 1 November 1964, the passenger service charge was abolished and the intercontinental sub-charge on landings reduced, which affected airport income adversely. But simultaneously, navigation service charges were introduced to be paid by the airlines and these are NOT recorded as items of airport income. On a full-year basis, for the fiscal year 1963-1964 (ending 31 March), the four airports collected passenger service charges totaling £1,182,658 (physically the airlines made the collection from the passengers for a 5% commission), but during the fiscal year 1965-1966 navigation service charges paid by the airlines added up to £3,509,345 (excluding £75,877 national receipts in respect of military and state traffic). Thus the net gain to the British Treasury from the navigation service charges after cancellation of the passenger service charges was quite substantial.

TABLE 2

INTERNATIONAL AIRPORTS: PASSENGER TRAFFIC, RATIOS OF: A) MAINTENANCE—AND CAPITAL COST; B) REVENUES AND MAINTENANCE COST 1961 - 1962

SOURCE: SEE TABLE 1

Ser. No.	Airport	Country	Passenger Traffic Total	Ratio of: Maintenance Cost and Capital Cost	Ratio of: Total Revenues and Maintenance Cost — Actual	Ratio of: Total Revenues and Maintenance Cost — Trend
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Santander	Spain	716	N.A.	.001	N.A.
2	Alicante	Spain	3,443	N.A.	.001	N.A.
3	Villa Cisneros	Spain	5,600	N.A.	.273	.140
4	Frobisher	Canada	5,888	N.A.	.189	.141
5	Jaffna	Ceylon	25,627	4.000	.281	.255
6	Bilbao	Spain	33,305	N.A.	.039	.280
7	Cotonou	Dahomey	33,813	.881	.354	.285
8	El Aanium	Spain	38,750	N.A.	.025	.300
9	Airvonimamo	Malagasy	41,932	N.A.	1.791	.315
10	Salta	Argentina	57,692	N.A.	.086	.355
11	Fort Lamy	Chad	65,360	.930	.229	.367
12	Colombo	Ceylon	72,256	5.786	.127	.386
13	Cork	Ireland	78,583	1.116	.351	.395
14	Stansted	United Kingdom	101,885	4.559	.924	.449
15	Gander	Canada	106,089	1.301	.669	.450
16	Luxembourg	Luxembourg	106,345	N.A.	.406	.451
17	Sevilla	Spain	111,650	N.A.	.057	.452
18	Accra	Ghana	118,462	N.A.	2.326	.470
19	Bremen	Germany	141,307	2.224	.646	.495
20	Valencia	Spain	142,707	N.A.	.063	.510
21	Bordeaux	France	143,160	.805	.578	.511
22	Rotterdam	Netherlands	146,451	1.228	.647	.515
23	Nüremberg	Germany	148,536	2.087	.643	.520
24	Perth	Australia	162,985	1.875	N.A.	.530
25	Benghazi	Libya	165,000	N.A.	.714	.540
26	Tripoli	Libya	165,000	N.A.	.736	.550
27	Malaga	Spain	168,820	N.A.	.060	.555
28	Ankara	Turkey	178,371	N.A.	.459	.560
29	Taipei	China	203,677	N.A.	3.889	.590
30	Manila	Philippines	216,335	N.A.	.837	.600
31	Basle-Mulhouse	Switzerland	247,788	1.186	1.052	.640
32	Gothenburg	Sweden	259,641	N.A.	1.242	.655
33	Saigon	Viet-Nam	281,595	N.A.	.990	.680
34	Cordoba	Argentina	282,934	N.A.	.114	.686
35	Dakar	Senegal	290,505	N.A.	3.396	.690
36	Las Palmas	Spain	300,688	N.A.	.109	.697
37	Prestwick	United Kingdom	349,328	2.970	1.206	.730
38	Halifax	Canada	360,362	.958	.672	.735
39	Shannon	Ireland	365,891	.917	1.958	.740
40	Malmo	Sweden	381,177	N.A.	1.631	.760

Ser. No.	Airport	Country	Passenger Traffic Total	Ratio of Maintenance Cost and Capital Cost	Ratio of Total Revenues and Maintenance Cost	
					Actual	Trend
(1)	(2)	(3)	(4)	(5)	(6)	(7)
41	Barranquilla	Colombia	383,824	N.A.	2.205	.762
42	Auckland	New Zealand	396,676	.235	2.227	.770
43	Ezeiza	Argentina	405,120	N.A.	.560	.772
44	Edmonton	Canada	409,584	.500	.669	.775
45	Stuttgart	Germany	416,071	2.134	.858	.790
46	Cologne/Bonn	Germany	438,842	.831	.905	.795
47	Christchurch	New Zealand	447,100	.514	1.832	.800
48	Wellington	New Zealand	497,290	.122	2.821	.825
49	Kingston & Montego	Jamaica	533,974	N.A.	1.931	.840
50	Istanbul	Turkey	537,027	N.A.	1.259	.844
51	Stockholm-Arlanda	Sweden	550,690	N.A.	1.213	.850
52	Nassau	Bahamas U.K.	559,708	N.A.	1.798	.870
53	San Antonio (Texas)	United States	568,211	.085	2.478	.890
54	Hong Kong	Hong Kong	641,119	.840	1.138	.920
55	Lisbon	Portugal	648,000	N.A.	1.196	.940
56	Winnipeg	Canada	653,917	1.055	.996	.945
57	Hannover	Germany	728,865	2.235	.551	.960
58	Aeroparque-Buenos Aires	Argentina	741,510	N.A.	.465	.980
59	Nice	France	793,528	.888	1.436	1.010
60	London (Gatwick)	United Kingdom	812,656	1.503	.468	1.020
61	Marseille	France	912,405	.807	1.518	1.050
62	Vancouver	Canada	926,724	.560	1.103	1.060
63	Barcelona	Spain	927,689	N.A.	.328	1.062
64	Dublin	Ireland	1,004,436	1.336	1.422	1.100
65	Münich	Germany	1,011,713	1.636	1.040	1.106
66	Palma de Mallorca	Spain	1,034,125	N.A.	.311	1.120
67	Le Bourget	France	1,045,932	1.620	1.128	1.122
68	Geneva	Switzerland	1,052,138	.658	2.045	1.124
69	Portland (Ore.)	United States	1,061,953	N.A.	1.088	1.125
70	Düsseldorf	Germany	1,086,220	1.732	1.286	1.140
71	Hamburg	Germany	1,121,215	1.053	1.168	1.150
72	Melbourne	Australia	1,196,911	2.035	N.A.	1.180
73	Bogota	Colombia	1,243,643	N.A.	2.317	1.195
74	New Orleans (La.)	United States	1,358,725	1.049	2.272	1.250
75	Friendship (Md.)	United States	1,362,395	N.A.	1.138	1.255
76	Madrid	Spain	1,368,657	N.A.	.251	1.262
77	Amsterdam	Netherlands	1,564,292	N.A.	1.801	1.300
78	Houston (Texas)	United States	1,578,056	.518	2.942	1.350
79	Zürich	Switzerland	1,661,753	1.081	1.714	1.380
80	Sydney	Australia	1,724,992	1.182	N.A.	1.390
81	Seattle (Wash.)	United States	1,734,669	N.A.	1.940	1.400

Ser. No.	Airport	Country	Passenger Traffic Total	Ratio of Maintenance Cost and Capital Cost	Ratio of Total Revenues and Maintenance Cost: Actual	Ratio of Total Revenues and Maintenance Cost: Trend
(1)	(2)	(3)	(4)	(5)	(6)	(7)
82	Berlin	Germany	1,957,494	.740	1.075	1.450
83	Copenhagen	Denmark	2,151,973	1.139	1.501	1.485
84	Montreal	Canada	2,258,146	1.078	1.237	1.500
85	Toronto	Canada	2,679,098	1.037	1.298	1.620
86	Frankfurt-Main	Germany	3,014,335	1.505	1.302	1.710
87	Orly	France	3,082,558	.934	1.517	1.725
88	Miami (Florida)	United States	3,363,010	.654	2.748	1.780
89	San Francisco (Calif.)	United States	4,126,148	1.555	2.745	1.925
90	Los Angeles (Calif.)	United States	6,292,053	.978	2.457	2.295
91	London (Heathrow)	United Kingdom	6,953,536	2.402	1.697	2.375

comparison among the airports of different countries as to revenue or costs cannot be economically correct because exchange rates only approximate international purchasing power. For example, "Construction costs in the low income countries may have been as little as one-sixth of the costs of comparable work in the United States for obvious reasons that construction costs are always predominantly a labor cost."[4]

However, it is not these generalities but their practical application with which we are concerned. Therefore, Table 2 presents the international airports in the ascending order of passenger traffic, and revenue and capital costs are expressed as a ratio of operating cost. The ratios, of course, are dimensionless. Thus, the difference in the international purchasing power among airports of the 29 countries that are listed in Table 2 has been eliminated, and for each airport the ratios are presented in the perspective of other airports with a similar order of magnitude of passenger traffic. For 40 airports out of a total of 91 that are listed in Table 2, the ratios of maintenance and capital cost (column 5) are not available, and among the remaining 51 airports the data vary widely even when total passenger traffic and the ratios of total revenue and operating costs are practically of the same order. For example, in relation to numbers 19 and 22, the ratio of maintenance and capital costs varies from 2.224 to 1.228 respectively. These significant discrepancies might reflect the differenct methods in accounting for the capital charges among the countries. Consequently, no useful conclusions could be drawn from the figures in column 5. It must be kept in mind, however, that by eliminating the capital costs a bias is introduced that favors large capital investments. It is conceivable that an old terminal building or hangar when compared with a modern structure might show an unimpressive ratio of revenue and cash expenses. But even with the capital charges accounted for, the old building might still be in the black when the modern one plunges deeply in the red.

[4] C. CLARK, THE CONDITIONS OF ECONOMIC PROGRESS (3d ed. 1957).

It might be noted from Table 2 that all Spanish international airports have, relative to their passenger traffic, an extremely low ratio of revenue and maintenance cost. Even Madrid, which handled close to 1.4 million passengers, indicates a revenue/maintenance cost ratio of only .251; whereas Munich, with traffic slightly over 1 million, has a ratio of 1.04, or, four times as high. Probably, Spanish airport revenue has been almost 2.9 times lower than the corresponding total for the Munich airport. In airport finance the first vital step is the break-even on maintenance cost. Table 2 shows eight airports where the ratio of revenue and operating cost varies from .9 to 1.1, or just below or above the break-even point.

C. *Table 2A*

Although this table presents data for eight international airports, we have only three distinct groups: (1) Five European airports, where the international purchasing power in 1962 of the three states, United Kingdom (represented by the Stansted Airport), Switzerland (Basle-Mulhouse Airport), and Germany (with three airports—Cologne, Munich and Berlin), is unlikely to distort significantly the absolute revenue data in the Table; (2) two Canadian airports (Winnipeg and Vancouver); and (3) Saigon in Vietnam which is definitely affected by the international purchasing power when its absolute revenue is compared with the other airports in Table 2A.

The achievement of almost a break-even level, with slightly over 100,000 passengers and 1,536 payable landings, by Standsted is impressive. But the average yield per landing from landing charges (column 11) that is ten times higher than the corresponding figures in the other seven airports is also very impressive.

Similarly, Cologne's ratio of .905, a relatively good achievement versus Berlin's of 1.075, is striking in that the airport at Cologne handled almost 4.5 times fewer passengers than Berlin.

D. *Trend Data*

Since we shall make considerable use of the trend data that are shown in column 7 of Table 2, it may be well to discuss at the outset some of the mechanics of the presentation. In order that the relation between the ratio of revenue/maintenance cost and total passenger traffic could be presented by a straight line which in turn would be calculated by the least square method, the figures in columns 4 and 5 of Table 2 were plotted on graph paper with logarithmic scales on both horizontal and vertical axis, by having passenger traffic on the abscissa.[5] From the graph, the trend figure has been read and inserted in column 7. It could also be calculated approximately from the equation:

[Equation (1)]

$$\text{(Revenue/Maintenance Costs)} = \frac{(\text{Total Passenger Traffic})^{.396}}{216}$$

[5] Jaworski, *The Effect of Standard Charges on Canadian Airport Operations*, 21 J. AIR L. & COM. 387 (1954).

TABLE 2A

INTERNATIONAL AIRPORTS

—CLOSE TO BREAKEVEN ON OPERATING COSTS

1961/62

SOURCE: COLS. 1 TO 4 FROM TABLE 2; COLS. 5 AND 6 FROM APPENDIX VI; COL. 8 FROM TABLE 1; COL. 9 FROM APPENDIX V

Serial No.	*Airports*	*Passenger Traffic Totals*	*Ratio of Total Revenues & Operating Costs*	*Yearly Number of Landings*		*Average Pass. Load per Payable Landing (Col.3-2xCol.6)*	*Revenues — U. S. Dollars*				
				Total	*Payable*		*Total (in thousands)*	*Landing Charges (in thousands)*	*% of total*	*Per Payable Landing*	*Total per Passenger*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
							$	$	%	$/Land.	$/Pass.
14	Standsted	101,885	.924	14,095	1,536	33.17	851	498	58.51	324.22	8.35
31	Basle-Mulhouse	247,788	1.052	19,763	5,322	23.28	321	N.A.	N.A.	N.A.	1.30
33	Saigon	281,595	.990	14,542	5,057	27.84	199	150	75.38	2.97	.71
46	Cologne	438,842	.905	N.A.	31,708	6.92	1,376	660	47.97	20.81	3.14
56	Winnipeg	653,917	.996	56,857	14,111	23.17	752	474	63.03	33.59	1.15
62	Vancouver	926,724	1.103	76,804	17,421	26.60	971	384	39.55	22.04	1.05
65	Münich	1,011,713	1.040	N.A.	47,206	10.72	2,415	1,100	45.55	23.30	2.39
82	Berlin	1,957,494	1.075	N.A.	42,068	23.27	1,499	481	32.09	11.43	.77
Average for Breakeven on Operating Costs		702,500	1.000	36,400	17,000	20.66	1,048	535	51.73	62.61	2.36

Airport management should examine its records carefully where its revenue/maintenance cost ratio versus passenger traffic in column 6 of Table 2 relative to the trend figure in column 7 lies conspicuously above or below the trend. If the ratio of revenue and operating or maintenance expense is low, it doesn't follow that the standard of airport management is low too. When revenue is predetermined by light traffic and standardized rates and severe climatic conditions push operating expenses to an exceptionally high level the ratio is beyond the control of the airport management. But, when airport management sees from the table that the figure for its airport is below the trend, it should investigate all circumstances which might be bringing the results below the average level of other airports where passenger traffic is of the same order. Some of those circumstances might be improved.

The minimum total passenger traffic necessary to obtain a break-even on maintenance cost could be calculated from the equation (1) by putting "1" on the right side of the equation. Then, by using the logarithmic tables the required yearly minimum traffic emerges as 785,000 passengers. Similarly, if we are looking for total yearly passenger traffic that might produce break-even on total cost where the capital charges equal maintenance cost, the (revenue/maintenance costs) ratio in equation (1) would equal two and the total yearly traffic required could be calculated with a slide rule to be in the order of: $(2 \times 216)^{1/.396} = 4.5$ millions of passengers.

Another method of measuring the same phenomenon is to introduce in the graphical derivation of equation (1) on the abscissa—instead of the number of passengers—the total airport revenues in dimensionless units. In practice, this measuring was carried out by expressing the revenues as a multiple of the average landing fee and by calculating the latter on a yearly basis as a quotient of airport revenue derived from landing fees and the number of payable landings. In other words, the multiple is actually the number of payable landings multiplied by the ratio of airport total revenue and the revenue only from landing fees. On that basis, the corresponding equation to the passenger traffic, would be:

$$[\text{Equation (2)}]\ (\text{Revenue/Maintenance Cost}) = \frac{(\text{Revenue})^{.354}}{39.6}$$

And from equation (2), the total airports expressed as a multiple of the average landing fee that would be needed for a break-even on maintenance cost might be calculated as an equivalent of 32,500 average landing fees. For the 74 airports where the revenues from the landing fees have been shown in the previously quoted Appendix V, it might be calculated that the weighted average of the airports' total revenues was 2.424 times that of the landing fees input. In short, using equation (2) to achieve a break-even, we may infer the yearly number of payable landings is in the order of 13,400 (*i.e.*, 32,500 ÷ 2.424).

Not too great an emphasis should be placed on the full extent of the difference between columns 6 and 7 in Table 2, nor would any claim to full comparability of the figures in Table 1 (especially the capital cost

data) be justified. All that this numerical illustration might suggest is simply a rule of "international thumb."

Furthermore, in many airports management has practically no influence on capital charges as the rate of interest reflects the economic conditions of the whole country and depreciation rates are not subject to frequent changes. However, at some airports (especially in the United States) where capital charges are determined by the redemption of bonds, airport management would in practice be consulted on the capital charges when the city which operates the airport makes a choice between general obligation bonds and strictly airport revenue bonds because a substantial difference in interest might be involved. Obviously, in many airports some scope is left for management to improve the ratio of revenue and expense especially by diminishing the expense. And in this respect, the graph may be useful by indicating to management other airports that are in the same bracket of traffic, or even a lower one, but are achieving a better ratio of revenue and expense.

The picture will continue to improve during the next few years, especially when the new rates for the jumbo jets bring more revenue in addition to the increase of revenue caused by traffic development.