REPUBLIC OF INDONESIA

FEASIBILITY STUDY FOR THE BALI INTERNATIONAL AIRPORT DEVELOPMENT

FINAL REPORT

APPENDIX

JUNE 1982

Japan International Cooperation Agency

SDF

82-099 (3/3)

•

JIGA LIBRARY 1031032[4]



REPUBLIC OF INDONESIA

FEASIBILITY STUDY FOR THE BALI INTERNATIONAL AIRPORT DEVELOPMENT

FINAL REPORT
APPENDIX

JUNE 1982

Japan International Cooperation Agency

国際協力事業団

Page APPENDIX TO CHAPTER 3 APPENDIX 3.7.1 DATA OF MONTHLY PASSENGER'S NUMBER (INCLUDING TRANSIT) 1 BREAKDOWN OF DOM. AIR TRAFFIC APPENDIX 3.7.2 VOLUME BREAKDOWN OF INT'L AIR TRAFFIC APPENDIX 3.7.3 3 VOLUME BREAKDOWN OF TOTAL OF INT'L APPENDIX 3.7.4 AND DOM. AIR TRAFFIC VOLUME ... DEMAND FORECAST OF PASSENGER APPENDIX 3.7.5 5 BY DOMESTIC ROUTE DEMAND FORECAST OF PASSENGER APPENDIX 3.7.6 1.1 BY INTERNATIONAL ROUTE APPENDIX 3.7.7 AIRCRAFT MIX PROJECTION 14 DOMESTIC ROUTE FORECAST OF ASSIGNED AIRCRAFT APPENDIX 3.7.8 15 BY DOMESTIC ROUTE APPENDIX TO CHAPTER 5 RUNWAY REQUIREMENTS (B-747 APPENDIX 5.2.1 17 TAKE-OFF) RUNWAY REQUIREMENTS (DC-10 APPENDIX 5.2.2 19 TAKE-OFF) 21 DATA OF UTILIZATION ON APRON .. APPENDIX 5.2.3 22

APPENDIX 5.2.4

APPENDIX 5.2.5

APPENDIX 5.2.6

LIST OF APPENDICES

DATA OF OCCUPY TIME ON APRON ..

MOVEMENTS (1) CALCULATION TABLE OF AIRCRAFT

MOVEMENTS (2)

23

24

CALCULATION TABLE OF AIRCRAFT

APPENDIX 5.2.	.12 CALCULATION TABLE OF A/C STAND REQUIREMENT ON APRON DOM	31
APPENDIX 5.5.	.1 INTERNATIONAL PASSENGER TERMINAL BUILDING (FACILITY REQUIREMENT)	33
APPENDIX 5.5.	.2 WAITING LOUNGE AND CONCESSION AREA	34
APPENDIX 5.5.	.3 CHECK-IN LOBBY	35
APPENDIX 5.5.	.4 NO. OF CLOSETS AND LAVATORIES FOR MEN AND WOMEN	36
APPENDIX 5.5.	.5 GATE LOUNGE AREA	37
APPENDIX 5.5.	.6 LINEAR CHECK-IN COUNTER	38
APPENDIX 5.5.	.7 EXAMPLES OF TYPICAL OUTBOUND/ INBOUND IMMIGRATION DESK LAYOUTS	39
APPENDIX 5.5.	.8 SECURITY LAYOUT	40
APPENDIX 5.5.		41
APPENDIX 5.5	.10 INPOUND BAGGAGE, CIRCULATING TYPE	42
APPENDIX 5.5	.11 CALCULATION FOR LENGTH OF CONVEYOR	43
APPENDIX 5.5	.12 DOMESTIC PASSENGER TERMINAL BUILDING (FACILITY REQUIRE-MENT)	47
APPENDIX TO CHAI	PTER 6	
APPENDIX 6.2	.1 THE AIRCRAFT STANDS IN THE EXISTING APRON	48
APPENDIX 6.3	.1 CONTROL DIAGRAM OF AIRFIELD LIGHTING	49
APPENDIX 6.3	.2 EXISTING EQUIPMENT LIST OF AIR NAVIGATIONAL AIDS	50
APPENDIX 6.3	.3 EXISTING EQUIPMENT LIST OF AIR TRAFFIC INFORMATION SERVICE	51
APPENDIX 6.3	2.4 EXISTING EQUIPMENT LIST OF AIR TELECOMMUNICATION SYSTEM	52
APPENDIX 6.3	.5 TELEPHONE SYSTEM	54
APPENDIX 6.3	6.6 EXISTING EQUIPMENT LIST OF AIRFIELD LIGHTING SYSTEM	56

APPENDIX	6.3.7	EXISTING EQUIPMENT LIST OF POWER SUPPLY & GENERATOR SYSTEM	57
APPENDIX	6.4.1	INTL. PAX TERMINAL BLDG. 1981 RENOVATION PLAN DESIGNED BY BIA	58
APPENDIX	6.4.2	EXISTING INTL. PAX TERMINAL BUILDING (ELEVATION) AND INTL. PAX TERMINAL BLDG. 1981 RENOVATION PLAN DESIGNED BY BIA	59
APPENDIX	6.4.3	INTL. PAX TERMINAL BLDG. 1981 EXISTING PLAN	60
APPENDIX	6.4.4	DOM. PAX TERMINAL BLDG. 1981 RENOVATION PLAN DESIGNED BY BIA	61.
APPENDIX	6.4.5	DOM. PAX TERMINAL BLDG. 1981 EXISTING PLAN	62
APPENDIX	6.5.6	EXISTING CARGO TERMINAL BLDG. 1ST FLOOR PLAN	63
APPENDIX	6.5.7	NEW FIRE STATION BLDG	64
APPENDIX TO	CHAPTER	7	
APPENDIX	7.5.1	FUNDAMENTAL LAYOUT OF TERMINAL AREA	65
APPENDIX TO	CHAPTER	9	
APPENDIX	9.2.1	EVALUATION OF EXISTING PAVE- MENT STRUCTURES	66
APPENDIX	9.4.1	DATA FOR CONSOLIDATION SETTLE- MENT DUE TO EMBANKMENT	75
APPENDIX	9.4.2	EVALUATION OF EXISTING STORM WATER DRAINAGE SYSTEM	78
APPENDIX	9.4.3	DESIGN CRITERIA FOR STORM WATER DRAINAGE SYSTEM	80
APPENDIX	9.5.1	THE CURRENT STAR FOR BALI INT'L AIRPORT	82
APPENDIX	9.5.2	THE CURRENT SID AT BALI INT'L AIRPORT	83
APPENDIX	9.5.3	THE CURRENT IAP AT BALI INT'L AIRPORT	84

APPENDIX	9.5.4	ONE OF THE RECOMMENDED STAR FOR BALI INT'L AIRPORT	88
APPENDIX	9.5.5	THE RECOMMENDABLE SID AT BALI INT'L AIRPORT	92
APPENDIX	9.5.6	ONE OF THE RECOMMENDABLE IAP AT BALI INT'L AIRPORT	94
APPENDIX		THE RELOCATION OF THE V.A.S.I'S UNIT	100
APPENDIX		LAYOUT PLAN OF AIRFIELD LIGHT- ING SYSTEM FOR THE SHORT TERM PLAN (1990)	101
APPENDIX	9.6.1	BOARDING BRIDGE INSTALLATION	103
APPENDIX	9.8.1	SKELETON DIAGRAM OF POWER SUPPLY SYSTEM DEVELOPMENT PLAN.	105
APPENDIX	9.8.2	STANDARD OF WATER QUALITY	106
APPENDIX	9.8.3	SEWAGE TREATMENT SYSTEM	107
APPENDIX	9.10.1	75 MASTER PLAN 2.0 MILLION ANNUAL PAX. (+1985)	108
APPENDIX	9.10.2	75 MASTER PLAN 3.5 MILLION ANNUAL PAX. (±1990)	109
APPENDIX	9.10.3	75 MASTER PLAN 5.0 MILLION ANNUAL PAX. (+1992)	110
APPENDIX	9.10.4	75 MASTER PLAN 6.5 MILLION ANNUAL PAX. (+1996)	111
APPENDIX	9.10.5	75 MASTER PLAN 6.5 MILLION ANNUAL PAX. LAYOUT OF TERMINAL BLDGS. (+1996)	112
APPENDIX TO	CHAPTER	. 10	
APPENDIX	10.5.1	AIRPORT ORGANIZATION	113
APPENDIX TO	CHAPTER	11.	
APPENDIX	11.1.1	LOCATION OF SOIL INVESTIGA- TION CARRIED OUT	115
APPENDIX	11.1.2	BORING PROFILE AT TUKAO KUTA	116
APPENDIX	11.1.3	BORING PROFILE AT TUKAO JIMBARAN - I	117
APPENDIX	11.1.4	BORING PROFILE AT TUKAO JIMBARAN - II	118

APPENDIX		PROPOSED CONSTRUCTION METHOD FOR 1990 DEVELOPMENT PLAN	119
APPENDIX	11.3.2	INT'L PAX TERMINAL BLDG	120
APPENDIX	11.3.3	DOM. PAX TERMINAL BLDG	121
APPENDIX	11.3.4	EXISTING CARGO TERMINAL BLDG. STEP-1	122
APPENDIX	11.3.5	EXISTING CARGO TERMINAL BLDG. STEP-3	123
APPENDIX	11.3.6	DOM. PAX TERMINAL BLDG. STEP-4	124
APPENDIX	11.5.1	BREAK-DOWN OF MAJOR ARCH. CONSTRUCTION COST OF INT'L AND DOM. PAX. TERMINAL BUILDINGS IN THE YEAR 1990 DEVELOPMENT PLAN	125
APPENDIX TO	CHAPTER	12	
APPENDIX	12.5.1	ECONOMIC ANALYSIS: CONSTRUC- TION COST UP 0%	126
APPENDIX	12.5.2	ECONOMIC ANALYSIS: CONSTRUCTION COST UP 10%	128
APPENDIX	12.5.3	ECONOMIC ANALYSIS: CONSTRUC- TION COST UP 20%	130
APPENDIX	12.10.1	FINANCIAL ANALYSIS: REVENUE UP 0%	132
APPENDIX	12.10.2	FINANCIAL ANALYSIS: REVENUE UP 30%	133
		FINANCIAL ANALYSIS: REVENUE UP 40%	134
APPENDIX	12.10.4	FINANCIAL ANALYSIS: REVENUE UP 50%	135
APPENDIX	12.12.1	ECONOMIC AND FINANCIAL ANALYSIS ON ALTERNATIVE CONSTRUCTION SCHEDULES: TWO CASES	136
		ECONOMIC ANALYSIS: (CASE-1) TABLE 1.1 CONSTRUCTION COST UP 0%	139
APPENDIX	12.12.3	ECONOMIC ANALYSIS: (CASE-2) TABLE 1.2 CONSTRUCTION COST UP 0%	140

APPENDIX	12.12.4		ANALYSIS: (CASE-1) REVENUE UP 0%	141
APPENDIX	12.12.5		ANALYSIS: (CASE-1) REVENUE UP 40%	142
APPENDIX	12.12.6		ANALYSIS: (CASE-1) REVENUE UP 50%	143
APPENDIX	12.12.7		ANALYSIS: (CASE-2) REVENUE UP 0%	144
APPENDIX	12.12.8	FINANCIAL TABLE 3.2	ANALYSIS: (CASE-2) REVENUE UP 40%	145
APPENDIX	12.12.9	FINANCIAL TABLE 3.3	ANALYSIS: (CASE-2) REVENUE UP 502	7.46

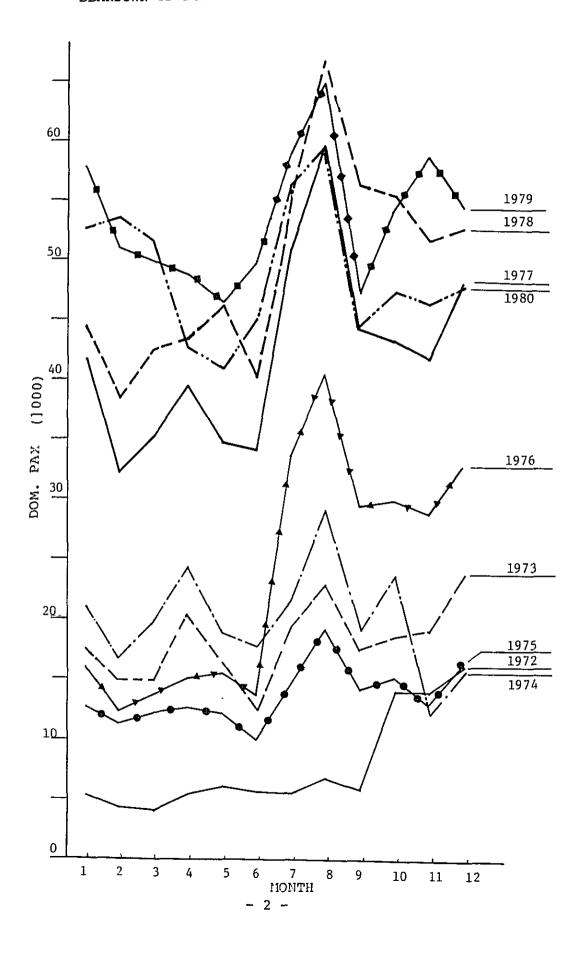
APPENDEX TO CHAPTER 35

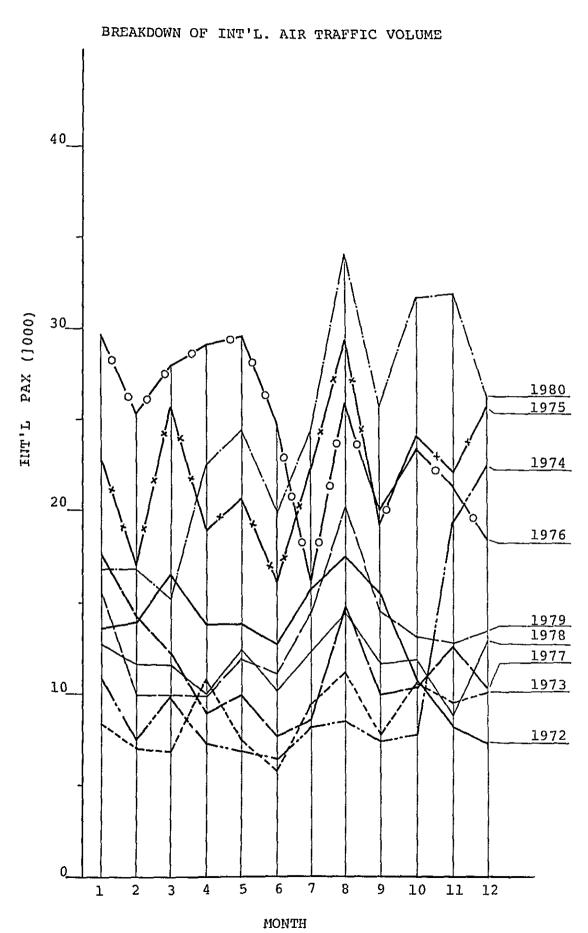


DATA OF MONTHLY PASSENGER'S NUMBER (INCLUDING TRANSIT)

0	69,674	65,321	107,40	65,124	65,324	64,784	19,983	93,245	777,69	78,770	.7,88.	:	ĭ.	,	~	τ
1980	16,923	16,862	15,178	22,535	2.1881	19,973	24,091	34,171 9	25,793 43,629 6	11.805 7. 1.96.4	31,987 40,898	26,282 4,284	796, "B" , 296, "I	× × ::	11 7 5	10 (A.)
62	73,695	60,612	59,531	58, 469	58, 102 1-	- 095,000 -	72,618 F	84,450 +-	61,292-	- /16,99	70,625	- 190.19	94, 13B	(Aug.)	(Auk)	(Aug)
1979	15,875	9,704	9,689	9,663	11,980	113035 49,525	14,161	20,213	14,502	13,075	12,7 LL 31,891	13, 30,	13,936,7	13.0% (A	16.1 (A	10 64 (A
1978	57,242	49,905	24,020	55,250	\$8,206 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	50,118	67,026	80,571	67,277	1 68 5 , 50	478,00	6-,701	.24,734	(Aug.)	(Aug.)	(Aug.)
19	12,841	11,615	11,578	43,333	12,257	10,010	12,229	14,407	11,460	11 4 79	8,712	12,677 -12,024	1.19,182	10.4, 6	11 2, 6	11.1
1977	59,634	46,478	47,264	48,206	44,498	1,58,	58,862	68,998	5 1,731	53,152	73,706	925,025	34,148	(lan)	(Aug.)	(Aug.)
5	17,840	14,286	12,136	8,886	9,923	7,624	8, 487	14,7,	9,884 43,847	10,298	12,443 41,2h3	16, 201	187.2091, 164.1497,097,	13.0% (10.9% (10.9
1976	45,752	17,568	11,548	202,***	+> 0.34	88, 405	.49,152	66,402	49,268	51,130	50,017) 0. h86 -	71.	(Yay)	(Aug.)	(Aur.)
51	29,727 16,0 <u>25</u>	25,263 12,405	27,935 13,613	29,132	29,603 1,29,603	23,289	13,718	201 42 42 94	19,942 29,326	23,403 29,27	21, 397 28, 618	18, 303	291, 374, 279, 279, 794, 1	10 1. () 77.7	11.6%
1975	35,479	28,117	37,723	86+*11	32,846	25,881	16,982	99C* K*	15, 189	39, 308	34,946	41, 78	. 6• ¢e:	(Aug.)	(Aug.)	(Aug.)
61	22,692	16,905	25,616 12,105	18,9,0	20,715	1,488,4	22,42)	19.00.61	19,204	7,15,146	08022	15,868 (4,110	26 1, 906, 23 162, 587, 142	11 2" () / 11) 27 II
1974	12,039	24,167	890.05	. I 6U	23,613	3.841	29,114	[]	107. 97	11,416,		x x		. ()	· ·	` * V
19	19,898	7,536	21,723 + 9,184	10,460 F 2+,212	188,4	2 2 4 2 2 4 4	21, 2	8,418 29,03,	, r , r	T.	7.5			· r		
1973	25,581	1 21,826		90,960	5, 41 - 98.74.62 -	2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	+ + + + + + + + + + + + + + + + + + +	, , , , , , , , , , , , , , , , , , ,	ж 2	<i>‡</i>	Ę. r	-	·	٠.		
61	8,951 - 8,104	7,036	14,821	19,269 - 10,638	19, 19 - 7, 349	12, 382	9,2,3	11,0e1 22,883	***************************************	4. 3.1.	1 5 k 1	•) * } -			1
1972	18,951		20,634			× 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2	1 + 15 + 1	. 161,	657.1	· ·	- ت •	٠				,
19	13,541	13,926	16, 114	15,466	13,585	12,802	12,001	, <u>*</u> ; ; ;	15,45)					=		j
	INITI	INT'1 DOM	LNT 1 DOM	1 TXT 1 1 NO0	1, INI BOM	DOM	INT'L DOM	T.INI T.INI	INT'L DOM	NOG NOG	FN1 1	INI.	·		ર 	111
Year Month	-	~	~	à	٠,	£		3 0	6	01	==	2	10141	Peak 14ter		

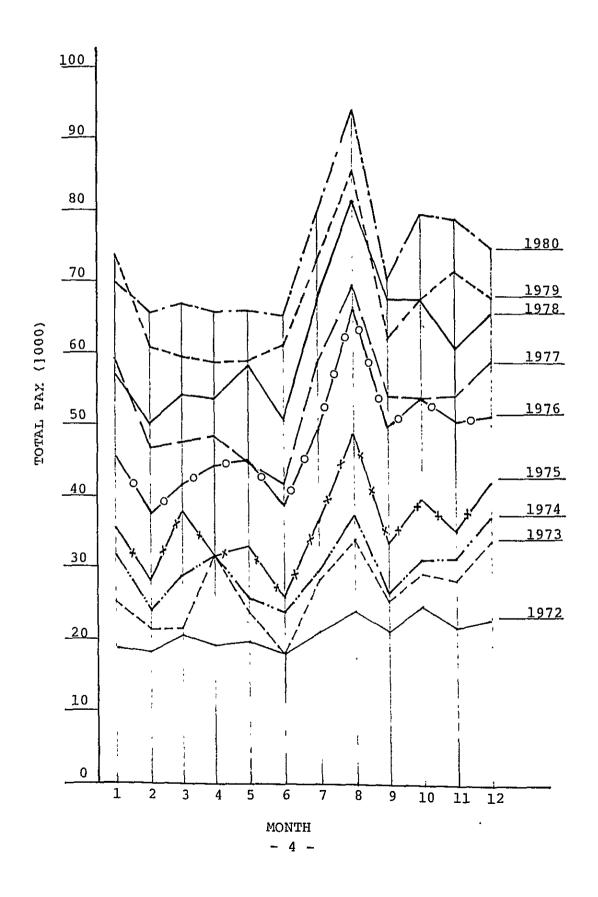
BEAKDOWN OF DOM. AIR TRAFFIC VOLUME





- 3 -

BREAKDOWN OF TOTAL OF INT'L AND DOM. AIR TRAFFIC VOLUME



DEMAND FORECAST OF PASSENGERS BY DOMESTIC ROUTE

(1) Share by route

There are about 20 airports which might be linked to Bali. Some of the airports are situated on one and the same island, and some are pioneer air routes with an exceedingly small transport volume. For this reason, future routes to the east of Bali are predicted here based on the condition that one airport would represent one island.

TABLE 1 FORECAST ROUTES

Island Airport		Representative Airport	City	
-	Halim	Halim	JAKARTA (JKT)	
-	JOGYA	Jogya	JOGYA (JOG)	
_	Juanda	Juanda	SURABAYA (SUB)	
LOMBOK	Rembiga	Rembiga	AMPENAN (AMI)	
SUMBAWA	Sumbawa BIMA	Sumbawa	SLMBAWA (SWQ)	
SUMBA	Wingapu Tambolaka	Wingapu	WINGAPU (WGP)	
FLORES	Ruteng Ende Maumere	Maumere	MAUMERE (MOF)	
TIMOR	Kupang Dili	Kupang	KUPANG (KOE)	
SULAWESI	Makassar	Makassar	UJUNG PANDAN (UPG)	
	Oth	er		

The past-record is an important index to forecast the demand for domestic passengers. There are wide variations for the domestic passenger on the DPS-JKT route because of the modification of statistical method for passenger volume between Domestic and International Airline, discontinuance of direct flights by foreign Air-

lines or commencement of mixed-flights by G.I.A.

TABLE 2.

Year	International Passenger	Ratio This Year/ Last Year	Domestic Passenger	Ratio This Year/ Last Year	Ratio (DOM./INTL.)
1972	158,504	_	93,067		0.59
1973	103,868	0.66	216,729	2.33	2.09
1974	121,019	1.17	237,400	1.09	1.96
1975	263,906	2.18	162,587	0.68	0.62
1976	291,374	1.10	279,794	1.72	0.96
1977	137,091	0.47	497,057	1.78	3.63
1978	139,182	1.02	589,551	1.19	4.26
1979	155,936	1.12	638,122	1.08	4.09
1980	290,083	1.86	579,718	0.91	2

The foreign airlines which discontinued direct flights to B.I.A. are as follows:

<u>Airline</u>	Operation Period	No. of Flights
PA	1971 - 1975	2FL/W
TG	1969 - 1980	3FL/W
LX	1974 - 1975	lfL/W
SQ	1980 (Jan-April)	5FL/W
TYO-DPS	(non-scheduled)	54 FL/1979

The passenger's share by each domestic route during three years are shown in Table-3.

TABLE 3 PASSENGER'S SHARE BY DOMESTIC ROUTE

Unit: %

Route to DPS	1979	1980	1981	Average
JKT	54.2	45.4	46.5	48.7
JOG	10.8	13.4	13.1	12.4
SUB	11.9	12.9	13.0	12.6
AMI	9.5	11.7	10.7	10.6
SWQ	1.5	1.8	2.0	1.8
WGP	1.1	1.1	0.5	0.9
MOF	0.3	0.3	0.4	0.3
KOE	4.9	6.6	6.2	5.9
UPG	5.4	6.4	6.4	6.1
OTHER	0.4	0.4	1.2	0.7
TOTAL	100	100	100	100

Generally, the average value of past data is used for the setting up a standard to determine the share by each route for the forecasted value. But is has wide variation in relation with international route.

Judging from the abovementioned table, 1979 to 1980 was considered to be too irregular. Therefore, the share value for each route was fixed by 1980 data.

(2) Passengers by route

The number of Indonesian's passenger in 1980 was calculated from the actual movement of domestic passengers including foreigners.

(a) 40% of foreign passengers to visit the Bali Island are coming from a place in Indonesia other than Bali.

Therefore:

- The Foreigners 478,000 x 0.6 ÷ 287,000 person/year coming to Bali

- The Foreigners 478,000 x 0.4 ÷ 191,000 person/year going to other destinations

191,000 foreigners per year were considered to come by mixed flight or other domestic route.

(b) There are 241,000 domestic passengers per year (Not including the transit passengers) on the JKT-DPS route (mixed-flight) in 1980.

The data from Peruma Angkasa Pura on B.I.A. indicates that the ratio between Indonesian and Foreigners is 50:50 on domestic routes.

This means that foreigners and Indonesians are each 120,500 person/year.

(c) The foreign passengers coming to Bali by domestic routes other than JKT-DPS are calculated as follows:

191,000 - 120,500 = 70,500 person/year

These foreign passengers can be allocated as 50% on Jogya route and 25% each on Ujungpandang and Surabaya routes.

JOGYA	35,000	person/year
SURABAYA	17,750	11
UJUNGPANDANG	17,750	n
TOTAL	70,500	person/year

(d) In total, the share of Indonesian passengers in Bali in 1980 is shown in Table 4.

TABLE 4 INDONESIAN PASSENGER'S SHARE BY EACH ROUTE

Route To DPS	1: DOM PAX	2 : Foreigner included in 1	1 – 2	Ratio
JKT	241,000	120,500	120,500	33.5
JOG	75,400	35,000	40,400	11.2
SUB	72,400	17,750	54,650	15.2
AMI	65,900	-	65,900	18.3
swq	9,900	-	9,900	2.7
WGP	5,900	-	5,900	1.6
MOF	1,500	-	1,500	0.4
KOE	37,100	-	37,100	10.3
UPG	36,000	17,750	18,250	5.1
OTHER	6,000		6,000	1.7

360,100 person/year 100%

DEMAND OF INDONESIAN PASSENGER ON EACH ROUTE

32,000 51,000 72,000 96,000 125,000 156,000			ND OF INDO		SSENGER U		
32,000 51,000 72,000 96,000 125,000 156,000	ROUTE	1985	1990	1995	2000	2005	2010
32,000 51,000 72,000 96,000 125,000 156,000 250,000 436,000 625,000 900,000 1,147,000 1,446,000 129,000 185,000 269,000 341,000 431,000 11,000 17,000 24,000 32,000 42,000 52,000 84,000 146,000 209,000 301,000 383,000 483,000 15,000 23,000 32,000 44,000 57,000 70,000 114,000 198,000 283,000 409,000 521,000 655,000 175,000 23,000 302,000 439,000 558,000 705,000 136,000 238,000 341,000 492,000 626,000 790,000 790,000 700,000	JKT	218,000	385,000	553,000	804,000	1,022,000	1,290,000
250,000		-	\	72,000	96,000	125,000	156,000
JOG 73,000 129,000 185,000 269,000 341,000 431,00 11,000 17,000 24,000 32,000 42,000 52,00 84,000 146,000 209,000 301,000 383,000 483,00 SUB 99,000 175,000 251,000 365,000 464,000 585,00 15,000 23,000 32,000 44,000 57,000 70,00 114,000 198,000 283,000 409,000 521,000 655,00 AMI 119,000 210,000 302,000 439,000 558,000 705,00 17,000 28,000 39,000 53,000 68,000 85,00 136,000 238,000 341,000 492,000 626,000 790,00 SWQ 18,000 31,000 44,000 65,000 82,000 104,00 2,000 4,000 6,000 8,000 10,000 13,00 WGP 10,000 18,000 26,000 38,000 49,000 <td><u> </u></td> <td></td> <td></td> <td>625,000</td> <td>900,000</td> <td>1,147,000</td> <td>1,446,000</td>	<u> </u>			625,000	900,000	1,147,000	1,446,000
11,000	JOG			185,000	269,000	341,000	431,000
SUB 99,000 175,000 251,000 365,000 464,000 585,00 15,000 23,000 32,000 44,000 57,000 70,00 114,000 198,000 283,000 409,000 521,000 655,00 AMI 119,000 210,000 302,000 439,000 558,000 705,00 17,000 28,000 39,000 53,000 68,000 85,00 136,000 238,000 341,000 492,000 626,000 790,00 SWQ 18,000 31,000 44,000 65,000 82,000 104,00 2,000 4,000 6,000 8,000 10,000 13,00 WGP 10,000 18,000 26,000 38,000 49,000 62,00 2,000 2,000 3,000 4,000 6,000 7,00 MOF 2,000 5,000 7,000 10,000 12,000 15,00		·	17,000	24,000	32,000	42,000	52,000
SUB 99,000 175,000 251,000 365,000 464,000 585,00 15,000 23,000 32,000 44,000 57,000 70,00 114,000 198,000 283,000 409,000 521,000 655,00 AMI 119,000 210,000 302,000 439,000 558,000 705,00 17,000 28,000 39,000 53,000 68,000 85,00 136,000 238,000 341,000 492,000 626,000 790,00 SWQ 18,000 31,000 44,000 65,000 82,000 104,00 20,000 4,000 6,000 8,000 10,000 13,00 WGP 10,000 18,000 26,000 38,000 49,000 62,00 2,000 2,000 3,000 4,000 6,000 7,00 MOF 2,000 5,000 7,000 10,000 12,000 15,00	-		146,000	209,000	301,000	383,000	483,000
15,000	SUB		175,000	251,000	365,000	464,000	585,000
AMI 119,000 210,000 302,000 439,000 558,000 705,000 17,000 28,000 39,000 53,000 68,000 85,000 136,000 238,000 341,000 492,000 626,000 790,000 2,000 4,000 65,000 82,000 104,000 20,000 35,000 50,000 73,000 92,000 117,000 WGP 10,000 18,000 26,000 38,000 49,000 62,000 2,000 20,000 3,000 42,000 6,000 7,000 12,000 12,000 55,000 69,000 MOF 2,000 5,000 7,000 10,000 12,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 15,000 10,000 10,000 15,000 15,000 10,000 12,000 15,000		15,000	23,000	32,000	44,000	57,000	70,000
17,000 28,000 39,000 53,000 68,000 85,00 136,000 238,000 341,000 492,000 626,000 790,00 SWQ 18,000 31,000 44,000 65,000 82,000 104,00 2,000 4,000 6,000 8,000 10,000 13,00 20,000 35,000 50,000 73,000 92,000 117,00 WGP 10,000 18,000 26,000 38,000 49,000 62,00 2,000 2,000 3,000 4,000 6,000 7,00 MOF 2,000 5,000 7,000 10,000 12,000 15,00	ļ	114,000	198,000	283,000	409,000	521,000	655,000
136,000 238,000 341,000 492,000 626,000 790,000 SWQ 18,000 31,000 44,000 65,000 82,000 104,000 2,000 4,000 6,000 8,000 10,000 13,000 20,000 35,000 50,000 73,000 92,000 117,000 WGP 10,000 18,000 26,000 38,000 49,000 62,000 2,000 2,000 3,000 4,000 6,000 7,000 12,000 20,000 29,000 42,000 55,000 69,000 MOF 2,000 5,000 7,000 10,000 12,000 15,000	AMI	119,000	210,000	302,000	439,000	558,000	705,000
SWQ 18,000 31,000 44,000 65,000 82,000 104,00 2,000 4,000 6,000 8,000 10,000 13,00 20,000 35,000 50,000 73,000 92,000 117,00 WGP 10,000 18,000 26,000 38,000 49,000 62,00 2,000 2,000 3,000 4,000 6,000 7,00 12,000 20,000 29,000 42,000 55,000 69,00 MOF 2,000 5,000 7,000 10,000 12,000 15,00		17,000	28,000	39,000	53,000	68,000	85,000
2,000 4,000 6,000 8,000 10,000 13,00 20,000 35,000 50,000 73,000 92,000 117,00 WGP 10,000 18,000 26,000 38,000 49,000 62,00 2,000 2,000 3,000 4,000 6,000 7,00 12,000 20,000 29,000 42,000 55,000 69,00 MOF 2,000 5,000 7,000 10,000 12,000 15,00		136,000	238,000	341,000	492,000	626,000	790,000
20,000 35,000 50,000 73,000 92,000 117,000 WGP 10,000 18,000 26,000 38,000 49,000 62,000 2,000 2,000 3,000 4,000 6,000 7,000 12,000 20,000 29,000 42,000 55,000 69,000 MOF 2,000 5,000 7,000 10,000 12,000 15,000	SWQ	18,000	31,000	44,000	65,000	82,000	104,000
WGP 10,000 18,000 26,000 38,000 49,000 62,00 2,000 2,000 3,000 4,000 6,000 7,00 12,000 20,000 29,000 42,000 55,000 69,00 MOF 2,000 5,000 7,000 10,000 12,000 15,00		2,000	4,000	6,000	8,000	10,000	13,000
2,000 2,000 3,000 4,000 6,000 7,00 12,000 20,000 29,000 42,000 55,000 69,00 MOF 2,000 5,000 7,000 10,000 12,000 15,00		20,000	35,000	50,000	73,000	92,000	117,000
12,000 20,000 29,000 42,000 55,000 69,00 MOF 2,000 5,000 7,000 10,000 12,000 15,00	WGP	10,000	18,000	26,000	38,000	49,000	62,000
MOF 2,000 5,000 7,000 10,000 12,000 15,00	Ì	2,000	2,000	3,000	4,000	6,000	7,000
		12,000	20,000	29,000	42,000	55,000	69,000
	MOF	2,000	5,000	7,000	10,000	12,000	15,000
- 1,000 1,000 1,000 2,00			1,000	1,000	1,000	1,000	2,000
2,000 6,000 8,000 11,000 13,000 17,00		2,000	6,000	8,000	11,000	13,000	17,000
KOE 67,000 118,000 170,000 247,000 314,000 397,00	KOE	67,000	118,000	170,000	247,000	314,000	397,000
10,000 15,000 22,000 30,000 38,000 48,00		10,000	15,000	22,000	30,000	38,000	48,000
77,000 133,000 192,000 277,000 352,000 445,00		77,000	133,000	192,000	277,000	352,000	445,000
UPG 33,000 59,000 84,000 122,000 156,000 196,00	UPG	33,000	59,000	84,000	122,000	156,000	196,000
5,000 8,000 11,000 15,000 19,000 24,00	<u> </u>	5,000	8,000	11,000	15,000	19,000	24,000
38,000 67,000 95,000 137,000 175,000 220,00		38,000	67,000	95,000	137,000	175,000	220,000
OTHER 11,000 20,000 28,000 41,000 52,000 65,00	OTHER	11,000	20,000	28,000	41,000	52,000	65,000
	<u> </u>		3,000	4,000	5,000	6,000	8,000
13,000 23,000 32,000 46,000 58,000 73,00		13,000	23,000	32,000	46,000	58,000	73,000
TOTAL 650,000 1,150,000 1,650,000 2,400,000 3,050,000 3,850,00	TOTAL	650,000	1,150,000	1,650,000	2,400,000	3,050,000	3,850,000
	1		152,000	214,000	288,000	372,000	465,000
746,000 1,302,000 1,864,000 2,688,000 3,422,000 4,315,00		746,000	1,302,000	1,864,000	2,688,000	3,422,000	4,315,000

upper : No. of PAX (ARR + DEPT)
medium: Transit

lower : Total

DEMAND FORECAST OF PASSENGER BY INTERNATIONAL ROUTE

	(A) Indonesian Passenger	(B) Foreign Passenger	Total		
1985 1990	650,000 1,150,000	800,000 1,250,000	1,450,000 2,400,000		
1995 2000	1,650,000	1,800,000	3,450,000		
2005	2,400,000 3,050,000	2,450,000	4,850,000		
2010	3,850,000	3,150,000 4,000,000	6,200,000 7,850,000		
	2,020,000	1,000,000	7,020,000		
	į				
	(C) Forei		reigner		
		_	nigrated		
			Bali		
			0%)		
1985			30,000		
1990 1995			50,000		
2000		•	30,000 70,000		
2005	1,260	-	90,000		
2010	1,600		00,000		
			<u> </u>		
		<u></u>			
		(E) Foreigner	(F) Foreigner		
		on Other than the	on the Australian		
		Australian	Route		
		Route		<u>.t.</u>	
1985		210,000	270,000	*1 (57%)	*2 (34%)
1990		290,000	460,000	(61%)	(37%)
1995		360,000	720,000	(67%)	(40%)
2000		440,000	1,030,000	(70%)	(42%)
2005		470,000	1,420,000	(75%)	(45%)
2010		480,000	1,920,000	(80%)	(48%)
			 1		
	(C) Mirror	† ! - flight's(H) D:	troot flight *3		
			rom Foreign		
	DPS 1		DPS-TYO)		
1005			53,000		
1985 1990		57,000 07,000	83,000		
1995		1,000	119,000		
2000		78,000	162,000		
2005		52,000	208,000		
2010	23	16,000	264,000		

Note: $*^1$: Ration of (F)/(D)

1985's share is the average value between 1977 \circ 1981.

*2 : Ratio of (F)/(B)

*3 : Calculated of 11.0% with actual movement of 1980

SHARE DEMAND OF EACH AUSTRALIAN ROUTE

Route to DPS	1979	1980	1981	Average
SYD	43,000 (48.3%)	76,200 (50.9%)	60,400 (46.5%)	(48.6%)
DRW	2,900 (3.3%)	4,650 (3.1%)	8,000 (6.2%)	(4.2%)
PER	18,200 (20.4%)	36,800 (24.6%)	34,800 (26.8%)	(23.9%)
MEL	25,000 (28.0%)	31,900 (21.3%)	26,637 (20.5%)	(23.3%)

100%

NO. OF FOREIGNER COMING BALI ISLAND BY DOMESTIC LINE OR MIXED FLIGHT BEING IMMIGRATED OTHER PLACE

ROUTE	1985	1990	1995	2000	2005	2010
JKT	160,000	250,000	360,000	490,000	630,000	800,000
JOG	80,000	125,000	180,000	245,000	315,000	400,000
SUB	SUB 40,000		90,000	122,000	158,000	200,000
UPG	40,000	62,000	90,000	123,000	157,000	200,000
TOTAL	320,000	500,000	720,000	980,000	1,260,000	1,600,000

DEMAND OF EACH AUSTRALIAN ROUTE

ROUTE	1985	1990	1995	2000	2005	2010
SYD	131,000 (8,000)	224,000 (13,000)	350,000 (19,000)	501,000 (29,000)	690,000 (42,000)	933,000 (58,000)
]	139,000	237,000	369,000	530,000	732,000	991,000
PER	65,000 (4,000)	110,000 (6,000)	172,000 (10,000)	246,000 (14,000)	339,000 (20,000)	459,000 29,000
	69,000	116,000	182,000	260,000	359,000	488,000
MEL,	63,000 (4,000)	107,000 (6,000)	168,000 (9,000)	240,000 (14,000)	331,000 (20,000)	447,000 (28,000)
<u> </u>	67,000	113,000	177,000	254,000	351,000	475,000
DRW	11,000 (1,000)	19,000 (1,000)	30,000 (2,000)	43,000 (3,000)	60,000 (4,000)	81,000 (5,000)
	12,000	20,000	32,000	46,000	64,000	86,000
TOTAL	270,000 (30,000)	460,000 (43,000)	720,000 (60,000)	1,030,000 (85,000)	1,420,000 (115,000)	1,920,000 (150,000)
	300,000	503,000	780,000	1,115,000	1,535,000	2,070,000

TYO	53,000 (3,000)	83,000 (5,000)	119,000 (7,000)	162,000 (9,000)	208,000 (13,000)	264,000 (16,000)
	56,000		126,000	171,000	221,000	280,000

upper :No. of PAX(ARR+DEP)

medium:Transit
lower:Total

AIRCRAFT MIX PROJECTION ON DOMESTIC ROUTE

L			CONDITION	z						100									ĺ	
ž	Route	Exlating	λ ₀	T	Scheduled					DEMAND FORECAST AND AIRCRAFT MIX BY RULLE	CECASI AN	D ALKCKA	I MIX II	r KUUTE			ĕ	(Unit 1000 Person/Year)	rson/Year	٦
		Length (m)	ğ	Projected Afreraft	PELITA III	0 50	100	200	300	40.0	200		0	700	800	006	1000		1,500	7 130 0 S'I
	JAKARTA (JkT)	3000×60	0 %	B-747								i k				- E &	1			P4 P5 P6 644,7056 Z476
~	JOGYAKARTA (JOG)	1830×10	4.5	6-30				<u> </u>	1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1		- X	Fat Sai		P S		2 8 9				
	SURABAYA (SUB)	3000000	09	DC-10	DC-10			EBB.	11.5		7.3 37.3 WB	- 2 - <u>2</u> - 2 - <u>2</u> - 2 - <u>2</u> - 2 - <u>2</u> - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	ļ	84.7 88.7 1		1 2 2		 		
-	AMPENAN (ANI)	1 60 0×4 0	64 64	F-28				18 STOL	2 1 3) ;	- F 632	2 8 3		2 8 3					
и	SUMBAWA (SNQ)	1.4 50 × 30	1.4	F-27		[2]														
۰	BIWA (BWU)	1255×30	1.4	118-748		- <u> </u>					_									
	WINGAPU (WDP)	0 E × 0 0 E I	2 4	F-27		saled rale dealid						_								
∞	TAMBOJAKA (TLK)	15 po x3 o	1.5	F2.F		12 12 12 12 12 12 12 12 12 12 12 12 12 1	7 7			-	_		_			• • •		<u> </u>		
ø,	RUTENO (RTO)	700×18	1	DIKC-6		FI P2 P3 P4	P3 P4 1 11 STOL STOL	Ps P6 13 17 STUL STUL												_
0.	(3\3) 30X3	750×18	1	1MC-6		 												<u> </u>		
11	WOMERE (NOF)	1.470×30	91	F-2.7	F-28															
12	hupang (hoe)	1,230/30	Ŧ	7. 8.		ı		<u>.</u>	12 <u>1</u> 2 –		[2]									
13	DILI (DIL)	1,400×25	12	P 2 7			<u>ַ</u>					a				i	j			
14	WUNGPANDANG (UPO)	1,550×30 2345×45	20	A300	DC−1 0			182 18	73 P4 186 186 186 186 186 186 186 186 186 186		* 8 P									
SC4	Scale for AC Projection	ction			سی	05 85 101 P	100		ង្គា		100		NAU		SW S				4	
							ļ		ļ					İ						

Forecast of Assigned Aircraft by Domestic Route

- A) Basic Assumptions:
 - (1) Mixed flights between JKT and DPS are expected not to be cancelled in the future.
 - (2) Wide-bodied aircraft B-747 are also expected to operate mainly between JKT and domestic trunk line airports (Category II), and for international routes.
 - (3) NMJ such as B-767 are anticipated to be operated by GIA as one of the major assigned aircraft for domestic air routes around 1995.
- B) Assigned Aircraft by Route are forecast, as follows:

operate for about 10 years from now on.

- (1) JOG Route

 Because the existing Jogya (Juanda) Airport cannot be expanded due to geographical limitations new Jogya Airport is planned to be constructed from 1982 and to be completed around 1995. Therefore, the presently assigned aircraft (DC-9 and NMJ) are expected to
- (2) Surabaya (SUB) Routes
 SUB routes between SUB and DPS has been operated by
 DC-9. The route between JKT and SUB, however, has
 been operated as a shuttle service by A-300 since
 January 1982.

Air transport volume on the route between SUB and DPS is expected to be increased rapidly in the future. A-300 aircraft is expected to be introduced in the route between JKT and DPS through SUB in the near future.

(3) Ampenan (AMI) Route
Ampenan (Rembiga) Airport is equipped with 1,600m long
of the runway. Because there is about 100Km in distance between AMI and DPS only, the route has been
operated by DHC-6 (by MNA).

the first transfer of the second seco

The following assumptions form the basis for assigning of aircraft for the future are:

- The route handles the largest air transport volume among the eastern air routes from Bali island.
- The route once had been operated by F-28
- Passenger volumes on the route are forecast to show rapid growh from 240,000 annual pax. in 1990 and 490,000 annual pax in 2000. DHC-6 aircraft cannot handle the increased passenger volume on the route in the future.

As explained above future air transport demand is expected to increase substantially. On the other hand, Ampenan Airport has not developed sufficient airport facilities based on air transport demand. Therefore, small aircraft are expected to continue operating in the future taking into consideration the present situation.

(4) Ujung Pandang (UPG) Routes The route between UPG and DPS has been operated by A-300 since January 1982. Based on present conditions, the type of aircraft to be assigned on the route are forecast.

APPENDEX TO CHAPTER 5



APPENDIX 5.2.1

RUNWAY REQUIREMENTS (B-747 TAKE-OI'I)

ASSUMPTIONS

OAT : 31° C (ISA + 16° C)

Elevation : 0 feet
Slope : 0 percent
Procedure : Take-off

Route : DPS ----- FUK

3224 NM 515 NM

FL/Wind : +15Kt/FL350 -70Kt/FL350

Alternate : Fukuoka

TAKE-OFF WEIGHT : 346,000 Kg

D.O.W : 173,000 Kg Fuel Carried : 107,000 Kg Max. Payload : 66,000 Kg

MONOGRAPH APPLIED : 2,750 m (20°FL), 3,000 m (10°FL)

RWY FIELD LENGTH

REQUIRED : 2,800 m (20°FL), 3,000 m (10°FL)

747-200

TAKEOFF JT9D-7Q OPERATIONS MANUAL **PERFORMANCE** 1000 KG LB OAT OF 100 120 -20 20 400 820 780 340. 740 320-FIELD LENGTH LIMIT GROSS WEIGHT -700 131 300 -660 260 580 -540 240 220 500 -450 200 -3,1 OAT OC TAIL RUMAY SLOPE X NOTE: FOR PACKS OFF, INCREASE ALLOWABLE WEIGHT BY 3000 KG (6600 LB) 9 10 FIELD LENGTH AVAILABLE 1000 FT

BOEING 707

USE THE SMALLER LIMIT MAX

APPENDIX 5.2.2

RUNWAY REQUIREMENTS (DC-10 TAKE-OFF)

ASSUMPTIONS

OAT : 31° C (ISA + 16° C)

Elevation : 0 feet Slope : 0 percent

Procedure : Take-off

Route : DPS ----- TYO(NRT) ----- FUK

Distance : 3224 NM 515 NM

FL/Wind : +15Kt/FL350 -70Kt/FL350

Alternate : Fukuoka

TAKE-OFF WEIGHT : 242,800 Kg

D.O.W : 123,400 Kg Fuel Carried : 75,600 Kg Max. Payload : 43,800 Kg

MONOGRAPH APPLIED : 3140 m

RWY FIELD LENGTH

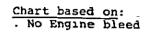
REQUIRED : 3,200 m

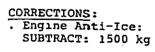
(Flaps 12°)

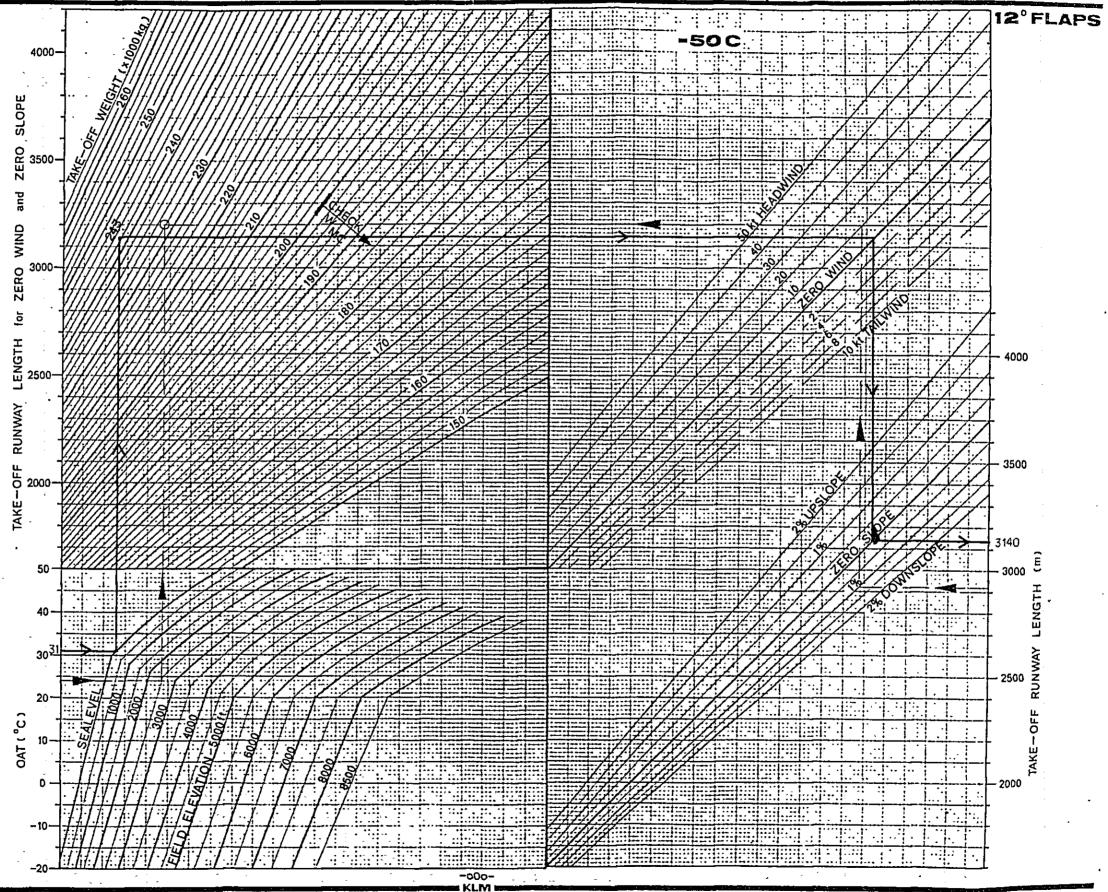
AIRCRAFT OPERATIONS MANUAL DC-10

TAKE-OFF PERFORMANCE 6.2.

Take-off Runway Length







. •		
	•	•
	•	

,

•

Friday at Dec. '81

DATA OF UTILIZATION ON APRON

\neg														_	-					T	-	1		7		7		
	••••			••••						 I					 , I						1		 }	}				
	••••		••••					••••	 	 	 	 			 		ן ן				. <u>l</u> .		ا إ		ا ا		} 	٠
22) 			 								-∤.						, 		ļ
23		syn																-	 		1]		
}	45	HLP S		į.																								
22	30 40	٠ (S.	15	HI,P			,					••••			 						*				•••	Ì
21	Į	MEC	30	HLP					**-		• • •					•••								••••				l
20		끂																••••		+	+			•••			• • • •	l
13												 -] 	•••										
18	••••															,				}.	}		•••	ļ				
ļ	25 25	HLP			 		0.5	100									55	SUB										
17	25	SYD	o 1	II.P		l									40	UPG				3							35	
16		•••	30:30	H.P.			52.4	HLP	• • • •		82	Ä	유	ure				••••	₽ 1	2	•	ا. ـ ـ ـ ـ .	****		20	- F		•
15	Ť	HLP.					40 25	DRW		 		SUB	 		ļ 		 .	••••	 									
4	30				••••		20		45;	SUB		ļ	 .			•	 ,	•	<u></u> .		5	AMI			 		 	
13		E.					20	202		න 	 	AND		·			 					AMI AMI		 .				
12							8	H	45	1	ļ 					••••	<u> </u> 		<u> </u>		÷ •	W		<u> </u> 				•
Ì					:		ន	HLP		KOE]	ا	S 🛦	MI	45	BMS				
=	****	***	••••		••••	••••				••••				*		•						AMI AMI	****					•
라						•••	35 15	90	ļ.,,	••••					 	•••	 -	• • • •	ļ									-
6																••••	45	 音	ļ		} } }	AMI AMI	 	••••]		} [-
∞ -			30 30	H			45 30	DRW	2 30	SUB AND	5.	UPG	112	SUB	22	KOE	 	····	က	- 1		Α						-
			စ္တ	1			4	111.	4	S			ļ						05 45	5 ≘ .	٠-,	ا	ļ . ,		12	, T	30	1
1						İ	30	Jog	911	5 5	} 				i		}			2	Ī	AMI		BNE				
9			1	끂		••••	· 	-		= .				•									•••				[
5					••••	•	••••						 		 				} - 	•		••••					 -	
*			 1				! 	.	;			\ 		l 	<u> </u>	!! !			ļ	}-	<u>\</u>			 I	1		. .	1
}	B-747		DC ~10	, -	06-36	, -	6:				 								IIS 748	+	DHC-6		DHC-6		DHC~6		DHC-E	-
- 1					_	. 1	7C ~			20	١ ٩	2 2	6	מ	o c		200)	1 72	- 1	- 1	,		1	, 1		. (ı

DATA OF OCCUPY TIME ON APRON [Calculated from A/L Time Table]

Date	Type of Aircraft	Stay	ing	Time	Data	[minute]	Mean Value of Staying Time
MONDAY	DC-10 DC-9 HS-748 F-28	60 40 30 45	60 40 30 45	60		:	Minute 60 40 30 44
	DHC-6 B-747	30 75	30 60	30 65			30 67
TUESDAY	DC-10 DC-9 B-747 HS-748 F-28	60 40 90 30 45	60 40 20 45	60 40			60 40 90 25 44
	DHC-6	30	30		30		34
WEDNESDAY	DC-10 DC-9 B-747 HS-748	60 40 60	60 40		70		63 40 60
	F-28 DHC-6	45 30	45 30		30	135	43 54
THURSDAY	DC-10 DC-9 B-747	60 40 60	60 40		90	85	71 40 60
	HS-748 F-28 DHC-6	45 45 30	40 45 30	40			43 44 35
FRIDAY	DC-10 DC-9 B-747 HS-748 F-28 DHC-6	60 45 90 40 45 30	60 40 60 20 45 25	60 90 40	40 65		70 46 77 30 44 29
SATURDAY	DC-10 DC-9 B-747 HS-748 F-28 DHC-6	60 40 65 10 45 30	60 40 90 30 45 30	45			60 42 78 20 44 30
SUNDAY	DC-10 DC-9 B-747 HS-748 F-28 DHC-6	60 45 60 30 45 30	60 40 60 30 40 30	40 90 30	45 65		60 43 69 30 43 30

Weekly Mean Value [minute] DC-10: 64 HS-748: 30 DC-9: 42 F-28: 44 B-747: 72 DHC-6: 35

APPENDIX 5.2.5

Calculation Table of A/C Movements (1)

PEAK DAY COEFFICIENT: 0.003548

INT'L 1985

	A/C				Number/	day			
_	Seal		WB	NMJ	MJ	SJ	LP	SP	STOL
ROUTE	PAX	432	270		105				
ME L SYD	206	(2.4) 40	··	·					
DRW	12				(0.6) 20				
PER	69	(0.8))							
ТҮО	56		(1.1) 2.0						
TOTAL		6.0	20		20				
						<u> </u>	<u> </u>		
	<u> </u>		<u> </u>						
: !	<u> </u>	ļ				İ			

PEAK DAY COEFFICIENT: 0.003548

INT'L 1990

									1990
	A/C				Number/	day			
ROUTE	Sea t PAX	J 4 3 2	WB 270	NMJ	MJ 1 0 5	SJ	LP	SP	STOL
MEL SYD	3 5 0	(4.1) 40							
DRW	20				(10) 2.0				
PER	116	(1.4)							
TYO	88		(1.7)						
TOTAL		6.0	20		2.0		!		
	- <u></u>							<u> </u>	<u></u>
						<u></u>			
		_			<u> </u>				

Calculation Table of A/C Movements (2)

PEAK DAY COEFFICIENT: 0.003387

INT'L 1995

	A/C				Number/	/day			,
	Seat	J	WB	NMJ	MJ	SJ	LP	SP	STOL
ROUTE	PAX	432	270		150	 	 	[-	
MEL SYD	546	(6.1) 60	<u></u>				 		
DRW	3 2				(1.0) 2.0				
PER	182	(2.0) 2 0							
ТҮО	126	(1.4) 20							
110	125	20							
TOTAL		1 0.0			2.0				
								<u> </u>	

PEAK DAY COEFFICIENT: 0.003387

1 N T'L 2 0 0 0

									2000
1	Seat	J	WB	NIME	Number	day			0 0 -
ROUTE	PAX	432	350	NMJ	MJ 150	ST	LP	SP	STOL
SYD	530	(59) 60							
DRW	4 6				(1.5) 20				
PER	260	(2.9) 40							
MEL	254	(28) 40							
TYO	171	(1.9) 20							
TOTAL		1 6.0			20			 	
			, , , , , , , , , , , , , , , , , , , ,						
		<u> </u>							
									
				}		}			[

Calculation Table of A/C Movements (3)

PEAK DAY COEFFICIENT: 0.003226

INT'L 2005

	A/C				Number/da	ay			
		J	WB	NMJ	MJ	SJ	LP	SP	STOL
ROUTE PA	AX Seat	432	3 5 0		150				
SYD	7 3 2	(7.8) 8.0							
DRW	6 4			[[(20) 20				
PER	359	(3.8)							
MEL	351	(3.7) 40							
TYO	221	(2.4) 4.0							<u> </u>
TOTAL		2 0.0			2.0				
								<u></u>	
			<u></u>						
									<u> </u>
	ļļ	į			İ				

PEAK DAY COEFFICIENT: 0.003226

INT'L 2010

									2010
	A/C			1	lumber / da	ıy			
		J	WB	NMJ	MJ	SJ	LP	SP	STOL
ROUTE	AX Seat	446	350	230					
SYD	991	(105) 12.0							
DRW	86			(1.7) 2.0					
PER	488	(5 2) 6.0	•						
MEL	475	(5.1) 6 Q				ļ			<u> </u>
түо	280	(3.0)							
TOTAL		28.0		2.0					
						ļ			
									
									<u> </u>
i									

Calculation Table of A/C Movements (4)

PEAK DAY COEFFICIENT: 0.003323

DOM 1985

	A/C				Number	/day			
	Seat		WB	NMJ	MJ	SJ	LP	SP_	STOL
ROUTE	PAX	485	283	230	105	65-85	135	60	20
JKT	5 7 7	2 0	80					<u> </u>	
JOG	164				8.0			 	
SUB	154				80				
AMI	136							8.0	80
SWQ	2 0								6.0
WPG	12								40
MOF	2								2.0
кое	77					60			
UPG	78		20						
OTHER	1 3								40
<u> </u>			 						
TOTAL		2.0	100		160	6.0		8.0	24.0
						11		<u> </u>	

PEAK DAY COEFFICIENT: 0.003323

DOM 1990

	A/C Seat				Numbe	r / day			
ROUTE	PAX	J 485	WB 283	NMJ 2 3 0	MJ 105	SJ 65~85	LP 1 3 5	8 P 6 0	STOL 20
ЈКТ	905	60	6.0						
10G	271				140				
SUB	261		4 0		20				
AM1	238					140			
SWQ	3 5							40	
WPG	20								6.0
MOF	6							 	2.0
KOF	133				60		· <u> </u>		
UPG	129		20			2.0		 -	
OTHER	23								6.0
			 						
TOTAL		60	1 20		2 20	160		40	14.0
1						1		\	1

Calculation Table of A/C Movements (5)

PEAK DAY COEFFICIENT: 0.003226

D OM 1 9 9 5

A/C				Number				
Seal	_J	WB	NMJ	MJ	SJ	I,P	SP	STOL
PAX	485	305	230	150	65~85	135	60	20
1,2 3 9	8.0	60						
389			40	60				
373		6.0		i 				
3 4 1				6.0	1 0.0			<u> </u>
50					4.0			
29				<u> </u>			20	20
8			<u> </u>					2.0
192				6.0				<u> </u>
185		2.0		20			<u> </u>	
3 2	<u> </u>	-				-		80
	8.0	1 2.0	4.0	2 0.0	1 4.0		20	1 20
	PAX 1,2 3 9 38 9 373 34 1 50 29 8 1 9 2 18 5	Seat J PAX 485 1,239 8.0 389 373 341 50 29 8 192 185 32	Seat J WB PAX 485 305 1,239 8.0 60 389 60 60 341 50 60 29 8 192 185 2.0 32 20	Seat J WB NMJ PAX 485 305 230 1,239 8.0 60 389 40 373 60 341 50 29 8 192 185 32 2.0	Seat J WB NMJ MJ 1,239 8.0 60 150 389 40 60 373 60 60 50 60 6.0 29 6.0 6.0 192 6.0 20 32 20 20	Seat J WB NMJ MJ SJ 1,239 8.0 60	Seat J WB NMJ MJ SJ I,P PAX 485 305 230 150 65~85 135 1,239 8.0 60	Seat J WB NMJ MJ SJ LP SP PAX 4 8 5 3 0 5 2 3 0 1 5 0 6 5 ~ 8 5 1 3 5 6 0 1,2 3 9 8,0 6 0 40 60 40 60 40 60 40 60 40 60

PEAK DAY COEFFICIENT: 0.003226

DOM 2000

1	A/C				Number	day			
	Seat	J	WB -	NMJ	MJ	ST	LP	SP	STOL
ROUTE	PAX	485	350	230	150	65~85	135	60	20
JKT	1,684	1 6.0							
JOG	546		6.0	2.0					
SUB	531		60	2.0					
AM I	492				160				
SWQ	73					40			
WPG	4 2							4 0	
MOF	11			_					40
KOE	277				10.0				<u> </u>
UPG	260		4 0				<u> </u>		
OTHER	4 6							2 0	60
TOTAL		1 6.0	1 6.0	4.0	2 6.0	4.0		6.0	1 0.0

Calculation Table of A/C Movements (6)

PEAK DAY COEFFICIENT : 0.003065

D O M 2 0 0 5

	A/C				Number	day			
	Seat	J	WB	NMJ	MJ	SJ	LP	SP_	STOL
ROUTE	PAX	485	350	230	150	65~85	135	60	20
J KT	2,055	200							
JOG	698	<u> </u>	100					<u> </u>	
SUB	679		1 0.0						
AMI	626			120				<u> </u>	
SIIQ	92				40				L
WPG	5 5					4.0			
MOF	13								4.0
кое	352	·		60	2.0				
UPG	332		4.0		2.0				
OTHER	58							2.0	80
									; !
TOTAL		2 0.0	240	1 8.0	80	4.0		2.0	1 2.0
				<u>.</u>					

PEAK DAY COEFFICIENT: 0.003065

DOM

	A/C				Numbe.	r/day			
ROUTE	Seat PAX	J	WB	NMJ	MJ	SJ	Γb	SP	STOL
	TAX	485	350	230	150	65~85	135	60	2.0
JKT	2,4 7 6	240					}		
JOG	883		1 2.0	1					
SUB	855		120						
AMI	790			160				·	1
SWQ	117				40				
WPG	6 9					40			
MOF	17								4.0
кое	445			80	2.0	11			
UPG	420		6.0					 -	 -
OTHER	7 3					1		40	60
						1	-		1 - 3 0
TOTAL		240	300	2 4.0	60	4.0		4.0	1 0.0
1						†		-1.0	10.0

Calculation Table of A/C Stand Requirement on Apron

INT'L (1)

		A]	3	(2	D	Е					
	ļ	J	WB	NMJ	MJ	SJ	SP	STOL	Total				
	No. of flight at day	60	20		20	•	_		1 0.0				
	Peak hour coefficient		0 2	22									
	Peak hour of A/C landing	0.73	024		0.24								
85	Ocupation time of Apron	75	90		55		<u> </u>						
03	Calculated stand	09	0.4		02		<u> </u>						
	Spare stand		<u> </u>		-								
	A/C stand												
	Stand cap.	10	10			•			2.0				
	No. of flight at day						•						
	Peak hour coefficient												
	Peak hour of A/C landing												
90	Ocupation time of Apron			D	ITTO				•				
	Calculated stand												
	Spare stand												
	A/C stand												
	Stand cap.	 					J		+				
	No. of flight at day	1 0.0			20			<u> </u>	1 2.0				
	Peak hour coefficient		0.	2	, , , , , , , , , , , , , , , , , , ,		 -		-				
	Peak hour of A/C landing	1.10		<u>.</u>	022								
0.5	Occupation time of Apron	75			55								
95	Calculated stand	1.4	_		0.2		-		-				
	Spare stand	1.0	-						· _				
	A/C stand	_				**			-				
	Stand cap.	30	-		(1.0) *			_	3.0				

NOTE: * Included in the surplus of A or B

APPENDIX 5.2.11

Calculation Table of A/C Stand Requirement on Apron

INT'L (2)

						c	D	E	
		A		B NMJ	MJ	SJ	SP	STOL	Total
ļ,	No of Order	J	WB	Nera					
	No. of flight at day	160			20			<u> </u>	180
	Peak hour coefficient		0 1	15		-			
	Peak hour of A/C landing	132	_		017		<u>-</u>	_	-
00	Ocupation time of Apron	75			55		-	-	-
	Calculated stand	1.7	_		02		_	<u>-</u>	_
	Spare stand	10			'		-		-
	A/C stand	_		i	_		_	_ 	-
	Stand cap.	30	-	·	(10)*		_	_	3.0
	No. of flight at day	200	_	_	20		-		2 2.0
	Peak hour coefficient		0.	14			<u> </u>		
	Peak hour of A/C landing	1.54	-		015		-	_	_
05	Ocupation time of Apron	75	_	,	55		-	_	_
	Calculated stand	19			01		-	-	•
	Spare stand	1.0		,		-	-	_	-
	A/C stand	_		i	•	-	-	-	
	Stand cap.	3.0	_	i	(1.0)*		_	_	3.0
	No of flight at day	280		20	-	-	_	-	300
	Peak hour coefficient		0:	13					-
	Peak hour of A/C landing	200		014	-	•	-	-	-
10	Occupation tune of Apron	75		55	-	-	-	-	_
	Calculated stand	25		0 1	-		-		_
	Spare stand	1.0	-		-	-	-	·	
	A/C stand		-						-
	Stand cap.	4.0		(1.0) *	•	-		-	4.0

Note: * Included in the surplus of A or B.

Calculation Table of A/C Stand Requirement on Apron DOM. (1)

APPENDIX 5.2.12

		A	1	3	(: 1	D	E	Total	
		1	WB	NMJ	MJ	21	SP	STOL	10121	
1	No. of flight	2.0	100		16.0	60	8.0	240	660	
ſ	Peak hour coefficient				0.1 4	0.1 4				
	Peak hour of A/C landing	015	0	77	1	1.69	062	185		
85	Ocupation time of Apron	70	7()	5	5	45	45		
] ده	Calculated stand	0.2	(0.9		1.5	0.5	1.4		
	Spare stand	1.0								
	A/C stand	1.0)			60	20	60		
	Stand cap.	20		ı.o	<u> </u>	60	2.0	60	170	
	No. of flight at day	6.0	120		220	160	40	110	740	
	Peak hour coefficient				014		·			
90	Peak hour of A/C landing	046	I	092		293	0.31	1.08		
	Ocupation time of Apron	70	7	0	5	5	45	45		
90	Calculated stand	0.5		1.0		2.7	02	08		
	Spare stand	1.0								
	A/C stand	2	۵			80	1.0	30	ļ	
	Stand cap.	20		1.0		80	1.0	30	150	
	No. of flight at day	0.8	120	4.0	20 0	140	20	1 2.0	720	
	Peak hour coefficient				0.1 4		· · · · · · · · · · · · · · · · · · ·			
	Peak hour of A/C landing	062		123		262	015	092	<u> </u>	
	Occupation time of Apron	70		70		55	45	45		
95	Calculated stand	0.7		1.4		31	01	07		
	Spare stand	10					ļ			
	A/C stand		2.0			100	20			
	Stand cap.	20		2.0		1 0.0		20	1 6.0	

APPENDIX 5.2.12

Calculation Table of A/C Stand Requirement on Apron

DOM (2)

									OM (2)
Γ		A		В		С	D	E	Total
L		J	WB	IMN	MJ	SJ	SP	STOL	Total
	No. of flight at day	160	1 60	40	260	40	60	100	820
	Peak hour coefficient				013	<u> </u>		-	
	Peak hour of A/C landing	114		143	215		1		
00	Ocupation time of Apron	70	7()	5 :	5	4.5		
	Calculated stand	1.3		1.7	:	25	0	8	
	Spare stand	1.0							
	A/C stand	20	2	20	9	9.0	5	0	
	Stand cap	30	20		9	۵۵	5.	0	190
	No. of flight at day	200	240	180	80	40	2.0	120	880
	Peak hour coefficient				013	·	·		 -
	Peak hour of A/C landing Ocupation time of Apron	1.43	2	29	0.	86	1.1	00	
05		70	70		55		45		
03	Calculated stand	1.7	2.	7	0.	8	0.5		
	Spare stand	1.0					· · · · · · · · · · · · · · · · · · ·		
	A/C stand	20	3 (0	20		2.0		
	Stand cap,	30	3 ()	20	o			100
	No. of flight at day	240	300	2 4.0	60	4.0	10	100	1 0 2.0
	Peak hour coefficient			* .!	013	1		100	1020
	Peak hour of A/C landing	1.72	3.8	36	0.7	72	1.0		
0	Occupation time of Apron	ion Apron 70			55				
	Calculated stand	2.0	4.5		0.7	,	45		
_	Spare stand	10					8.0		
	A/C stand	20	30		20				
	Stand cap.	3.0	50		2.0		20		
	·					<u> </u>	2.0		120

Int'l Pax Terminal BLDG.

Facility requirement

1. Check-in Counter

$$L = \frac{p \cdot t_2}{t - t_1} \cdot \ell = \frac{289 \times 4}{60 - 10} \times 2 = 46 \text{ m}$$

Where: L : Length of check in counter (m)

P : Peak hour pax (PAX/H) 525 x 0.55 = 289

t : Check-in time (min)

t1: Resting time for check-in counters (min)

t2: Handling capacity per PAX (min)

l : One unit length (2 m)

2. Departure Lobby

$$S = \frac{X_1 + X_2}{60} \cdot t \cdot a = \frac{289 + 29}{60} \times 30 \times 2.5 = 397.5 \text{ m}^2$$

Where: S: DEPT. Lobby (m2)

X1: Peak Hour Pax (PAX/H)

 X_2 : Visitors (PAX/H) = $X_1 \times 0.1$

t: Staying time (min)

a: Unit rate (m²/PAX)

3. Immigration Counter "For DEPT & ARR"

$$I = \frac{P \times t}{T} = \frac{289 \times 1.5}{45} = 9.6 \div 10 \text{ units}$$

Where: I: No. of Immigration Counters (Unit)

P : Peak hour Pax (PAX/H)

t: Handling capacity per PAX (min)

T: Inspection time (min)

4. Quarantine Inspection Counter (Q.I.C) "For ARR"

QIC =
$$\frac{P \times t}{T}$$
 = $\frac{289 \times 1}{45}$ = 6.4 \div 7 units

Where: QIC: No. of Q.I.C. (Unit)

P : Peak hour Pax (PAX/H)

t : Handling Capacity per PAX (min)

T : Inspection time (min)

5. Customs Inspection Counter (CIC) "For ARR"

CIC =
$$\frac{P \times t}{T} = \frac{289 \times 2}{45} = 12.8 \div 13$$
 units

Where: CIC: No. of CIC (Unit)

P : Peak Hour Pax (PAX/H)

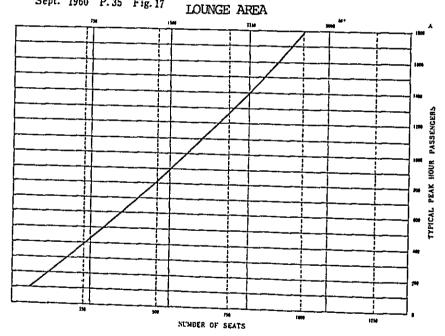
t : Handling capacity per PAX (min)

T : Inspection time (min)

APPENDIX 5.5.2

WAITING LOUNGE

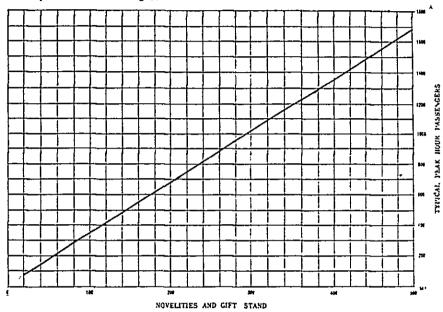
FAA "Space Relationships & Area Requirements" Airport Terminal Buildings Sept. 1960 P. 35 Fig. 17 TOTAGE ALEA



For Reference Only

CONCESSION AREA

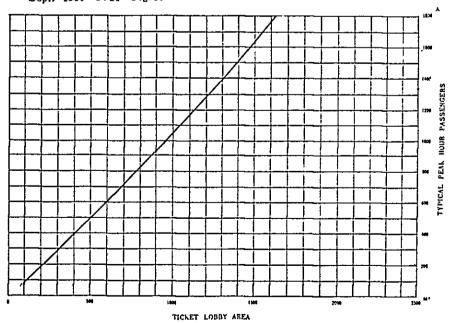
FAA "Space Relationships & Area Requirements" Airport Terminal Buildings Sept. 1960 P.41 Fig. 19



APPENDIX 5.5.3

CHECK-IN LOBBY

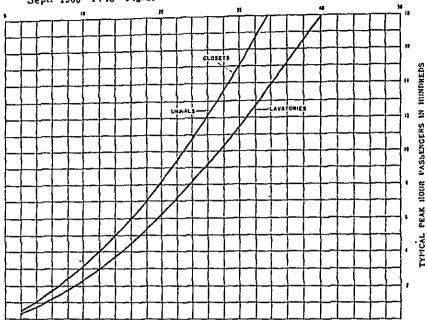
FAA "Space Relation ships & Area Requirements" Airport Terminal Buildings Sept. 1950 P.21 Fig. 10



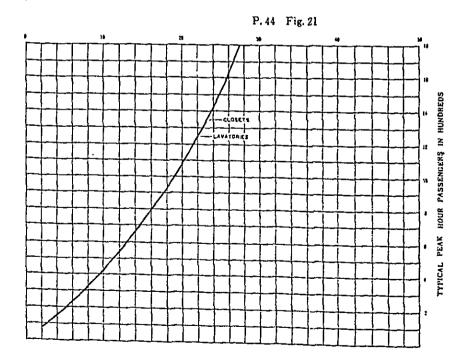
For Reference Only

No. OF CLOSETS AND LAVATORIES FOR MEN

FAA "Space Relationships & Area Requirements" Airport Terminal Buildings Sept. 1960 P. 43 Fig. 20



NO. OF CLOSETS AND LAVATORIES FOR WOMEN

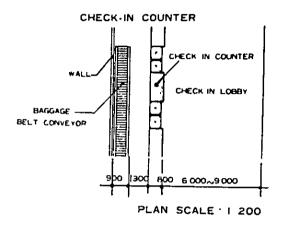


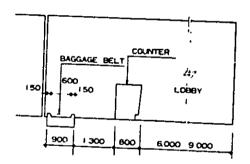
GATE LOUNGE AREA TYPE OF AIRCRAFT SERVED (LOAD FACTOR 40 TO 80 %)

AIRCRAFT TYPE MODEL	SEAT CAPACITY RANGE	TOTAL AREA (M ²) RANGE
CV-580; DC-9 -10; BAX-111; YS-11-B; M-404; F-227B		35 TO 65
B-737; B-727 -100; DC-9 30; CV-880	90 TO 110 AV 100	60 TC 100
DC-8 -50; DC-8 -62; B-727 -200; B-727 -300; B-707 (ALL); B-720	120 TO 160 AV 140	80 TO 140
DC-8 61 '	170 TO 210 AV 190	110 TO 190
DC-10; L-1011	220 TO 210 AV 250	140 TO 240
B-747	300 TO 420 AV 360	210 то 360

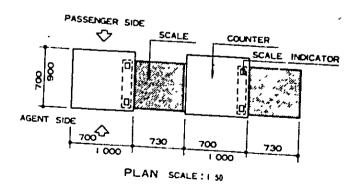
For Reference Only

LINEAR CHECK-IN COUNTER



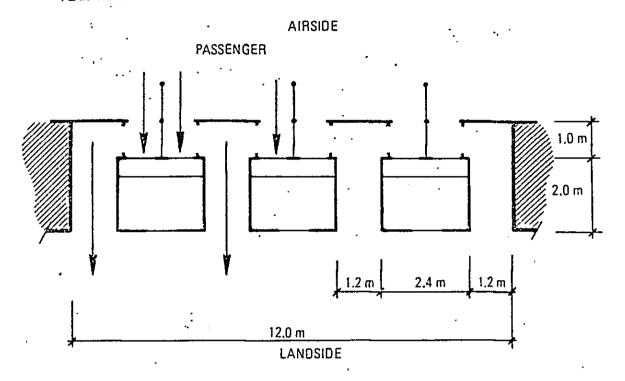


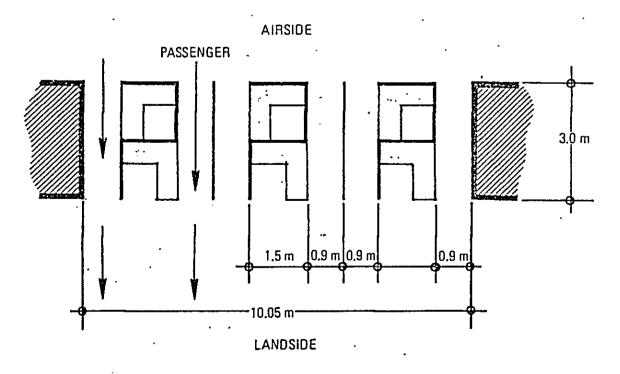
SECTION SCALE: 1/100



For Reference Only

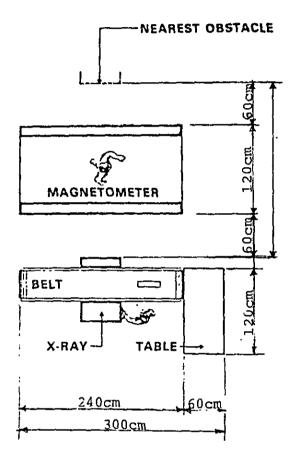
EXAMPLES OF TYPICAL OUTBOUND/INBOUND IMMIGRATION DESK LAYOUTS IATA: Airport Terminals Reference Manual PLAN VIEW 6th. Edition ATRM 3.3.7





For Reference Only

SECURITY LAYOUT



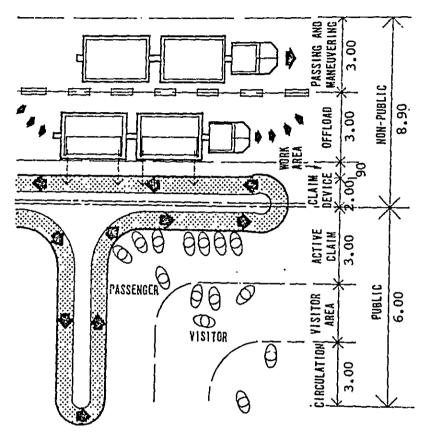
X-RAY SEARCH

EXAMPLE OF RELATIONSHIP OF AIRCRAFT HEIGHTS TO BUILDING LEVEL

IATA: Airport Terminals Reference Manual 6th. Edition ATRM 3.4.3

- B-707/DC-8/727 - L-1011-DC-10 - 8-747 MEAN HEIGHT RAMP DRIVE TYPE MAXIMUM SLOPE 10% 2 APRON ROTUNDA TERMINAL

For Reference Only



Inbound Baggage, Circulating Type UNIT = cm

Calculation for Length of Conveyor

- 1. Conveyor for Departure Length of conveyor will be determined by adding the total length of check-in counters charged with the conveyor and of make-up area and the distance between the check-in counter and the make-up area.
- 2. Conveyor for Arrival General speaking, as a guide line, the standard for the length of conveyor is mentioned below.

Type of Aircraft	The effective baggage claim length
B-747 & wide bodied aircraft	40 - 45m
DC-9-80	20 - 30m

- 3. Required length of conveyor will basically be determined by type of aircraft based on the following assumptions:
 - The first passenger arrives at the baggage claim area within 10 minutes after he gets off the airplane.
 - It is assumed that all baggages will be handled within the following specific period from the time when the first passenger arrives at the baggage claim.
 - 20 minutes for domestic flights
 - 30 minutes for international flights

Formula:

 $Pn = \frac{N2}{N1} \times \frac{(N2 - 1)}{(N1 - 1)} \times Pax \times (1 - Overlook rate)$

Where:

Pn: No. of Baggages that can be picked up

in one cycle of conveyor

N1: Total No. of Baggages

N2: No. of Bags that can be carried by the

conveyor in one cycle of conveyor

Pax: No. of Pax. that can stand abutting the

conveyor

4. The followings are the assumptions:

Total length of conveyor : 55m Effective baggage claim length of: 40m

conveyor

Velocity : 24m/min.= 0.4m/sec.

One cycle 55m/0.4: 137 sec. = 2 min.17sec.

Baggage interval : 0.41m Pax. interval : 0.50m

No. of Bags per Pax. : 2

Overlook rate : 5%

5. Calculation for Length of Conveyor for B-747(INT'L & DOM)

$$N1 : 425 \times 0.6 \times 0.5 \times 2 = 256$$

N2 : 40m / 0.41m = 98

Pax: 40m / 0.50m = 80

					No. of Bags	f Time	
$P1 = \frac{98}{256} \times$	— x	80 x	0.95	=	6	2 min.17 s	ec.
$P2 = \frac{98}{250} x$	97 — x	80 x	0.95	=	12		
	97 — x	80 x	0.95	=	13		
98 P4 = — x	97 —— x	80 x	0.95	=	14		
$ \begin{array}{c} 225 \\ 98 \\ P5 = {} \times \\ \end{array} $	97 — ×	80 x	0.95	=	16	11 min.25 s	ec.
P6 = x	97 — x	80 x	0.95	=	19		
195 98 P7 = ——	97 x	80 x	0.95	=	23		
176 98 P8 = — x	97	80 x	0.95	=	31		
153 98 P9 = —— x	152 97				49		
122	121 97					22 min.50 s	00
	72 x	00 X	0.95	-		22 MIII. 30 S	c,

Total Bags 259

For INT'1 Flights: 22 min. 50 sec. (less than 30 min.

therefore, OK)

For DOM Flights: 22 min. 50 sec. (a little more than 20 min., therefore, almost OK)

6. Calculation for Length of Conveyor for A-300 (DOM)

N1 : $302 \times 0.6 \times 0.5 \times 2 = 181$

N2 : 40m / 0.41m = 98Pax.: 40m / 0.50m = 80

									No.	of Bags	5	Ti	me	
Pl	=	 x	$\frac{97}{180}$	x	80	x	0.95	=		22	2	min.	17	sec.
P2	=	x		x	80	x	0.95	=		29				
P3	=	x		x	80	x	0.95	=		43				
P4	=	 x	86 86	×	80	x	0.95	=		76				
P5	=	 x	10	x	80	x	1	=		11	11	min.	25	sec.

For DOM Line: 11 min. 25 sec. (less than 30 min., therefore, OK)

DOM Pax Terminal BLDG.

Facility requirement

1. Check-in Counter

$$L = \frac{P \cdot t_2}{t - t_1} \cdot \ell = \frac{420 \times 3}{60 - 10} \times 1.75 = 44 \text{ m}$$

Where: L : Length of check-in counter (m)

P : Peak hour Pax 765 x 0.55 = 420 (PAX/H)

t : Check-in time (min)

t₁: Resting time for check-in counter (min)

t2: Handling capacity per PAX (min)

l : One unit length 1.75

2. Departure Lobby

$$S = \frac{X_1 + X_2}{60} \cdot t \cdot a = \frac{420 + 42}{60} \times 30 \times 2.5 = 577 \text{ m}^2$$

SEE APPENDIX 5.5.1 of Page 33

Calculation for the length of curb

General speaking, length of curb in Japan has a range between 100m-200m per 1,000 peak hour passengers.

Hence, one peak hour passenger is needed to have 0.1-0.2 m long as a unit. The length of curb at BIA is calculated based on the unit, as follows;

year	Peak hour Pax.	Unit length of curb
1990	1,390 x	0.1-0.2 m/pax =140-280 m
2010	3,425 x	0.1-0.2 m/pax = 340-680 m

BIA is planned to have length of curb, 330 and 580 m by the year 1990 and 2010 respectively. In conclution, BIA has is small traffic volumes at BIA as compared with airport in Japan.

The second of th