

APPENDIX A

RUNWAY LENGTH REQUIREMENTS ANALYSIS

Table A-1

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

RUNWAY LENGTH REQUIREMENTS
FULL LOADS (1)

Aircraft	Required Takeoff Length (feet) at Full Load								Required Landing Length at Maximum Landing Weight
	500 Mi Trip	750 Mi Trip	1000 Mi Trip	1250 Mi Trip	1500 Mi Trip	1750 Mi Trip	2000 Mi Trip	2250 Mi Trip	
B-727-200 (JT8D-7)	9,400	11,400	12,200	-	-	-	-	-	5,800
B-727-200 (JT8D-15)	6,700	7,600	8,100	9,300	9,900	12,100	12,900	-	5,600
B-727-100 (JT8D-7)	6,500	7,700	8,300	8,700	10,800	11,500	12,300	-	5,700
DC-9-30 (JT8D-9)	9,300	-	-	-	-	-	-	-	5,400
B-737-200 (JT8D-15)	6,900	7,500	8,000	8,600	-	-	-	-	6,000
B-737-300 (CFM56-3-B1)	5,400	5,600	5,900	6,500	7,200	-	-	-	5,600
MD-82 (JT8D-217)	6,500	7,500	7,500	7,500	8,500	9,000	-	-	5,900
B-747-200B (JT9D-7A)	5,700	-	6,200	-	6,700	-	7,300	8,000	8,600
B-757-200 (RB11-535E4)	4,300	4,600	4,700	4,900	5,100	5,200	5,400	5,600	5,450
B-767-200 (CF6-80A)	5,100	5,300	5,600	5,700	5,900	6,100	6,400	6,700	5,600
L-1011-385-1 (RB211-22B)	6,900	7,300	7,900	8,500	9,700	10,200	-	-	6,700
DC-10-10 (CF6-6D)	7,800	8,200	9,300	9,700	10,600	12,300	12,700	-	7,700

(1) 100% Passenger Load; 50% Cargo Load

Sources: FAA AC 150/5325-4; B-737, B-747, B-757, B-767, MD-80, Planning Manuals.

Table A-2

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

RUNWAY LENGTH REQUIREMENTS
AVERAGE LOADS (1)

Aircraft	Required Takeoff Length (feet) at Average Load								Required Landing Length at Maximum Landing Weight
	500 Mi Trip	750 Mi Trip	1000 Mi Trip	1250 Mi Trip	1500 Mi Trip	1750 Mi Trip	2000 Mi Trip	2250 Mi Trip	
B-727-200 (JT8D-7)	8,100	8,600	9,300	11,200	12,000	-	-	-	5,800
B-727-200 (JT8D-15)	5,800	6,300	6,700	7,600	8,100	9,300	9,900	12,100	5,600
B-727-100 (JT8D-7)	5,600	6,100	7,200	7,800	8,300	8,900	10,900	11,700	5,700
DC-9-30 (JT8D-9)	6,200	7,000	9,300	-	-	-	-	-	5,400
B-737-200 (JT8D-15)	5,500	5,800	6,300	7,200	7,800	8,300	-	-	6,000
B-737-300 (CFM56-3-B1)	4,400	4,800	4,900	5,200	5,300	5,500	5,900	6,300	5,600
MD-82 (JT8D-217)	5,200	5,500	6,400	6,400	6,400	6,500	7,500	7,500	5,900
B-747-200B (JT9D-7A)	4,800	-	5,300	-	5,800	-	6,300	-	8,600
B-757-200 (RB11-535E4)	3,700	4,000	4,200	4,300	4,300	4,600	4,700	4,900	5,450
B-767-200 (CF6-80A)	4,400	4,500	4,600	4,700	5,100	5,100	5,300	5,600	5,600
L-1011-385-1 (RB211-228)	6,000	6,400	6,700	7,100	7,700	8,000	8,600	9,900	6,700
DC-10-10 (CF6-60)	6,100	6,300	7,000	7,200	8,000	8,400	9,500	9,900	7,700

(1) 70% Passenger Load; 30% Cargo Load

Sources: FAA AC 150/5325-4; B-737, B-747, B-757, B-767, MD-80, Planning Manuals.

Table A-3

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

PERCENT OF FLEET ACCOMMODATED BY ALTERNATIVE RUNWAY LENGTHS, FULL LOADS (1) (2) (3)
1987 FLEET AND STAGE LENGTHS

Aircraft Type	Fleet Mix	Runway Length (Feet)										
		7000	7500	8000	8500	9000	9500	10000	10500	11000	11500	12000
B-727-200(4) (JT8D-15)	18.0%	33%	33%	33%	54%	54%	67%	79%	79%	79%	79%	79%
B-727-100(4)	1.8%	13%	13%	38%	38%	38%	38%	38%	38%	100%	100%	100%
DC-9-30(4)	1.2%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%
B-737-200(4)	52.6%	66%	84%	92%	92%	100%	100%	100%	100%	100%	100%	100%
B-737-300(4)	15.1%	79%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
MD-82	5.2%	38%	63%	63%	100%	100%	100%	100%	100%	100%	100%	100%
B-757-200	2.8%	71%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
B-767-200	0.7%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
L-1011	1.0%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%
DC-10-10	1.4%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%
B-747	0.2%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total	100.0%	58%	73%	78%	83%	88%	91%	95%	95%	96%	96%	96%

(1) Assumes aircraft loaded at 100% of passenger capacity and 50% of cargo capacity.

(2) Fleet does not include the 727-200(JT8D-7).

(3) Calculations do not adjust for the .23 percent runway gradient on existing runways.

(4) Based on 250-mile incremental stage lengths; all others are 500-mile.

Source: Tables 2-22, 2-23 and HNTB analysis.

Table A-4

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

PERCENT OF AIRCRAFT FLEET ACCOMMODATED BY ALTERNATIVE RUNWAY LENGTHS, AVERAGE LOADS (1) (2) (3)
1987 FLEET AND STAGE LENGTHS

Aircraft Type	Fleet Mix	Runway Length (Feet)										
		7000	7500	8000	8500	9000	9500	10000	10500	11000	11500	12000
B-727-200(4) (JT8D-15)	18.0%	54%	54%	67%	79%	79%	100%	100%	100%	100%	100%	100%
B-727-100(4)	1.8%	38%	38%	38%	100%	100%	100%	100%	100%	100%	100%	100%
DC-9-30(4)	1.2%	50%	50%	50%	50%	50%	100%	100%	100%	100%	100%	100%
B-737-200(4)	52.6%	92%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%
B-737-300(4)	15.1%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
MD-82	5.2%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
B-757-200	2.8%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
B-767-200	0.7%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
L-1011	1.0%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%
DC-10-10	1.4%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
B-747	0.2%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total	100.0%	85%	88%	92%	95%	95%	100%	100%	100%	100%	100%	100%

(1) Assumes aircraft loaded at 70% of passenger capacity and 30% of cargo capacity.

(2) Fleet does not include the 727-200(JT8D-7).

(3) Calculations do not adjust for the .23 percent runway gradient on existing runways.

(4) Based on 250-mile incremental stage lengths; all others are 500-mile.

Source: Tables 2-22, 2-23 and HMTB analysis.

Table A-5

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

RUNWAY LENGTH REQUIREMENTS FOR LONG RANGE AND INTERNATIONAL FLIGHTS *
FULL LOADS (1)

Aircraft	Required Takeoff Length (feet) at Full Load					Required Landing Length at Maximum Landing Weight
	2000 Mi Trip	3000 Mi Trip	4000 Mi Trip	5000 Mi Trip	6000 Mi Trip	
B-767-200ER (JT9D-7R4D)	5,900	6,600	7,400	9,100	-	5,700
B-747-400 (PW4256)	6,500	7,800	9,300	-	-	6,400
DC-10-30 (CF6-50C)	8,200	9,200	11,000	14,700	-	7,000
B-747-200B (JT9D-7A)	7,800	9,200	11,700	13,700	-	7,800

* Potential long range and international markets include:
 London 5,269 miles
 Tokyo 5,749 miles

(1) 100% Passenger Load, 50% Cargo Load

Sources: FAA AC 150/5325-4; 747-400, 767, and DC-10 Planning Manuals.

Table A-6

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

RUNWAY LENGTH REQUIREMENTS FOR LONG RANGE AND INTERNATIONAL FLIGHTS *
AVERAGE LOADS (1)

Aircraft	Required Takeoff Length (feet) at Average Load					Required Landing Length at Maximum Landing Weight
	2000 Mi Trip	3000 Mi Trip	4000 Mi Trip	5000 Mi Trip	6000 Mi Trip	
B-767-200ER (JT9D-7R4D)	5,100	5,600	6,300	7,100	8,700	5,700
B-747-400 (PW4256)	6,600	6,700	6,900	7,600	8,400	6,400
DC-10-30 (CF6-50C)	7,200	8,300	9,300	11,500	14,800	7,000
B-747-200B (JT9D-7A)	6,800	8,000	9,500	12,000	14,000	7,800

* Potential long range and international markets include:
 London 5,269 miles
 Tokyo 5,749 miles

(1) 70% Passenger Load, 30% Cargo Load

Sources: FAA AC 150/5325-4; 747-400, 767, and DC-10 Planning Manuals.

Table A-7

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

RUNWAY LENGTH REQUIREMENTS
MAXIMUM TAKEOFF AND LANDING WEIGHTS

Aircraft	Maximum Takeoff Weight at PHX (lbs.)	Required Length at Maximum Takeoff Weight	Required Landing Length at Maximum Landing Weight
B-727-200 (JT8D-7)	167,000	12,200	5,800
B-727-200 (JT8D-15)	189,000	12,900	5,600
B-727-100 (JT8D-7)	167,000	12,300	5,700
DC-9-30 (JT8D-9)	100,000	9,500	5,400
B-737-200 (JT8D-15)	115,000	8,600	6,000
B-737-300 (CFM56-3-B1)	124,500	7,200	5,600
MD-82 (JT8D-217)	149,500	9,400	5,900
B-747-200B (JT9D-7A)	736,000	12,200	8,600
B-757-200 (RB11-535E4)	240,000	7,100	5,450
B-767-200 (CF6-80A)	300,000	6,700	5,600
L-1011-385-1 (RB211-22B)	403,000	10,400	6,700
DC-10-10 (CF6-6D)	400,000	12,700	7,700
B-767-200ER (JT9D-7R4D)	351,000	9,100	5,700
B-747-400 (PW4256)	496,000	11,200	6,400
DC-10-30 (CF6-50C)	555,000	15,300	7,000
B-747-200B (JT9D-7A)	785,000	14,400	7,800

Sources: FAA AC 150/5325-4; B-737, B-747, B-757, B-767,
MD-80, and DC-10 Planning Manuals.