

Airfield Capacity

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Introduction: Purpose of This Unit is to

- Explain how to calculate an airfield's Hourly Capacity and Annual Service Volume Using FAA AC for Long Range Planning
- Determine how to calculate the delay associated with a particular airfield layout

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Assumptions Upon Which FAA Capacity Tables Are Based

- Runway layout approximated by drawings on your handouts
- Arrivals = Departures
- Ample taxiways, nav aids and no airspace limitations
- Percent touch and goes within the ranges in Table 2-1

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To Determine Airfield Capacity

- Find the runway-use configuration that coincides with your airport's layout
- Calculate the Aircraft Mix Index for the Airport based on the formula $(C+3D)$
- Read over on the table showing runway use configurations the hourly capacity and the annual service volume

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Aircraft Mix Categories & Index

- Category A = small, single engine
- Category B = small, twin engine
- Category C = large aircraft
- Category D = heavy aircraft

Mix Index = $C+(3XD)$

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Computing Mix Index $(C+3XD)$

Airport has:

80% A; 15% B; 5% C; 0% D

$$= (5+(3 \times 0)) = 5$$

60% A; 19% B; 21% C 0% D

$$= (21+(3 \times 0)) = 21$$

10% A; 20% B; 60% C; 10% D

$$= (60+(3 \times 10)) = 90$$

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Sample Capacity Problem 1



- Glendale Airport
- Single Runway
- 90% A; 10%B Aircraft
- Estimate
 - Hourly Capacity
 - Annual Service Volume

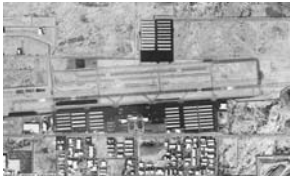
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Runway-use Configuration	Mix Index %(C+3D)	Hourly Capacity Ops/Hr		Annual Service Volume Ops/Yr
		VFR	IFR	
[Diagram of single runway]	0 to 20	98	59	230,000
	21 to 50	74	57	195,000
	51 to 80	63	56	205,000
	81 to 120	55	53	210,000
121 to 180	51	50	240,000	
700' to 2499'* [Diagram of two parallel runways]	0 to 20	197	59	355,000
	21 to 50	145	57	275,000
	51 to 80	121	56	260,000
	81 to 120	105	59	285,000
	121 to 180	94	60	340,000

Sample Capacity Problem 2



- Deer Valley Airport
- Parallel runways separated by 700 feet
- 92% A; 11%B 7% C Aircraft
- Estimate
 - Hourly Capacity
 - Annual Service Volume

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Runway-use Configuration	Mix Index %(C+3D)	Hourly Capacity Ops/Hr		Annual Service Volume Ops/Yr
		VFR	IFR	
[Diagram of single runway]	0 to 20	98	59	230,000
	21 to 50	74	57	195,000
	51 to 80	63	56	205,000
	81 to 120	55	53	210,000
121 to 180	51	50	240,000	
700' to 2499'* [Diagram of two parallel runways]	0 to 20	197	59	355,000
	21 to 50	145	57	275,000
	51 to 80	121	56	260,000
	81 to 120	105	59	285,000
	121 to 180	94	60	340,000

Sample Capacity Problem 3



- Air Carrier Airport
- Three parallel runways 800 ft and 3,500 ft separation
- 5% A; 5%B; 74% C and 16% D Aircraft
- Estimate
 - Hourly Capacity
 - Annual Service Volume

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No.	Runway-use Configuration	Mix Index %(C+3D)	Ops/Hr		Volume Ops/Yr
			VFR	IFR	
6.	[Diagram of three parallel runways: 700' to 2499', 2500' to 3399' or 4299' **, 700' to 2499']	0 to 20	295	62	385,000
		21 to 50	219	63	310,000
		51 to 80	184	65	290,000
		81 to 120	161	70	315,000
		121 to 180	146	75	385,000
7.	[Diagram of three parallel runways: 700' to 2499', 3400' or 4300' +**, 700' to 2499']	0 to 20	295	119	625,000
		21 to 50	219	114	475,000
		51 to 80	184	111	455,000
		81 to 120	161	117	510,000
		121 to 180	146	120	645,000
8.	[Diagram of three parallel runways: 700' to 2499', 3400' or 4300' +**, 700' to 2499']	0 to 20	394	119	715,000
		21 to 50	290	114	550,000
		51 to 80	242	111	515,000
		81 to 120	210	117	565,000
		121 to 180	189	120	675,000

Computing Aircraft Delay at Glendale

Take Annual Demand/ASV

Current demand = 140,000 ops a year

Future demand is 188,000 ops a year

Glendale Airport ASV = 230,000 operations a year

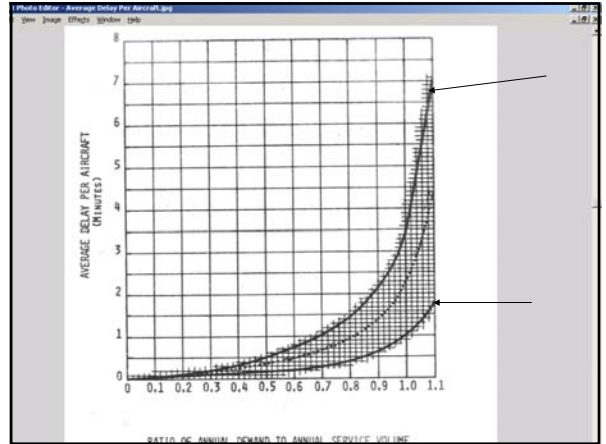
Current Ratio $140,000/230,000 = .6$

Future Ratio $188,000/230,000 = .8$

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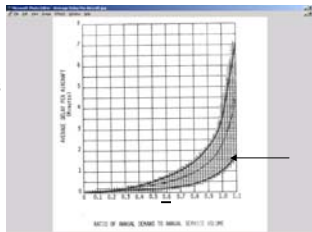
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Low Level of Current Delay At Glendale

- Find on X axis of graph .6
- Draw line vertically to lower line
- Look across on the Y axis to find minutes of delay per aircraft operation
- Multiply annual op's by minutes of delay to get low level of annual delay



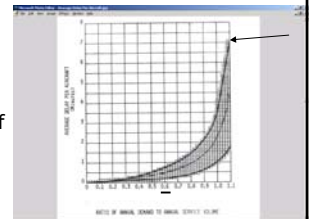
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High Level of Current Delay

- Find on X axis of graph .6
- Draw line vertically to upper line
- Look across on the Y axis to find minutes of delay per aircraft operation
- Multiply by annual op's to get high level of annual delay



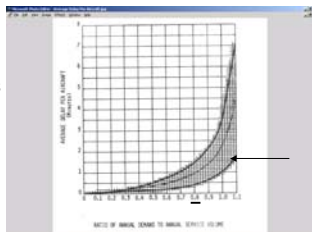
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Low Level of Future Delay

- Find on X axis of graph .8
- Draw line vertically to lower line
- Look across on the Y axis to find minutes of delay per aircraft operation
- Multiply by annual op's by minutes of delay per aircraft to get low level of annual delay



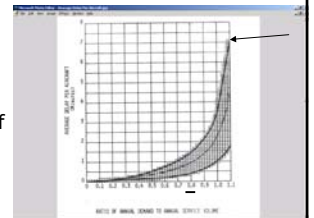
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High Level of Future Delay

- Find on X axis of graph .8
- Draw line vertically to upper line
- Look across on the Y axis to find minutes of delay per aircraft operation
- Multiply by annual op's to get high level of annual delay



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Airport	Optimum	Reduced	
ATL	Atlanta Hartsfield International	185-200	167-174
BOS	Boston Logan International	118-126	78-88
BWI	Baltimore-Washington International	111-120	72-75
CLT	Charlotte/Douglas International	130-140	108-116
CVG	Cincinnati-Northern Kentucky	123-125	121-125
DCA	Washington Reagan National	76-80	62-66
DEN	Denver International	204-218	160-196
DFW	Dallas-Fort Worth International	261-270	183-185
DTW	Detroit Metro Wayne County	143-146	136-138
EWR	Newark International	92-108	74-78
HNL	Honolulu International	120-126	60-60
IAD	Washington Dulles International	120-121	105-117
IAH	Houston Bush Intercontinental	120-123	112-113
JFK	New York Kennedy International	88-98	71-71
LAS	Las Vegas McCarran International	84-85	52-57
LAX	Los Angeles International	148-150	127-128
LGA	New York LaGuardia	80-81	62-64
MCO	Orlando International	144-145	104-112
MEM	Memphis International	150-152	112-120

MIA	Miami International	124-134	95-108
MSP	Minneapolis-St. Paul International	115-120	112-112
ORD	Chicago O'Hare International	200-202	157-160
PHL	Philadelphia International	100-110	91-96
PHX	Phoenix Sky Harbor International	101-110	60-65
PIT	Greater Pittsburgh International	140-160	110-131
SAN	San Diego Lindbergh Field	43-57	38-49
SEA	Seattle-Tacoma International	90-91	78-81
SFO	San Francisco International	95-99	67-72
SLC	Salt Lake City International	130-132	95-105
STL	Lambert St. Louis International	104-112	64-65
TPA	Tampa International	110-119	80-87

3.		0 to 20	197	62	355,000
		21 to 50	149	63	285,000
		51 to 80	126	65	275,000
		81 to 120	111	70	300,000
4.		0 to 20	197	119	370,000
		21 to 50	149	113	320,000
		51 to 80	126	111	305,000
		81 to 120	111	105	315,000
5.		0 to 20	295	62	385,000
		21 to 50	213	63	305,000
		51 to 80	171	65	285,000
		81 to 120	149	70	310,000
		121 to 180	129	75	375,000

9.		0 to 20	98	59	230,000
		21 to 50	77	57	200,000
		51 to 80	77	56	215,000
		81 to 120	76	59	225,000
10.		0 to 20	197	59	355,000
		21 to 50	145	57	275,000
		51 to 80	121	56	260,000
		81 to 120	105	59	285,000
		121 to 180	94	60	340,000

* Staggered threshold adjustments may apply, see paragraph 4-6.
** Refer to paragraph 2-2.f.

Figure 2-1. Capacity and ASV for long range planning (cont.)

No.	Runway-use Configuration	Mix Index %(C+3D)	Hourly Capacity Ops/Hr		Annual Service Volume Ops/Yr
			VFR	IFR	
16.		0 to 20	295	59	385,000
		21 to 50	210	57	305,000
		51 to 80	164	56	275,000
		81 to 120	146	59	300,000
		121 to 180	129	60	355,000
17.		0 to 20	197	59	355,000
		21 to 50	145	57	275,000
		51 to 80	121	56	260,000
		81 to 120	105	59	285,000
		121 to 180	94	60	340,000