Presentation for NASA-Ames Workshop

– *Two Types of Modeling*

- *Fast Time*
  - *Quick,Relativity Low Cost*
  - *Use to screen all improvements for benefits, benefit – cost business case*
- *Real Time*
  - *Great Fidelity, Real World Conditions*
  - *Assure that promising proposals are possible and workable*

Fast Time Modeling

Capacity Modeling

Peak Hour

Annual

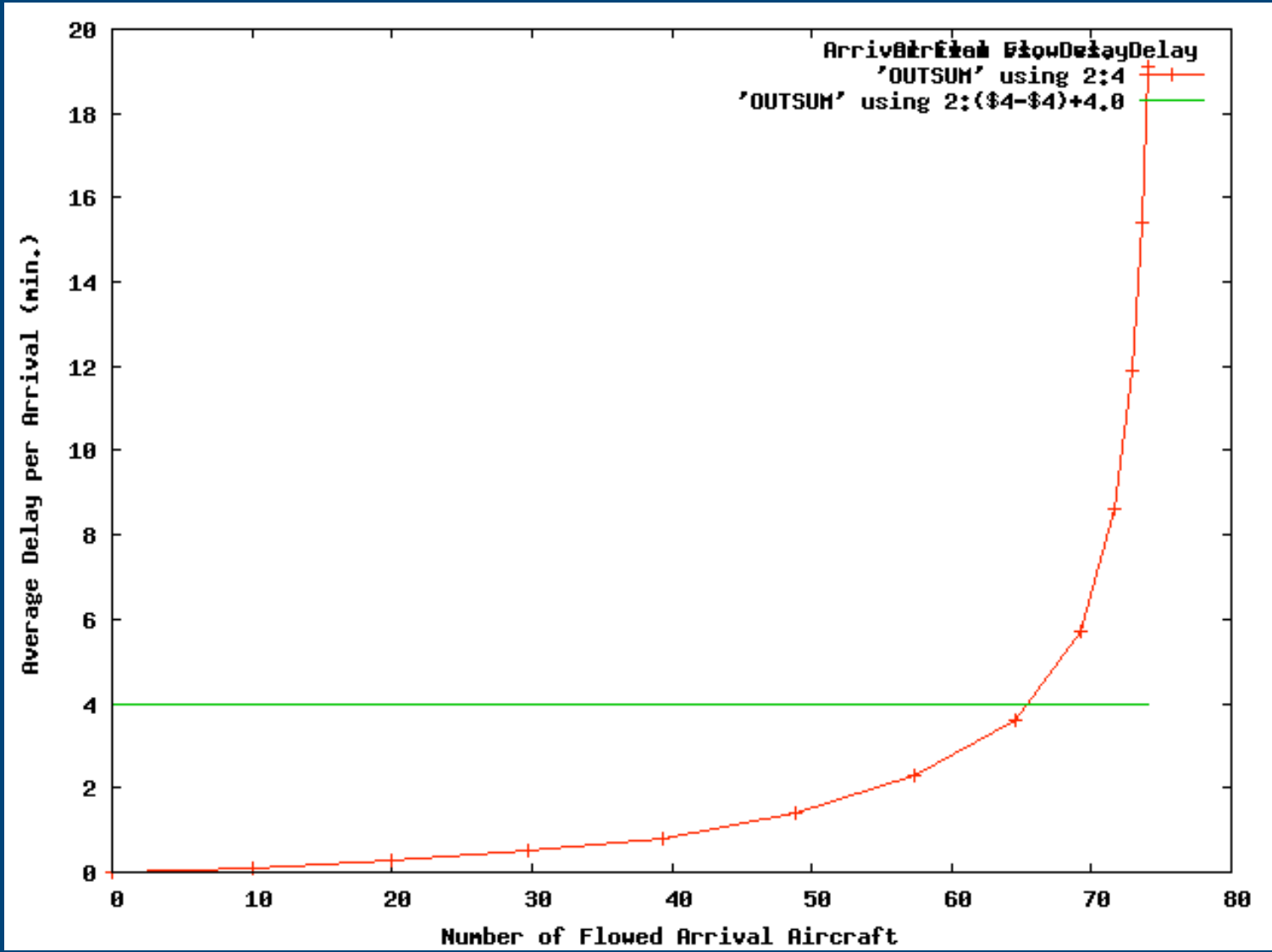
Delay Modeling

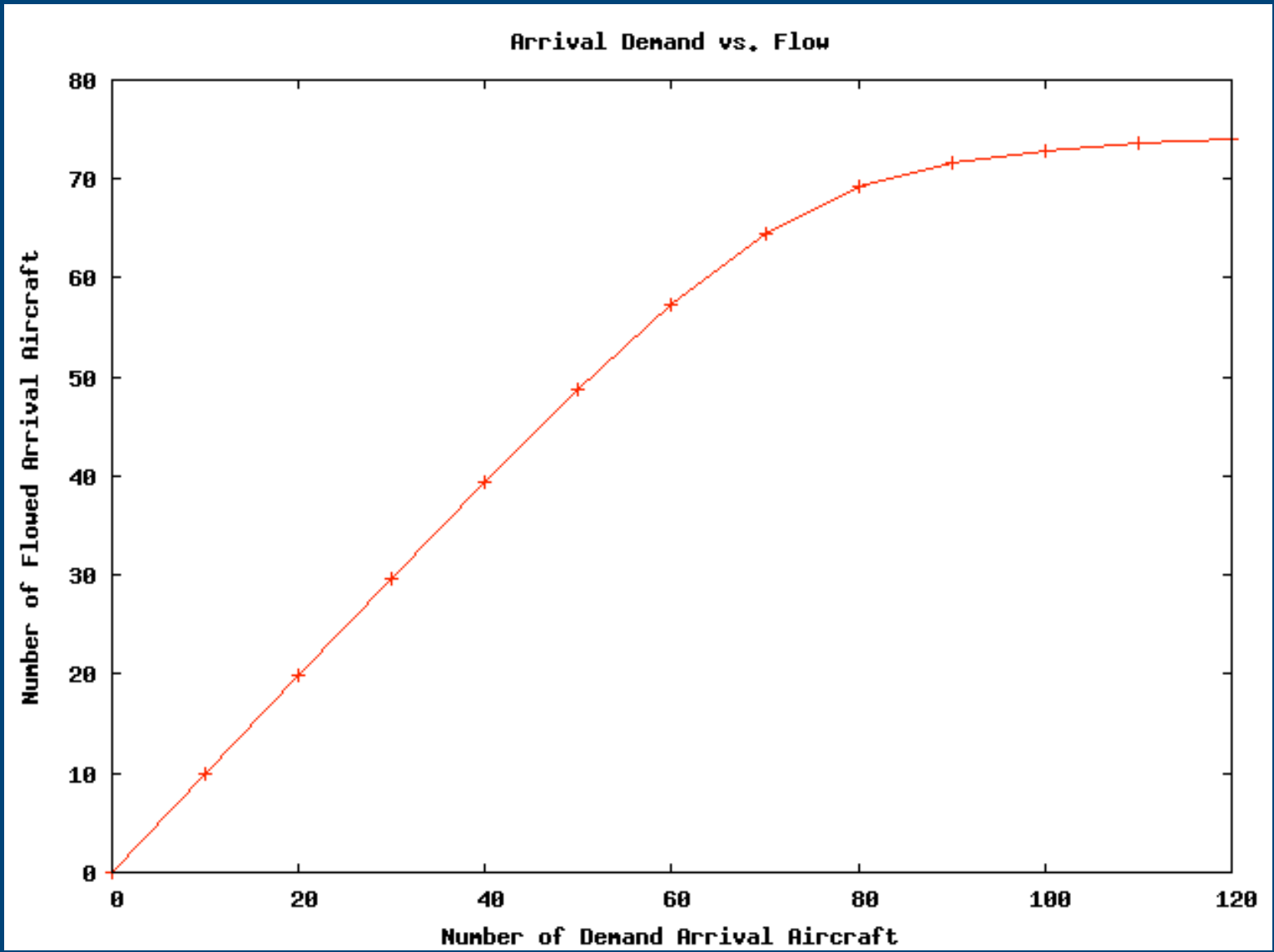
Daily

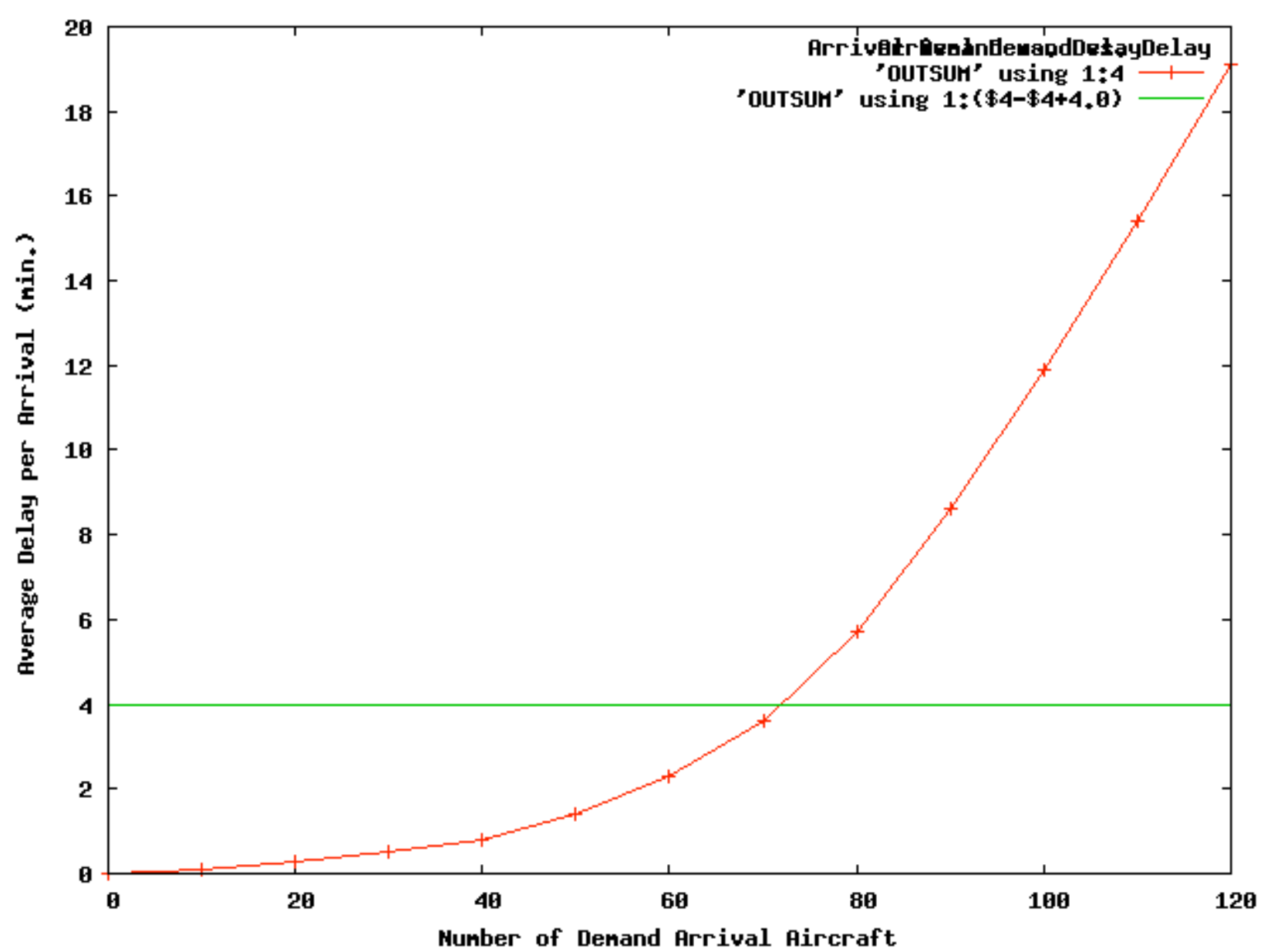
Annual

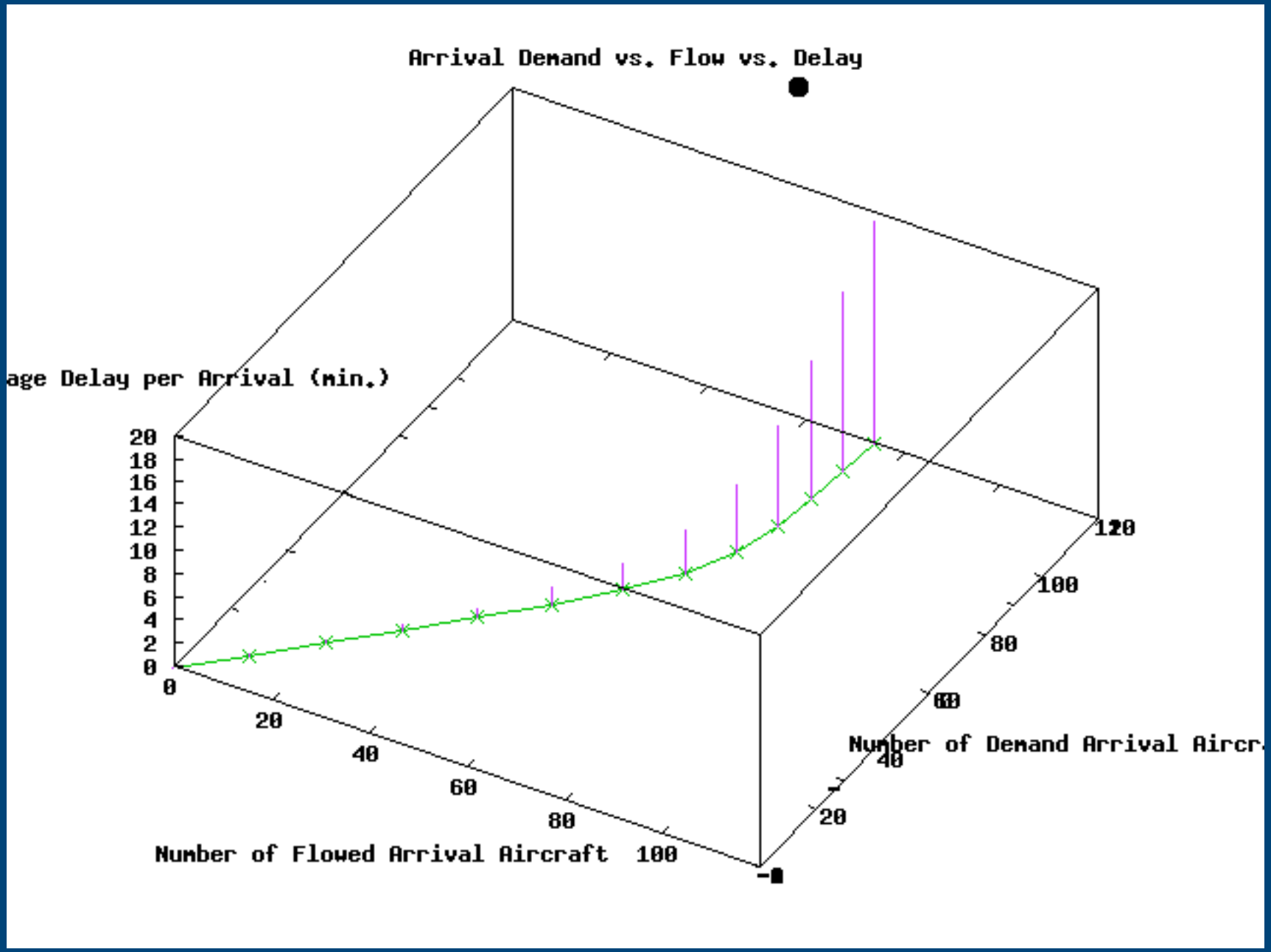
Capacity Modeling – Peak Hour

- *Maximum throughput*
  - *Absolute maximum number of operations that a runway system can process without regard to associated delays*
- *Throughput at specified delay level*
  - *Number of operations that can be processed by a runway system with an average delay per operation equal to the specified level*


'OUTSUM' using 2:4
'OUTSUM' using 2:($4-$4)+4.0
Average Delay per Arrival (min.)
Number of Flowed Arrival Aircraft
0
2
4
6
8
10
12
14
16
18
20
0
10
20
30
40
50
60
70
80


Arrival Demand vs. Flow
Number of Flowed Arrival Aircraft
Number of Demand Arrival Aircraft
0
10
20
30
40
50
60
70
80
0
20
40
60
80
100
120


'OUTSUM' using 1:4
'OUTSUM' using 1:($4-$4+4.0)
Average Delay per Arrival (min.)
Number of Demand Arrival Aircraft
0
2
4
6
8
10
12
14
16
18
20
0
20
40
60
80
100
120


Arrival Demand vs. Flow vs. Delay
age Delay per Arrival (min.)
20
18
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
Number of Flowed Arrival Aircraft
20
40
60
80
100
120
Number of Demand Arrival Aircr

Capacity Modeling - Annual

Annual capacity modeling is used to determine the Annual Service Volume – the number of operations the airport can accommodate in a year.

Annual Demand

Runway Configuration and Weather(Procedures)	Daily Demand	Configuration Use	Weighted Daily Demand
EAST-VFR1	1508	2.0%	30
WEST-VFR1	1508	88.2%	1330
WEST-VFR2	1508	4.5%	68
WEST-IFR1	1508	5.3%	80
		100.0%	1508

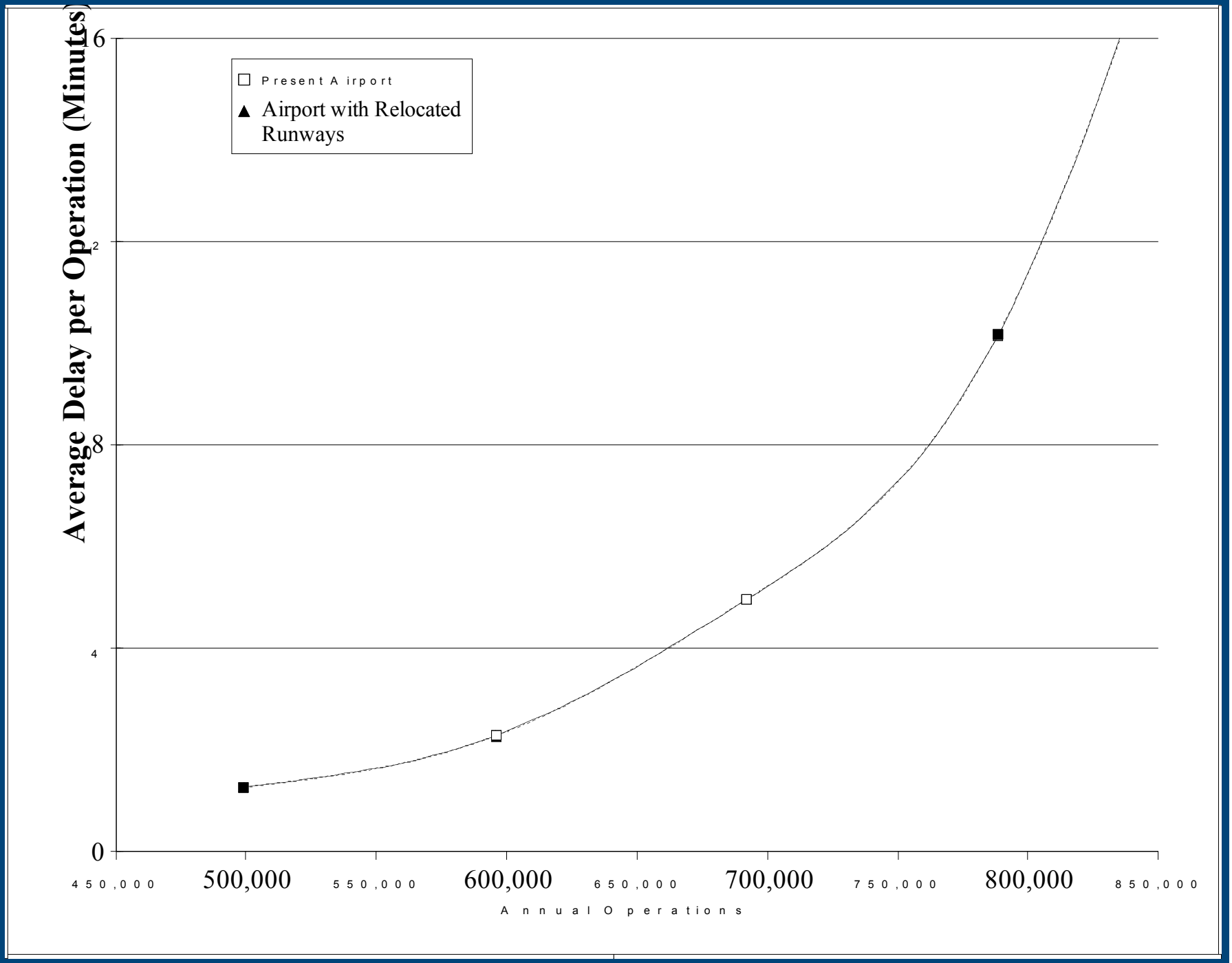
Weighted Daily Demand:	1,508
Equivalent Days:	331
Annual Operations:	499,148

Annual Delay

Runway Configuration and Weather(Procedures)	Daily Demand	Weather Weighing Factor	Daily Delay (minutes)	Configuration Use	Weighted Daily Delay (minutes)
EAST-VFR1	1508	1.0	6177	2.0%	124
WEST-VFR1	1508	1.0	1814	88.2%	1600
WEST-VFR2	1508	1.0	2638	4.5%	119
WEST-IFR1	1508	0.5	2972	5.3%	79
				100.0%	1921

Weighted Daily Delay (min):	1,921
Equivalent Days:	331
Annual Delay (min):	635,851
Annual Delay (hrs):	10,598

Weighted Daily Delay(min):	1,921
Weighted Daily Demand:	1,508
Avg.Delay/Operation (min):	1.27


Average Delay per Operation (Minutes)
16
12
8
4
0
Present Airport
Airport with Relocated Runways
450,000
500,000
550,000
600,000
650,000
700,000
750,000
800,000
850,000
Annual Operations

Weighted Daily Demand	Equivalent Days	Annual Operations	Present Airport Avg. Delay/ Operation (mins.)	Airport with Relocated Runways Avg. Delay/ Operation (mins.)
1508	331	499,148	1.27	1.27
1,800	331	595,800	2.29	2.28
2,091	331	692,121	4.97	4.97
2,382	331	788,442	10.17	10.16
2,674	331	885,094	23.90	23.88