OEP 35 Airports

Estimated Ultimate Airport Gate & Terminal Capacity Study

Joint Planning and Development Office
(JPDO)
Airport Working Group & IPSA

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Issue

- Air transportation is comprised of an interdependent group of elements, one of which is the airport, of which it has interdependent sub elements one of which is the gate/terminal complex.
- Most major US airports are old and are reaching their ultimate capacity.
- We need to know when the airports will constrain airplane traffic to allow for balanced improvements among the interdependent elements.

Basic Priority and Assumptions

1. Property line is fixed and does not change
2. Runways are highest priority over anything else
3. Runway capacity represents all known future additions plus NextGen technologies.
4. Fuel farm & ground access next priority
5. Apron & Terminal next priority
   - Current Gate capacity will only meet about 85% of the future aircraft demand due to the aircraft wingspan increasing, etc.
   - Current layout efficiencies used for future.
   - Except in a limited number of cases, not validated with airports.
6. Gate utilization not considered

Capacity Assessment Methodology

- Acquire areal view of airport on Google Earth
- Use polygon function to describe airport property line. This also yields area in acres.
- Use polygon function to describe existing gate/ terminal area. Include acres.
- Use polygon function to describe other areas on property for future gate/terminal area, in acres.
- Compute existing acres per gate and apply the result to the “other areas” to determine potential expansion.
- Correct for future wing span growth.
- Validate images with airports using assumptions.

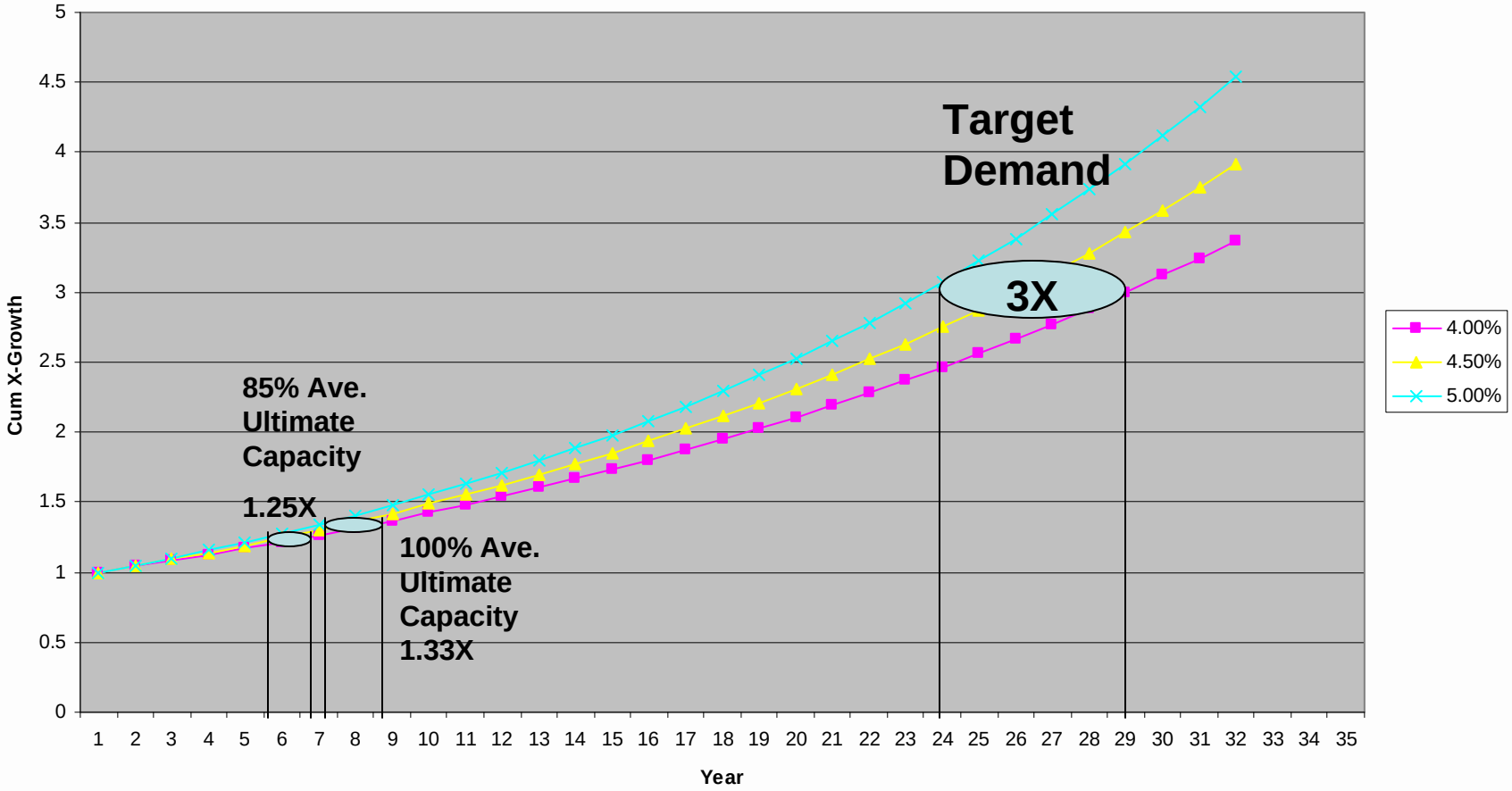
Airport Capacity Calculation Sheet

Airport Code	Airport Name	Gates*	FAA 5010 Acres	Schoen Method Acres	R/W (2) Capacity	100 % Ultimate Capacity	Schoen Method Cur. Wing Limiting Capacity	85% Ultimate Capacity	85% Limiting Capacity	Runways	Per AP Gates (3)	Per AP Terminal	Per AP Landside	Source	Airport Code
BWI	BALTIMORE INTERNATIONAL	74 (1)	3,160	2801	1.81	**3.30**	**1.81**	**2.80**	**1.81**	4					BWI
CLT	CHARLOTTE INTERNATIONAL	91	5,000	2209	1.74	3.30	1.74	**2.80**	**1.74**	3				online	CLT
SEA	SEATTLE TACOMA INTERNATIONAL	84 (4)	2,500	1605	2.42	1.68	1.68	**1.43**	**1.68**	3	1.68	1.68		Schoen	SEA
TPA	TAMPA INTERNATIONAL	73	3,300	2396	1.66	1.99	1.66	**1.69**	**1.66**	3				Marchi	TPA
IAH	HOUSTON GEORGE BUSH INTERCONTINENTAL	110	10,000	6811	1.47	2.27	1.47	**1.93**	**1.47**	5					IAH
DFW	DALLAS FT WORTH INTERNATIONAL	155	18,076	10877	1.45	2.24	1.45	**1.90**	**1.45**	6					DFW
SLC	SALT LAKE CITY INTERNATIONAL	90	7,700	4240	1.44	4.19	1.44	**3.56**	**1.44**	4					SLC
IAD	WASHINGTON DULLES INTERNATIONAL	143	13,000	7775	2.23	1.69	1.69	**1.43**	**1.43**	3					IAD
DEN	DENVER INTERNATIONAL	138	33,422	25502	1.33	3.70	1.33	**3.14**	**1.33**	6					DEN
PHL	PHILADELPHIA INTERNATIONAL	123	2,302	2634	1.32	1.89	1.32	**1.60**	**1.32**	4					PHL
LAX	LOS ANGELES INTERNATIONAL	153 (4)	3,500	2683	1.31	1.78	1.31	**1.51**	**1.31**	4	1.7 to 1.0	1.7 to 1.0		Schoen	LAX
SFO	SAN FRANCISCO INTERNATIONAL	92	5,207	2006	1.45	1.53	1.45	**1.30**	**1.30**	4					SFO
MEM	MEMPHIS INTERNATIONAL	99	3,900	3336	1.28	1.68	1.28	**1.43**	**1.28**	4					MEM
HNL	HONOLULU INTERNATIONAL	80	4,220	5010	1.27	1.77	1.27	**1.50**	**1.27**	4					HNL
PDX	PORTLAND INTERNATIONAL	65	3,000	2550	1.29	1.50	1.29	**1.27**	**1.27**	3					PDX
CVG	CINCINNATI INTERNATIONAL	143	7,000	2969	1.26	3.49	1.26	**2.97**	**1.26**	4				online	CVG
MCO	ORLANDO INTERNATIONAL	98	13,302	10232	1.25	2.83	1.25	**2.40**	**1.25**	4					MCO
STL	LAMBERT ST LOUIS INTERNATIONAL	88	2,800	2245	1.25	1.78	1.25	**1.51**	**1.25**	4					STL
MSP	MINNEAPOLIS ST PAUL INTERNATIONAL	117	2,930	3989	1.24	1.55	1.24	**1.32**	**1.24**	4					MSP
PIT	GREATER PITTSBURGH INTERNATIONAL	100	10,000	3148	1.22	2.03	1.22	**1.72**	**1.22**	4				online	PIT
CLE	CLEVELAND HOPKINS	82	1,900	1735	1.20	2.10	1.20	**1.79**	**1.20**	4				online	CLE
DTW	DETROIT METRO WAYNE COUNTY	145	6,400	4647	1.20	1.77	1.20	**1.51**	**1.20**	7				online	DTW
PHX	PHOENIX SKY HARBOR INTERNATIONAL	121	3,400	2125	1.20	2.08	1.20	**1.77**	**1.20**	3					PHX
FLL	FT LAUDERDALE INTERNATIONAL	57	1,380	1318	1.54	1.38	1.38	**1.17**	**1.17**	3				online	FLL
LAS	LAS VEGAS MCCARRAN INTERNATIONAL	104	2,800	2570	1.12	1.77	1.12	**1.51**	**1.12**	4					LAS
SAN	SAN DIEGO INTERNATIONAL	51	614	666	1.20	1.30	1.50	**1.10**	**1.10**	1	1.5	1.5		Schoen	SAN
DCA	WASHINGTON NATIONAL	44	861	722	1.26	1.27	1.26	**1.08**	**1.08**	3					DCA
ATL	ATLANTA INTERNATIONAL	179 (1)	4,700	4451	1.22	3.20	1.22	**2.72**	**1.07**	5	1.07	1.07		Terreri	ATL
BOS	BOSTON INTERNATIONAL	84 (1)	2,384	1617	1.26	1.25	1.25	**1.06**	**1.06**	6					BOS
EWR	NEWARK INTERNATIONAL	130	2,027	1930	1.21	1.22	1.21	**1.04**	**1.04**	3					EWR
LGA	NY LAGUARDIA	76	680	658	1.30	1.22	1.22	**1.04**	**1.04**	2					LGA
MDW	CHICAGO MIDWAY	43	650	745	1.67	1.12	1.12	**0.95**	**0.95**	5				online	MDW
MIA	MIAMI INTERNATIONAL	141	3,300	2651	1.27	1.11	1.11	**0.95**	**0.95**	4					MIA
JFK	NY KENNEDY INTERNATIONAL	108	5,200	4595	1.44	1.01	1.01	**0.86**	**0.86**	4					JFK
ORD	CHICAGO O'HARE INTERNATIONAL	178	7,627	6991	1.86	1.00	1.00	**0.85**	**0.85**	8				online	ORD
	Mathematical Average				**1.42**	**1.97**	**1.33**	**1.68**	**1.25**	**4.06**					

Notes

*(1) From TRB list.
*(2) Runway capacity based on 2025 VMC conditions with planned runways included.
*(3) Land available based ultimate capacity based on 2006
*(4) Airport Source
*(5) Gate Count from Kumar Amit

Demand vs. Capacity



2006 2024 2029

Next Steps

1. Validate initial capacity assessments with airports.
2. Identify alternative strategies to absorb overages.
3. Identify probability of realization of expansion strategy per airport metroplex.
4. Estimate cost impact of growth to 3X capacity.