

# **Aviation Gridlock: Airport Capacity Infrastructure How Do We Expand Airfields?**

**By**

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# Issue

**What can be done to expand  
airfield capacity?**

# Facts

- **Airline travel is affordable for most citizens**
- **Demand is growing steadily**
- **Passengers will grow 52% from 660 million annually in 1999 to approximately 1 billion in 2011**
- **Operations will grow 28% from 68 million to 87 million in this time frame**
- **Efficiency has and will increase as evidenced above with passenger growth at double the operations growth**
- **At top 20 airports, only five runways planned, enplaning 59% of passengers**
- **At the top 100 airports, 50 runways could be built, enplaning 96% of passengers**

# Facts (cont.)

➤ **Only two new hub airports in the last 30 years**

➤ Denver - 1995 (replacement)

➤ Dallas/Fort Worth - 1974

➤ **Three non-hub airports in the last three years**

➤ Northwest Arkansas

➤ Mid-America

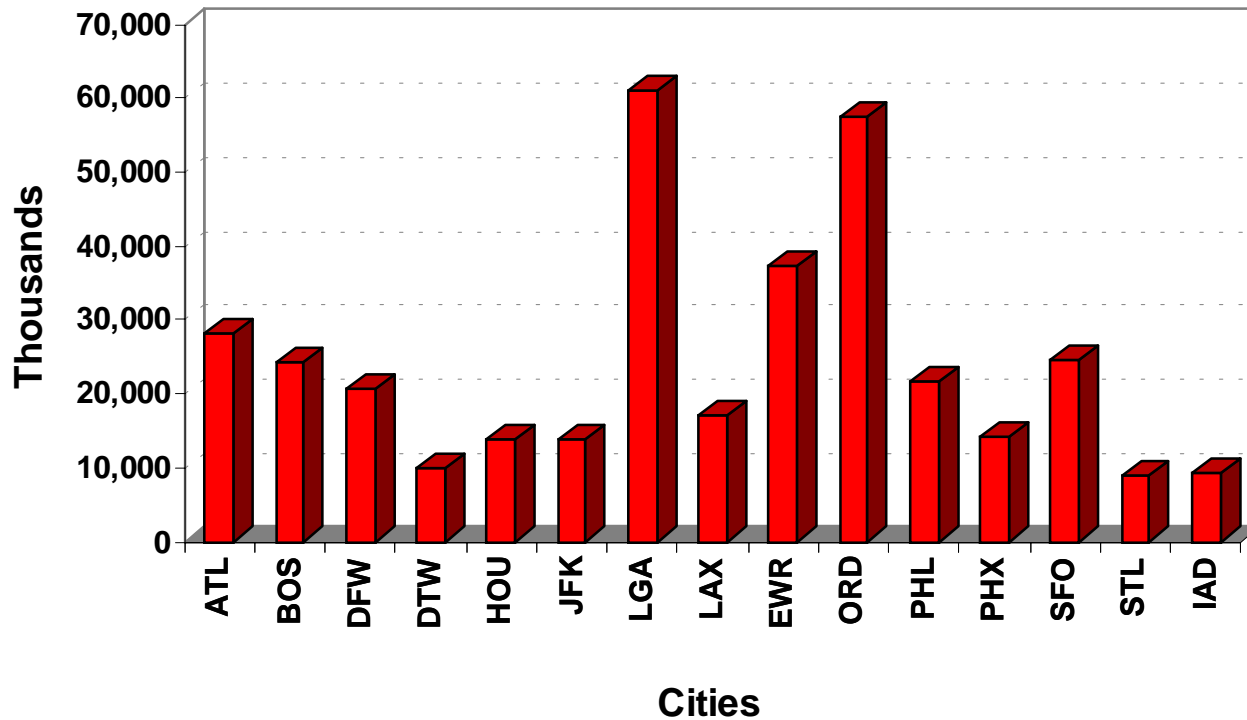
➤ Austin (replacement)

# Facts (cont.)

- ⇒ **\$25 billion in hub infrastructure projects are planned for 2001 - 2007**
  - ⇒ Growth potential must be realized
  - ⇒ Operational constraints (i.e. gates, runways, slots, airspace, terminal facilities, etc.) can slow the growth of a given airport to match the potential demand
  - ⇒ Most noted 2001 projects:
    - ⇒ DTW new Midfield terminal
    - ⇒ Monorail connecting EWR to Penn Station

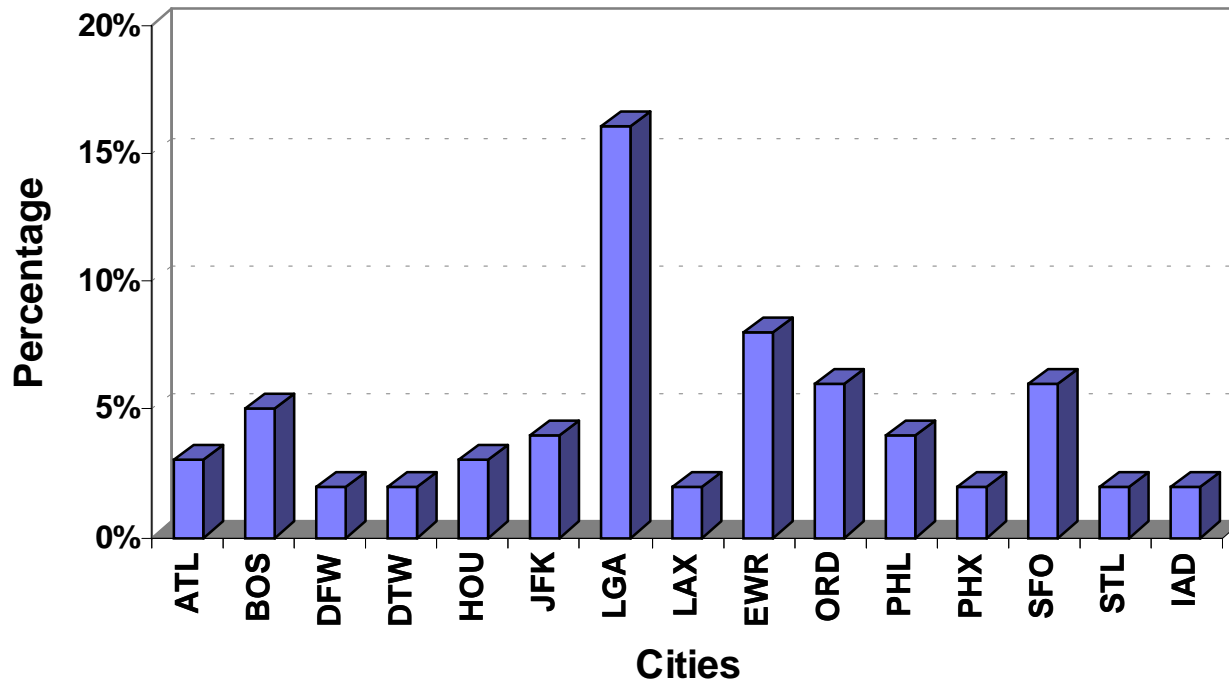
# Delays

Total Flights Delayed in 2000



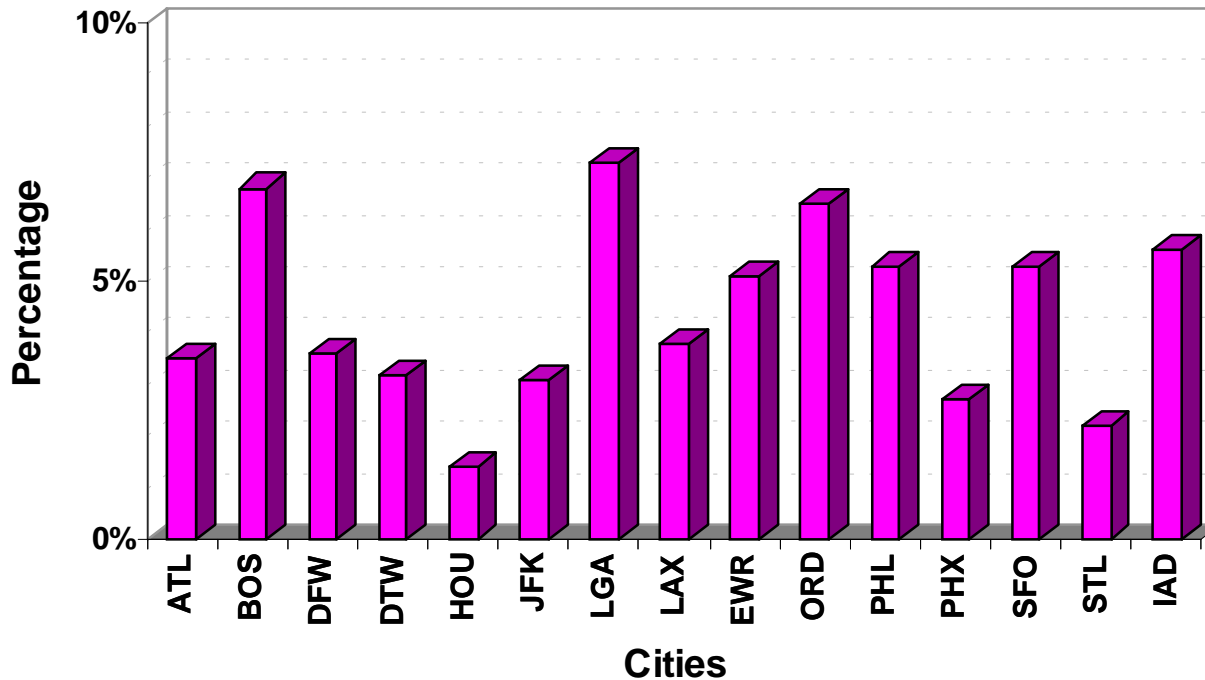
# Delays (cont.)

Percentage of Flights Delayed in 2000



# Delays (cont.)

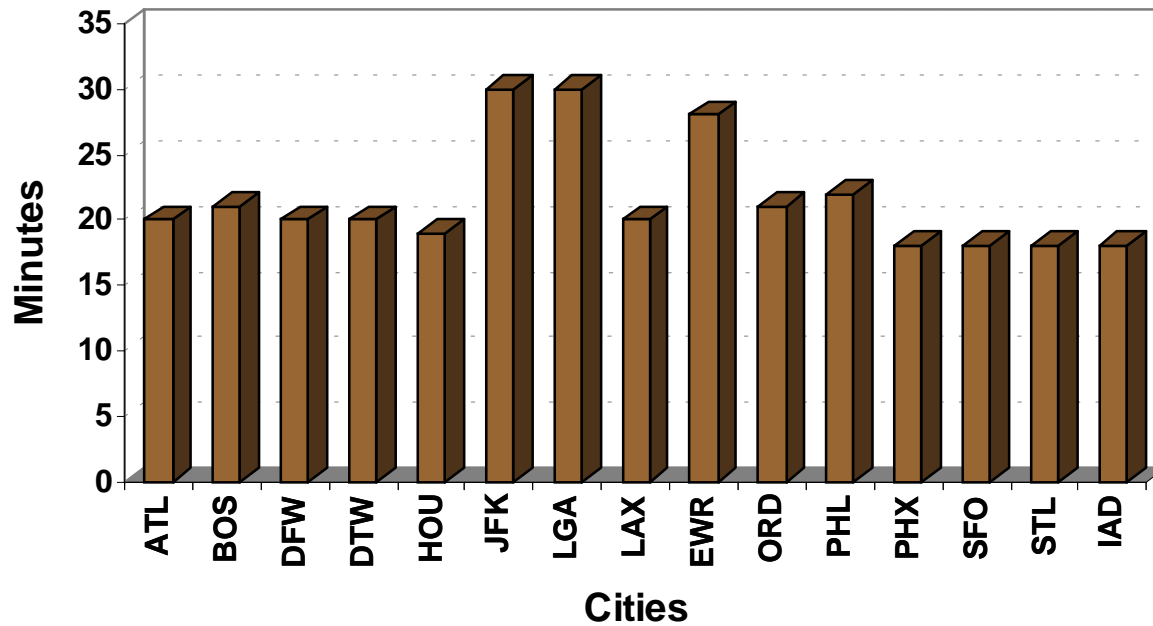
Percentage Of Major Airline Flights Canceled in 2000





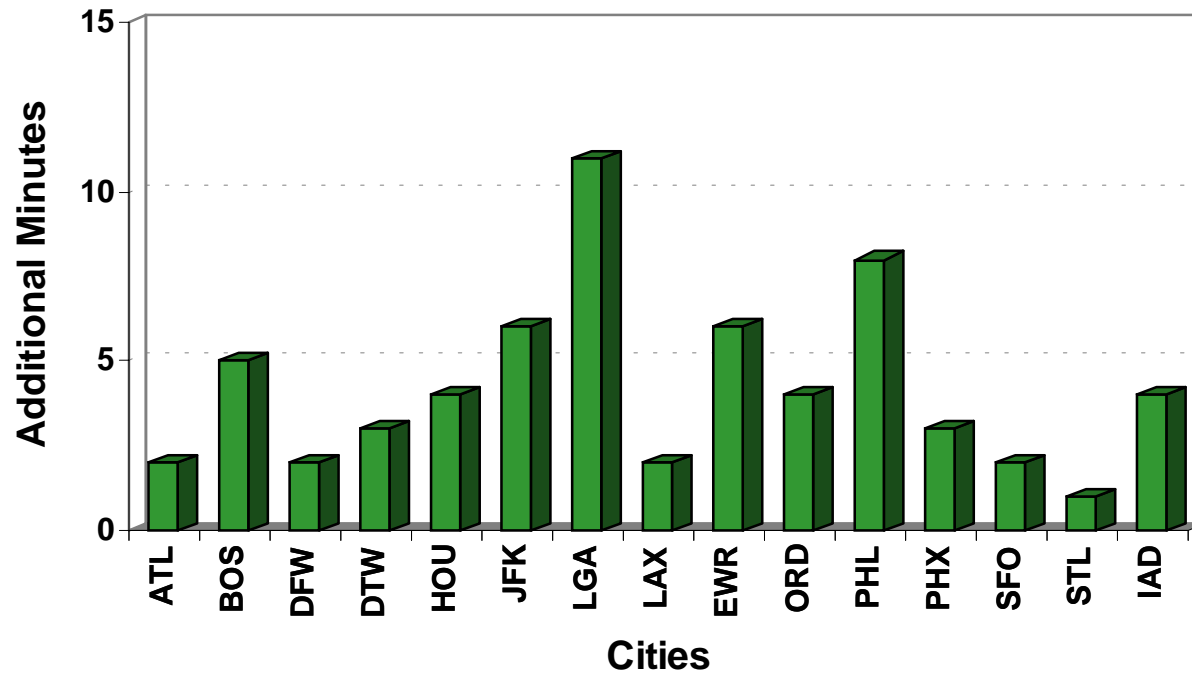
# Delays (cont.)

Average Minutes For  
Taxi-Out in 2000



# Delays (cont.)

Additional Minutes For Average Taxi-Out  
2000 vs. 1995



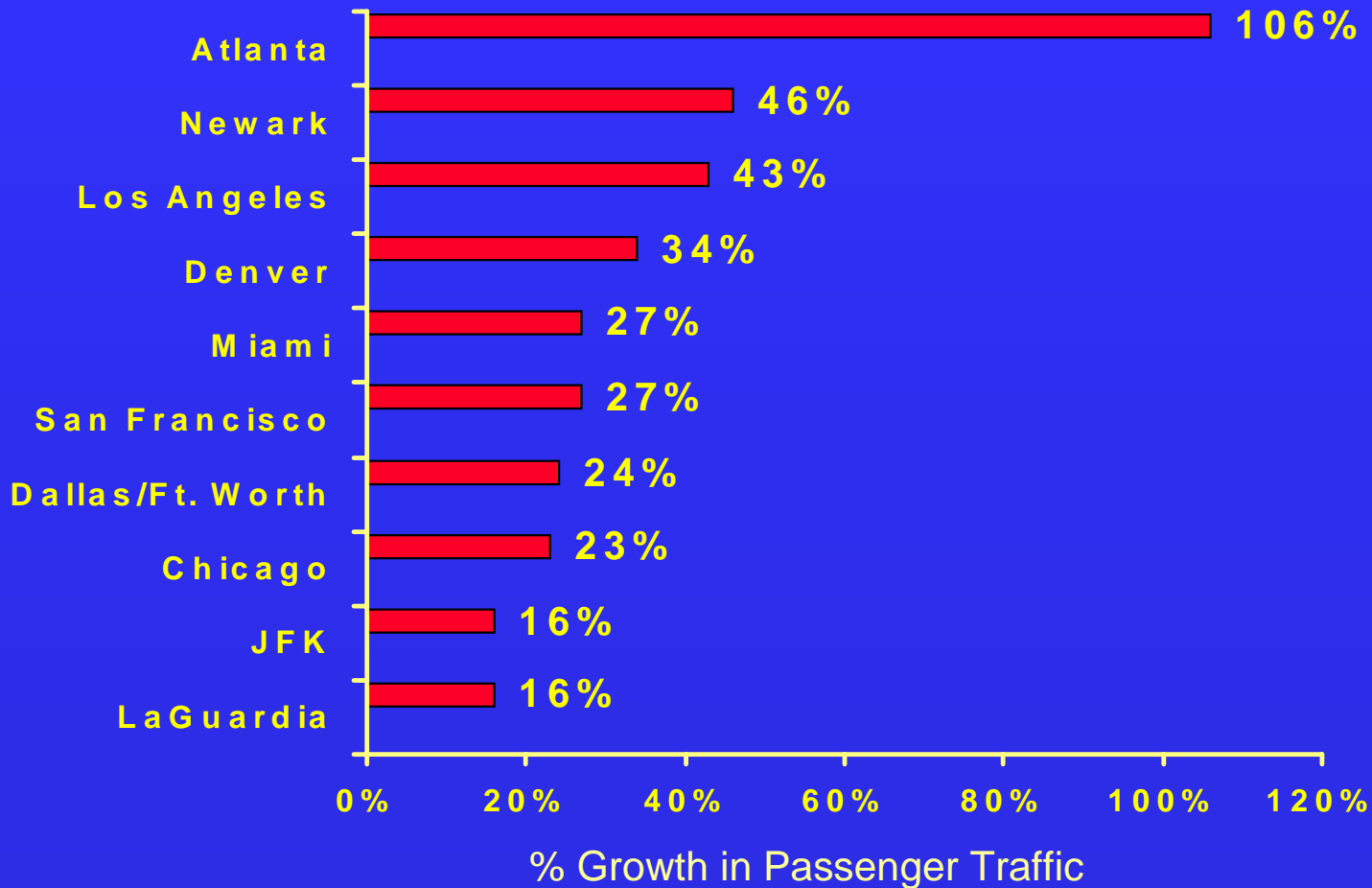
# Delays (cont.)

- **“Keep looking below surface appearances. Don’t shrink from doing so (just) because you might not like what you find”**

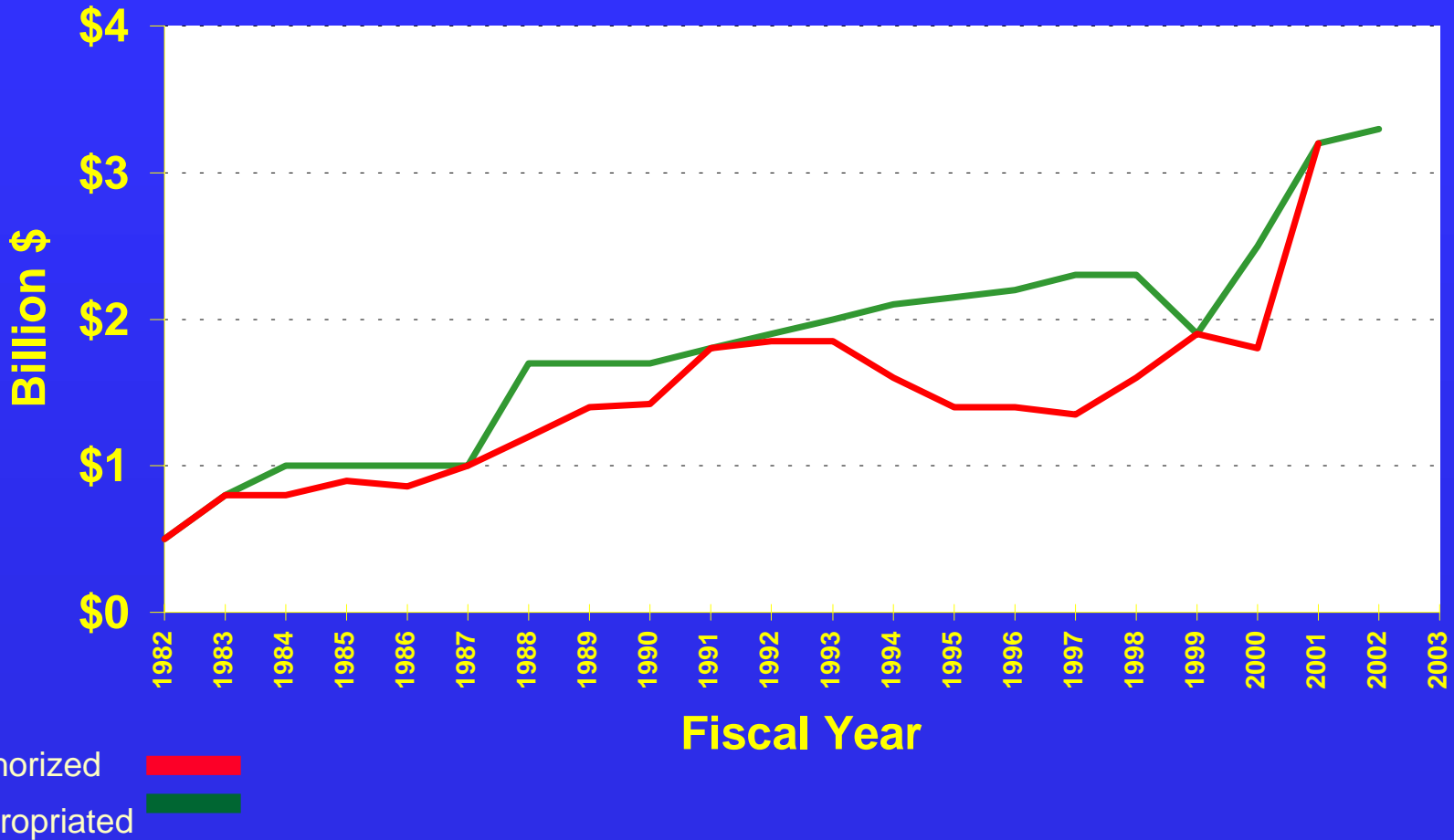
General Colin Powell

- Complacency = “If it ain’t broke, don’t fix it”
- Our goal has to be to look below all the surfaces and fix the problems - with teamwork we will succeed because we all share in the pain!

# Growth in Passenger Traffic 1991 vs. 1999



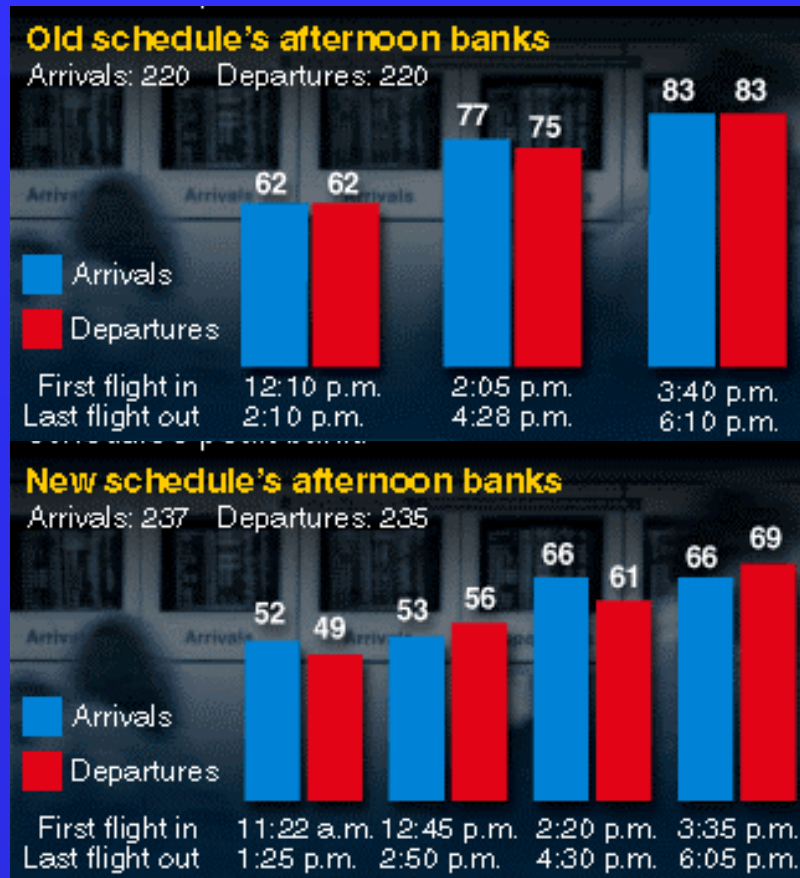
# AIP Funding Levels



Note: FY 2002-AIP Planned at \$3.3 Billion

# Delta's ATL schedule

- Spreads flights more evenly so that there are fewer flights at peak times of the day (17 fewer arrivals and 14 fewer departures)

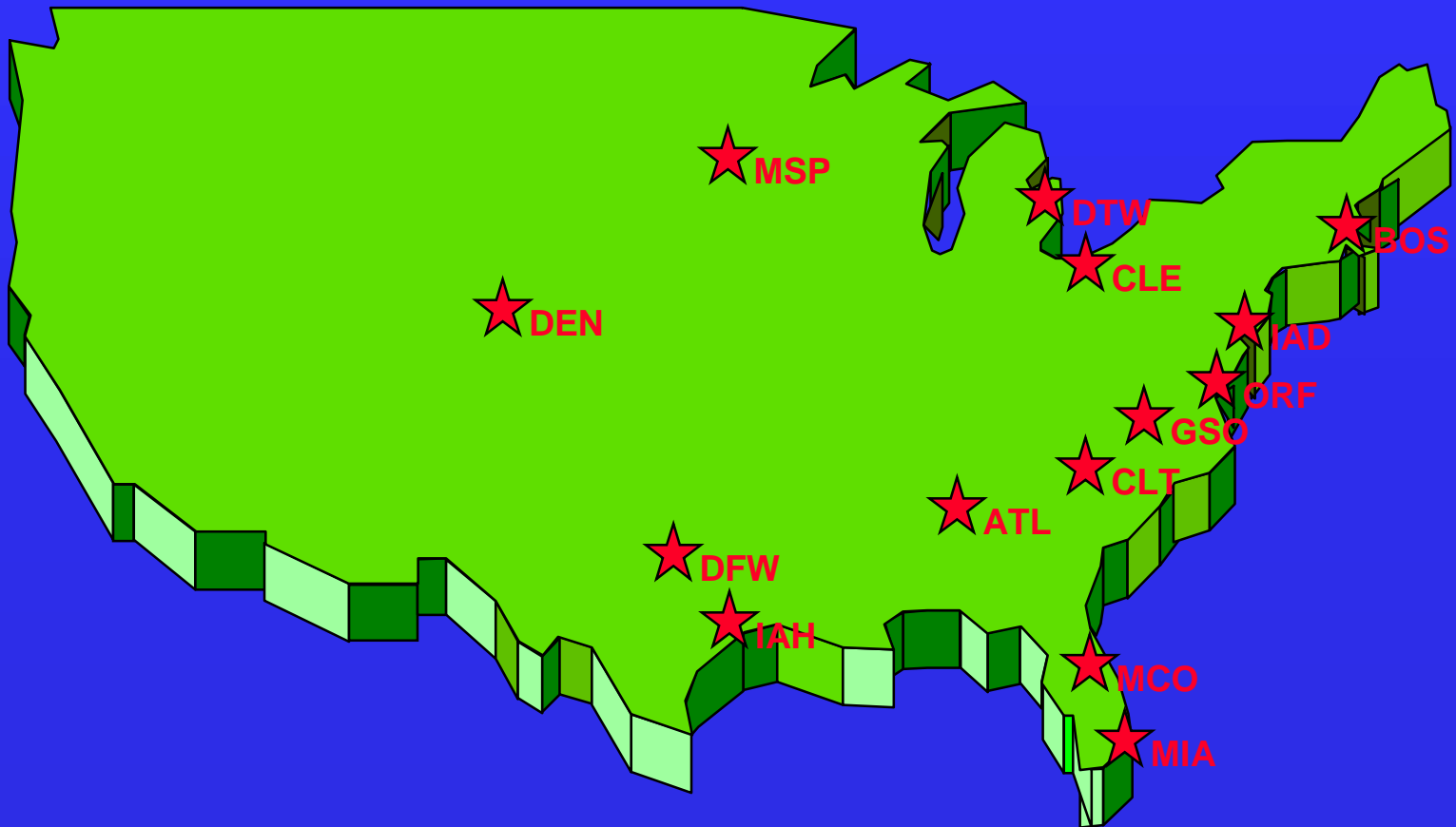


# Eight Runways Opened Since 1995



# 14 Runways Slated to Open by December 2005

(Of the top 100 Airports)





Most projects take from 10 to 15 years from start of planning to operation.  
 Typically, a third to half of the overall development time is spent on environmental approval. The average time to complete is 12.4 years!  
 These nine runways required 111 years to complete!!!!

Airport	Runway Length	Cost Estimate	Master Plan		Environmental Approval		Land Acquisition and Construction		Total Development Duration
			Start	Finish	Start	Finish	Start	Finish	
Houston (IAH)	9,000'	\$257 Million	1994	1996	1996	2001	2001	2003	10 Years
Cleveland (CLE)	9,000'	\$467 Million	1990	1997	1998	2001	2001	2002	13 Years
Atlanta (ATL)	9,000'	\$1 Billion	1996	1999	1999	2002	2003	2005	10 Years
Cincinnati (CVG)	8,000'	\$220 Million	1992	1996	1998	2001	2002	2005	13 Years
Seattle (SEA)	8,500'	\$773 Million	1992	1996	1996	2001	2002	2006	15 Years
St. Louis (STL)	9,000'	\$1.1 Billion	1994	1996	1996	2001	2002	2006	13 Years
Washington (IAD)	10,000'	\$216 Million	1999	2000	2001	2004	2005	2007	9 Years
Phoenix (PHX)	7,800'	\$170 Million	1987	1989	1990	1995	1996	2000	14 Years
Memphis (MEM)	9,100'	N/A	1984	1986	1987	1992	1993	1997	14 Years

\* Data includes estimates and was confirmed with varying sources including city planners, airlines, airport consultants, and ATA.

# Opportunities-A Call to Action!

- **New runways**
- **Airspace capacity-technology**
- **Scheduling efficiency**
- **Teamwork**
- **Streamlining processes and approvals**
- **Runways: A National Coalition/EASE**

# Appendix

# Runways - Under Construction

<i>City</i>	<i>Finish</i>	<i>Start</i>	<i>Length</i>	<i>Cost</i>	<i>Description/Status</i>
<b>DTW</b>	2001	1999	10000	\$120	A sixth runway (4/22) (fourth north-south parallel) is being built. This runway could potentially permit triple IFR arrivals with one dependent and one independent pairing.
<b>PHX</b>	2001		7800	\$180	Third parallel (7/25) is nearing completion. It is being construction 800 feet south of 8R/26L. The ALP indicates the runway will ultimately extend to 9,500 feet but no further construction is schedule at this time.
<b>IAH</b>	2003	2000	8500	\$250	Third parallel (8L/26R) ROD was approved in 9/00 and construction starts 11/00. This runway will be parallel to and north of the existing pair of east-west parallels. These three runways have the potential to support triple IFR approaches.
<b>MCO</b>	2003	1990	9000	\$200	Environmental mitigation for the fourth runway (17L/35R) began in 1990; funding is set, land acquired. It will be located 4,300 feet east of 17R/35L and may permit triple independent IFR operations.
<b>MSP</b>	2003	1999	8000	\$490	Fourth runway (17/35) now under construction; expected to increase capacity by 25%. The runway will be used primarily for departures to the south and arrivals from the north.
<b>CLE</b>	2004	2000	9000	\$512	Replacement parallel (5W/23W) (increases capacity through greater separation); ROD expected 11/00; 7145 feet (6000 operable) will be delivered 12/01 (assuming 11/00 ROD).
<b>SEA</b>	2006	1997	8500	\$1000	A new runway (16W/34W) is being constructed 2,500 feet west of 16L/34R.

# Runways - Planned

<i>City</i>	<i>Finish</i>	<i>Start</i>	<i>Length</i>	<i>Cost</i>	<i>Description/Status</i>
<b>CLT</b>	2003	2001	9000	\$80	Third parallel (fourth total) runway (18W/36W) planned 3,800 feet west of 18R/36L and would permit triple dependent IFR approaches.
<b>DEN</b>	2003	2001	16000	\$160	Sixth runway (16R/34L) is being built 2,600 feet west of 16L/34R; earthwork was done when the airport was built; PFC-funded and AIP funds received. The runway will (i) reduce aircraft delays and congestion during poor visibility conditions and snow; (2) provide a longer runway to improve economic viability of overseas flights to Europe and Asia; and (3) improve flexibility in handling aircraft flows on the ground and in the airspace.
<b>MIA</b>	2003	2001	8600	\$110	Bids have just been opened for a fourth runway (8/26) to be built 800 feet north of existing 9L/27R. An EIS was completed in 1998. The new runway is planned primarily to be used for arrivals in VFR and non-precision IFR conditions.
<b>CVG</b>	2004		8000	\$233	A third parallel (18R/36L) to be located 3,500 to 5,000 feet west of the existing 18R/36L (to be renamed 18C/36C) is in EIS. The new runway may allow triple independent IFR approaches.
<b>GSO</b>	2004	2001	10000	\$96	A new parallel (5L/23R) is planned 5,300 feet north of existing 5/23. Construction is expected to begin upon completion of the EIS (which is underway). The new runway would allow dual independent arrivals and departures in all weather conditions.
<b>IAD</b>	2004			\$217	A new (12R/30L) runway (the fourth) was included in expansion program approved in August 2000. This runway will be located 4,300 feet southwest of 12/30.
<b>SRQ</b>	2004			\$10	A new parallel (14L/32R) is being planned 1,230 feet northwest of 12/32. IFR arrivals and departures on the new runway will be dependent on 14/32 operations.
<b>STL</b>	2004			\$1000	Property is currently being acquired for new parallel (12R/30L) to support independent IFR arrivals.

# Runways - Planned (cont.)

<i>City</i>	<i>Finish</i>	<i>Start</i>	<i>Length</i>	<i>Cost</i>	<i>Description/Status</i>
<b>ATL</b>	2005	2001	9000	\$869	Fifth runway (10/28) now in EIS process (ROD expected 07/01); land acquisition and site prep work has begun. The runway will permit triple independent IFR approaches using the PRM. Initial phase (4,200 feet) is for commuters only but an EIS is underway to extend the runway to 9,000 feet.
<b>DFW</b>	2005			\$367	Eighth runway (18R/36L) is approved and will allow four simultaneous ILS landings. It will be located 5,800 feet west of 18L/36R and used primarily for arrivals.
<b>FLL</b>	2005	2003	9000	\$300	This is an extension of short (currently commuter) runway 9R/27L to be used for arrivals and departures and allow for dual dependent IFR arrivals of all aircraft types.
<b>ORF</b>	2005			\$100	A new runway (5R/23L) is planned just southeast of 5/23. Completion date is dependent on the airports ability to acquire a small amount of additional land needed to construct the runway.
<b>TUS</b>	2005	2003			An additional parallel (11R/29L) is planned. Upon completion, the existing 11R/29L (a GA runway) will revert to taxiway status.
<b>PIT</b>	2006			\$150	A southern parallel (10/28) will be located 4,300 feet south of 10R/28L.
<b>BWI</b>	2008			\$150	A new 7,800-foot runway (10R/28L) is planned 3,500 feet south of 10/28. When the new runway opens, 4/22 will be converted to a taxiway.
<b>IAD</b>	2008			\$200	A third parallel (1W/19W) is planned 4,300 feet west of the existing parallels. This could provide triple independent parallel approaches, if they are approved.
<b>IND</b>	2008			\$80	A third parallel (5R/23L) is planned to the south of existing 5R/23L (to be renamed 5C/23C).
<b>GSP</b>	2010		8200	\$65	A new parallel (3R/21L) is planned 4,300 feet east of 3L/21R. This would allow dual independent IFR arrivals, potentially doubling hourly IFR arrival capacity.

# Runways - Planned (cont.)

<i>City</i>	<i>Finish</i>	<i>Start</i>	<i>Length</i>	<i>Cost</i>	<i>Description/Status</i>
<b>MSY</b>	2010			\$400	A new parallel north-south runway (18/36) is currently at the EIS stage. It will be located 11,000 feet to the west of and nearly parallel to runway 1/19.
<b>RSW</b>	2010	2008	9100	\$80	A new parallel (6R/24L) is to be constructed at least 4,300 feet southeast of 6/24. The new runway will support independent parallel operations.
<b>TUL</b>	2010		9000	\$115	A new parallel runway (18/36) is planned 6,400 feet east of the present 18L/36R, potentially allowing IFR triple independent approaches.
<b>JAX</b>	2011	2010		\$50	A new parallel runway (7R/25L) is planned 6,500 feet south of the existing 7/25 permitting independent parallel IFR operations and potentially doubling hourly IFR arrival capacity.
<b>OKC</b>	2012			TBD	A third parallel (17/35) is planned 1,600 feet to the west of the existing 17R/35L.
<b>TPA</b>	2012	2010	10160	TBD	A third parallel (17/35) is being planned 700 feet west of the centerline of 18R/36L. The new runway would be used primarily for arrivals with 18R/36L being used primarily for departures. However, during VFR conditions, it is anticipated that both runways may be used simultaneously for arrivals and/or departures in both north and south flow operations.
<b>BOI</b>	2015			TBD	A third parallel (10R/28L) is planned 5,400 feet south of existing 10R/28L (which will be renamed 10C/28C).
<b>MKE</b>	2015			\$160	A third parallel (7/25) is being planned south of the existing parallels.
<b>CMH</b>	2020		10250	\$100	A third parallel (10S/28S) is planned 800 feet south of 10R/28L providing 3,650 feet of separation between the new runway and 10L/28R. With the installation of PRM, these two runways would be used for arrivals with 10R/28L being used for departures.
<b>SAT</b>	2020			\$400	A third parallel (12N/30N) is being planned for long-term growth.
<b>SAV</b>	2020		9000	TBD	A new parallel (9L/27R) is planned 5,000 feet north of 9/27. This runway will allow independent parallel operations thereby potentially doubling hourly capacity.

# Runways - Proposed

<i>City</i>	<i>Finish</i>	<i>Start</i>	<i>Length</i>	<i>Cost</i>	<i>Description/Status</i>
<b>BNA</b>	TBD			TBD	A new runway (2E/20E) will have 1,500 to 3,500 feet of separation from 2R/20L.
<b>DAY</b>	TBD		11000	TBD	A third parallel northwest of 6L/24R is being studied.
<b>GEG</b>	TBD		8800	TBD	A new parallel runway (3L/21R) is proposed 4,400 feet northwest of 3R/21L and will enable independent parallel operations, doubling hourly IFR arrival capacity.
<b>GRR</b>	TBD		7000	TBD	A new parallel (8L/26R) would replace an existing shorter runway which would be converted into a taxiway.
<b>IAH</b>	TBD			TBD	A fourth parallel (9R/27L) is on the airport's master plan.
<b>MCI</b>	TBD			TBD	An additional parallel west of the existing parallels is being considered.
<b>OAK</b>	TBD			TBD	Authority approved study for a second parallel; environmental process not started.
<b>RDU</b>	TBD			TBD	A new parallel (5W/23W) proposed 1,050 feet west of existing 5L/23R.
<b>SFO</b>	TBD			TBD	Studying a runway in the bay. Four or five options are being reviewed with costs of up to \$3 billion (the airport has applied for a \$1 billion grant). The costs are so high that one alternative being considered is a tunnel to Oakland.
<b>SJC</b>	TBD			TBD	Authority approved study; environmental process not started.
<b>SYR</b>	TBD		7500	\$55	A new parallel (10L/28R) is proposed 3,400 feet north of 10/28 to provide independent parallel IFR operations, doubling hourly IFR arrival capacity. The runway is planned for an ultimate extension to 9,000 feet.

Commuter runways are not included.

Runway extensions are included only if they result in a significant increase in operational capacity (e.g., conversion of commuter runway to jet runway).

Please contact Wayne Herndon at 404-715-2269 with corrections or additions.

Last updated December 11, 2000.