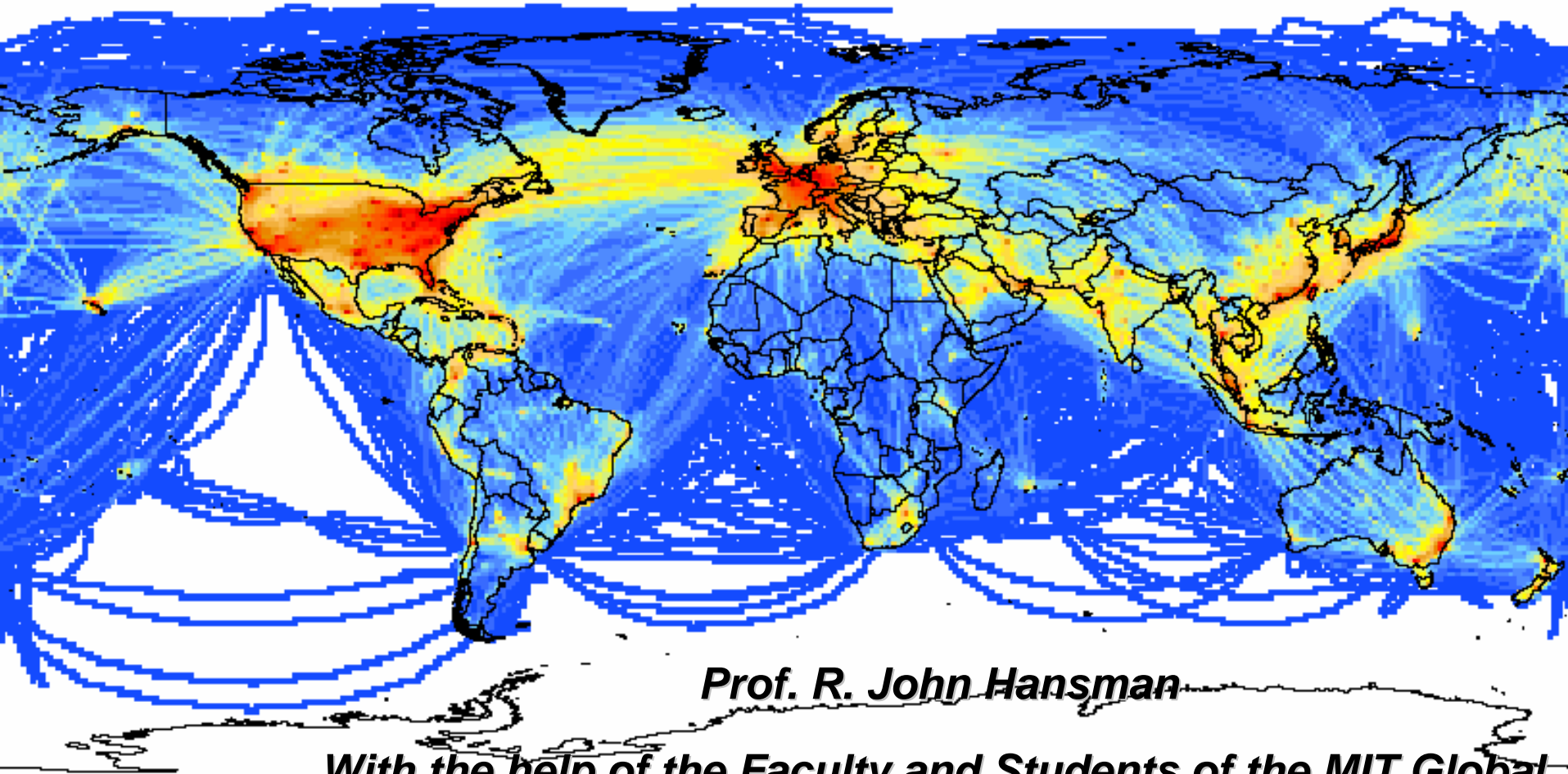




Airline Industry Recent Trend Update (October 2006)



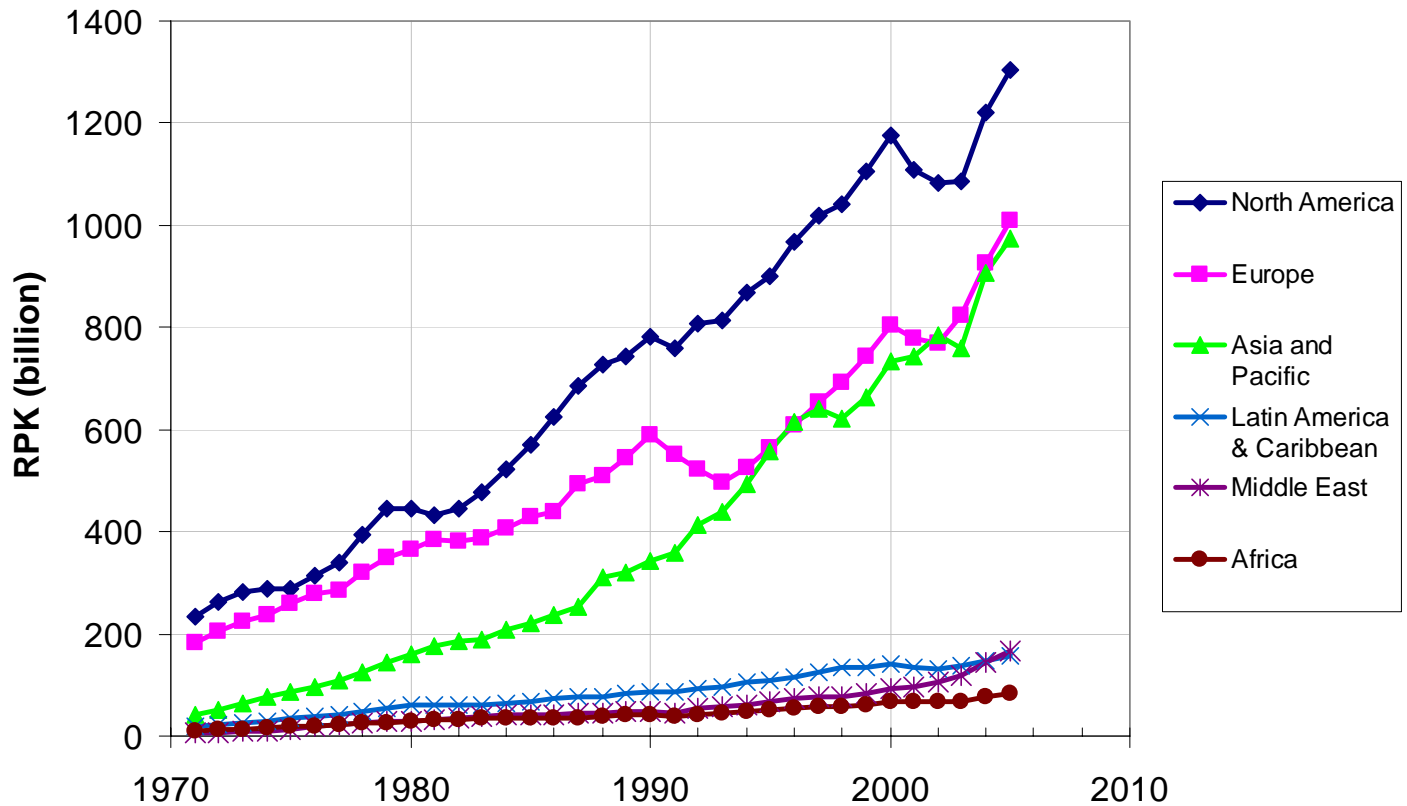
Prof. R. John Hansman

***With the help of the Faculty and Students of the MIT Global
Industry Study***

rjhans@mit.edu

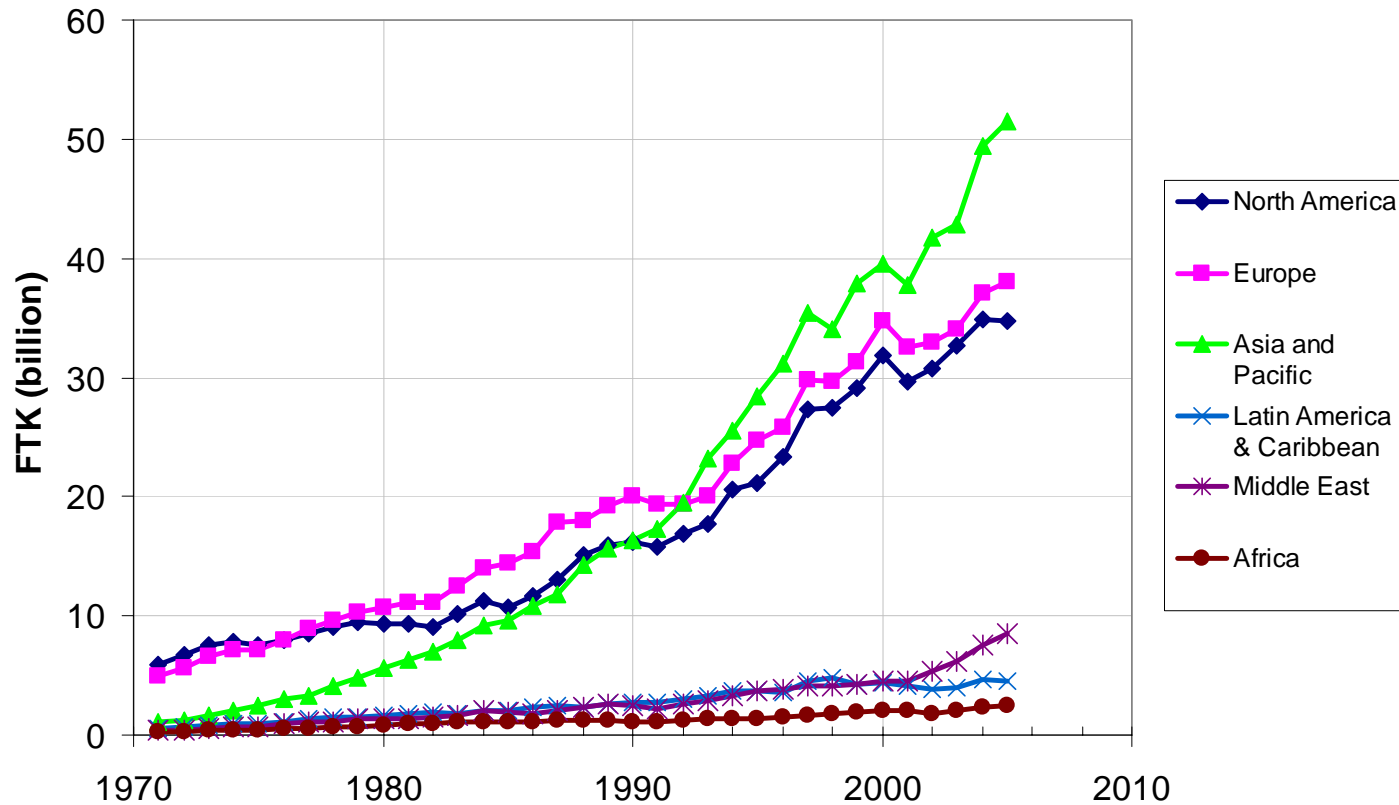
RPK by Region

Scheduled Revenue Passenger-Kilometers by Region



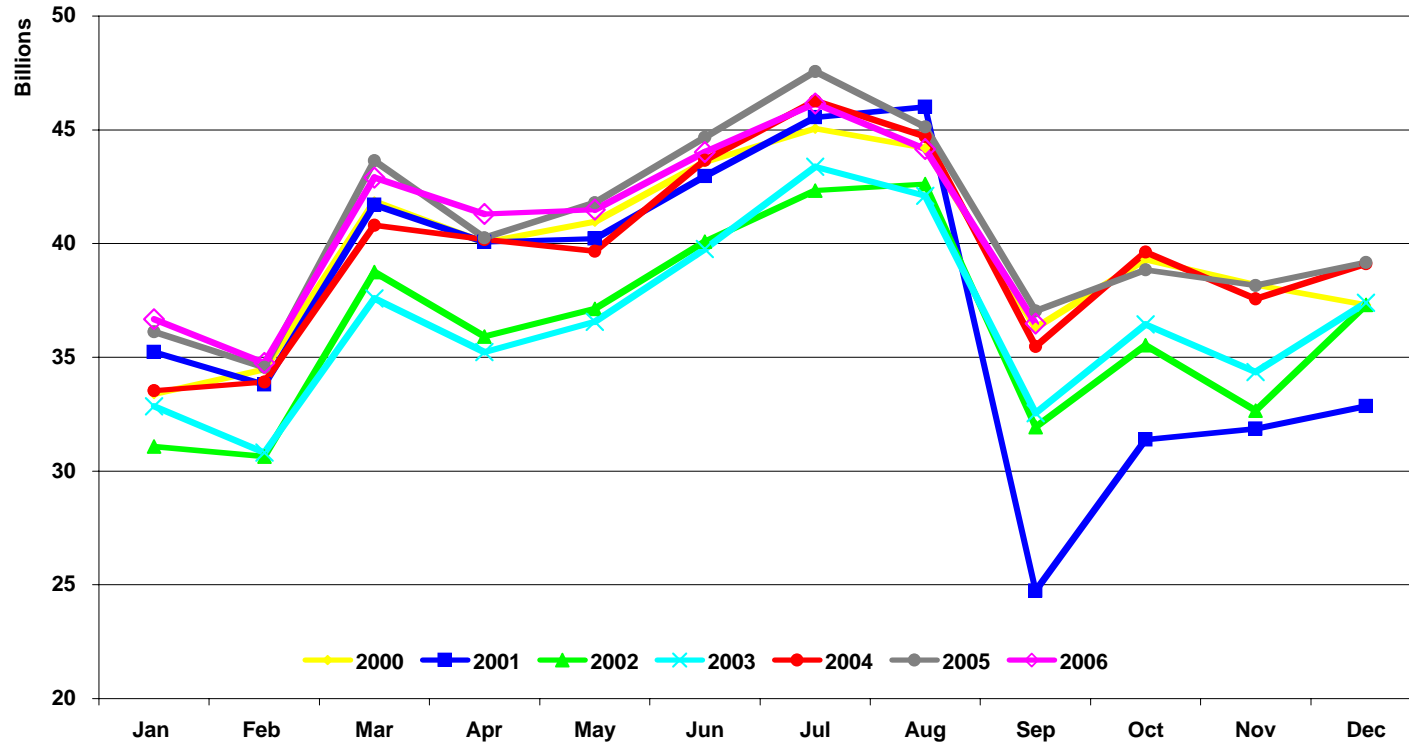
Freight Trends by Region

Freight Tonne-Kilometers by Region



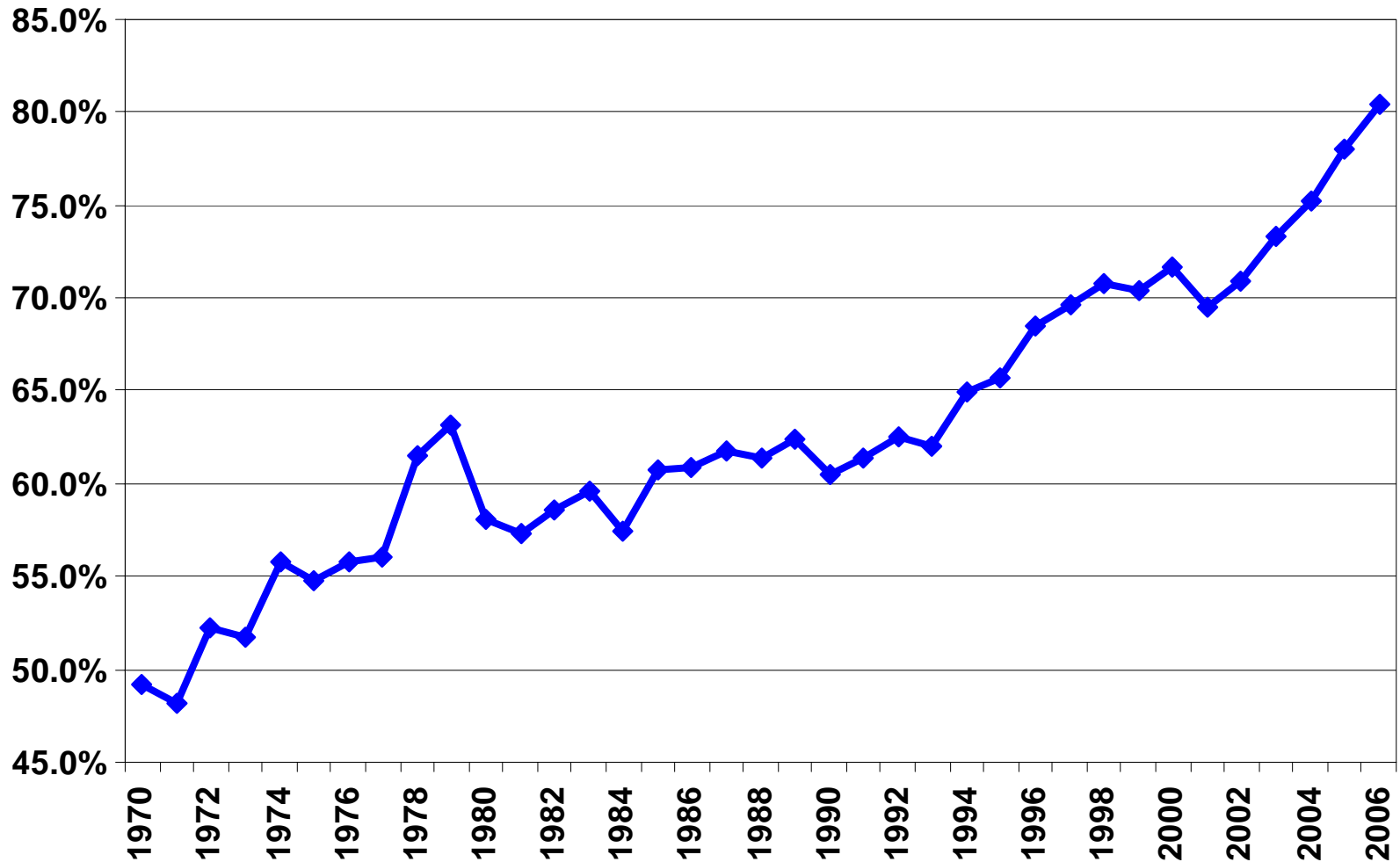


U.S. Domestic RPMs





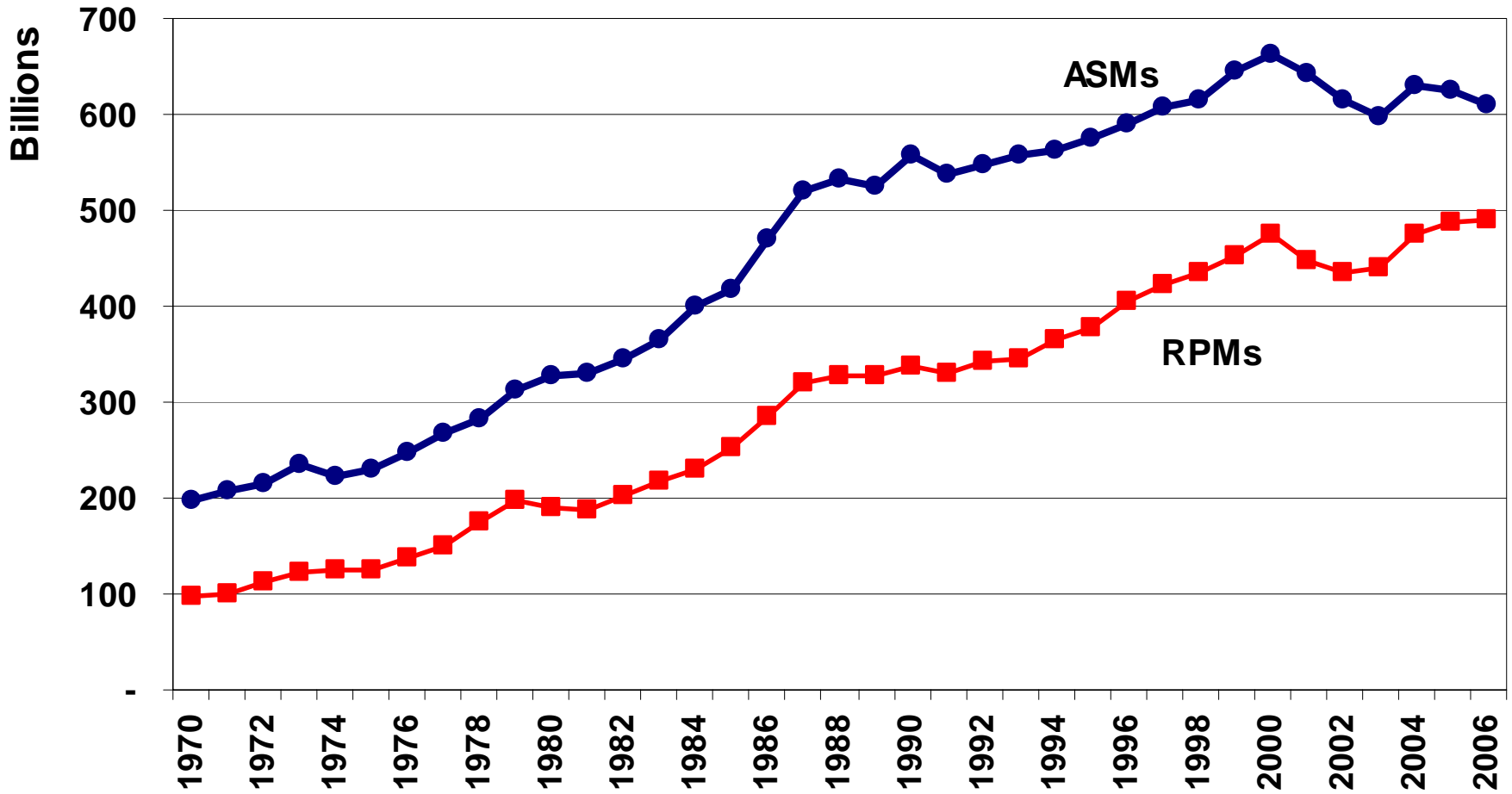
U.S. Domestic Average Load Factor



Data source: ATA, US member airlines, scheduled mainline service (average of first 9 months for 2006)

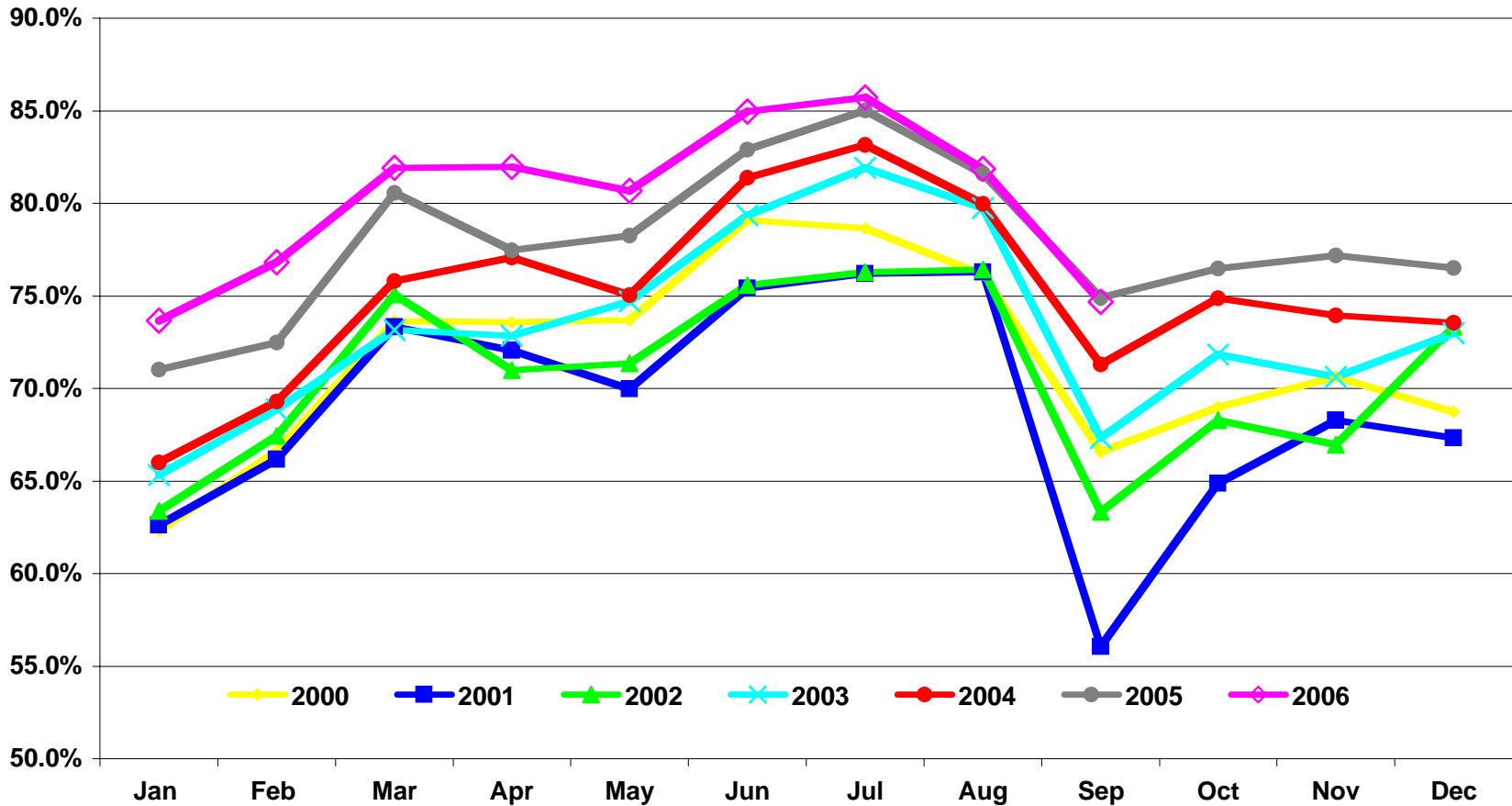


U.S. Domestic ASMs and RPMs



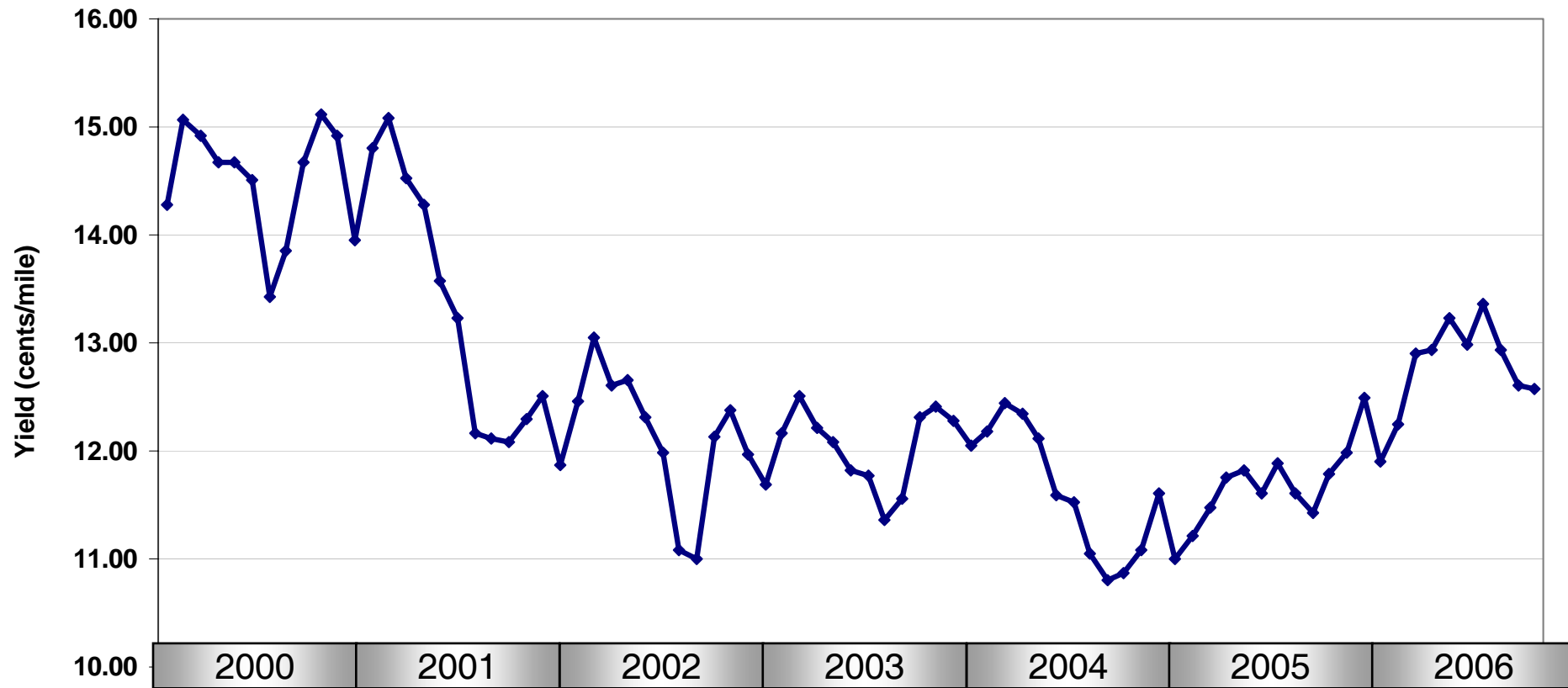


U.S. Domestic Load Factors





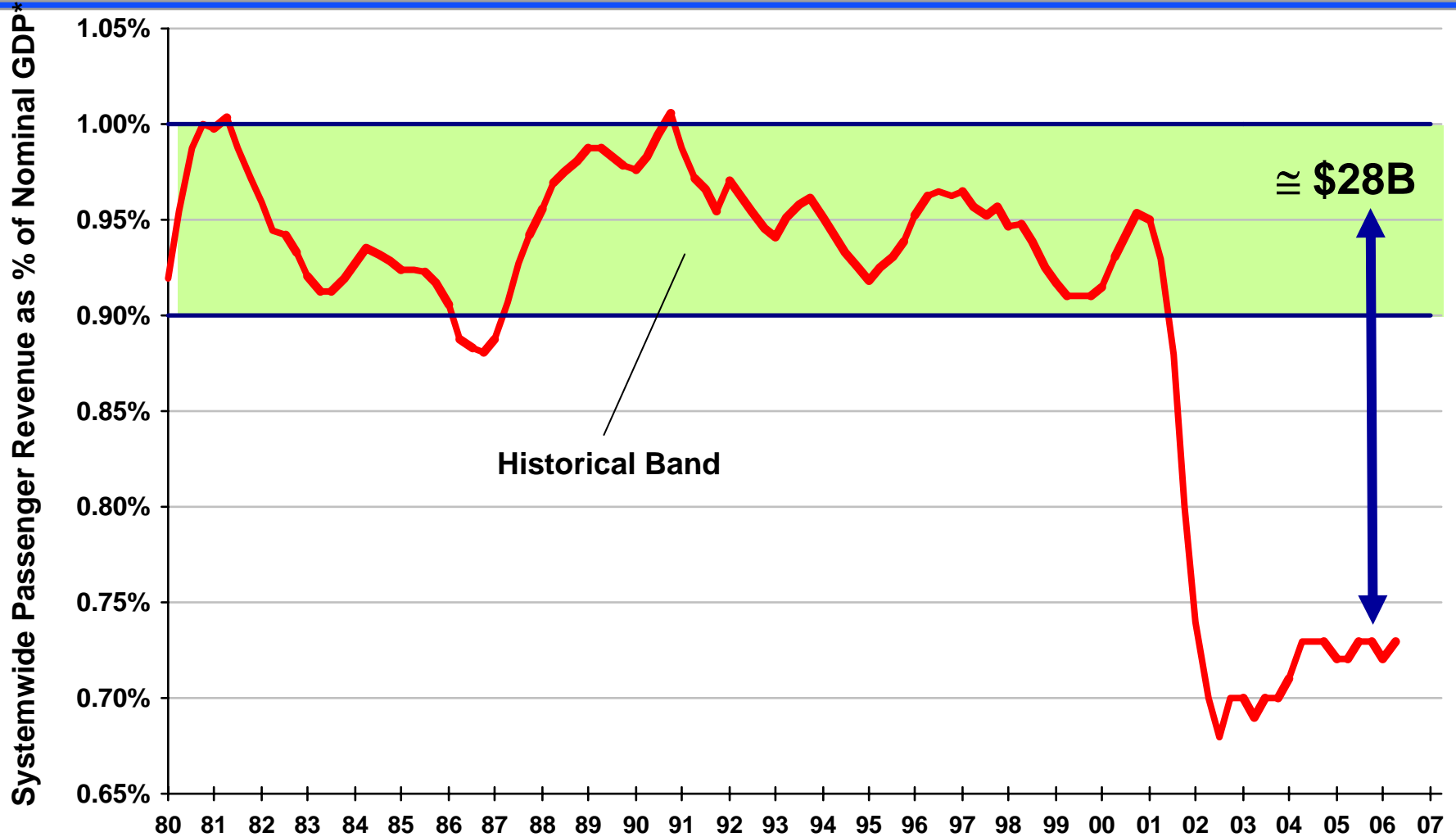
U.S. Average Domestic Yield





Spending on Air Travel Has Fallen as % of U.S. Economy

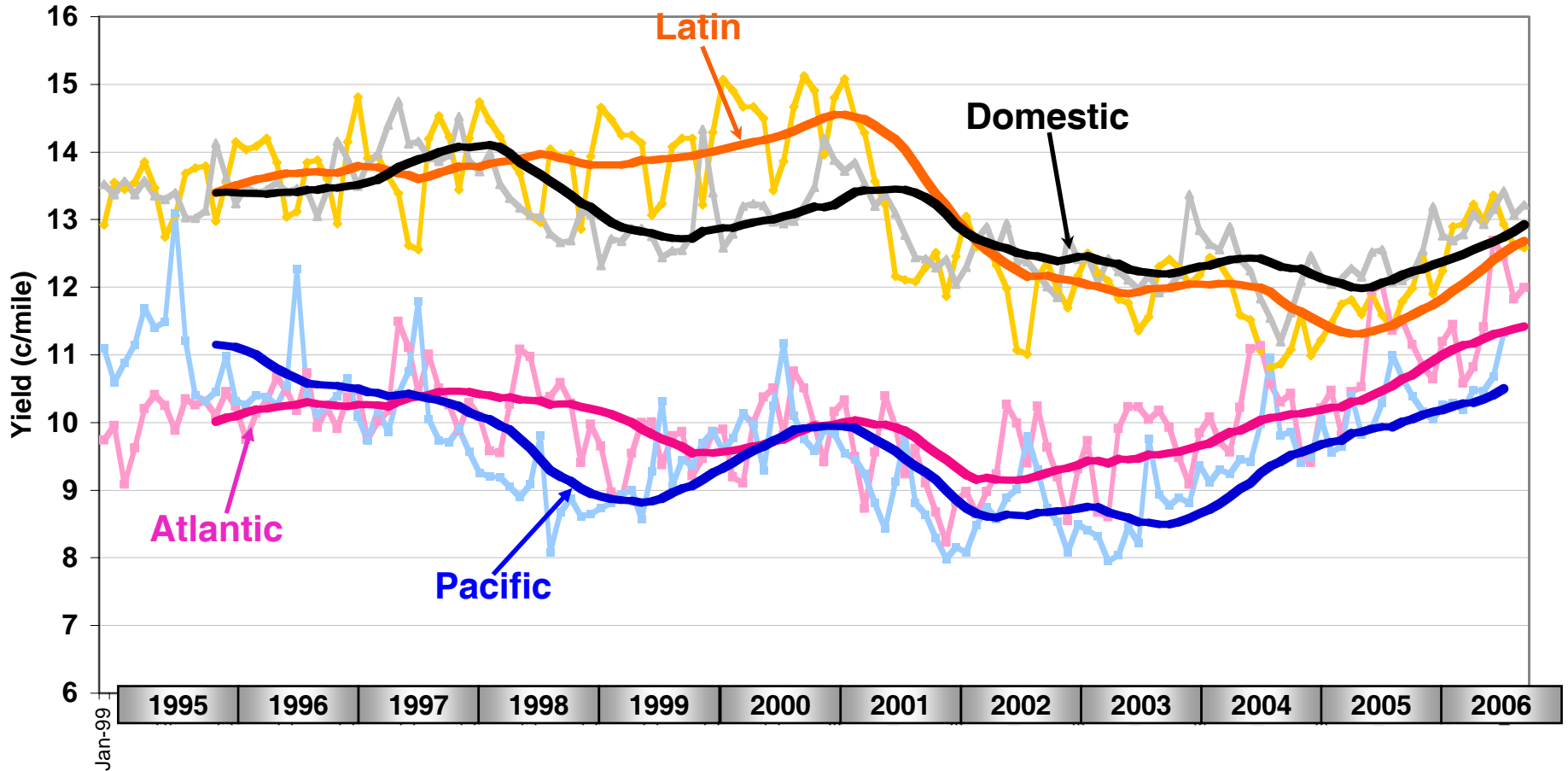
Recent Quarters' Modest Recovery Still \$28B Short of Historical Norm



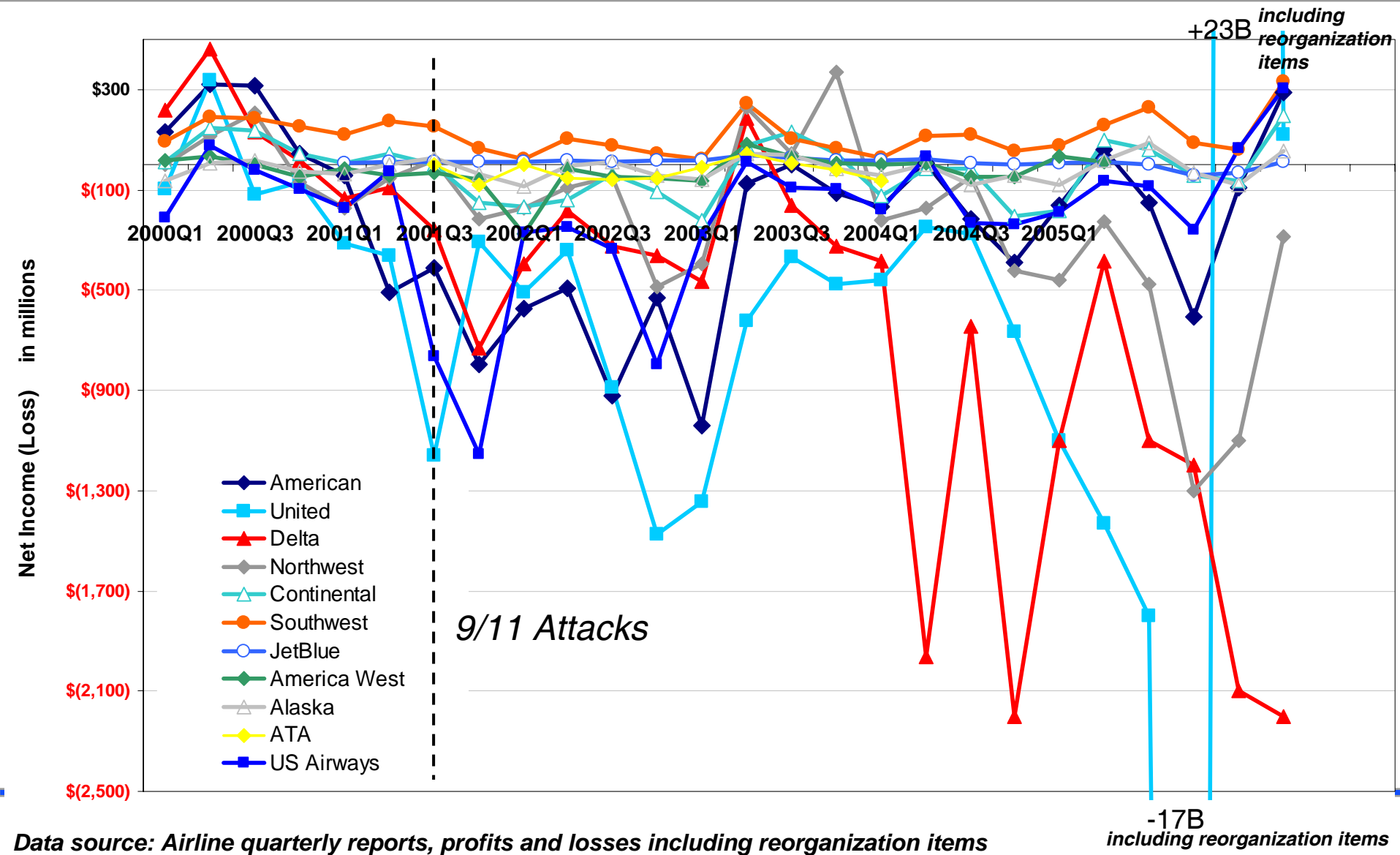
*Four-quarter rolling passenger revenue derived from government filings of U.S. passenger airlines



Historic Yield Trend 1995-2006

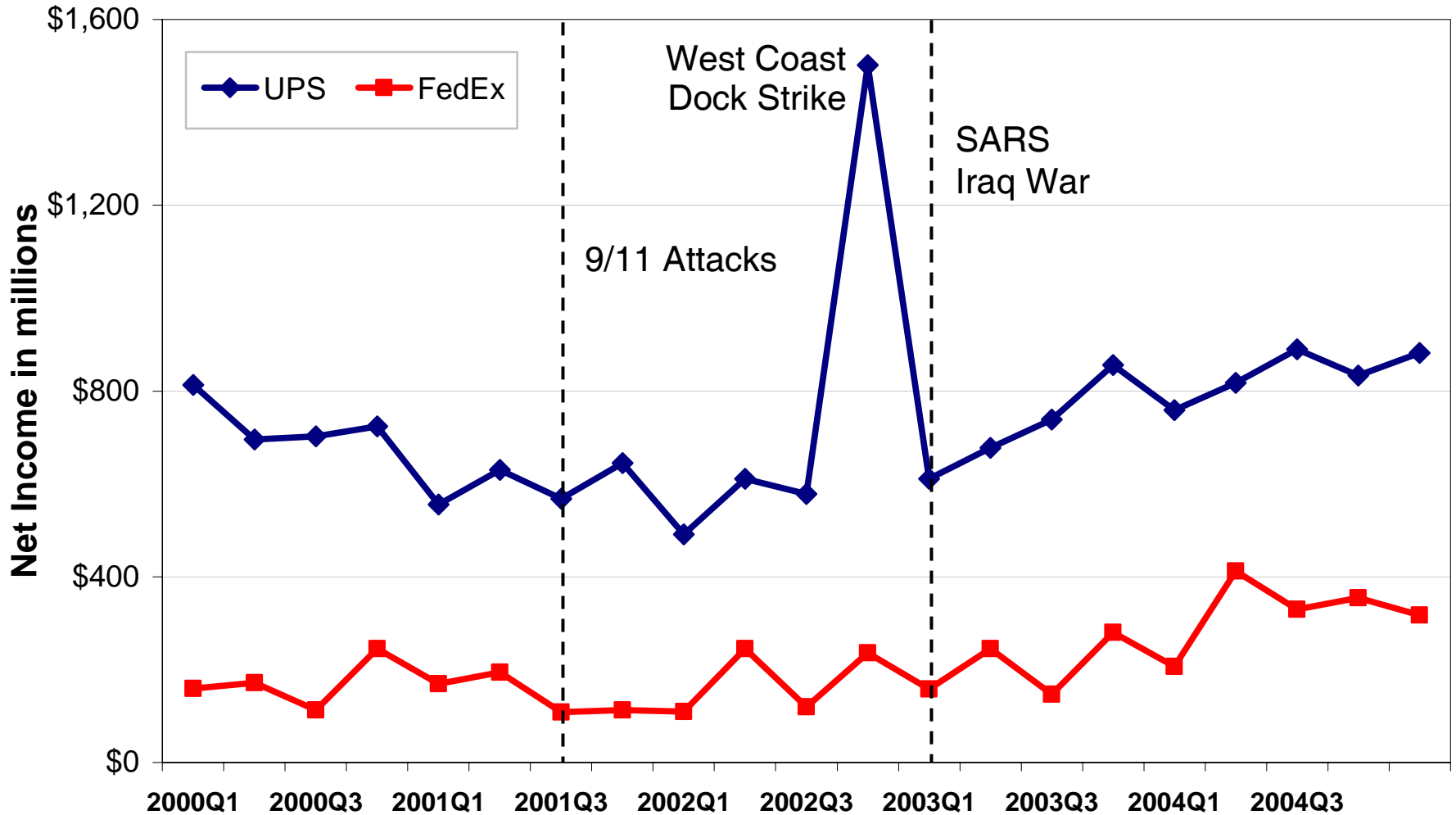


Airline Profits



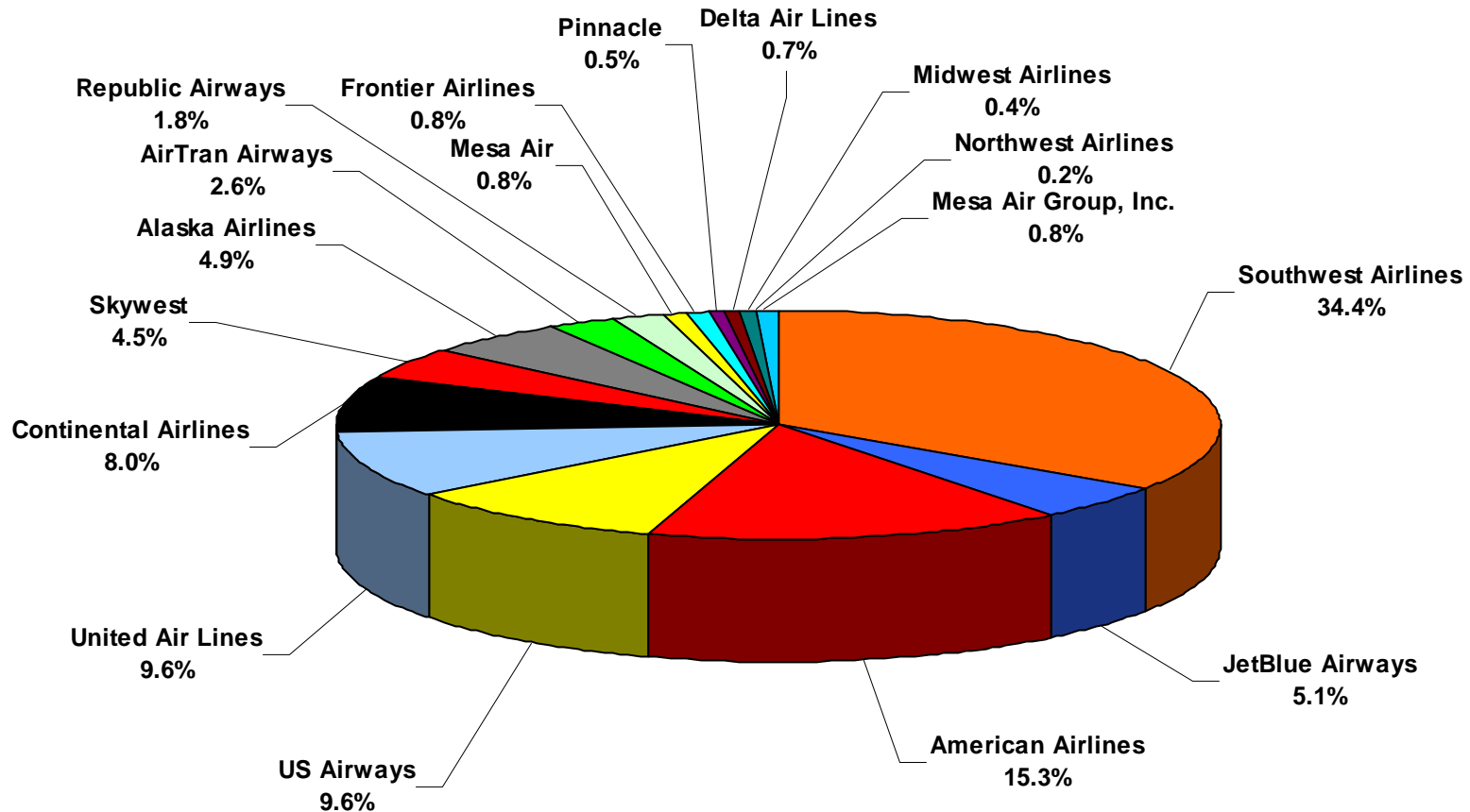


Cargo Operations Remain Profitable





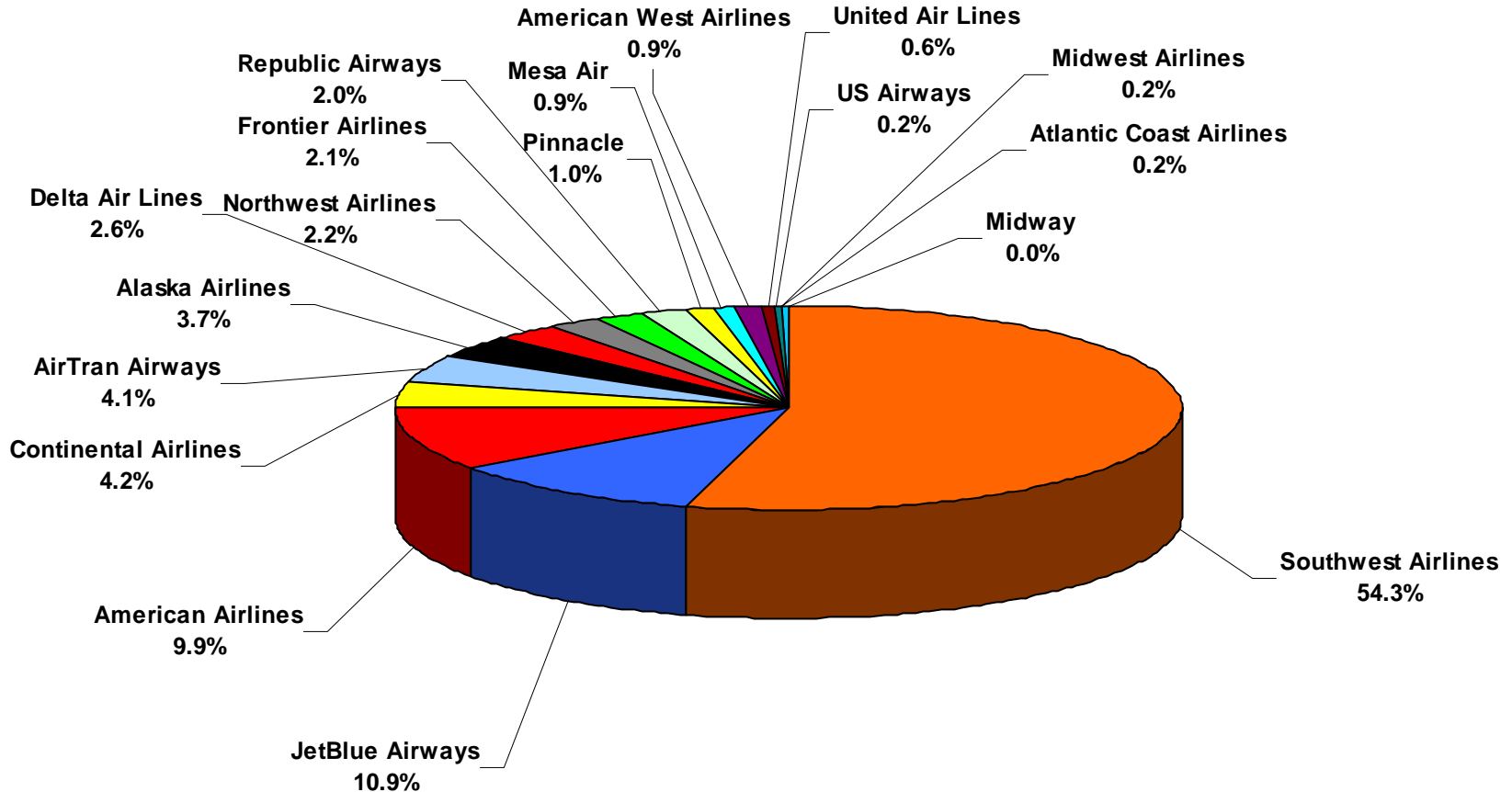
Market Cap: US Majors, 20-October-2006



Total Market Cap: \$36.6 billion



Market Cap: US Majors, 26-May-2005

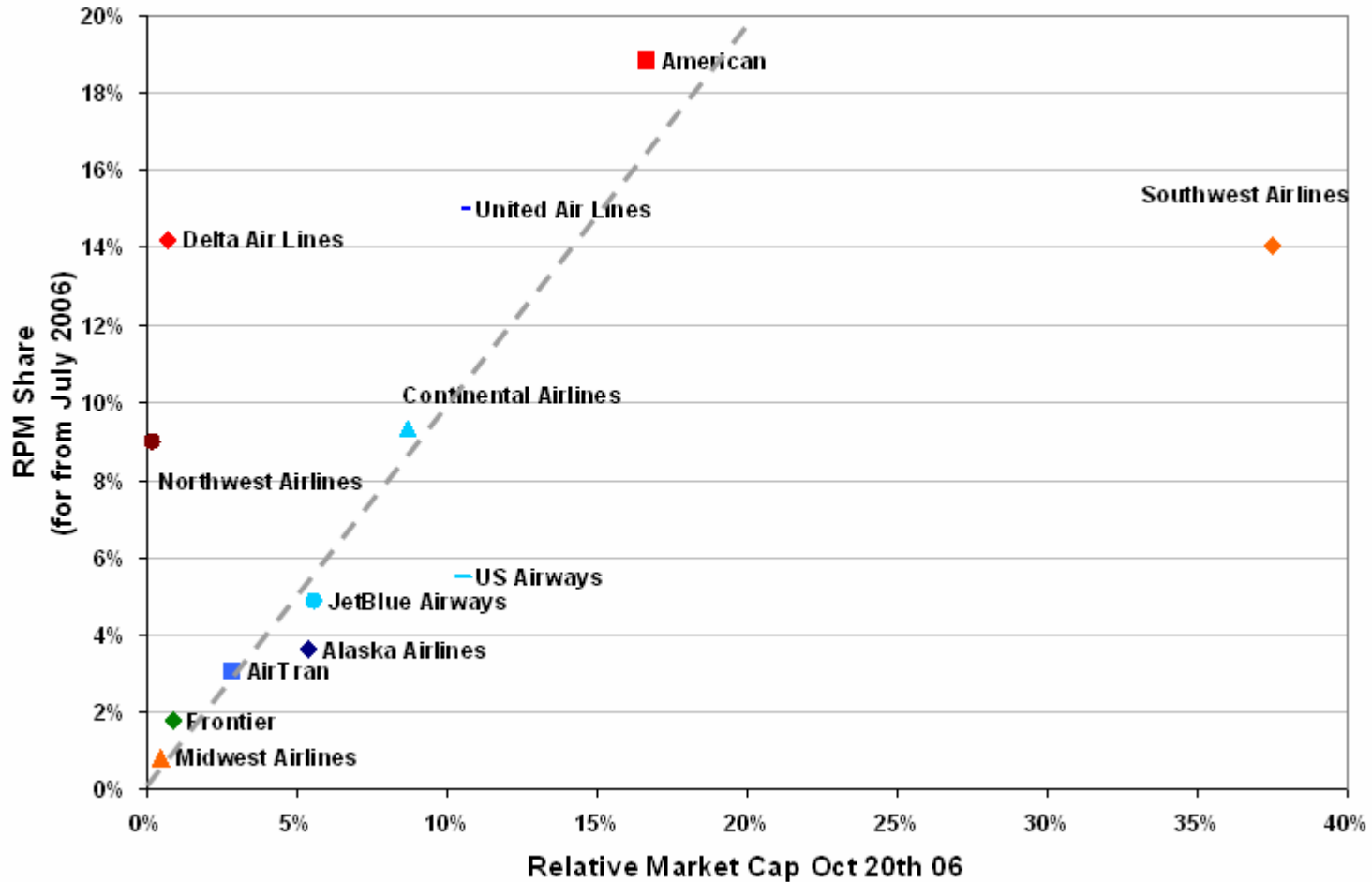


Total Market Cap: \$21.2 billion



Current Market Cap vs. RPM Share

US Majors (RPMs: July 2006 / Market Cap: October 20th 2006)

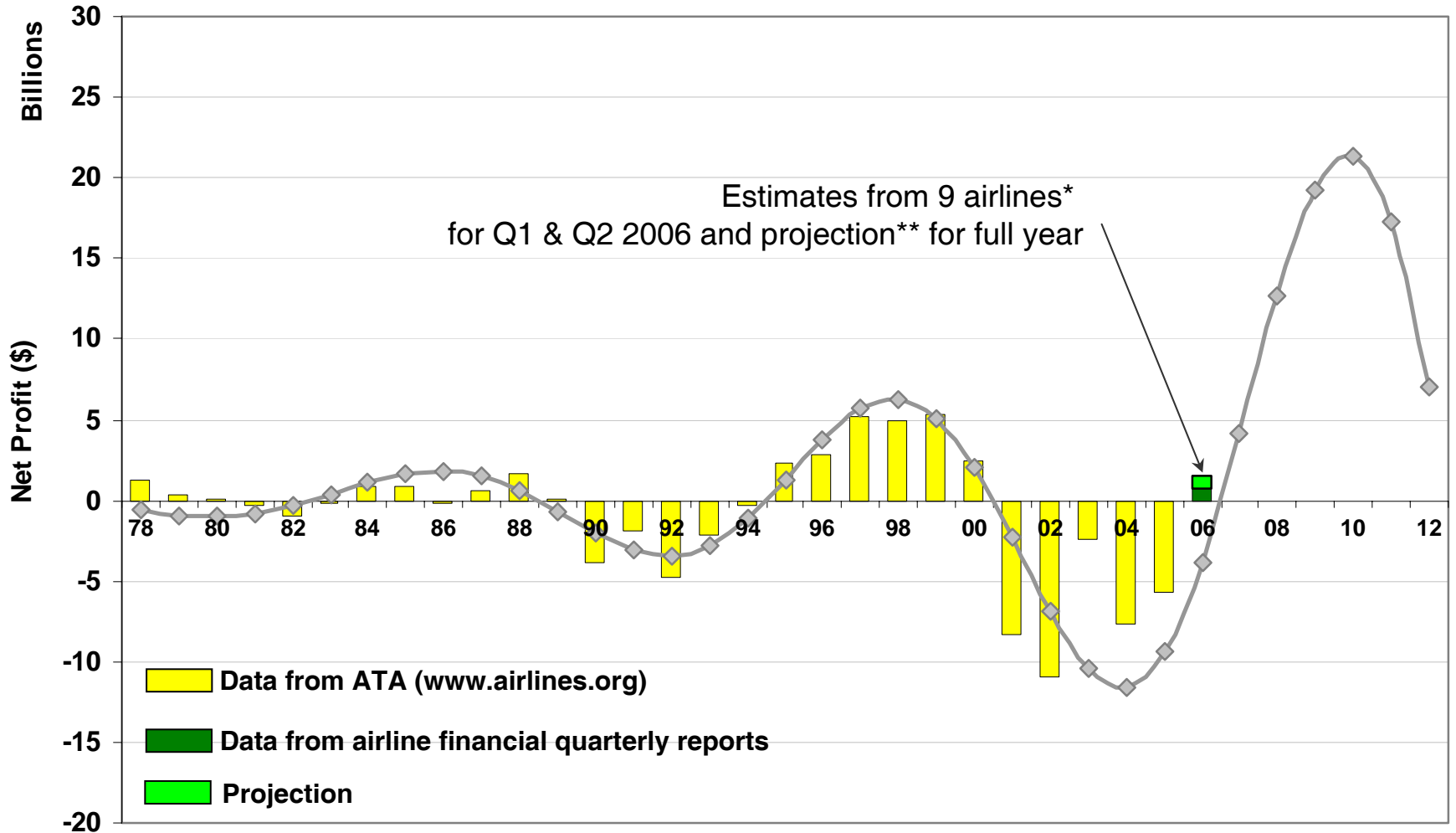




US Airline Net Profit Model

Best Fit of Undamped Oscillation

Cycle Period = 11.3 yr eFolding Time = 7.9 yr



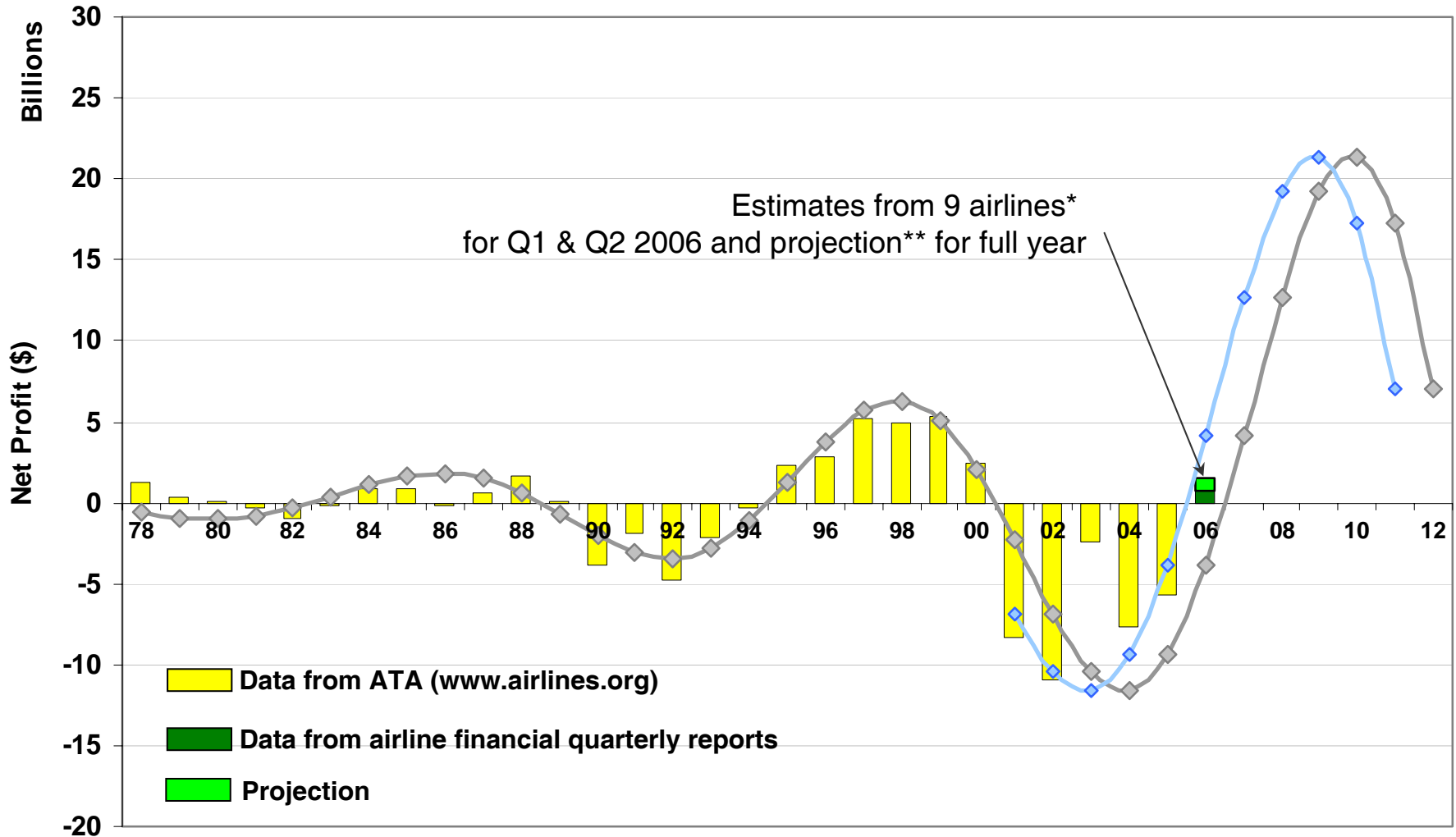
* American Airlines, Delta Airlines, United Airlines, Northwest, Continental, Southwest, JetBlue, America West, Alaska.

** The projection for the full year is computed as 2 times the loss for Q1 & Q2 combined



US Airline Net Profit Model

Apparent 1 year phase advance in cycle



* American Airlines, Delta Airlines, United Airlines, Northwest, Continental, Southwest, JetBlue, America West, Alaska.

** The projection for the full year is computed as 2 times the profits for Q1 & Q2 combined



Low-Cost Carrier Envy

Emergence of LCCs

Canada (7, 1 in 2004)

CanJet
 HMY Airways
 JetsGo Airlines
 Tango Airlines
 Westjet
 Zip
Canada West

USA (19, 4 in 2003/2004)

AirTran
 Allegiant Air
 American West
 ATA
 Frontier Airlines
 Interstate Jet
 JetBlue Airways
 Midwest Express
 Pan American
 Southeast Airlines
 Southwest Airlines
 Spirit Airlines
Song
 Sun Country Airlines
 USA 3000 Airlines
 Vacation Express
Ted
Independence Air
Virgin USA

Europe (60, 3 in 2004)

Aer Arann
 Air 2000
 Air Baltic
 Air Berlin
 Air Finland
 Air Luxor Lite
 Air Polonia
 Air Scotland
 Air Southwest
 Air Wales
 Alpi Eagles
 Azzurra Air
 Baboo
 Basiq Air
 Bexx Air
 BMI Baby
 British European
 BudgetAir
 Corendon
 Deutsche BA
 EasyJet
 Evolavia
 Excel Airways
 Fairline Austria
 Fare4U
 German Wings
 Germania Express
 Globespan
 Hapag Lloyd Express
 Hellas Jet
 Helvetic Airways
 Iceland Express
 Ryanair
 Snalskjutsen
 SnowFlake Airlines
 Sterling
 Sun Express
 Swedline
 ThomsonFly
 V Bird
 Virgin Express
 VLM Airlines
 VolareWeb
 WindJet Vola

Hi Fly
Fly Me
Fly Nordic
Air Service +
Blue1
Blue Air
Central Wings
Dau Air
Iceland Express
Monarch
My Air
Scand Jet
Transavia
Vueling
Inter Sky
Jet 2
LTU
Meridiana

Asia/Pacific (20, 8 in 2004)

Air Arabia
 Air Asia
 Air Deccan
 Athena Air Services
 Citilink
 Freedom Air
 Lion Airways
 One-Two-Go
 Skymark Airlines
 Skynet Asia Airways
 Aero Asia
 Awair
 Spice Jet
 ValuAir
 Virgin Blue
Air Blue
Air One
BackpackersXpress
Jetstar
Nok Air
Pacific Blue
SkyAsia
Tiger Airways
Bangkok Air
Spring
Origin Pacific
Kingfisher
Jazeera Airways

Inter continental LCCs

Air Madrid
 Condor
 East Jet
 LTU
 Martinair
 Zoom Airlines

South America (3)

Bra
 Gol
 U Air

Africa (2)

1Time
 Kulula

Legend:
 New in 2003 / 2004
 New in 2005 / 2006



Low-Cost Carrier Envy (or not)

Emergence of LCCs

Canada (7, 1 in 2004)

CanJet
 HMY Airways
 JetsGo Airlines
 Tango Airlines

Westjet
 Zip
Canada West

USA (19, 4 in 2003/2004)

AirTran
 Allegiant Air
 American West
 ATA
 Frontier Airlines
 Interstate Jet
 JetBlue Airways
 Midwest Express
 Pan American
 Southeast Airlines
 Southwest Airlines

Spirit Airlines
Song
 Sun Country Airlines
 USA 3000 Airlines
 Vacation Express
Ted
Independence Air
Virgin USA

Europe (60, 3 in 2004)

Aer Arann	Baboo	Fare4U	Sun Express
Air 2000	Basiq Air	German Wings	Swedline
Air Baltic	Bexx Air	Germania Express	ThomsonFly
Air Berlin	BMI Baby	Globespan	V Bird
Air Finland	British European	Hapag Lloyd Express	Virgin Express
Air Luxor Lite	BudgetAir	Hellas Jet	VLM Airlines
Air Polonia	Corendon	Helvetic Airways	VolareWeb
Air Scotland	Deutsche BA	Iceland Express	WindJet Vola
Air Southwest	EasyJet	Ryanair	Smart Wings
Air Wales	Evolavia	Snalskjutsen	Wizz Air
Alpi Eagles	Excel Airways	SnowFlake Airlines	Hop
Azzurra Air	Fairline Austria	Sterling	

Asia/Pacific (20, 8 in 2004)

Air Arabia	ValuAir
Air Asia	Virgin Blue
Air Deccan	Air Blue
Athena Air Services	Air One
Citilink	BackpackersXpress
Freedom Air	Jetstar
Lion Airways	Nok Air
One-Two-Go	Pacific Blue
Skymark Airlines	SkyAsia
Skynet Asia Airways	Tiger Airways
Aero Asia	Bangkok Air
Awair	Spring
Spice Jet	Origin Pacific
	Kingfisher
	Jazeera Airways

Inter continental LCCs

Air Madrid
 Condor
 East Jet
 LTU
 Martinair
 Zoom Airlines

South America (3)

Bra
 Gol
 U Air

Africa (2)

1Time
 Kulula

Legend:
 New in 2003 / 2004
 New in 2005 / 2006

Not Operating



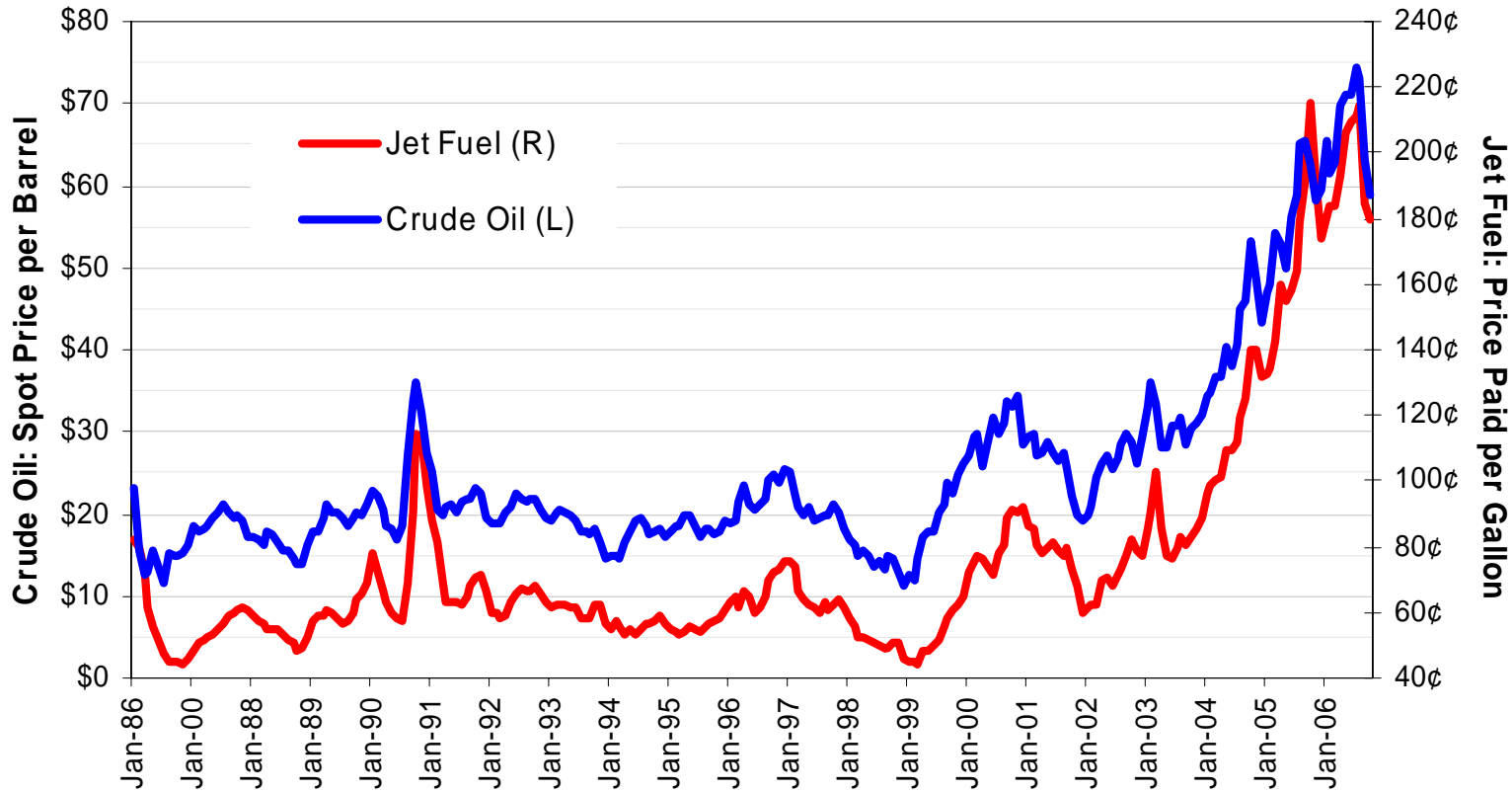
Consolidation America West - USAirways Merger





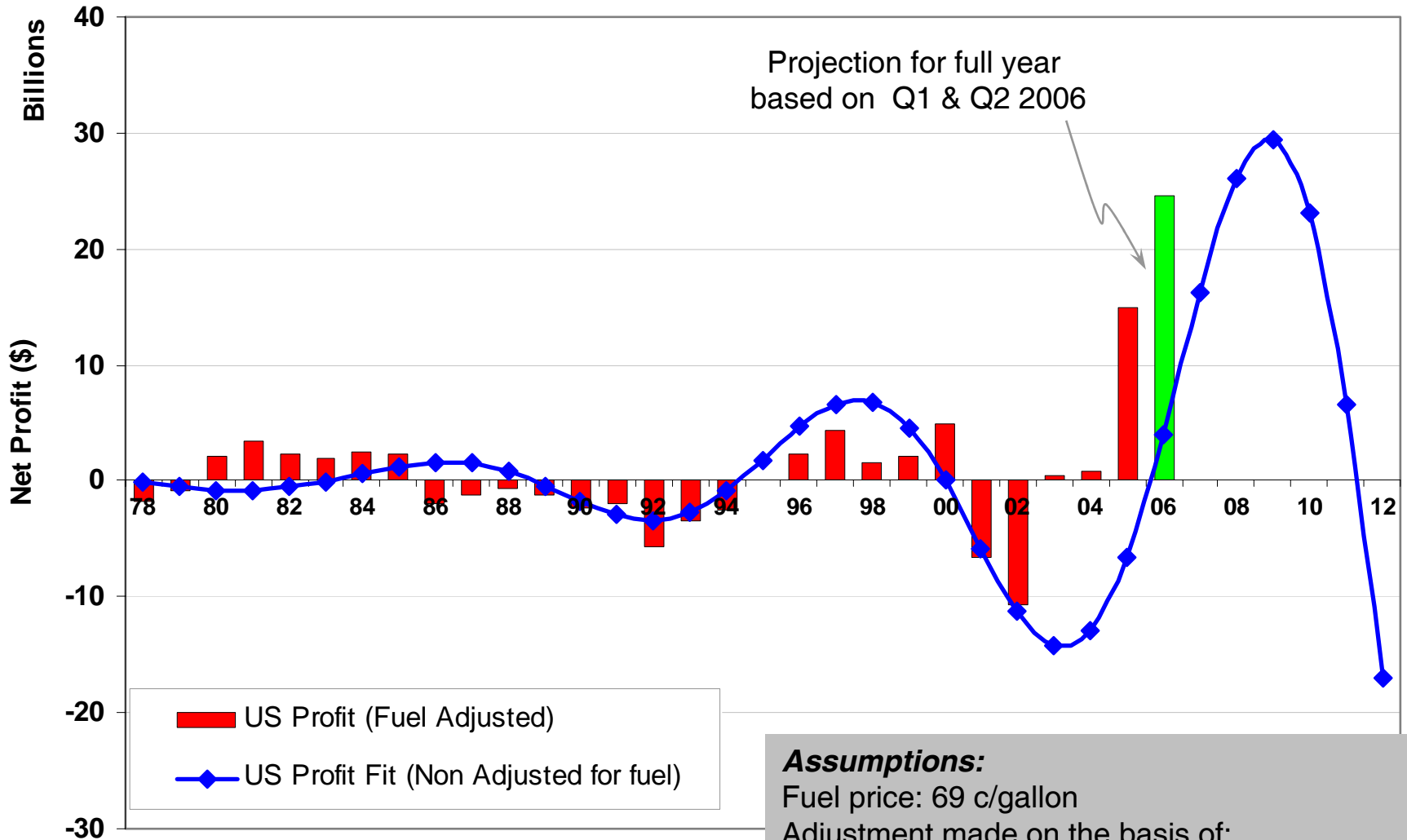
Trends in Fuel Price

Average Crude Oil and Jet Fuel Prices





Airline Profits Adjusted for Constant Fuel Price



Assumptions:

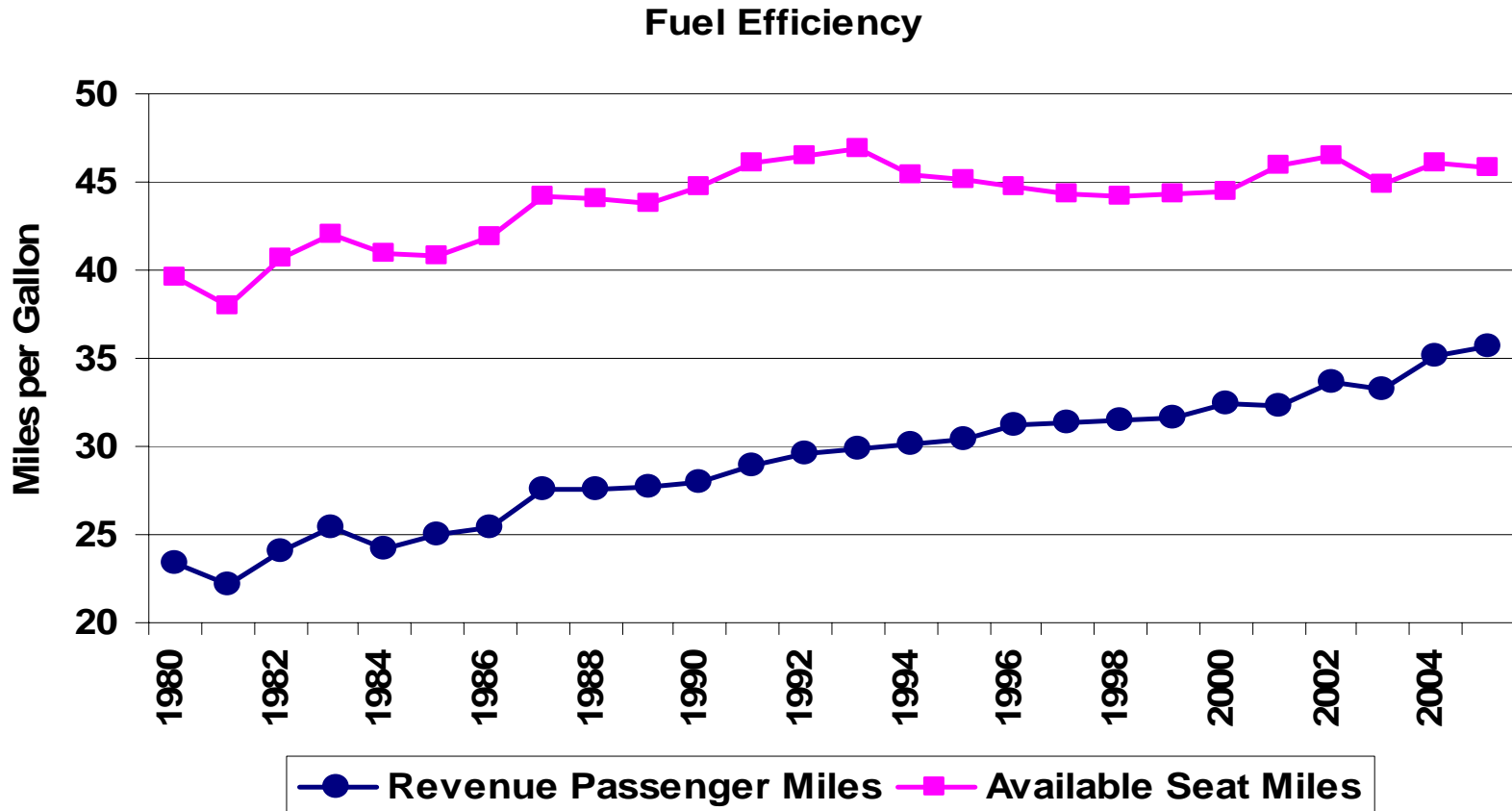
Fuel price: 69 c/gallon

Adjustment made on the basis of:

- difference between actual and assumed fuel price
- annual fuel consumption

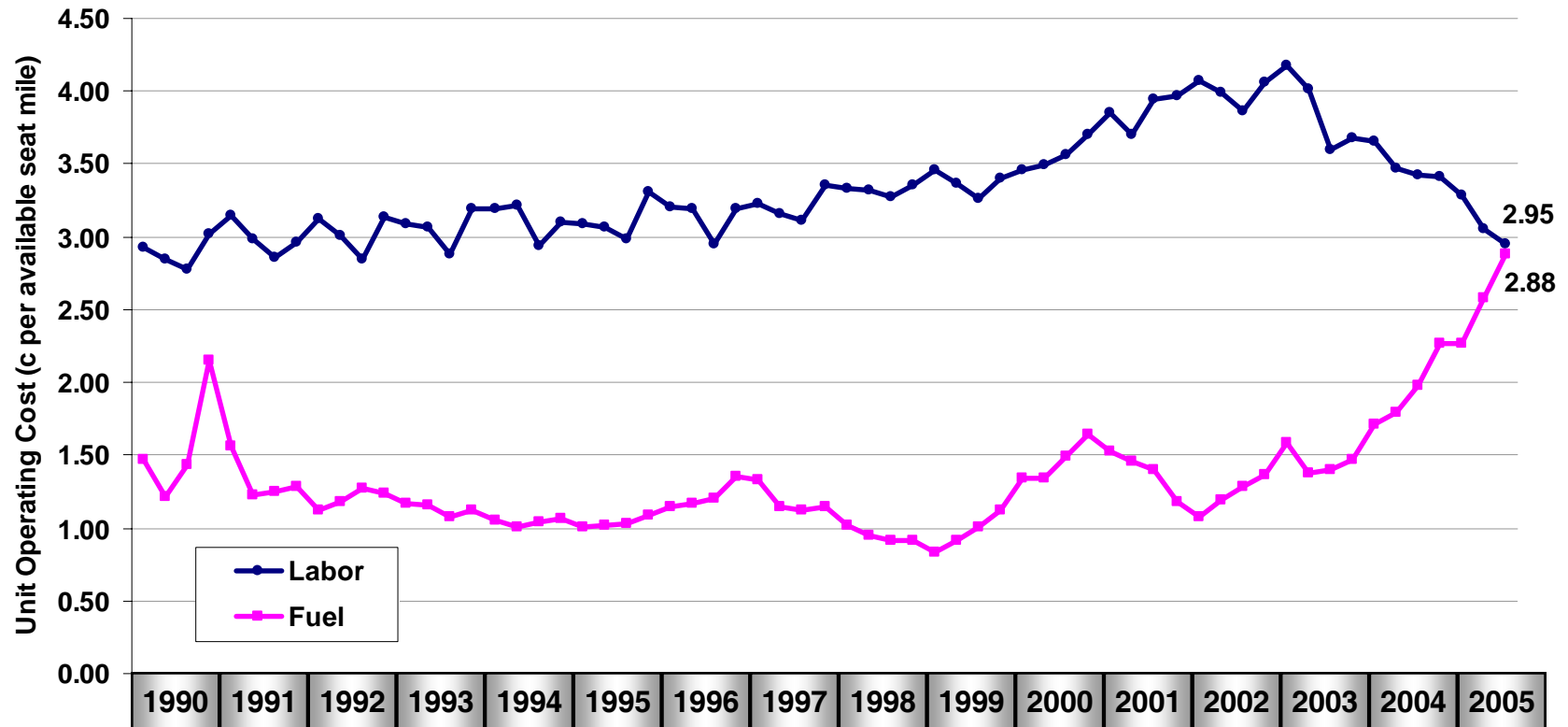


Fuel Efficiency Through Increased Load Factor





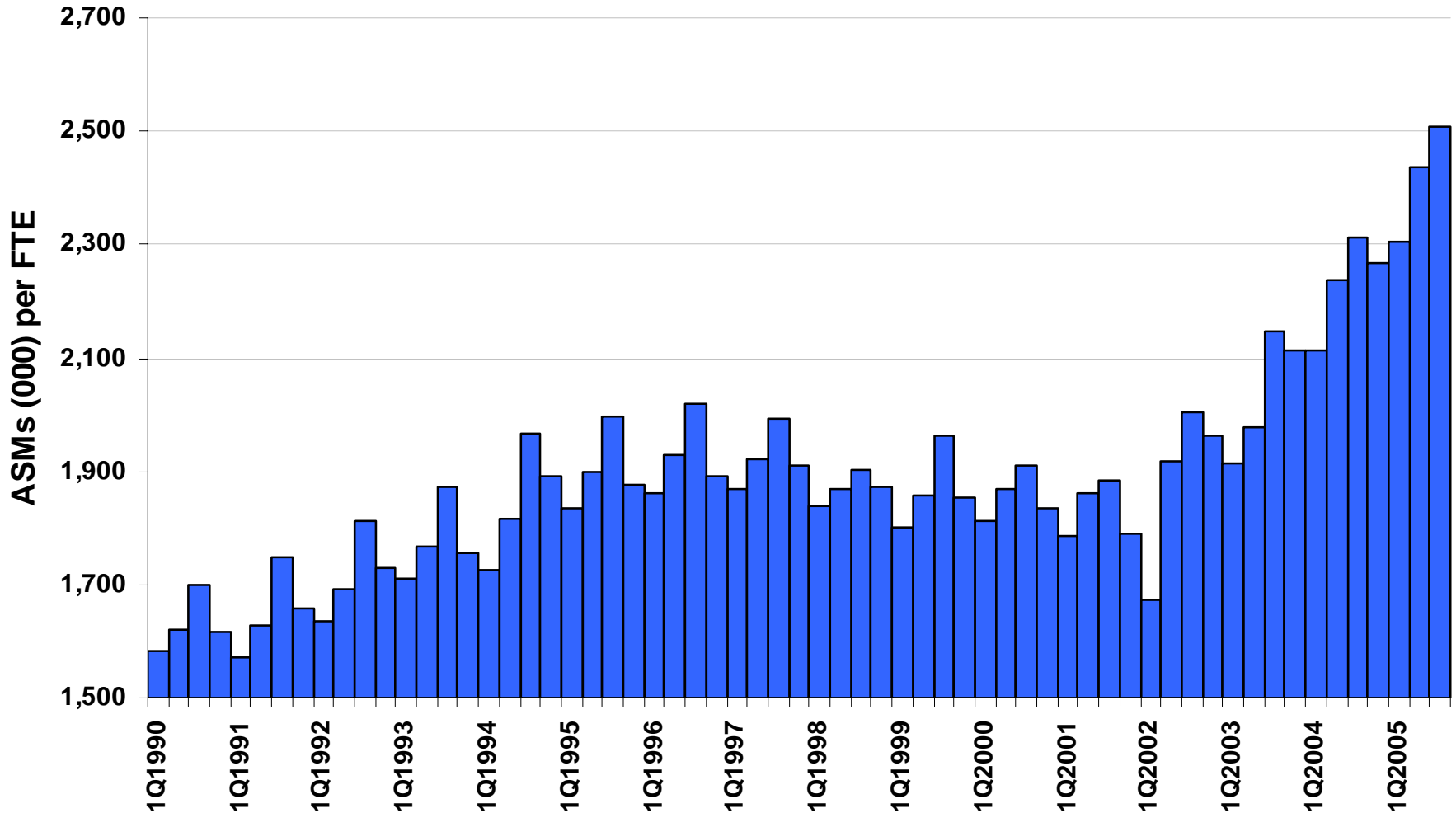
Unit Costs for Labor and Fuel





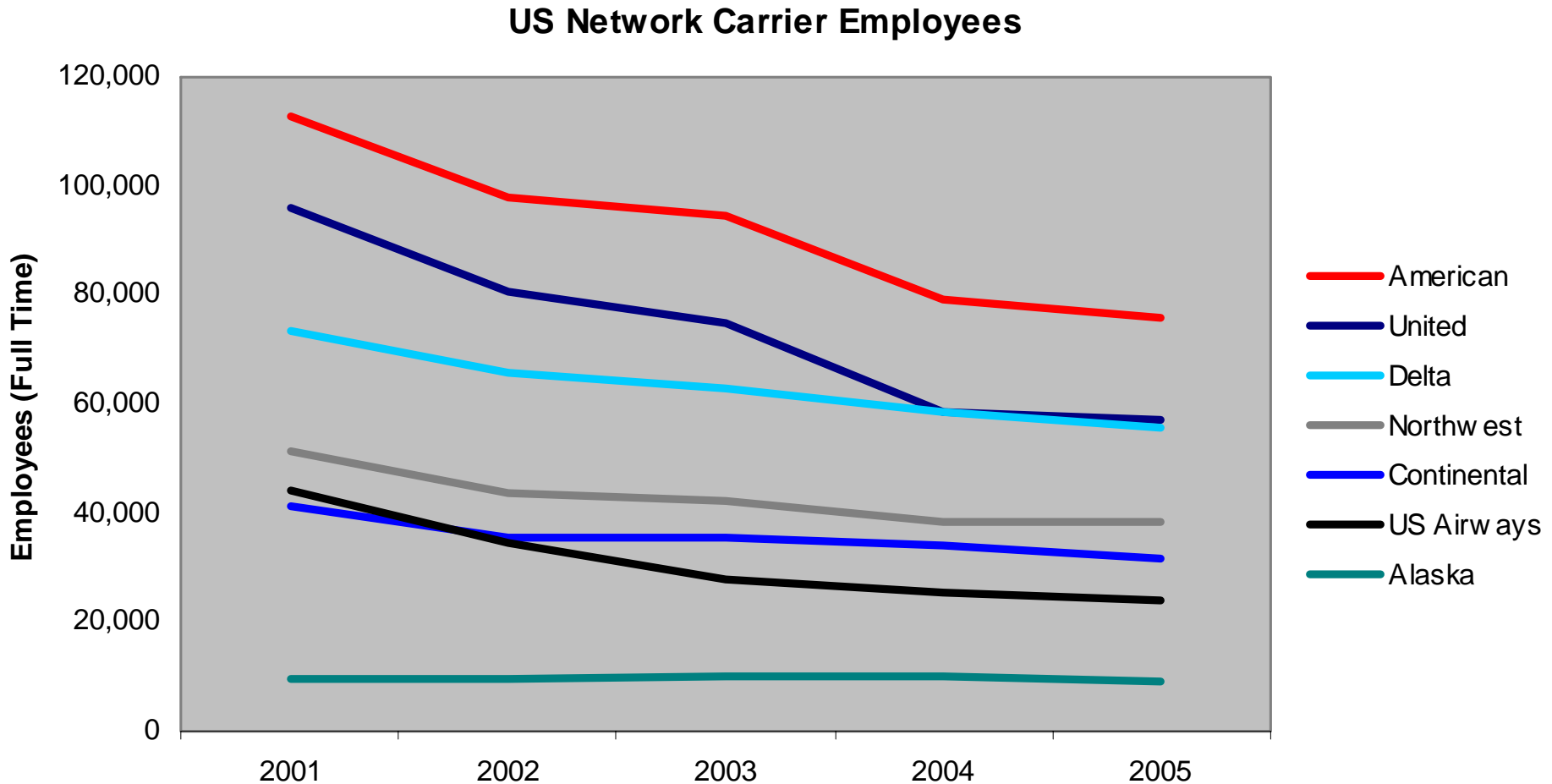
Productivity Improvements Driving Cost Relief

Network Restructuring, Work Rules, Human Capital, Outsourcing, Technology





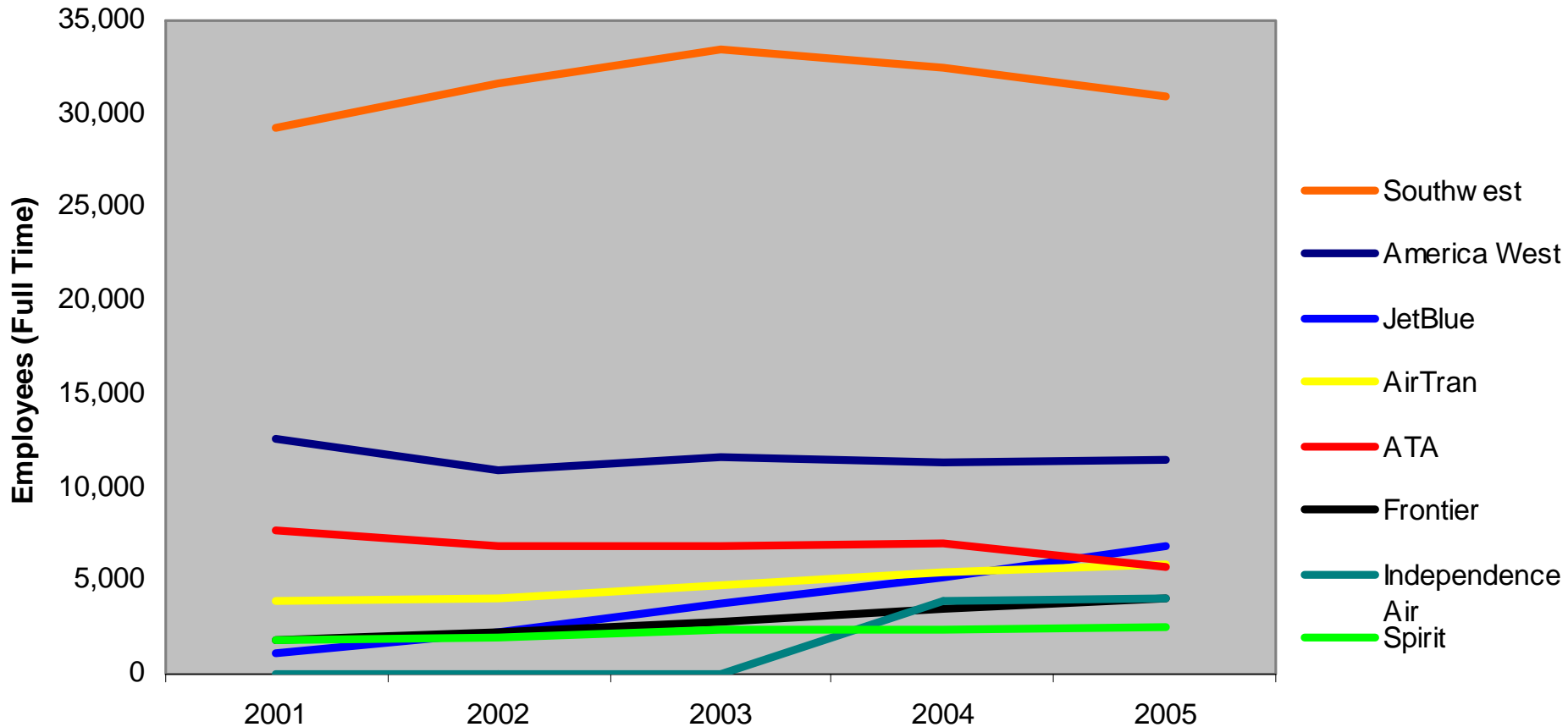
Employees Full Time: US Network Carriers 2001-2005





Employees Full Time: Low Cost Carriers 2001-2005

Low-Cost Carrier Employees





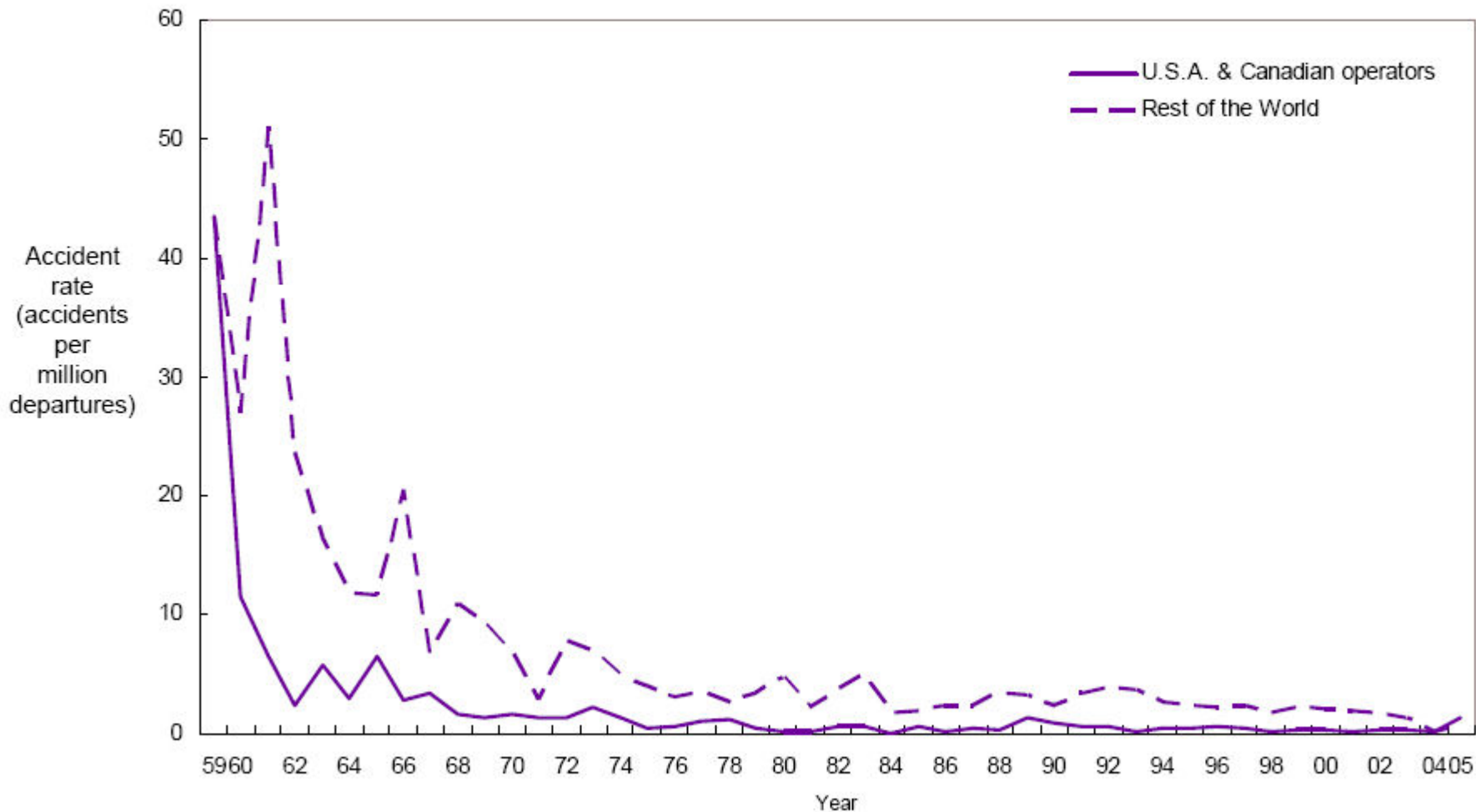
Retirement Plan Terminations

Summary of US and United Plan Terminations (\$ in billions)		
	US Airwa ys	United Airlines
Total Termination Liability	\$7.9	\$16.8
Assets	\$2.9	\$7.0
Unfunded Termination Liability	\$5.0	\$9.8
PBGC Guaranteed Portion of Underfunding	\$2.9	\$6.6
Value of Lost Benefits	\$2.1	\$3.2
Lost Benefits as % of Total Term. Liability	26.58%	19.05%

Delta and NWA Chap 11 filings estimated at \$16B Liability

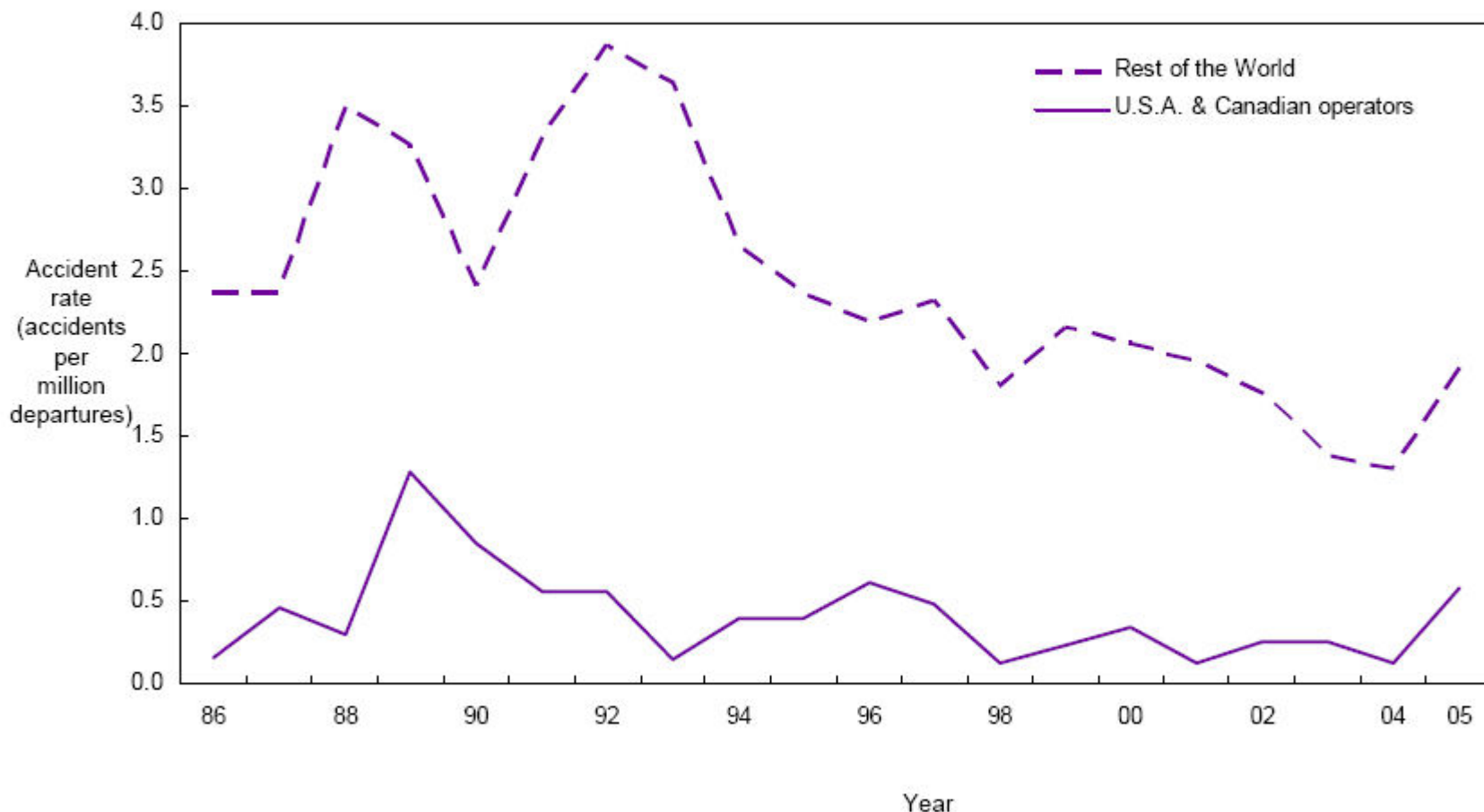
U.S.A. and Canadian Operators Accident Rates

Hull Loss and/or Fatal accidents – Worldwide Commercial Jet Fleet – 1959 through 2005



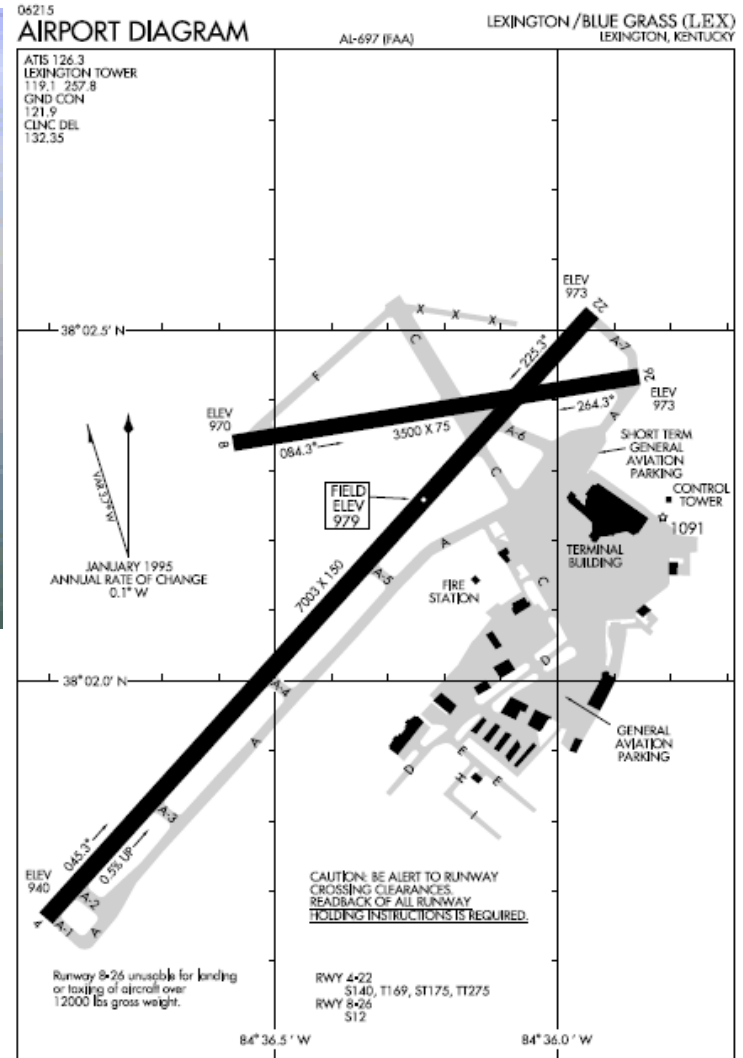
U.S.A and Canadian Operators Accident Rates

Hull Loss and/or Fatal accidents – Worldwide Commercial Jet Fleet – 1986 through 2005



Comair Accident

27 - Aug - 2006

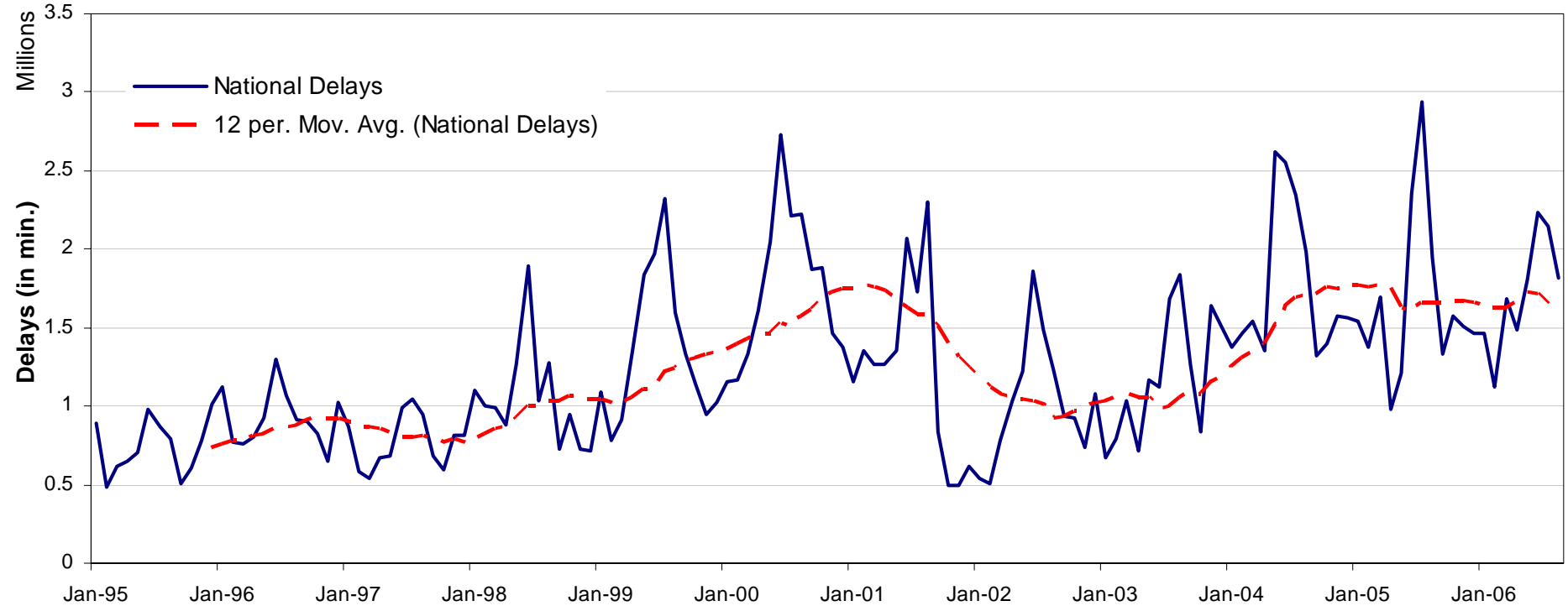




US Flight Delays

from 1995 to 2006

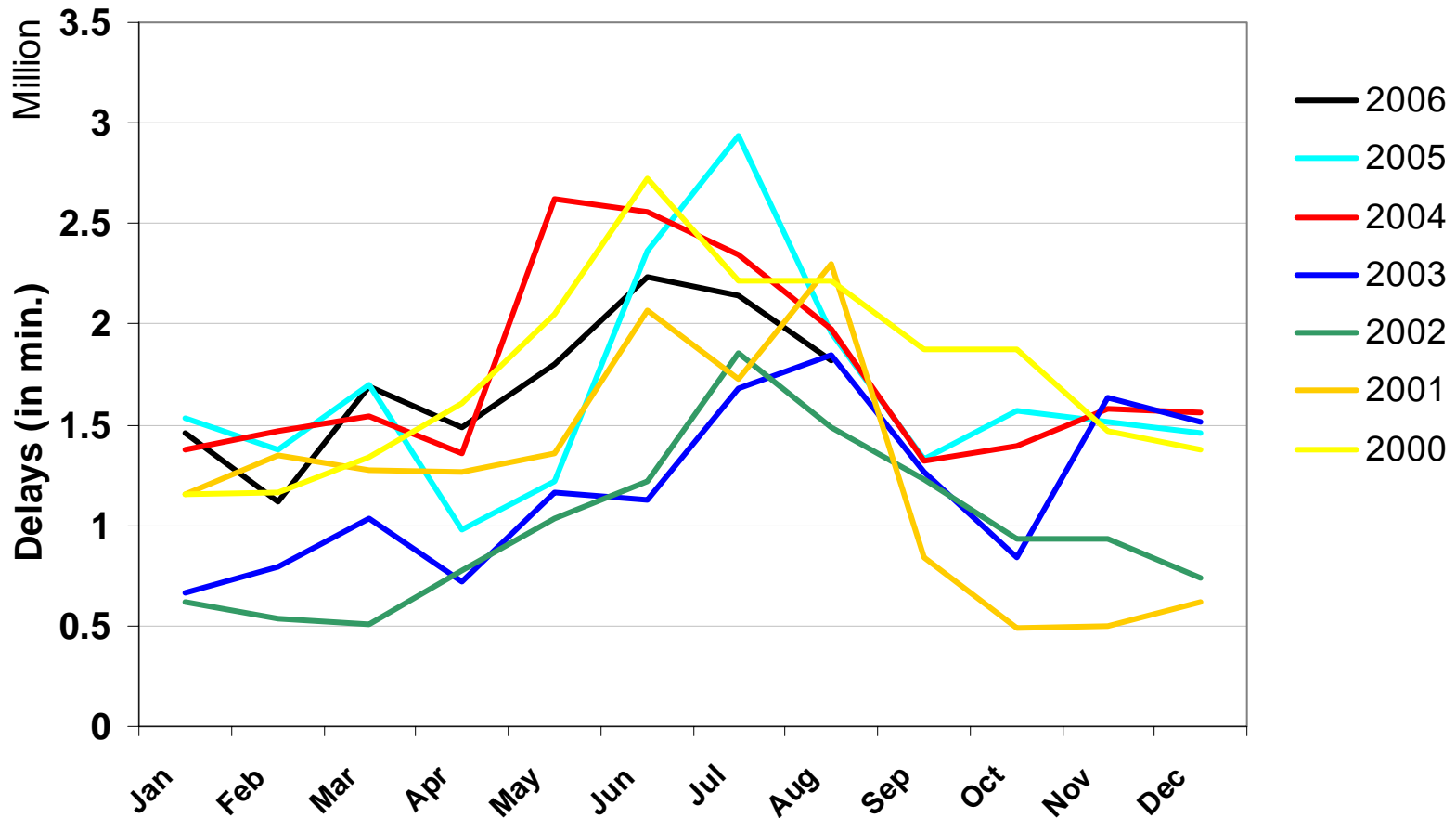
National delays from 1995 to 2006



US Flight Delays

from 2000 to 2006

National Delays (in minutes)





New Delay Cause *TSA Power Failure's*

- LGA 7/16/06
- Hawaii 10/15/06





Aviation Remains Perceived Target Expanding Security Burden

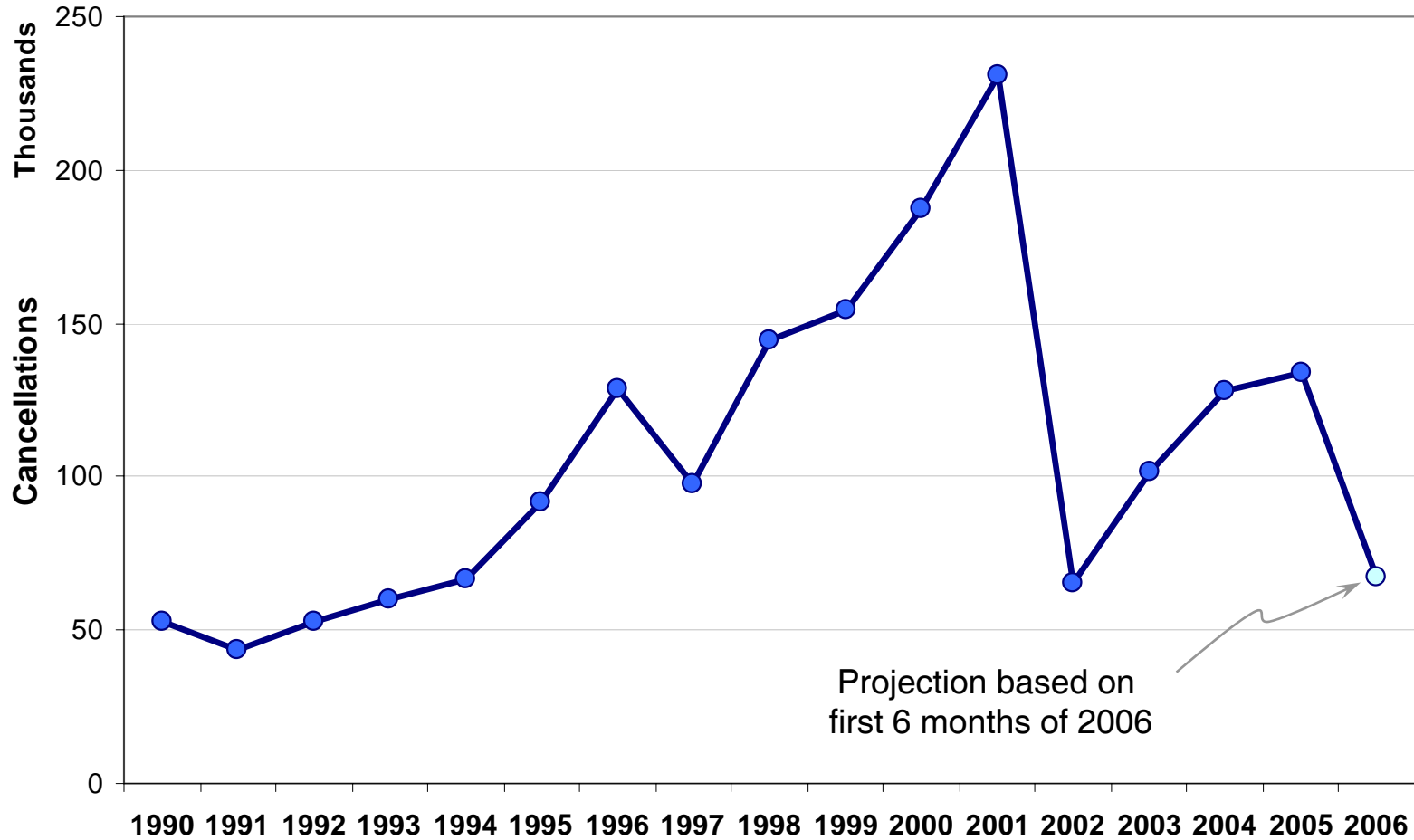
QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

**NO LIQUIDS OR GELS OF ANY
KIND WILL BE PERMITTED IN
CARRY-ON BAGGAGE. THESE
ITEMS MUST BE IN CHECKED
BAGGAGE.** This includes all
beverages, shampoo, suntan
lotion, creams, tooth paste,
hair gel, and other items of
similar consistency. Read our
Permitted and Prohibited Items **list**
for more information.

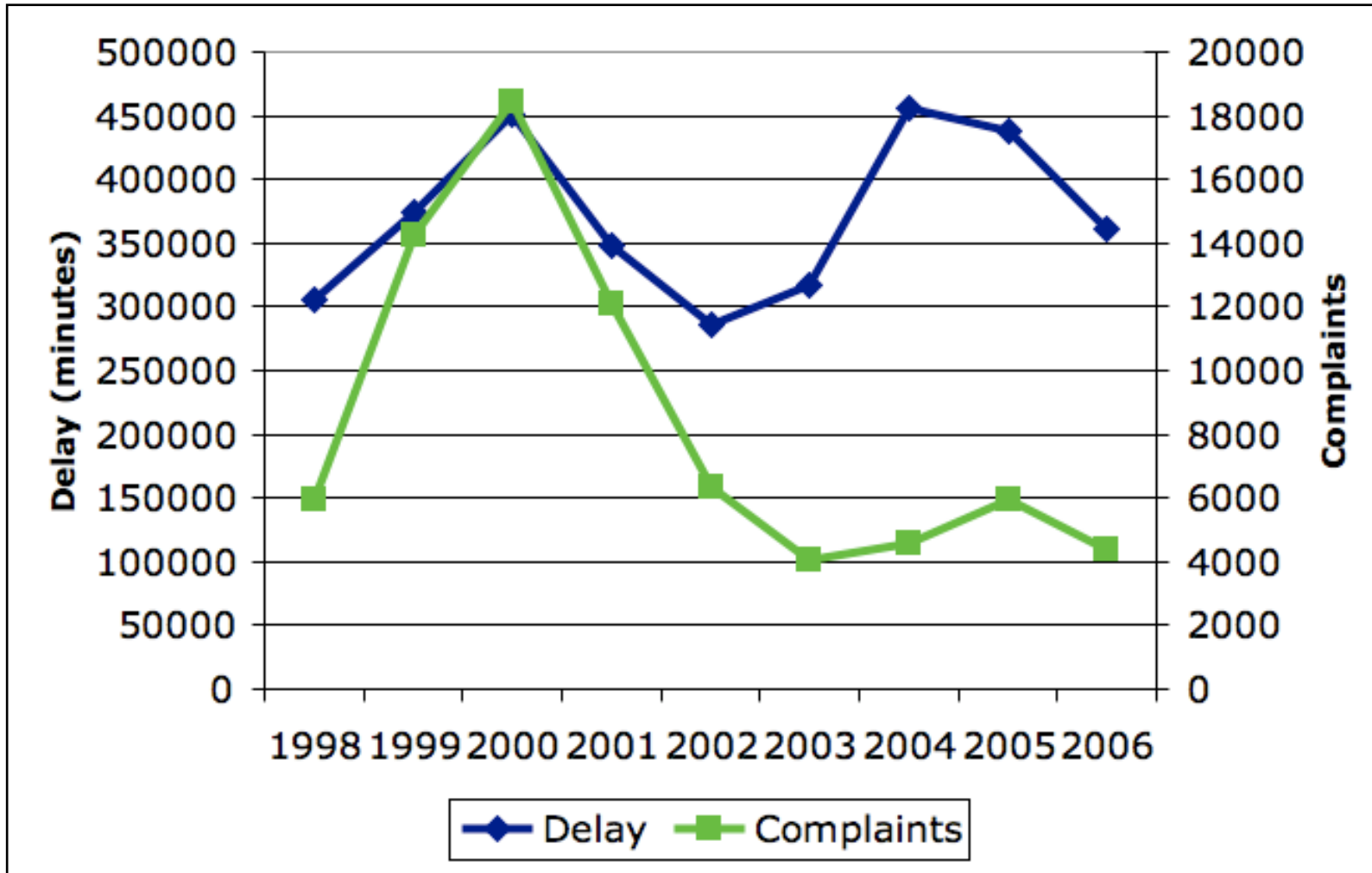


Flight Cancellations

from 1990 to 2006



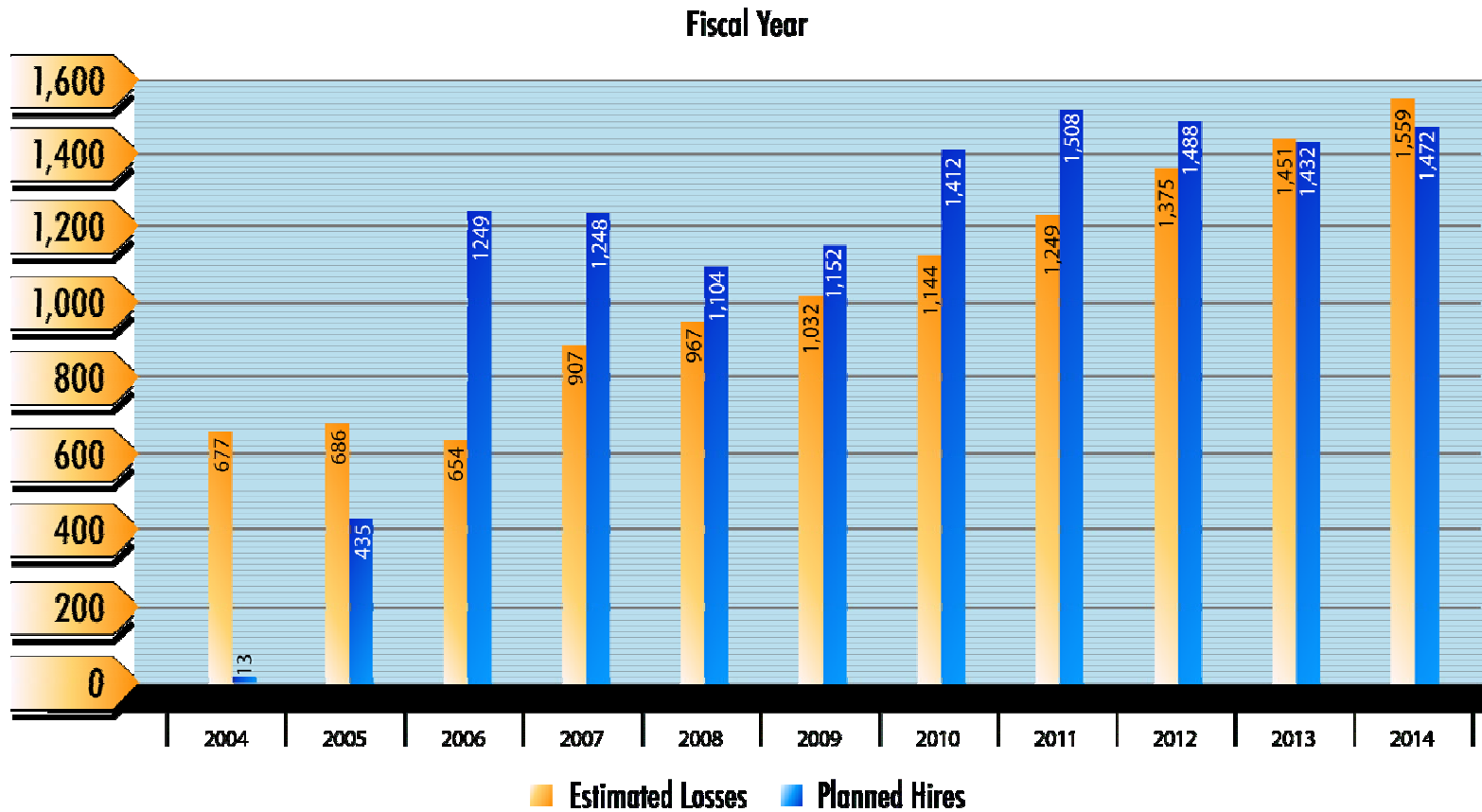
Consumer Complaints



Note: Consumer Complaint Data 1998-2006, OPSNET Data

Air Traffic Controller Staffing

ATO Hiring Forecast vs. Losses



Time to CPC (Certified Professional Controller)

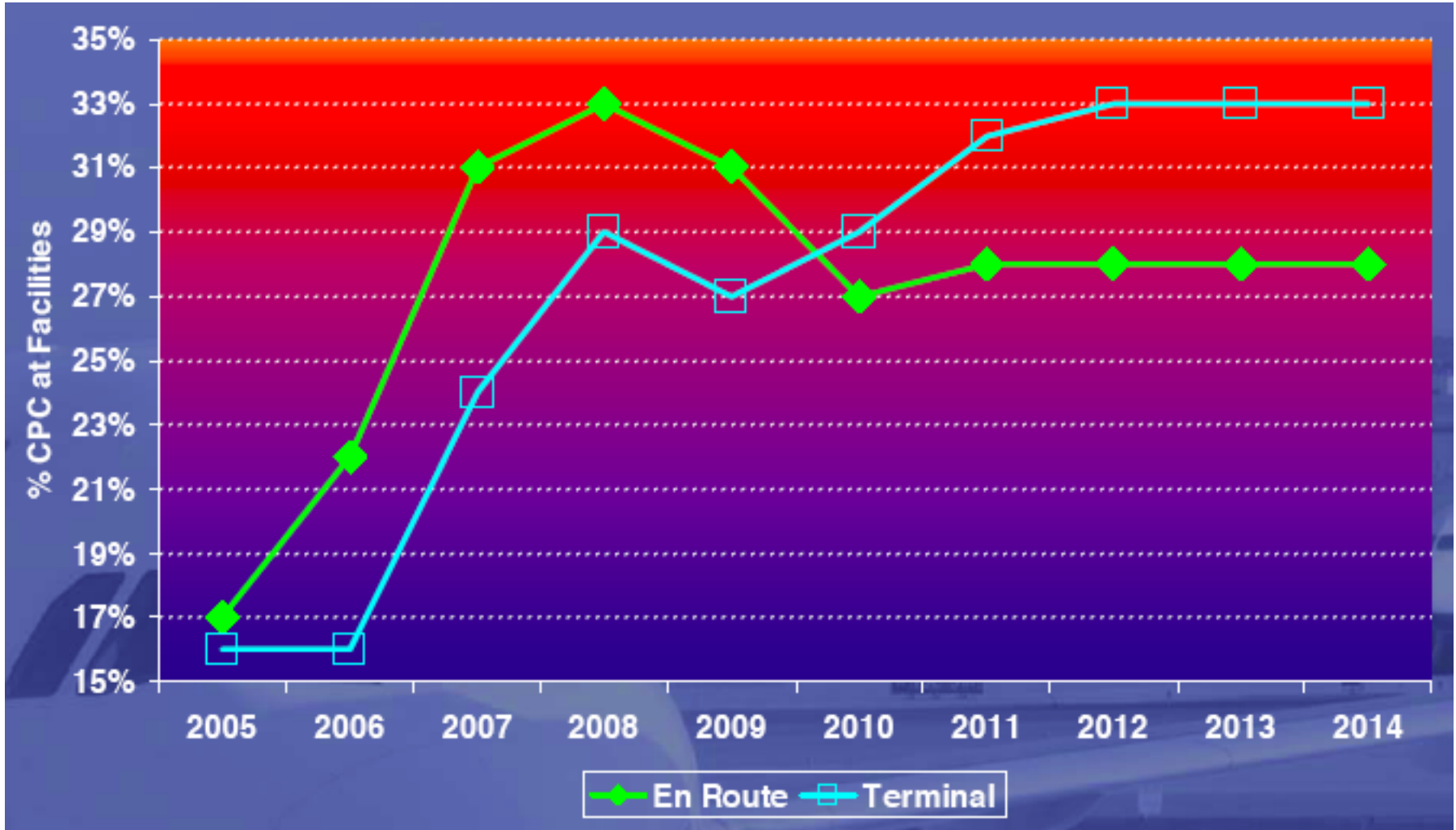
Terminal; 8 - 24 months

Enroute: 36 - 60

Source: *Air Traffic Controller Workforce Plan - 2004*



Projected % Developmental Controllers



From: ATCS Workforce Plan Briefing



Controller Contract

Congressional 60 day response period ended June 5, 2006



Federal Aviation
Administration

U.S. Department of Transportation Federal Aviation Administration

Submission to the United States Congress
Concerning the Agency's Collective Bargaining Proposal
to the National Air Traffic Controllers Association

April 5, 2006

NATCA's Rebuttal to the FAA Administrator's Submission to the United States Congress Concerning the Agency's Collective Bargaining Proposal to the National Air Traffic Controllers Association

Considering that the FAA Administrator routinely demonstrates her disdain for the role of the United States Congress in setting our national aviation policy, it should come as no surprise that the FAA Administrator's Submission to the United States Congress Concerning the Agency's Collective Bargaining Proposal to the National Air Traffic Controllers Association is a collection of revisionist history, misrepresentation, finger pointing and contempt for the role of the Legislative branch. This coming from an Administrator who just last week told a U.S. Senator, during a public hearing, that there was not a list of TRACON's planned for co-location on Tuesday -- by Friday that list was published in Congressional Quarterly. The same FAA told the Chairman of its oversight committee that controllers in New York who were fired were not really fired, even as the FAA processed their final termination papers. Her efforts to exclude Congress from exercising its oversight role even extends to advocating a new funding process that would extract the FAA from the appropriations process, virtually eliminating the system of checks and balances envisioned under the Constitution when the drafters gave Congress the power of the purse. Providing misleading information to Congress has sadly become status quo for this Administrator.

After the FAA rejected NATCA's proposal, declined further bargaining, and ended mediation on Friday, March 31, the FAA issued numerous public statements denying that negotiations had ended and that the parties were still bargaining. It is clear that the FAA was simply buying time to prepare a submission to Congress and launch a sneak attack by sending the submission to the hill just prior to leaving for a two-week district work period. It is important to note that the FAA is not subject to any timeline with regard to making its submission to Congress. There is nothing that requires them to send it within one day, one week, or even a month of ending negotiations. The only other time the FAA chose to take this course of action regarding a bargaining impasse, it was several months after bargaining broke down before the submission. Once it was submitted, the FAA waited a year and a half to impose the proposal.

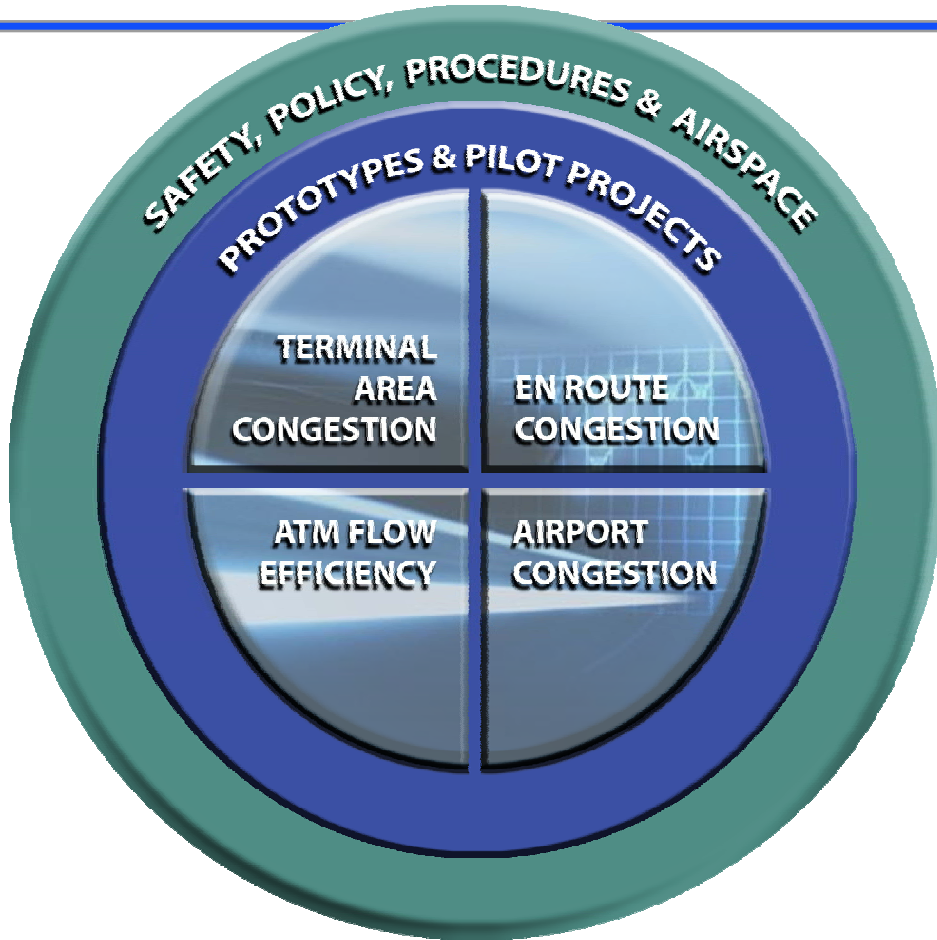
Throughout this process, the union has worked to meet the stated needs of the administrator. With regard to pay, the major issue in dispute, the union came to the table proposing the status quo, including the government-wide pay raises set by Congress and the GCI which supplanted the step increase. The union was asking to be treated as other government employees. As the talks progressed, NATCA made considerable movement on every pay provision. It offered to eliminate the two highest pay bands in the system, lower the top of all pay bands by 13% and the bottom of the bands by 3%, as well as institute a multi-year freeze in band movement which would allow the FAA to close the gap between controllers and other FAA employees (there is no gap between controllers and FAA managers or supervisors as their pay bands are above the controller pay bands.) The NATCA proposal would have closed the gap by approximately 12% depending on the Administrator's treatment of other pay bands. In contrast, the FAA proposal was to lower pay bands by 30% when bargaining started in July of 2005 and at the end of negotiations in April of 2006. The FAA made no movement on the fundamentals of their pay proposal, with agency counterproposals amounting to little more than editorial changes. It is difficult to characterize the FAA's actions as truly seeking a voluntary agreement when it was unwilling to make any progress on this key issue.

Revisionist History

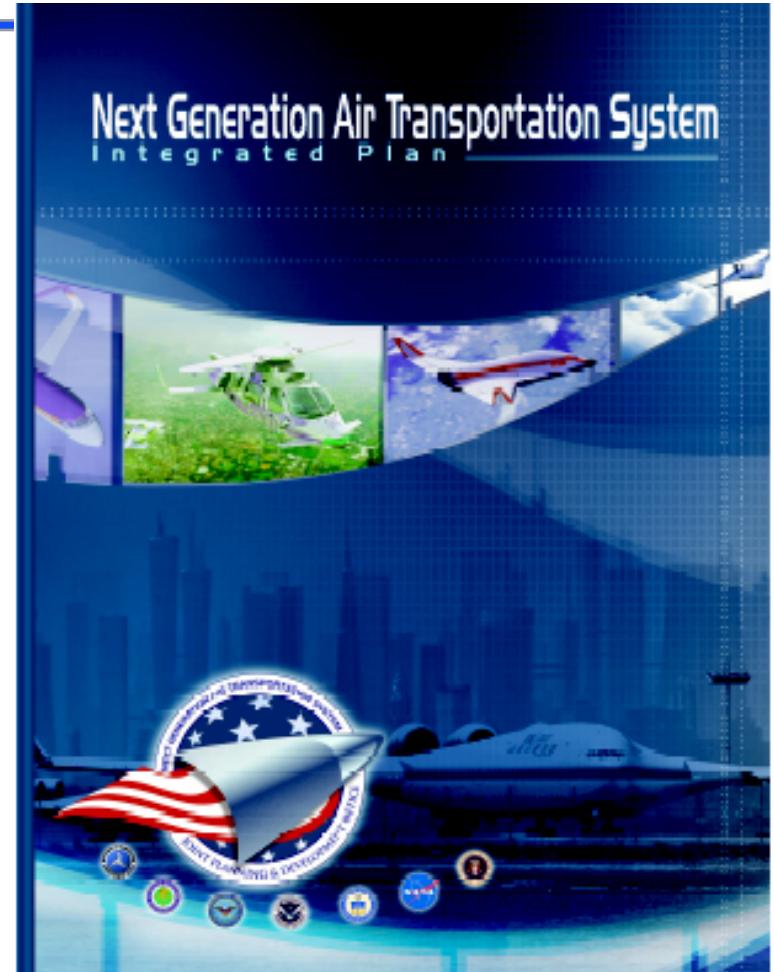
The FAA submission states, "In 1996, as part of reauthorization, the Agency's statute was amended to bar the Administrator from negotiating with labor unions over compensation and benefits except under limited circumstances..." This odd sentence construction and emphasis on the word "bar" appears intended to lead the reader to believe that the 1996 reauthorization had a new provision to preclude bargaining. In fact, the FAA statute previously restricted the scope of bargaining to subjects that did not include compensation and benefits. The amendments to the statute required bargaining over



OEP and NGATS



10 Year Plan
FAA



20 Year Plan
Multi-Agency

FAA, DOD, Commerce
DHS, NASA, DOT, OSTP



FAA Reauthorization '07

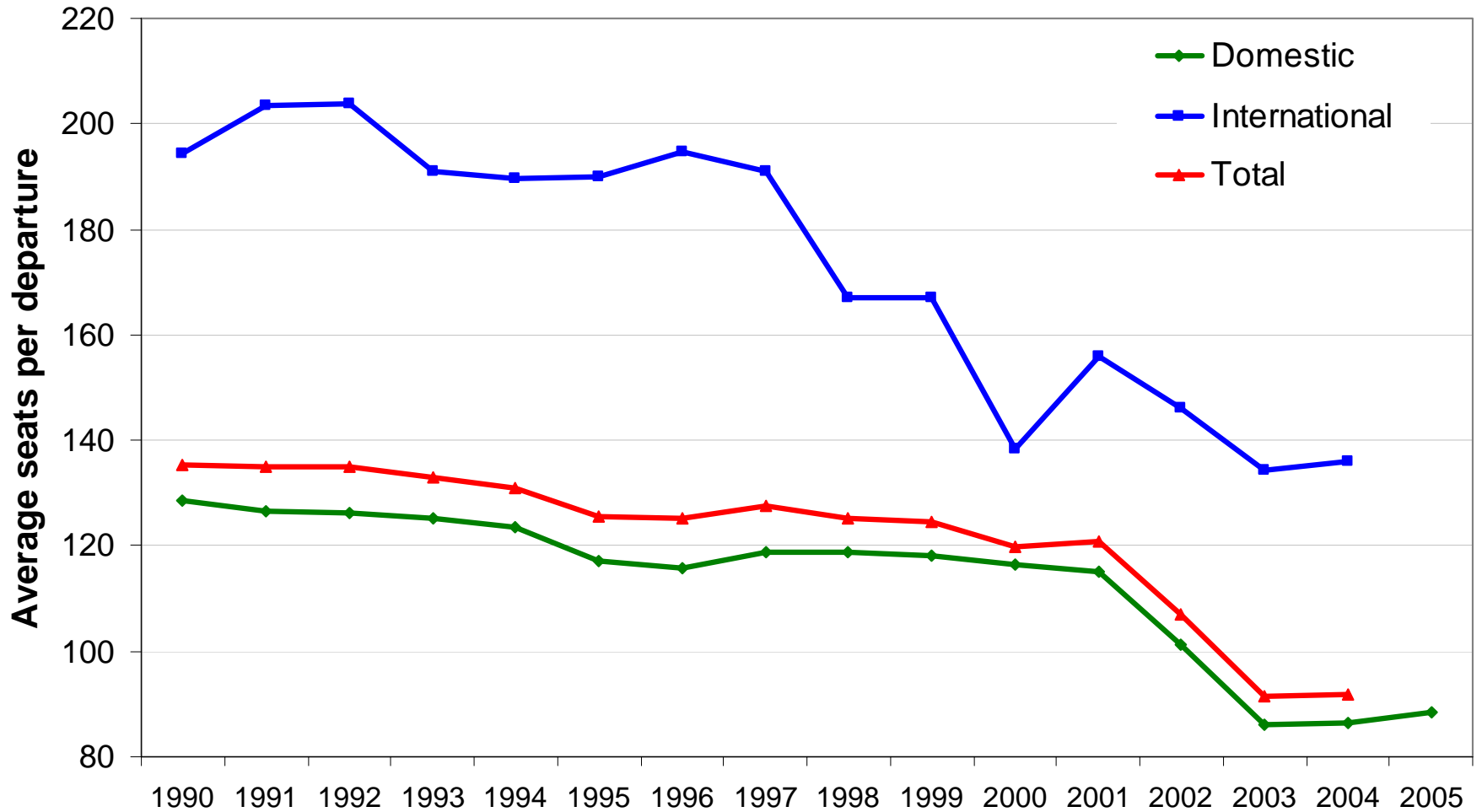
- **FAA Reauthorization bill: deadline Sept. 30, 2007**
- **Funding Modernization (NGATS)**
- **Contributions from the general fund**
- **The “battle” over user fees:**
 - Airlines vs Business Aviation

<u>Tax</u>	<u>Rate</u>	<u>Percentage of Total Tax Collections in FY 2004</u>
Ticket Tax	7.5% on Airfares	49.7%
Segment Tax	\$3.20 per Flight Segment	19.6%
Rural Airport Tax	7.5% on Airfares from Rural Airports	0.8%
Waybill Tax	6.25% on Price of Freight and Mail Transferred by Air	5.4%
GA and Jet Fuel	GA Fuel: 19.3 cents/gallon Jet Fuel: 21.8 cents/gallon	1.9%
Commercial Jet Fuel	4.3 cents/gallon	5.8%
International Departures/Arrivals	\$14.10 per international departure/arrival	14.4%
Alaska/Hawaii Tax	\$7.00 per domestic departure/arrival to Alaska or Hawaii	0.8%
Frequent Flyer Tax	7.5% on proceeds of third party sales of frequent flyer miles	1.6%
Total		100%

Source: FAA



Trends in Aircraft Size



A-380



- **A380 Baseline**
 - Shrink
 - Stretch
 - ER Variants
- **555 passengers (3 class)**
- **14,800km/8,000nm range**
- **Payload: 330,000lbs over 10,400km/5,600nm**
- **Rolls-Royce Trent 900 engines or GP7200 engines**



A380 First Flight (4/27/05)

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.



A-380 Delays

SELECTED A380 MILESTONE SCHEDULES ¹		
	ORIGINAL	CURRENT
First flight	12/2005	4/27/2006
First delivery to Singapore Airlines (19 a/c)	Early 2006	10/2007
First delivery to Emirates Airlines (43 a/c)	10/2006	8/2008
First freighter delivery (FedEx)	2008	2010

- **Bad News¹:**

- On Oct 4th Airbus announced a third delay to A380 production prompting airlines to review their orders (no cancellations yet).
- CEO Christian Streiff resigned after 100 days of tenure on Oct 10th.
- Cash-flow crisis at EADS puts the development of A350XWB (replacement of A330/A340) on hold.
- Financial analysts are skeptical that Airbus cost-cutting program Power8 can deliver.
- Lack of funds to develop the A320 replacement in the coming decade.
- Differences between the proposed A350XWB and the original A350 for which Airbus has contracts.

- **Good News²:**

- Airbus Wake Vortex Steering Group found that 10 nm separation for following the A380 needs to be applied only to light aircraft, with 6 nm for heavy and 8 nm for medium-sized aircraft.

(Approximately breakeven on airport seat throughput)



A 380 Orders

aprox 159 (17 Cargo)

- Singapore Airlines (10)
- Lufthansa (15)
- Emirates (43)
- Air France (10)
- Qantas (12)
- Malaysia Airlines (6)
- Virgin Atlantic (6)
- International Lease Finance (10)
- Kingfisher Airlines (5)
- Qatar Airways (2)
- Federal Express (10)
- Korean Air (5)
- Thai Airways (6)
- Etihad Airways (4)
- China Southern Airlines (5)
- **Delivery Delays (normal)**
 - 9 in 2007 vs 25 plan
- **Wake Vortex Issue**
 - ICAO 10 Mile in trail requirement



B-787

■

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TIFF (Uncompressed) decompressor
are needed to see this picture.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

-300 (290-330 pax) (3000-3500 nm)

-800 (210-250 pax) (8000-8500 nm)

-900 (250-290 pax) (8600-8800 nm)

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.





B 787 Orders

aprox 432 Firm, 30+ Airlines

- ANA - All Nippon Airways (30) 300 (20)800
- Japan Air Lines. (30) mix
- Primaris Airlines (20) 800
- Air India (20) 800
- ILFC (20) mix
- Northwest Airlines (18) 800
- Air China (15) 800
- China Eastern (15) 800
- Air Canada (14)
 - - 14 787
- China Southern Airlines (10) 800.
- Continental Airlines (10-13) 800
- Ethiopian Airlines (10) 800
- Garuda Indonesia (10) 800
- Korean Air (10) 800
- Shanghai Airlines (9) 800
- Hainan Airlines (8) 800
- LOT Polish Airlines (7) 800
- First Choice UK (6) 800
- LCAL (6) 800
- Shanghai Airlines (6) 800
- Blue Panorama (4) 800
- Royal Air Maroc (4) 800
- Vietnam Airlines (4) 800
- Xiamen Airlines (3) 800
- Air New Zealand (4) 800
- Icelandair (2) 800
- Air Pacific (5)
- Kenya Airways (6)
- QUANTAS (45)
- Air Canada (15)
- Northwest (18)
- Air India (27)



“All New” A350

Not your fathers A330

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

250-300 Seats
7500-8800 nm Range

Source: <http://www.airbus.com>

Turboprops



ATR sales 2005/2006:

- Record 90 orders for ATR 42/72 turboprops in 2005
- Sold 46 in the Q1 2006

Very Light Jets

Small turbofan aircraft



Eclipse500
Eclipse Aviation



Mustang
Cessna



Adam700
Adam Aircraft



Phenom-100
Embraer



ProJet
Avocet Aircraft



D-Jet
Diamond Aircraft



Epic LT
Epic



HondaJet
Honda



Safire26
Safire Aircraft



Excel Sport Jet



Spectrum 33



Eviation EV-20

Aircraft characteristics*

- Passengers:
4 to 8
- Acquisition price:
\$m 1.4 to 3.6
- Cruise speed:
340 to 390 kts
- Operating ceiling:
41,000ft to 45,000ft
- Range:
1100 to 1750 NM
- Take off field length:
2200ft to 3400ft

Orders

- Eclipse: **2300**
- Adam: **75**
- Mustang: **330+**

** for twin-engine VLJs (excludes D-Jet)*

Battle for New Nonstop Service between China and the U.S.

Nonstop to China

Four carriers are competing for one new route to China. Here's what each carrier proposes.

Continental Airlines

Route: Newark, N.J. to Shanghai
Seats: 283
Flight Time: 14 hr.

United Airlines

Route: Washington, D.C. Worth to Beijing
Seats: 347
Flight Time: 15 hr. 15 mins.

Northwest Airlines

Route: Detroit to Shanghai
Seats: 335
Flight Time: 14 hr. 45 mins.

American Airlines

Route: Dallas/Ft. Worth to Beijing
Seats: 247
Flight Time: 14 hr. 30 mins.

- Current services: from New York, Chicago and San Francisco.
- The U.S. Department of Transportation will award one last route (until 2008) between China and the U.S. by the end of the year.
- Four U.S. airlines are competing for the route:
 - United,
 - Northwest,
 - Continental,
 - American
- Contest between airlines to develop support for a particular route.



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Microsoft Video 1 decompressor
are needed to see this picture.