# Price Competition in the Top US Domestic Markets:

## Revenues and Yield Premium

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# Objectives

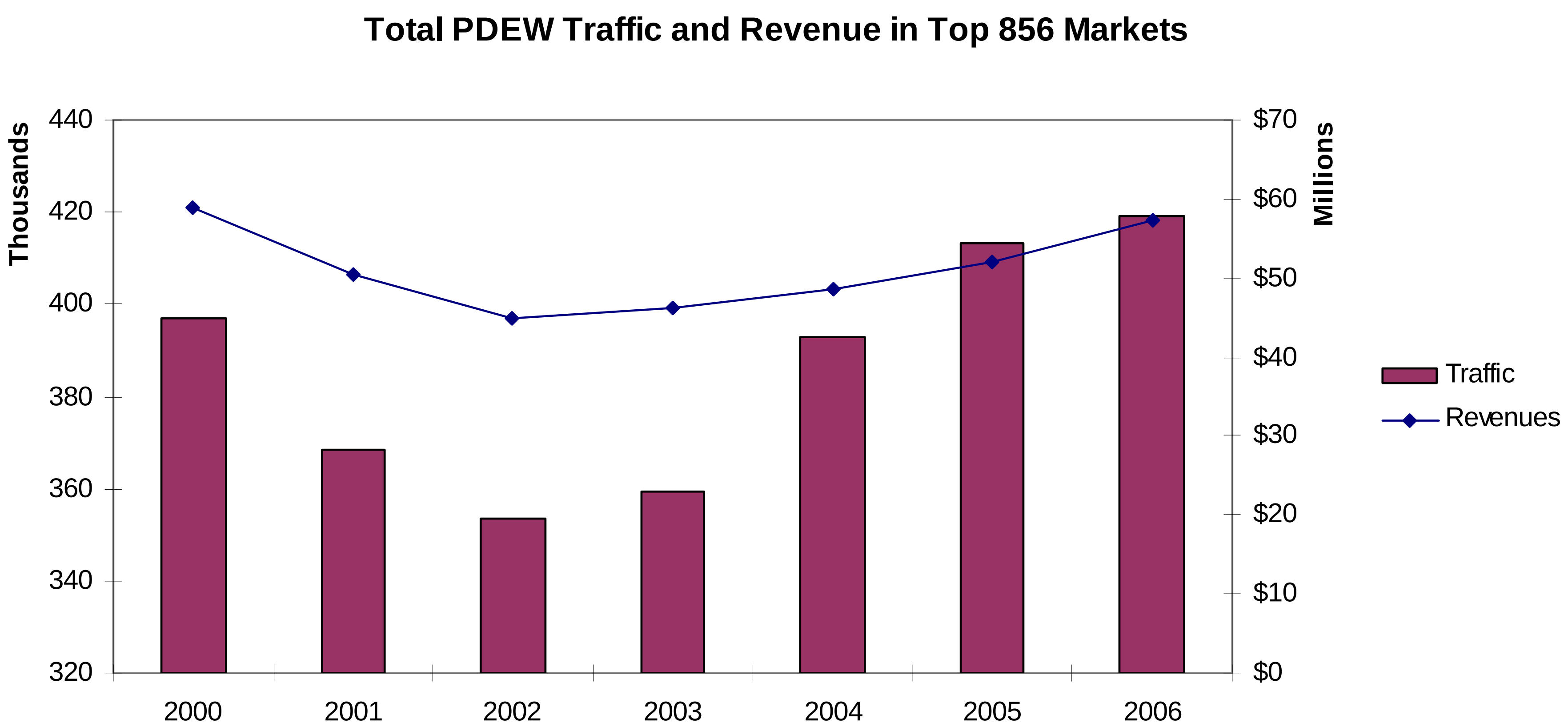
- Perform an analysis of US Domestic markets from years 2000 to 2006 in order to:
  - Realize the yield differential between Legacy Airlines and Low Cost Carriers.
    - *Yield is the revenue generated by one passenger carried one mile.*
  - Identify trends in traffic, revenues, average fare.
  - Get an overview of the competition each legacy carrier faces and how this has changed from 2000 to 2006.
  - Identify differences in yield premium, revenues, traffic and market share for each Legacy Carrier in its Hub Markets

# Data Sample

10% sample of tickets of **all US airlines** which operate a/c with capacity greater than 60 seats → US DOT → Data Base Products → O&D Plus

- Data source: O&D Plus
  - Summary of all domestic O-D markets by carrier by quarter
- Top 1000 US domestic markets extracted from O&D Plus for the period 2000-06
- Database: 856 OD markets that appeared every year in the Top 1000 markets
  - Traffic, Revenues, Yield, Market Share, Average Haul
  - Within each market airlines with market share below 5% are excluded from the database

# Changes in Overall Traffic and Revenue

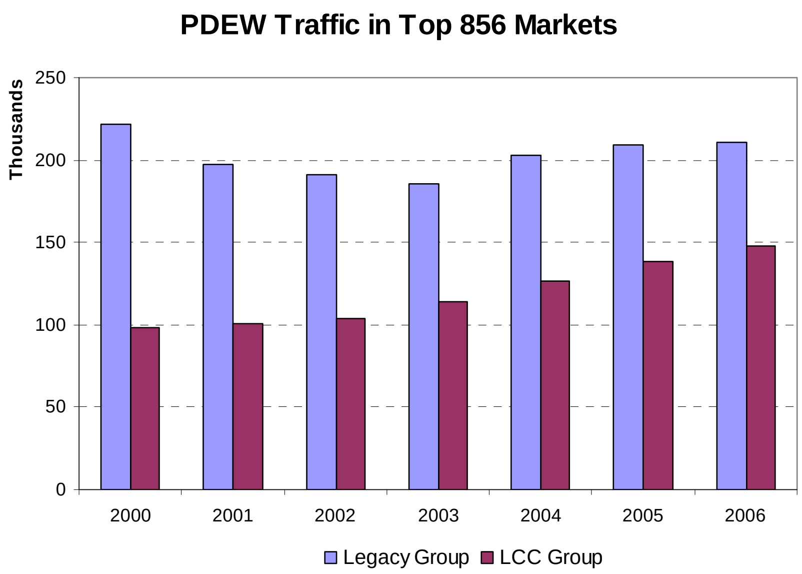


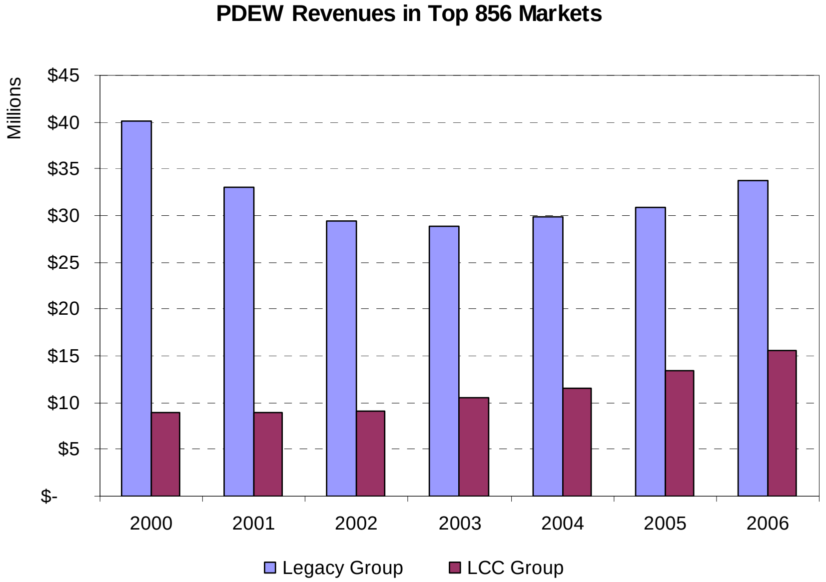
# Legacy Carriers vs LCCs

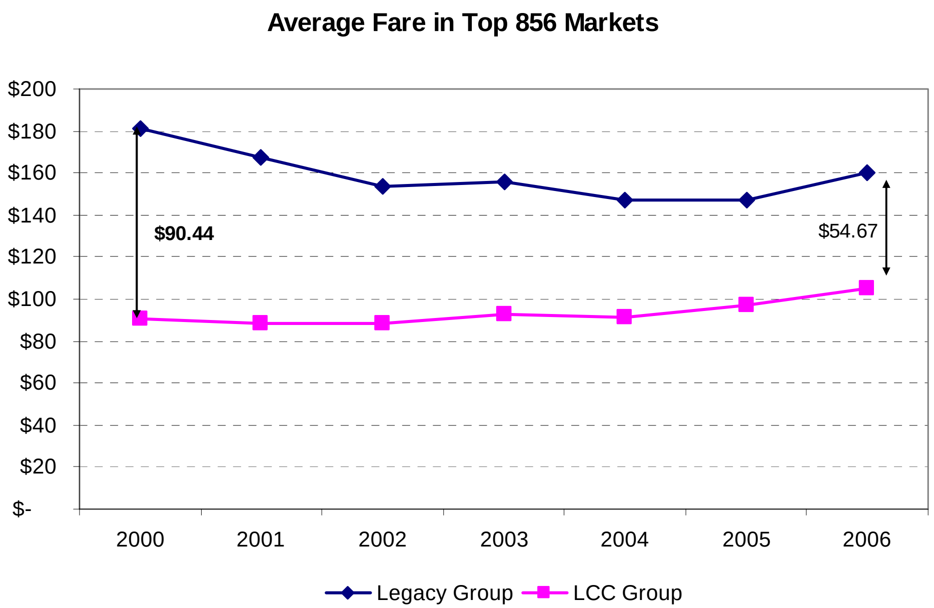
- Two distinct groups of airlines:
  - LCCs were selected according to their traffic during 2005 in the Top 856 Markets; i.e. the six with the highest traffic (and revenues) in 2006.

| *Legacy Group* | *LCC Group* |
|---|---|
| American Airlines | Airtran/Frontier |
| Continental Airlines | America West Airlines |
| Delta Air Lines | Frontier Airlines |
| Northwest Airlines | Jet Blue |
| United Airlines | Southwest Airlines |
| US Airways | Spirit Air Lines |

# Legacy Group vs LCC Group

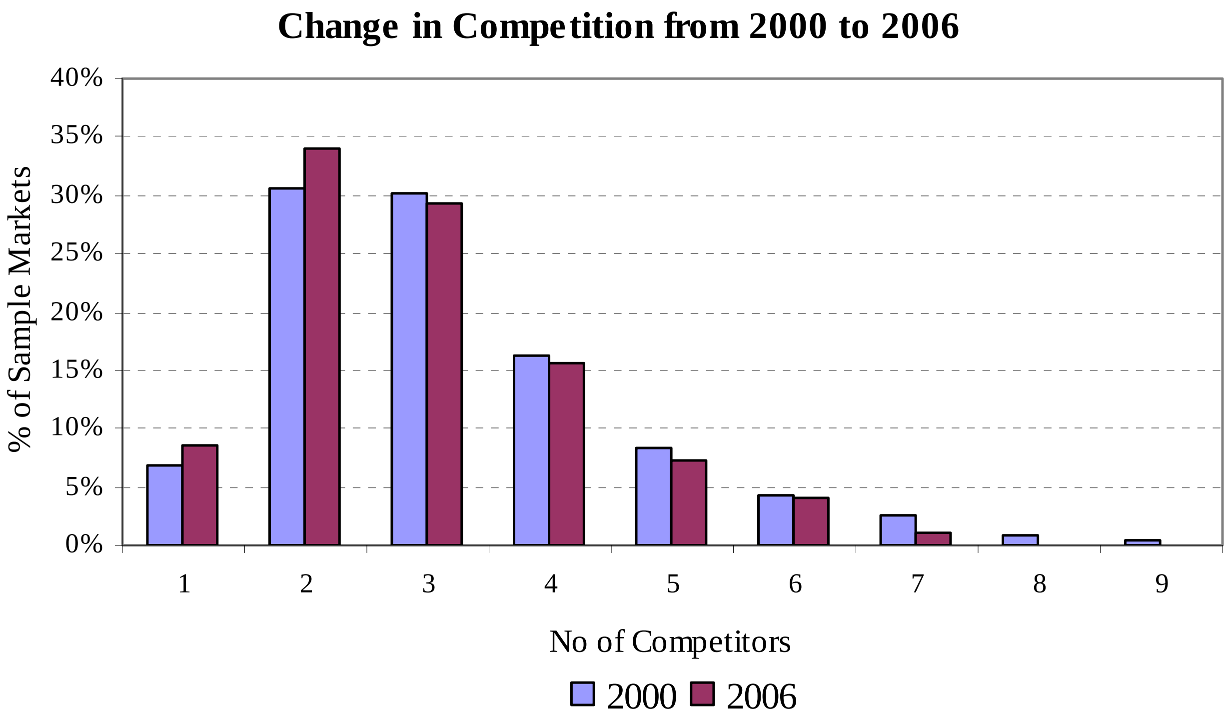


# Effective Competitors

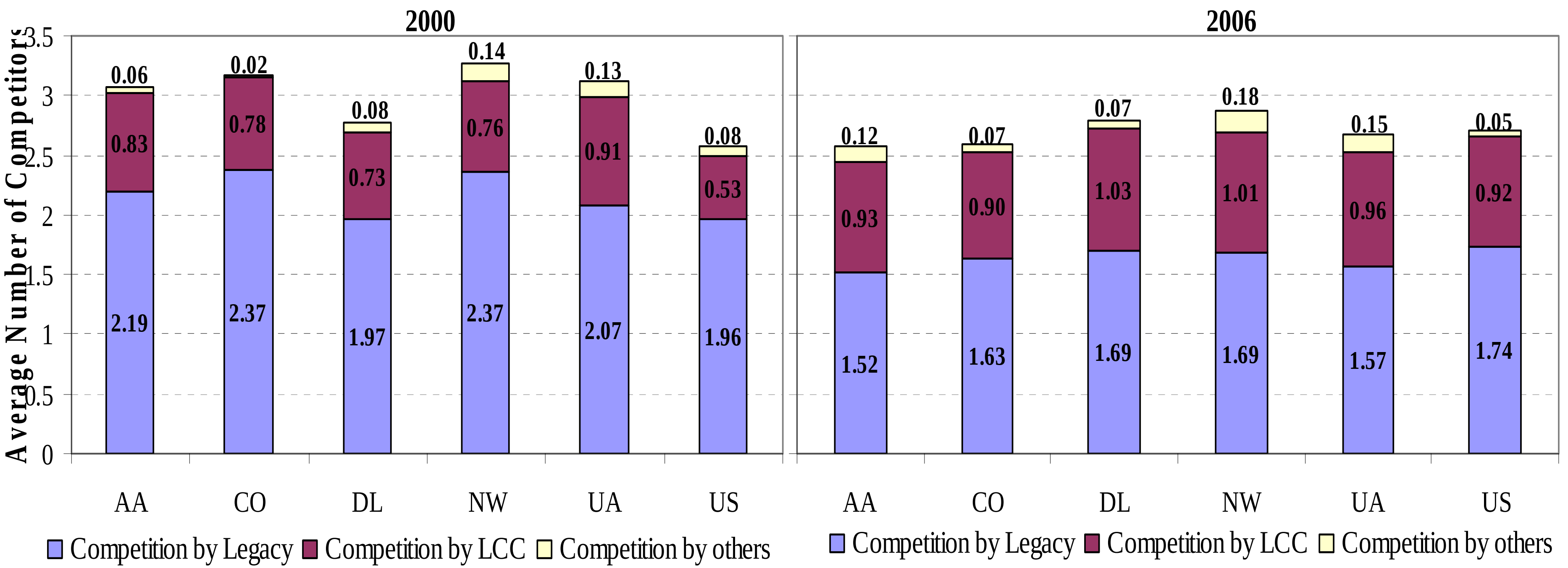
- Effective Competitors in the Top 856 Markets in 2000 and 2006:
  - Average Number of Competitors per market
  - Excluding airlines with Market Share below 5%




- Effective Competitors drop from 3.18 in 2000 to 2.95 in 2006
- More Monopoly and Duopoly markets in 2006 than in 2000
- Fewer markets with more than 3 competitors in 2006

# Effective Competitors 2

- Effective Competition by Legacy Carriers Drops from 2000 to 2006
- Competition by LCCs increases
- Largest drop for CO by 2006
- US faces the fewest competitors in 2000, but together with DL is the only airline which faces higher competition in 2006
- By 2006 DL and NW are the carriers most exposed to LCC competitors



# Yield Premium Approach

- A new variable was introduced on the data set:

Yield Index $YI_{ij}$ = (Airline i Yield in a market j) / (Avg Yield in market j)

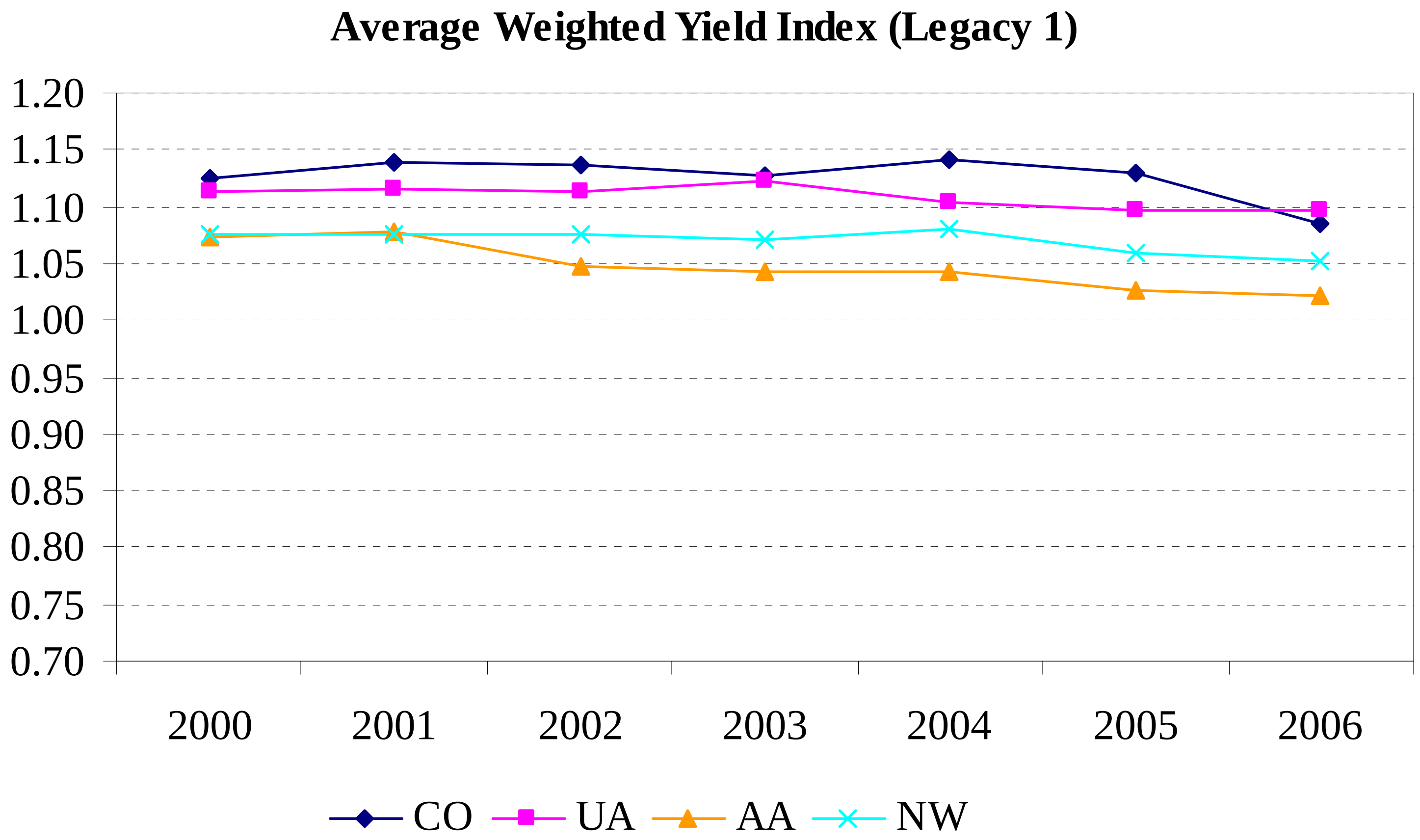
- The avg yield index of every airline across all markets in one year was calculated by weighting in respect to pax on each market:

Avg Weighted Yield Index $AX_i = \sum(YI_{ij} \times \text{Pax of airline i on market j}) / \sum(\text{Pax of airline i})$

- $AX_i$ from 2000 to 2006 was plotted for the major Legacy Airlines and LCCs.

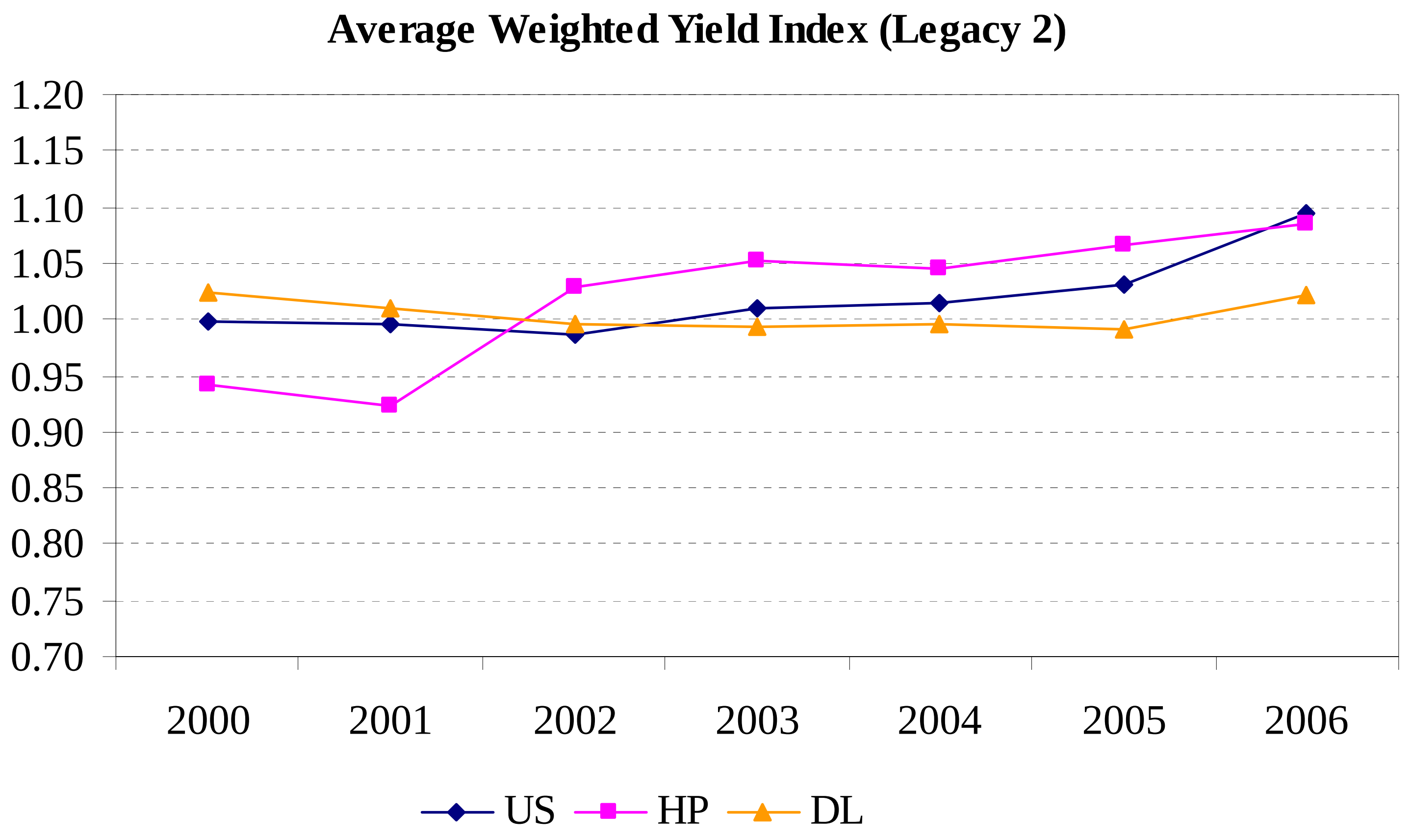
# Results: Legacy Carriers 1

- The legacy carriers that maintain a yield premium are grouped together.
- These airlines operate constantly above the average yield.



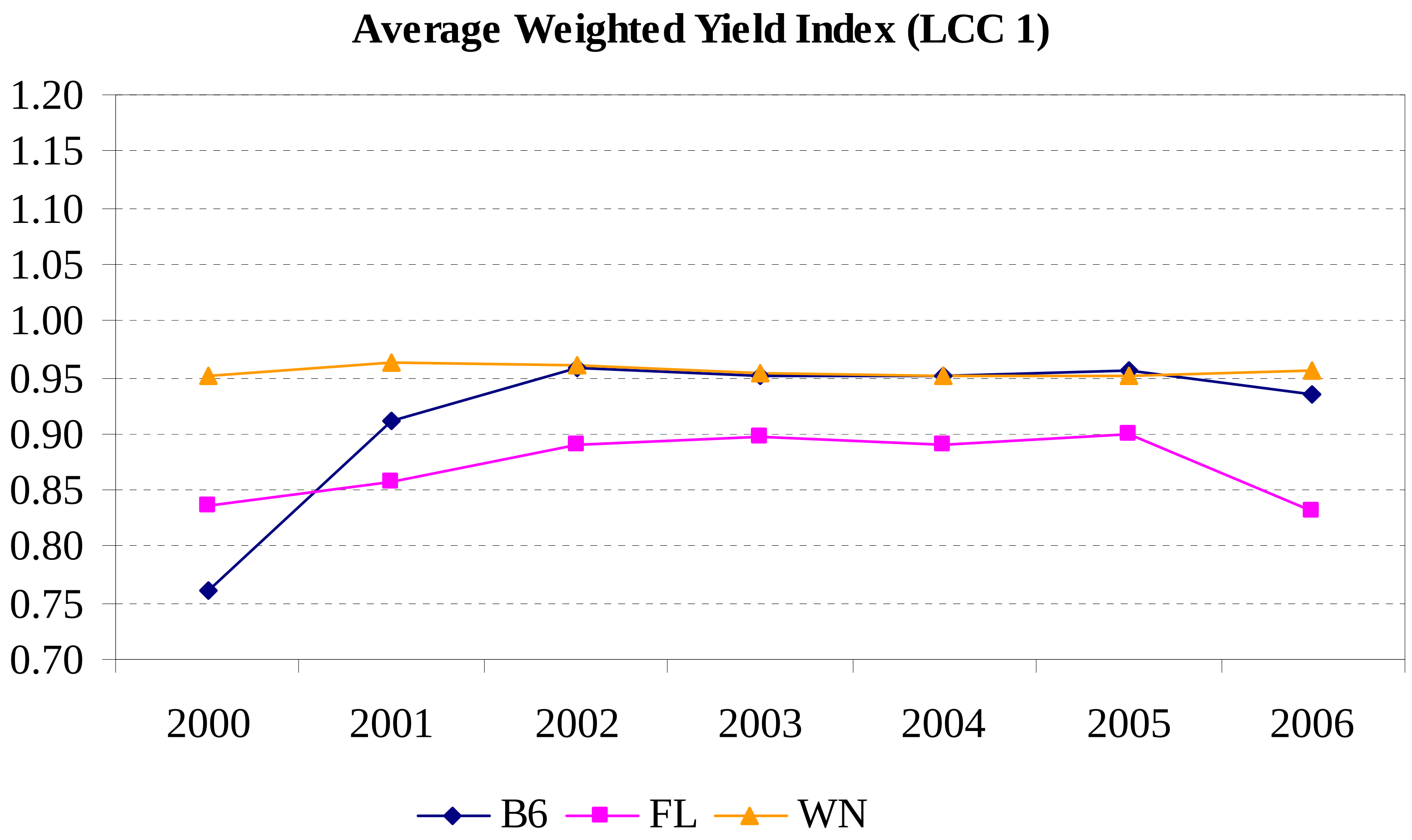
# Results: Legacy Carriers 2

- Delta Air Lines and US Airways are the only legacy carriers that show a yield below average for most years during the period 2000-06.
- US improves since 2002
- America West, although it is considered an LCC, produces yields above average.



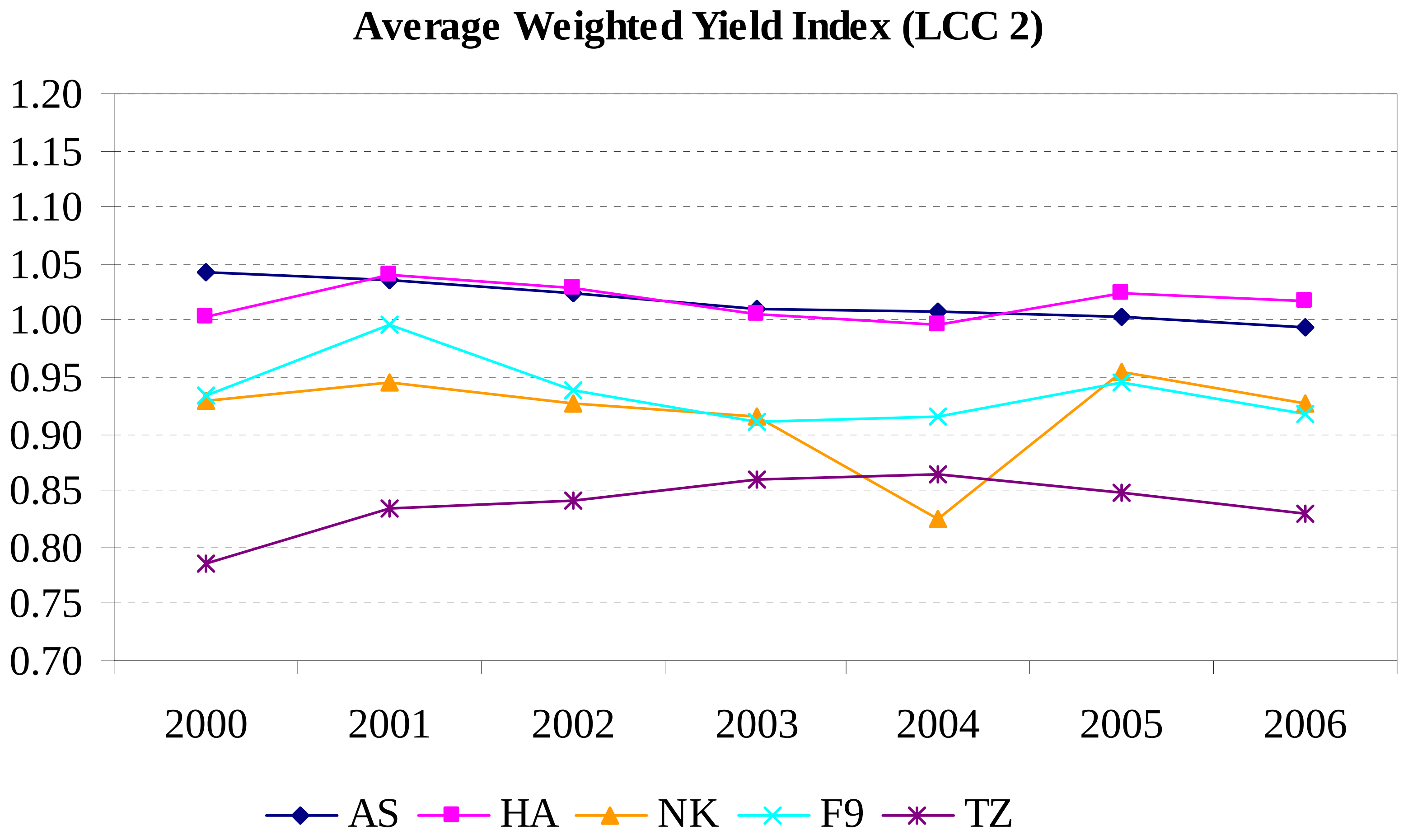
# Results: LCC 1

- Major LCCs have a yield lower than the average from 2000 to 2006



# Results: LCC 2

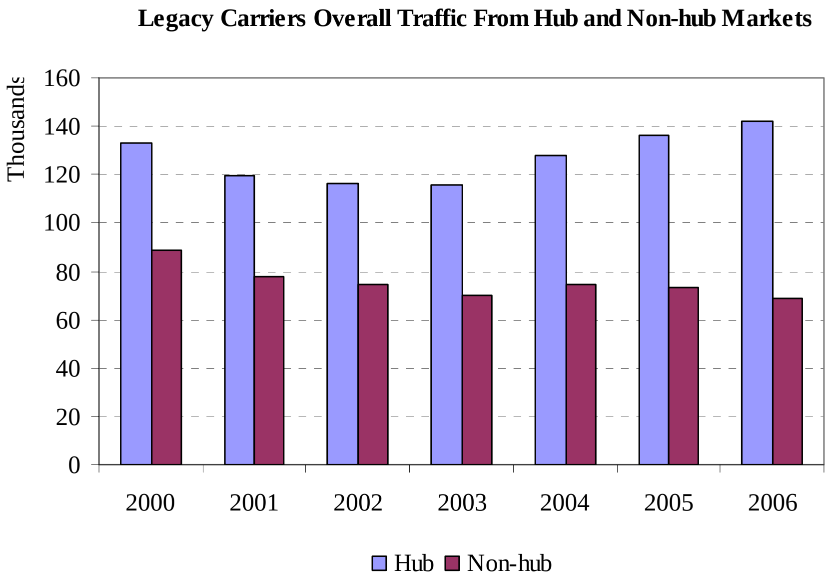
- Other LCC carriers are below average yield, except Alaska Airlines

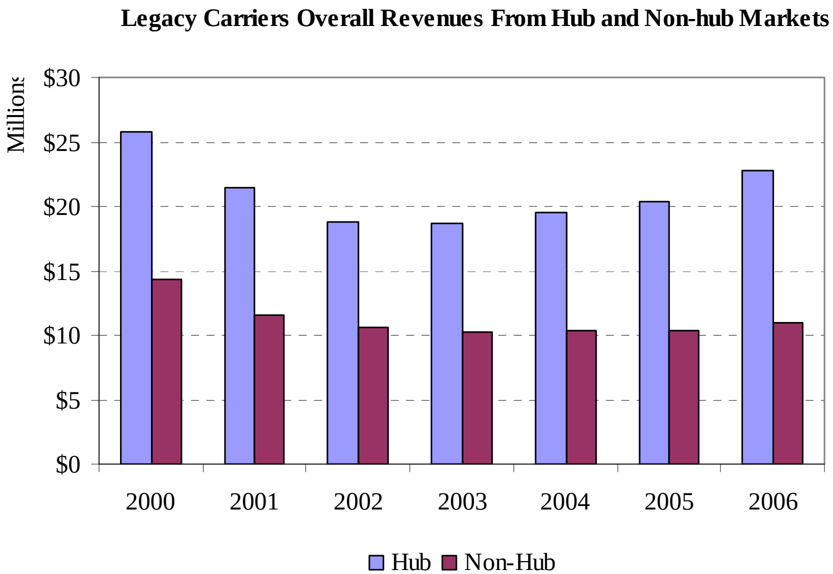


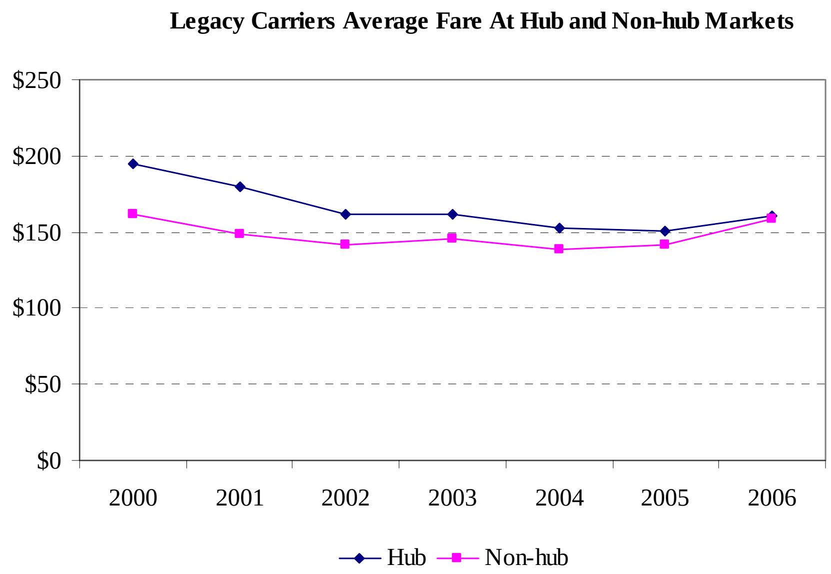
# Hub analysis: Yield Premium

- The yield index at the Hub Markets of each Legacy Carrier was evaluated and compared to the overall yield index of the carrier
- The hubs considered were:
  - Atlanta (Delta)
  - Chicago O'Hare (American, United)
  - Charlotte (US)
  - Cincinnati (Delta)
  - Cleveland (Continental)
  - Dallas Fort Worth (American)
  - Denver (United)
  - Detroit (Northwest)
  - Houston (Continental)
  - Memphis (Northwest)
  - Minneapolis St Paul (Northwest)
  - New York (Continental)
  - Philadelphia (US)
  - Pittsburgh (US)
  - Salt Lake City (Delta)

# Hub Analysis: Overall Trends

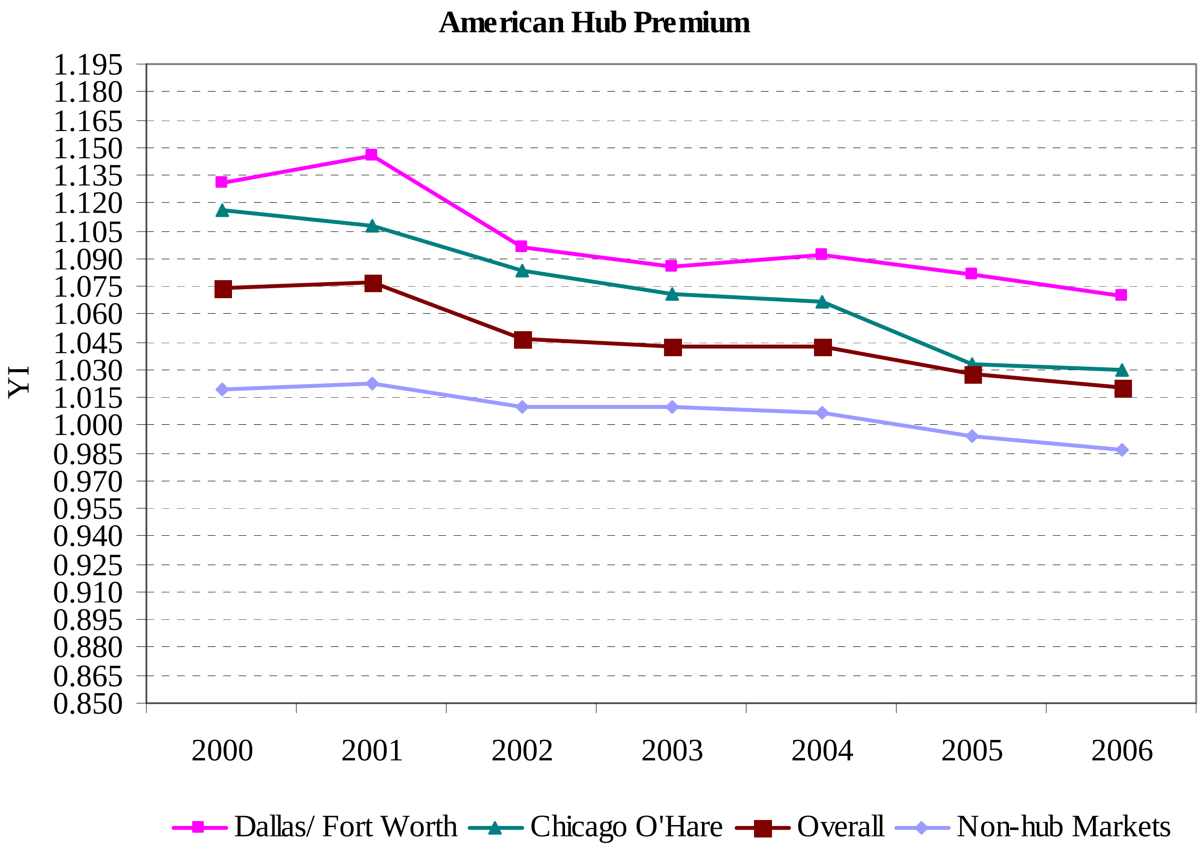


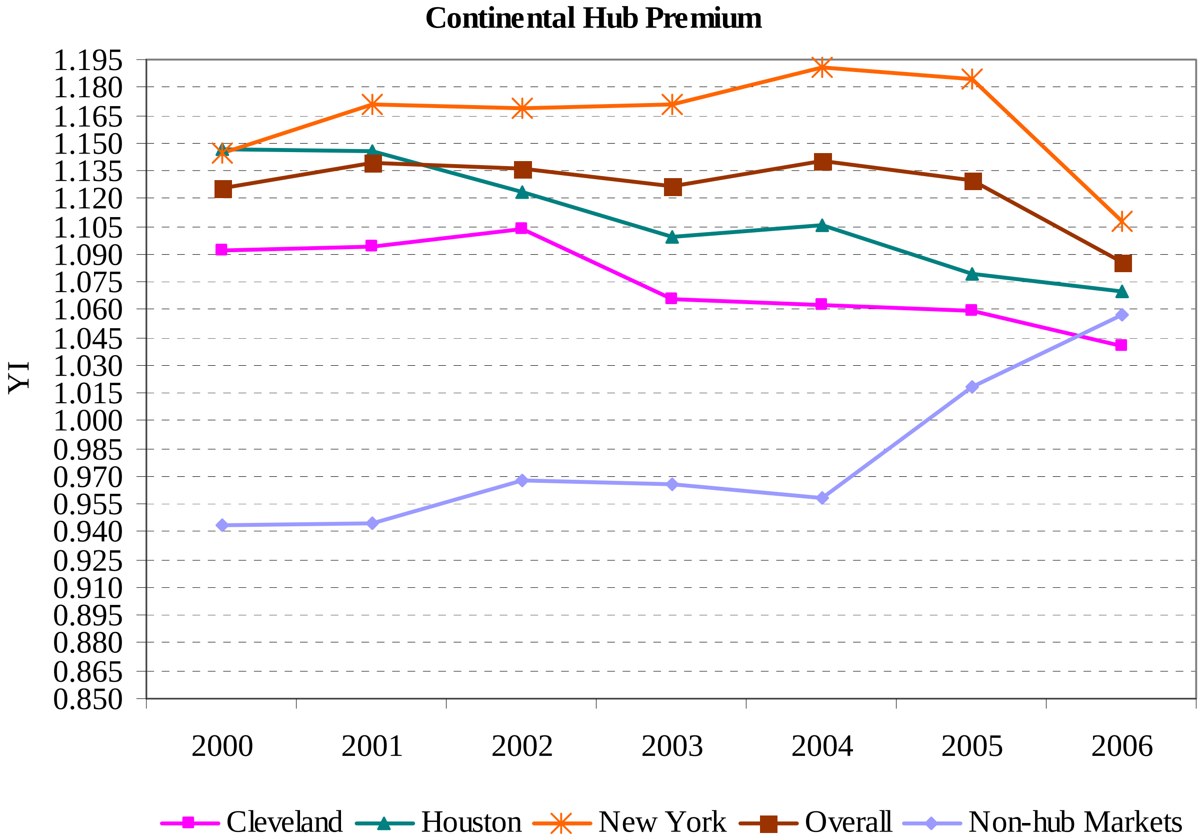
# American Hub Premium

| AMERICAN | Number of Markets in 2006 | % of Total Revenues in 2006 |
|---|---|---|
| Dallas/ Fort Worth | 61 | 33% |
| Chicago O'Hare | 62 | 21% |
| Non-hub Markets | 255 | 48% |
| Overall | 377 | 100% |



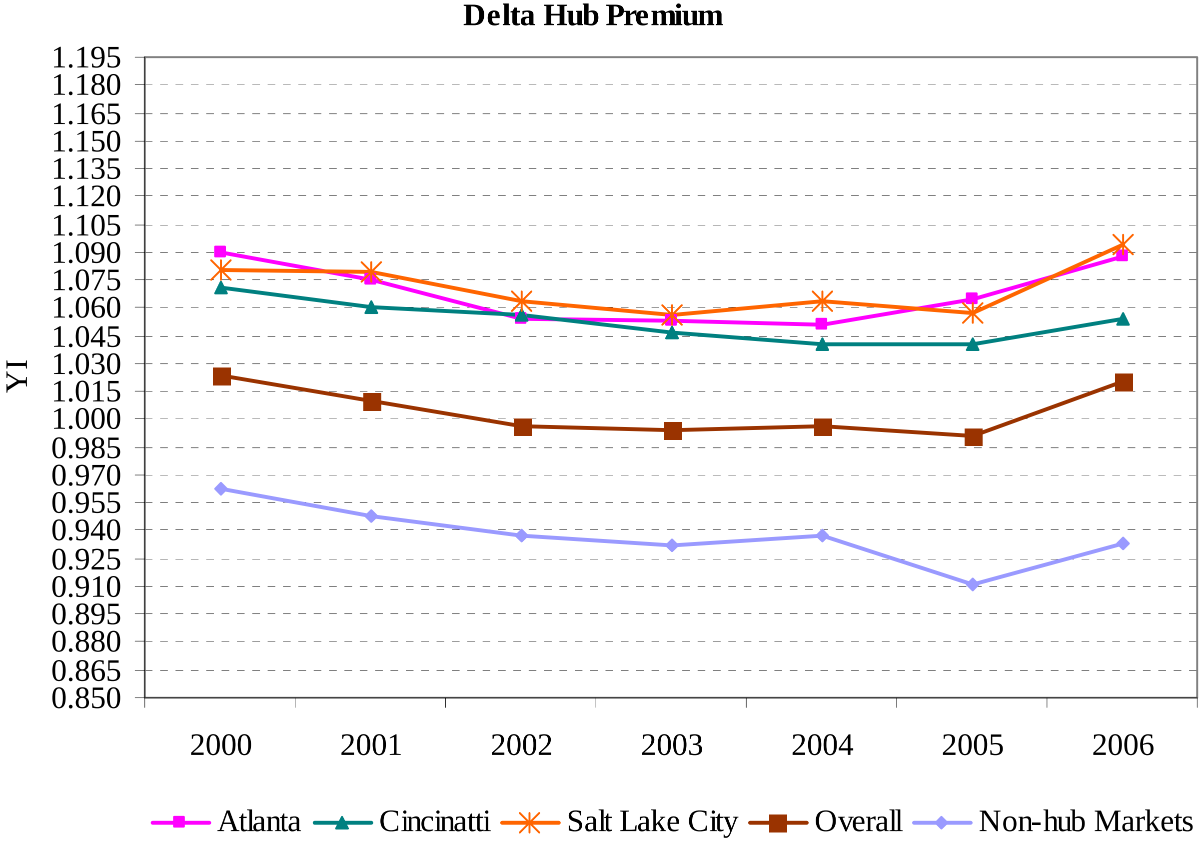
# Continental Hub Premium

| CONTINENTAL | Number of Markets in 2006 | % of Total Revenues in 2006 |
|---|---|---|
| New York | 65 | 58% |
| Cleveland | 21 | 11% |
| Houston | 51 | 35% |
| Non-hub Markets | 56 | 3% |
| Overall | 190 | 100% |



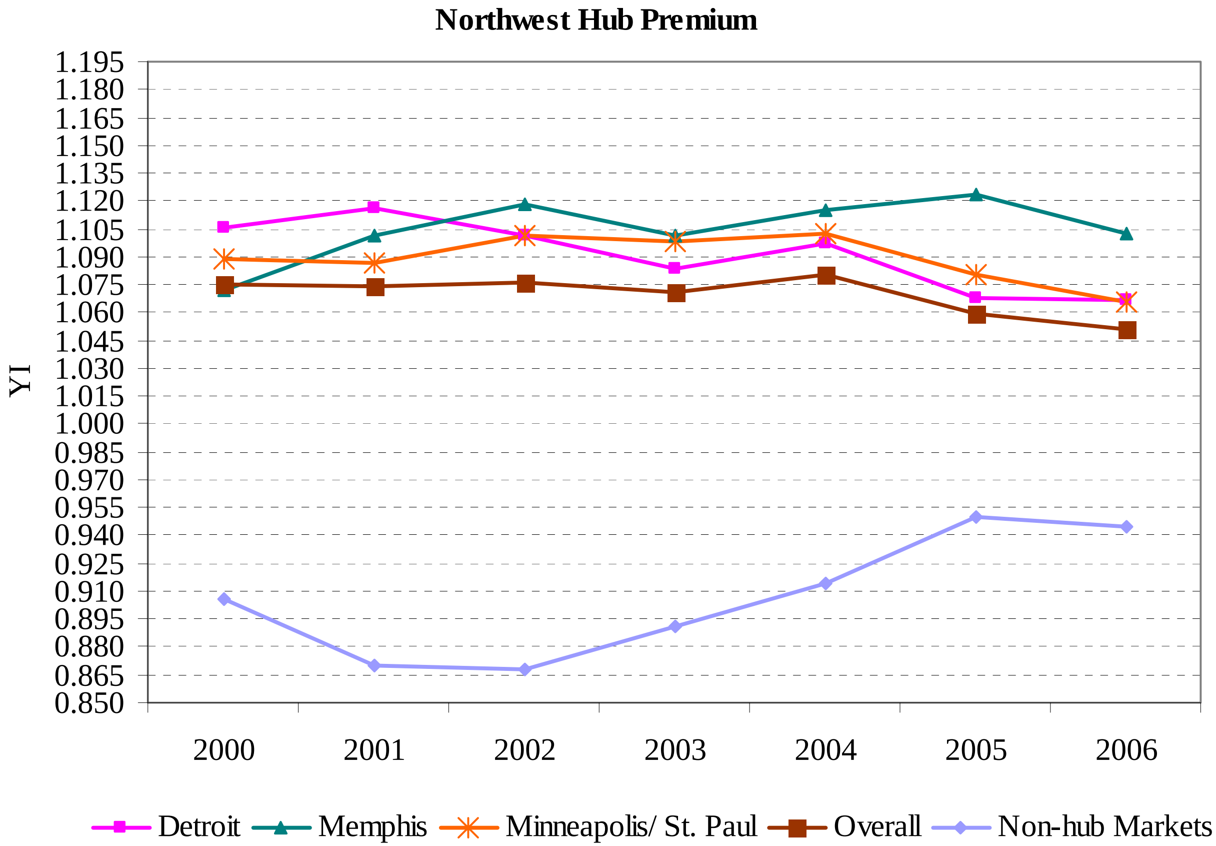
# Delta Hub Premium

| DELTA | Number of Markets in 2006 | % of Total Revenues in 2006 |
|---|---|---|
| Cincinatti | 14 | 7% |
| Atlanta | 56 | 47% |
| Salt Lake City | 27 | 10% |
| Non-hub Markets | 223 | 37% |
| Overall | 318 | 100% |



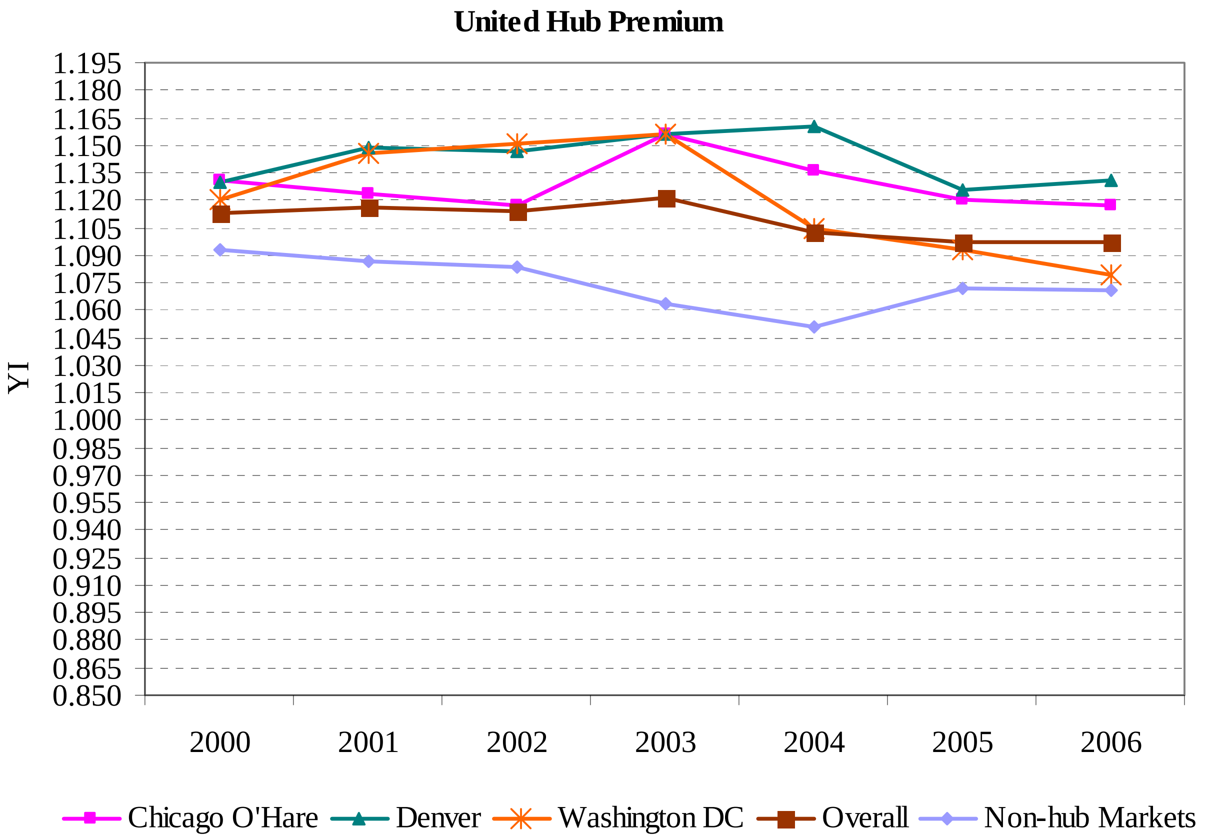
# Northwest Hub Premium

| NORTHWEST | Number of Markets in 2006 | % of Total Revenues in 2006 |
|---|---|---|
| Memphis | 7 | 4% |
| Detroit | 32 | 37% |
| Minneapolis/ St. Paul | 36 | 48% |
| Non-hub Markets | 74 | 12% |
| Overall | 148 | 100% |



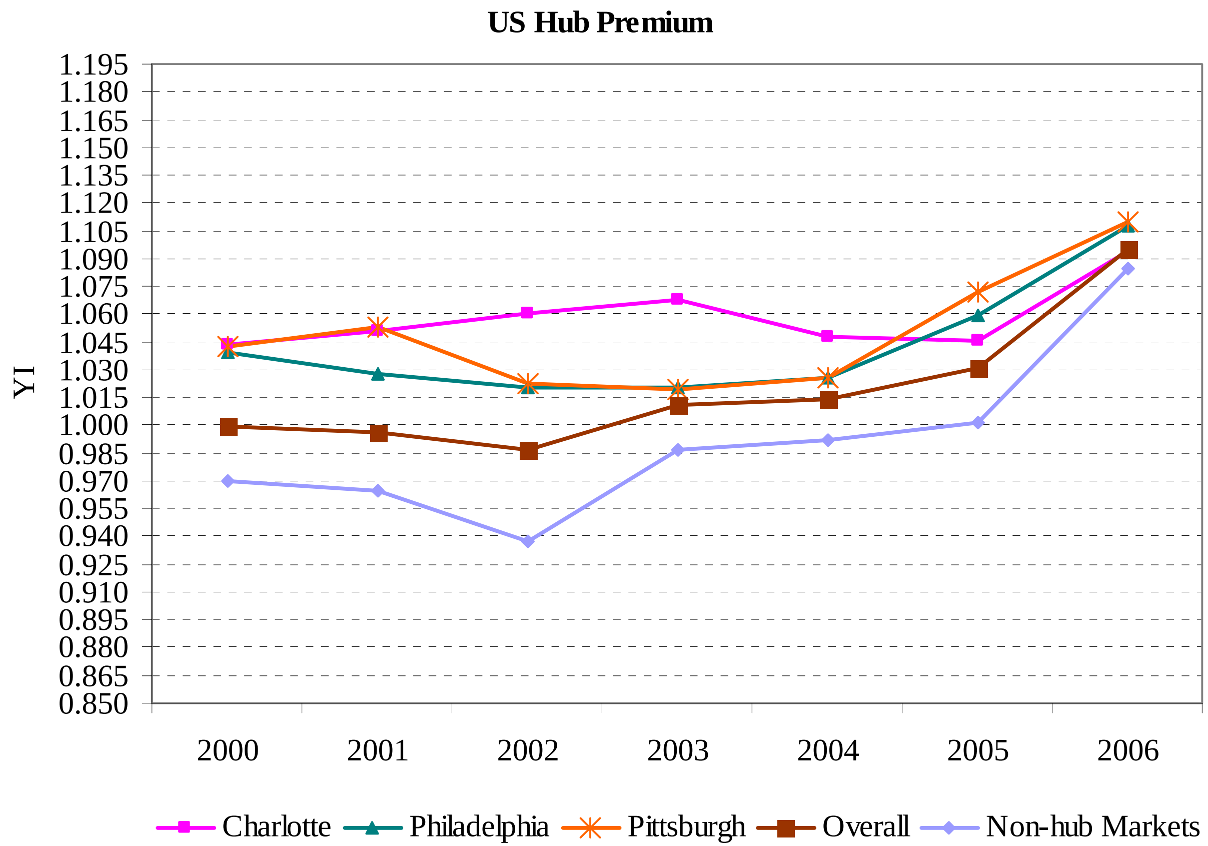
# United Hub Premium

| UNITED | Number of Markets in 2006 | % of Total Revenues in 2006 |
|---|---|---|
| Washington DC | 43 | 18% |
| Chicago O'Hare | 64 | 30% |
| Denver | 46 | 21% |
| Non-hub Markets | 186 | 36% |
| Overall | 336 | 100% |



# US Hub Premium

| US | Number of Markets in 2006 | % of Total Revenues in 2006 |
|---|---|---|
| Charlotte | 18 | 18% |
| Pittsburgh | 17 | 10% |
| Philadelphia | 33 | 35% |
| Non-hub Markets | 116 | 40% |
| Overall | 183 | 100% |



# Summary

- Legacy carriers have a yield premium in the Top US markets.
  - LCCs yield index is always below 1 with a very stable pattern
- All six legacy carriers generate higher yields than their competitors in their own hub markets but lower than average in the non-hub markets.
  - AA's yield premium is constantly decreasing since 2000 both in hub and non-hub markets.
  - CO is very strong in its EWR hub while the yield index in its non-hub markets is rising. Losing pricing power in IAH hub.
  - NW's yield index is very low in non-hub markets but is improving since 2002.
  - US's yield index has been improving since 2003 in all of its hub and non-hub markets.

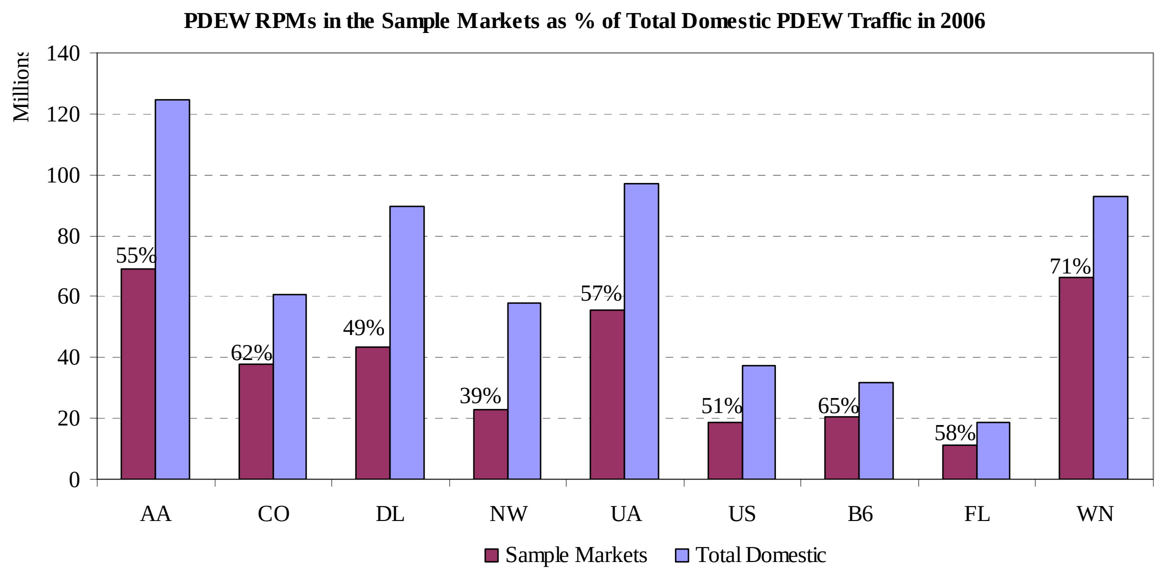
# Deleted Slides

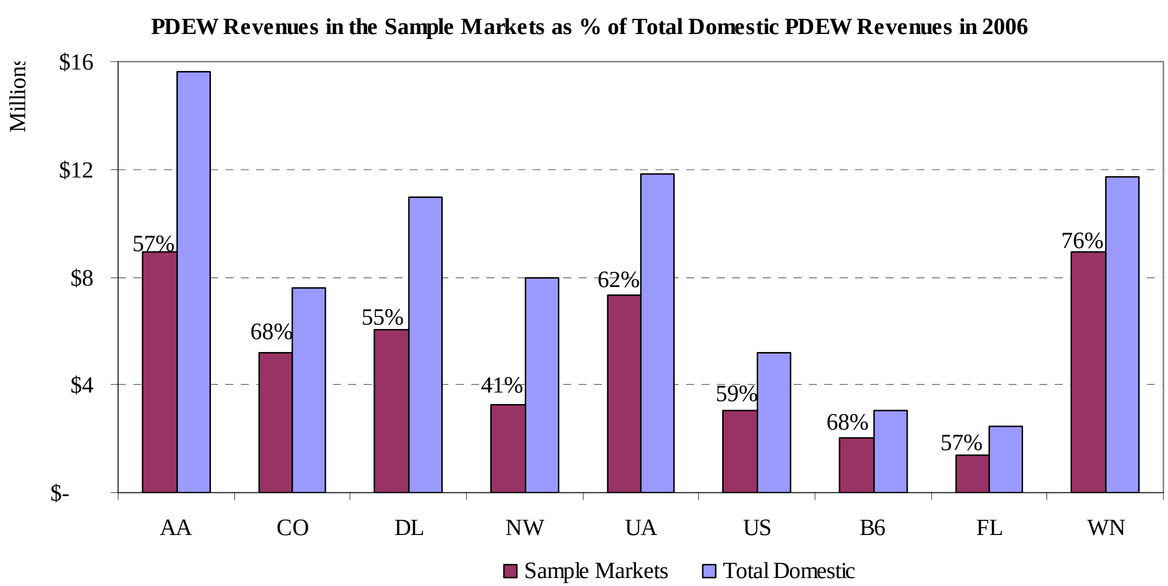
# Objectives 2

- Perform a disaggregate analysis of US Domestic markets from years 2000 to 2005 in order to:
  - Identify differences in yield premium, revenues, traffic and market share for each carrier for different market segmentations:
    - Markets with and without significant LCC presence.
    - Short, medium, long haul markets.
    - Hub vs non-hub markets.

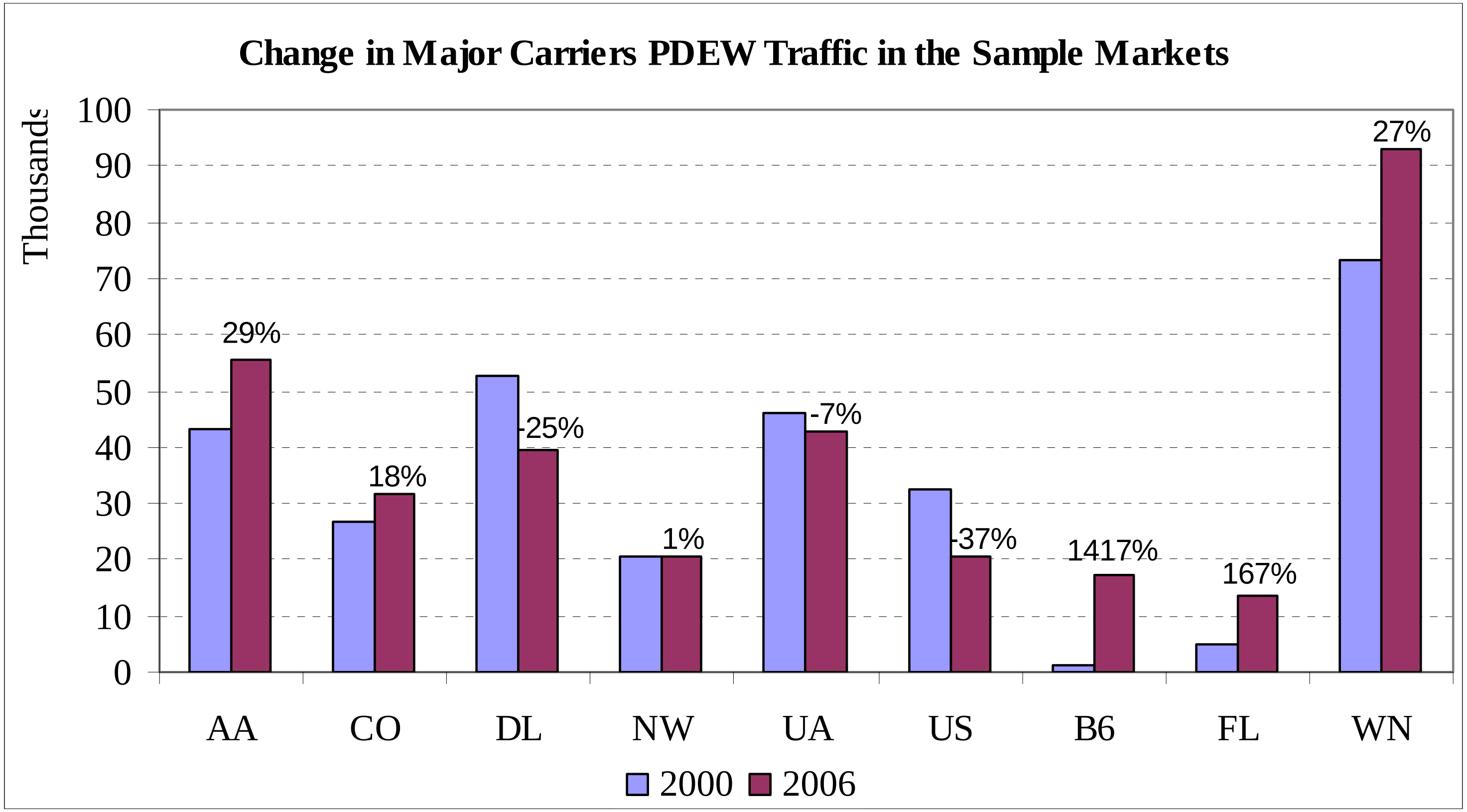
# Sample Size

- 856 markets out of the Top 1000 Markets appeared every year from 2000 to 2005. These 856 markets constitute the market sample analyzed.
- RPMs in Sample markets for major airlines range from 39 to 71% of the total domestic.
- Revenues' range is higher.

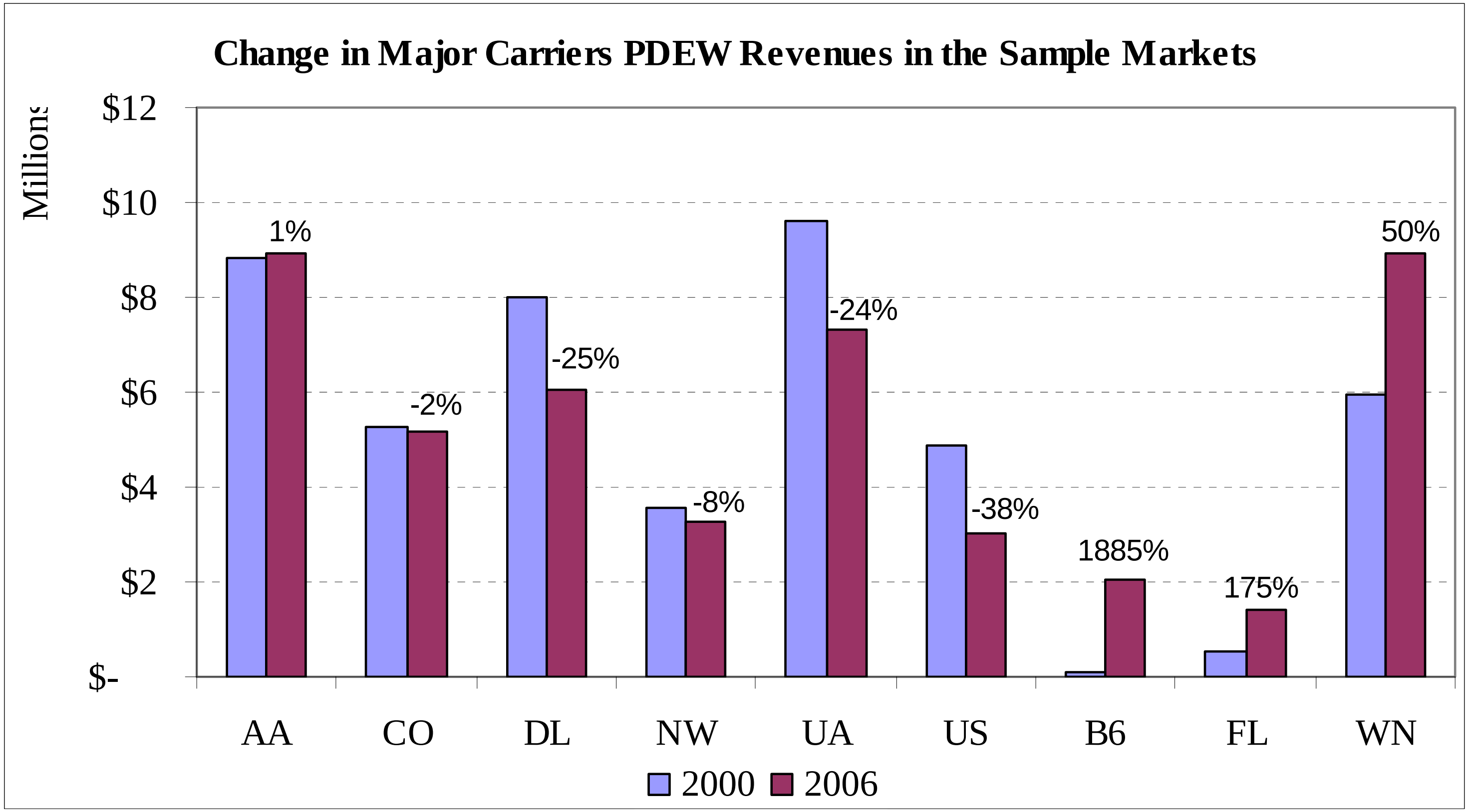


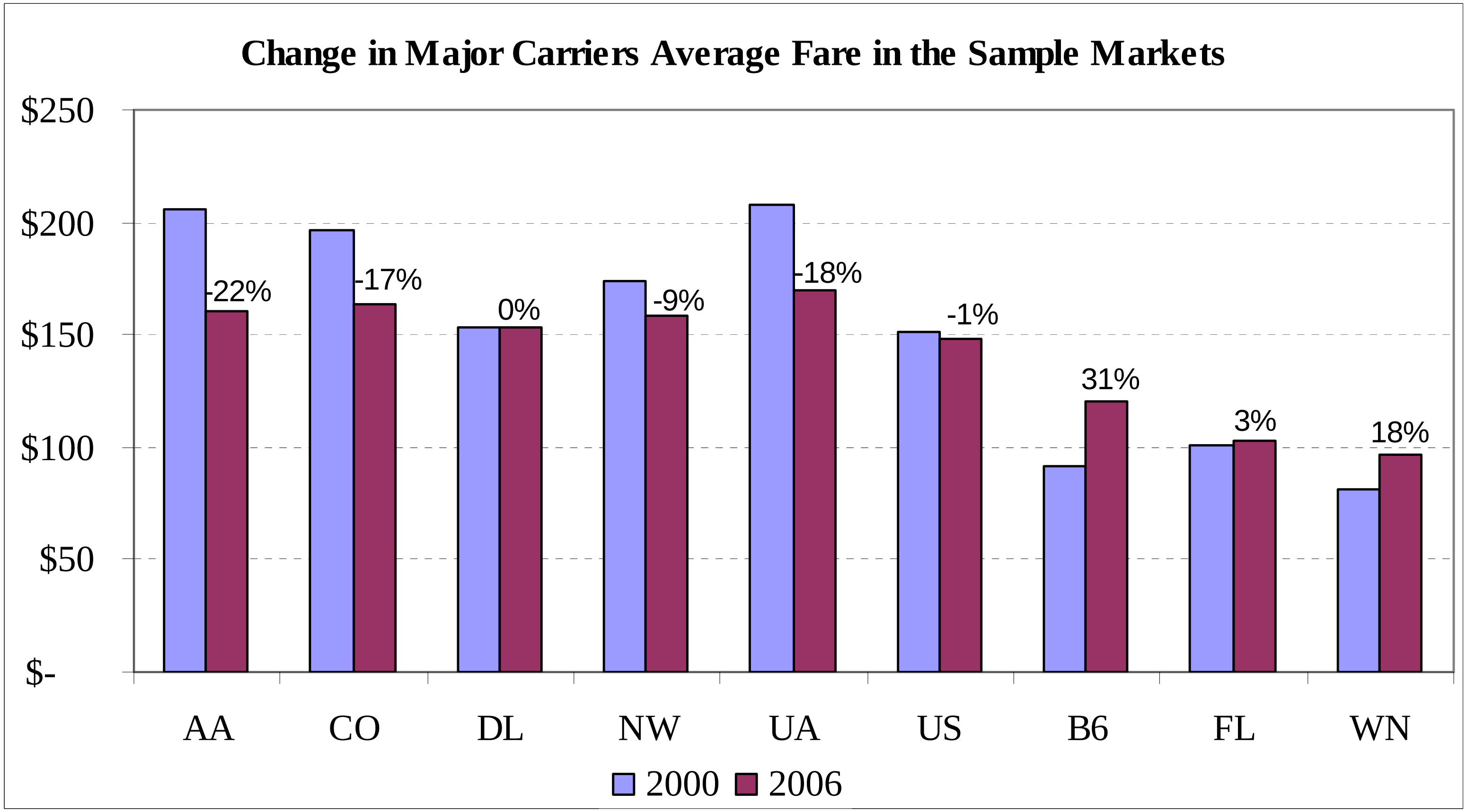
# Initial Analysis Per Carrier: Traffic



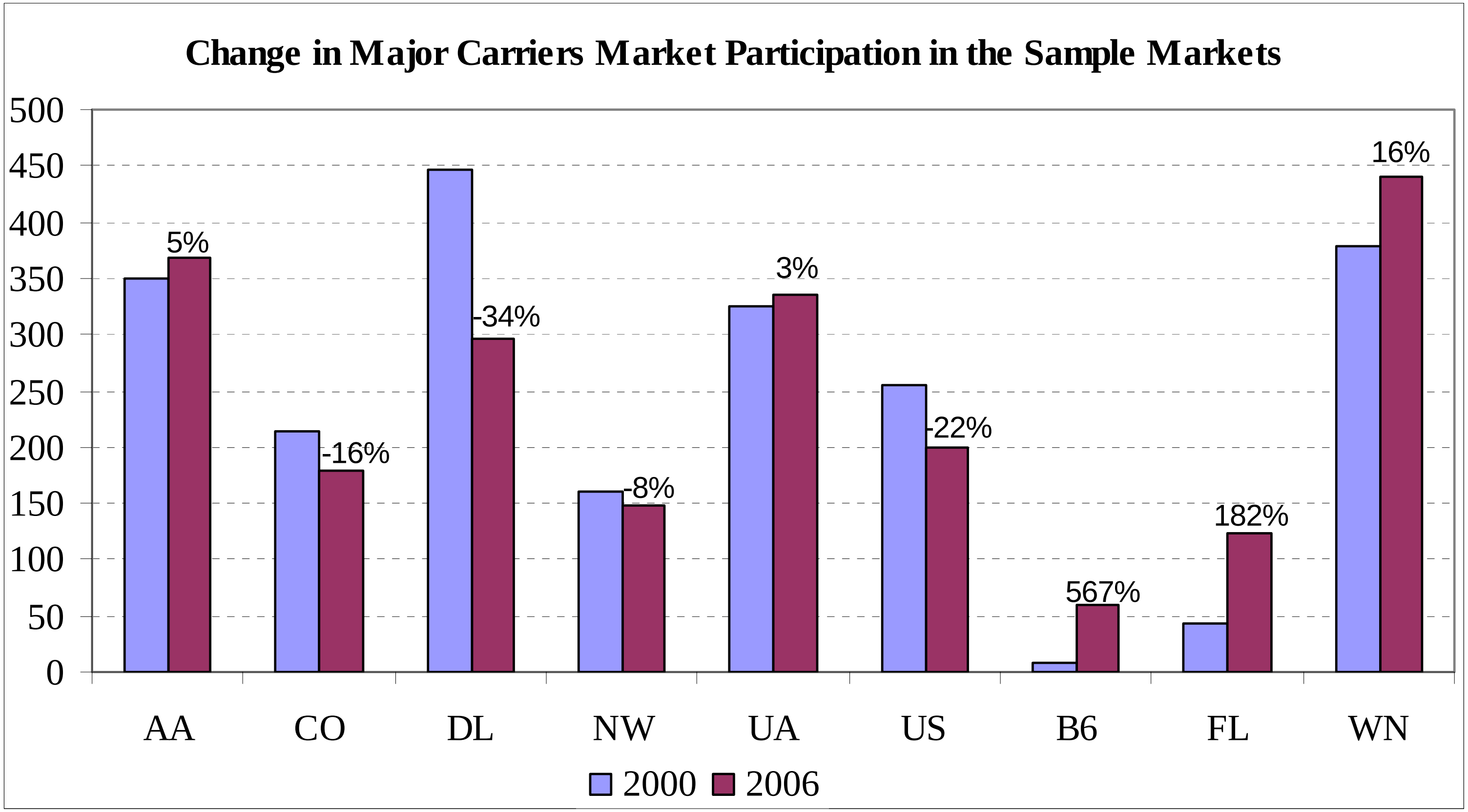
# Initial Analysis Per Carrier: Revenues



# Initial Analysis Per Carrier: Average Fare



# Per Carrier Initial Analysis: Market Participation



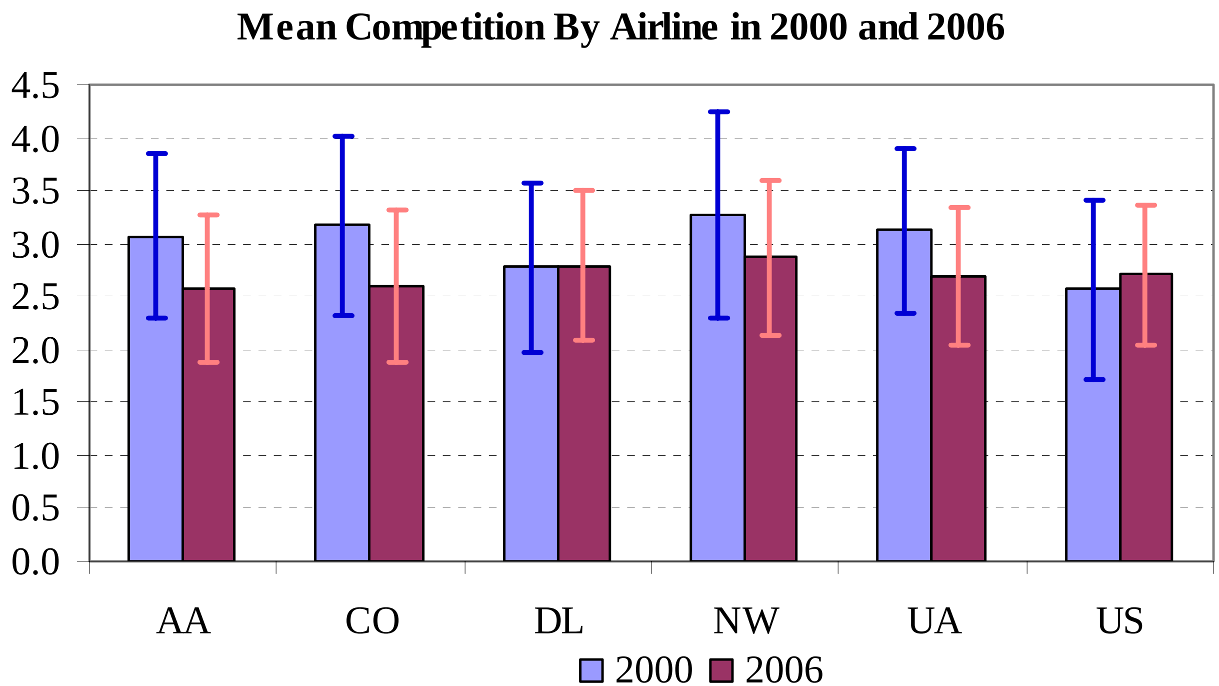
# Effective Competition per Carrier

- With how many carriers (LCC and Legacy) on average does each of the legacy carriers compete across the Top 856 Markets.
- Mean competition decreased during the period 2000-06.

| | AA | | CO | | DL | | NW | | UA | | US | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| 2000 | 3.071 | 1.567 | 3.172 | 1.697 | 2.774 | 1.584 | 3.269 | 1.951 | 3.123 | 1.558 | 2.569 | 1.694 |
| 2001 | 3.052 | 1.461 | 3.174 | 1.579 | 2.851 | 1.532 | 3.313 | 1.850 | 3.092 | 1.469 | 2.658 | 1.610 |
| 2002 | 2.874 | 1.351 | 2.951 | 1.507 | 2.733 | 1.426 | 3.271 | 1.714 | 3.039 | 1.359 | 2.618 | 1.446 |
| 2003 | 2.778 | 1.344 | 2.862 | 1.508 | 2.702 | 1.389 | 3.126 | 1.546 | 2.900 | 1.327 | 2.603 | 1.400 |
| 2004 | 2.764 | 1.387 | 2.802 | 1.491 | 2.648 | 1.446 | 3.027 | 1.592 | 2.856 | 1.325 | 2.663 | 1.334 |
| 2005 | 2.578 | 1.412 | 2.753 | 1.542 | 2.673 | 1.490 | 2.709 | 1.659 | 2.756 | 1.332 | 2.454 | 1.329 |
| 2006 | 2.568 | 1.383 | 2.594 | 1.429 | 2.787 | 1.421 | 2.872 | 1.463 | 2.682 | 1.303 | 2.705 | 1.325 |

# Competition per Carrier

- Average Competition Drops from 2000 to 2006
- Competition more concentrated around the average for 2006 (smaller error bars)
- Largest drop for CO by 2006
- US faces the smallest competition in 2000 but is the only airline which faces higher competition in 2006

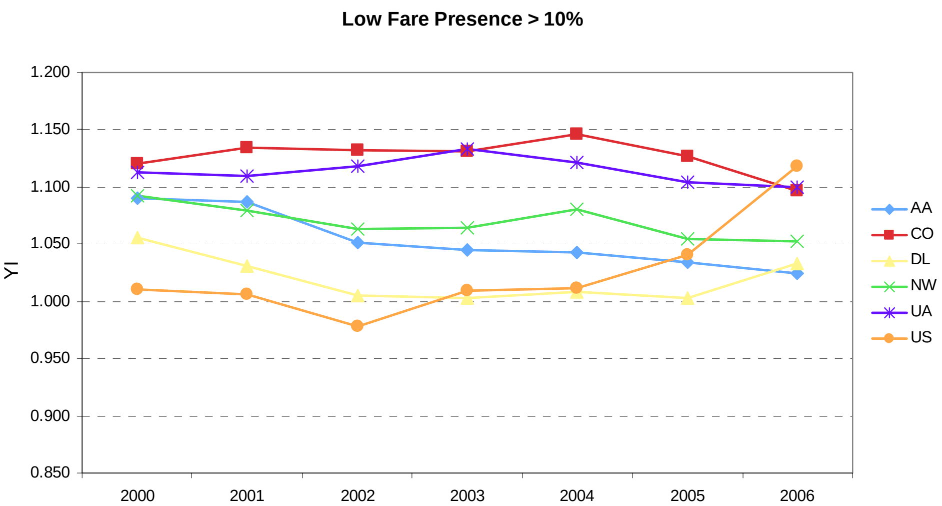


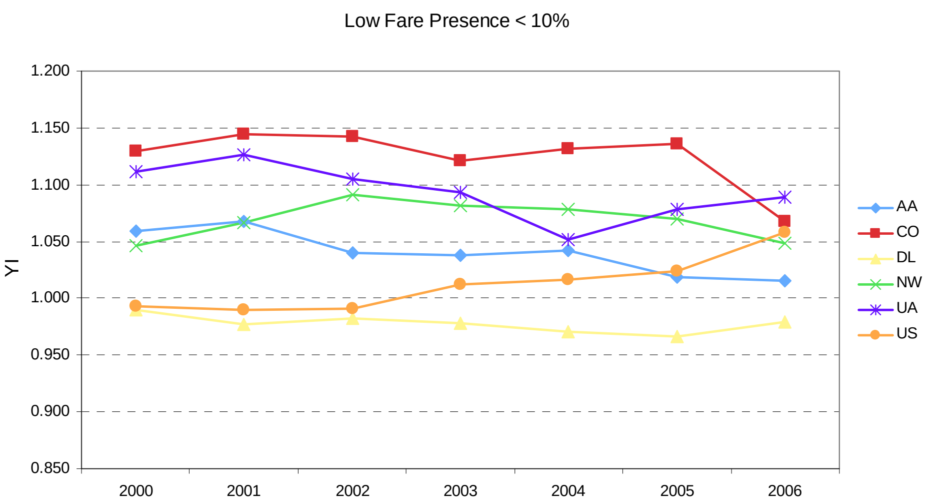
# Further Analysis

- The Yield Index for all carriers was determined for the following segments of the top 856 O-D markets:
- Avg Haul Segmentation
  - Avg market haul < 500 miles
  - 500 miles < Avg market haul < 1500 miles
  - Avg market haul > 1500 miles.
- LCC presence
  - Markets with LCC market share above 10%
  - Markets with LCC market share below 10%
- Hub Analysis
  - Yield Index of legacy carriers at markets originating from their hubs

# Low fare presence analysis

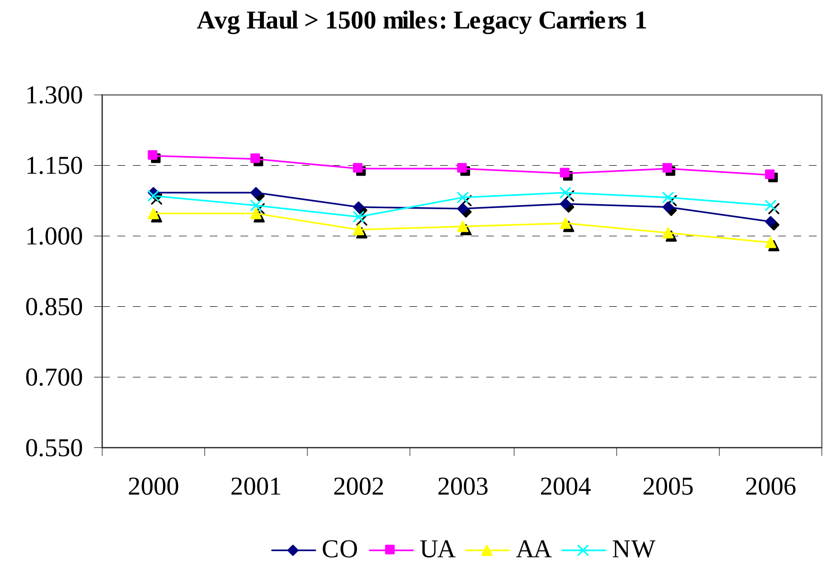
- Markets segmented in terms of the market share of low fare carriers in two categories:
  - LCC market share above 10%
  - LCC market share below 10%

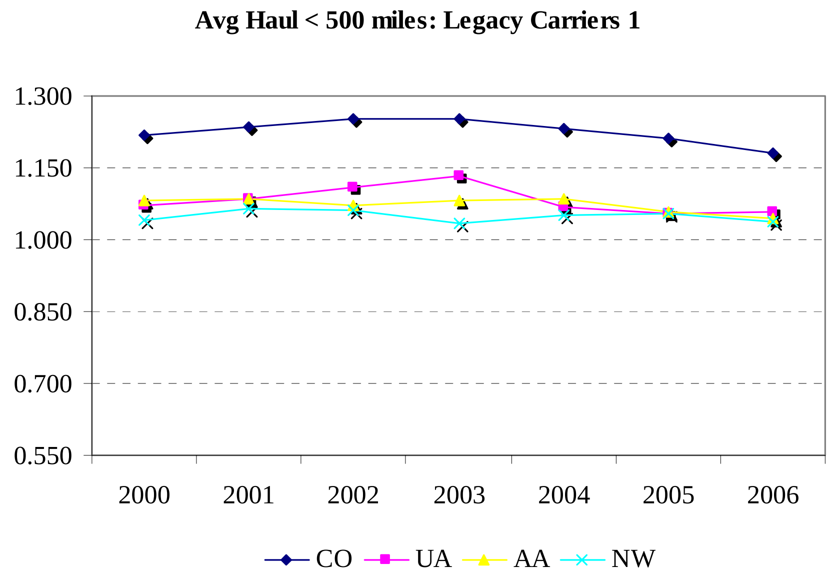


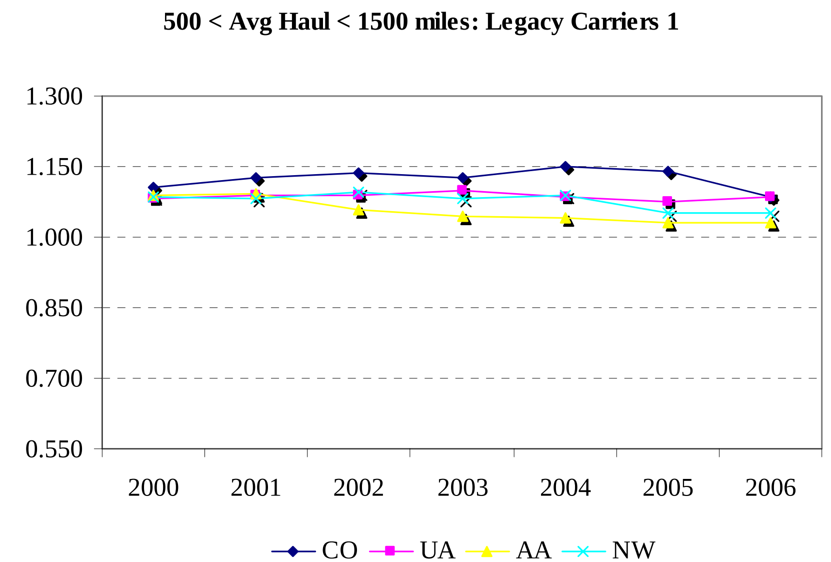



# Average Haul Segmentation 1

- Avg Haul segmentation for CO, UA, AA, NW

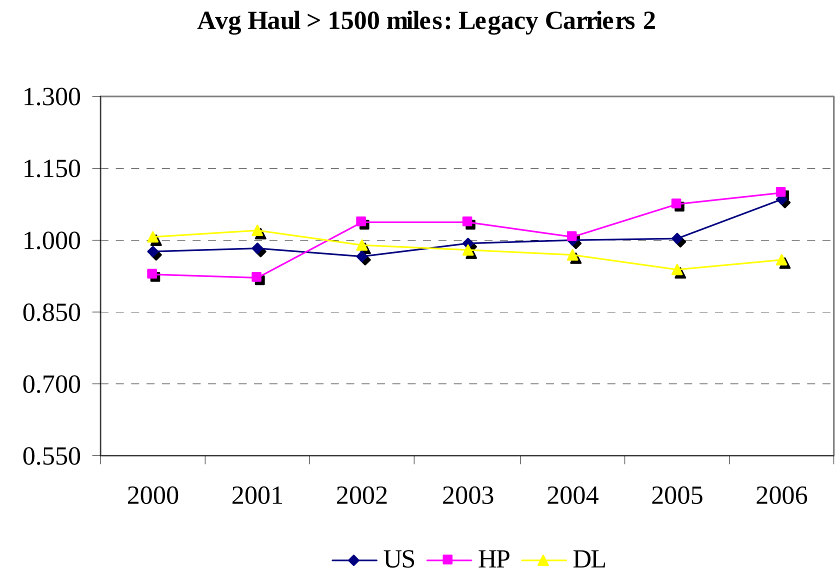


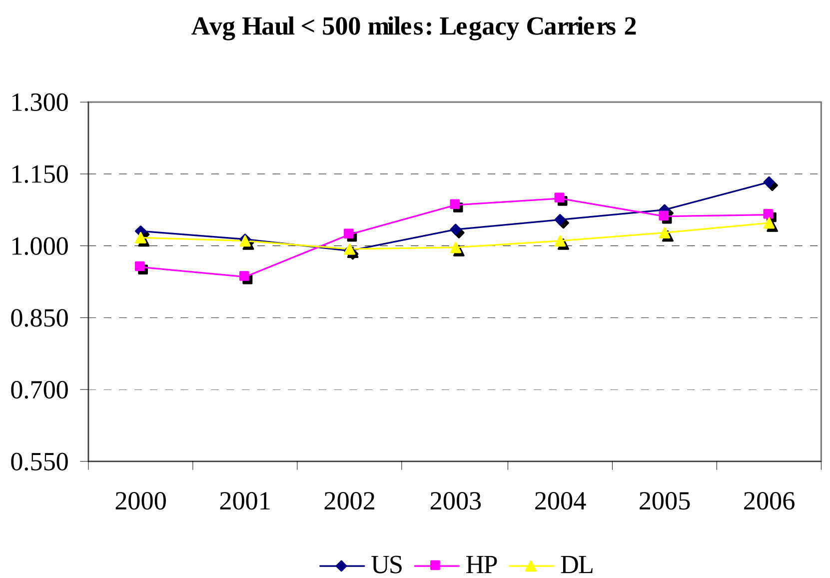



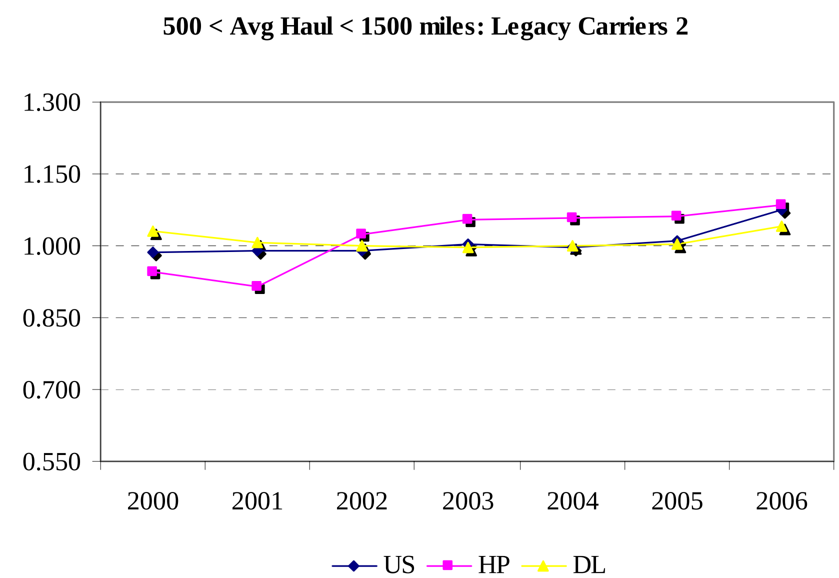



# Average Haul Segmentation 2

- Avg haul segmentation for US, DL, HP



# Average Haul Segmentation 3

- Avg Haul segmentation WN, B6, FL