



# **Managing Airline Arrival Variability Through Scheduled Block Times**

**Capacity And Delay – Pat Oldfield (United Airlines)**

**Nextor – National Airspace System Performance Workshop  
April 13 – 16, 2009      Asilomar Conference Center, Pacific Grove, CA**

## **Overview Of Discussion:**



- Importance Of NextGen To The Airline Industry
- Current State Of Capacity And Delays – United’s Perspective
- How Scheduled Block Time Is Currently Used At United
- Changes In Actual Block Performance (2002/03 To 2009)
- Why Every Minute Is Critical In On-Time Performance
- Moving Towards NextGen

# **The Obama Administration Has Pledged To Make The U.S. A Leader On Climate Change By Reducing Greenhouse Gas Emissions 80% By 2050 ...**

**NEXTGEN Air Traffic Management Systems Will Be A Key Component In Reducing Emissions**

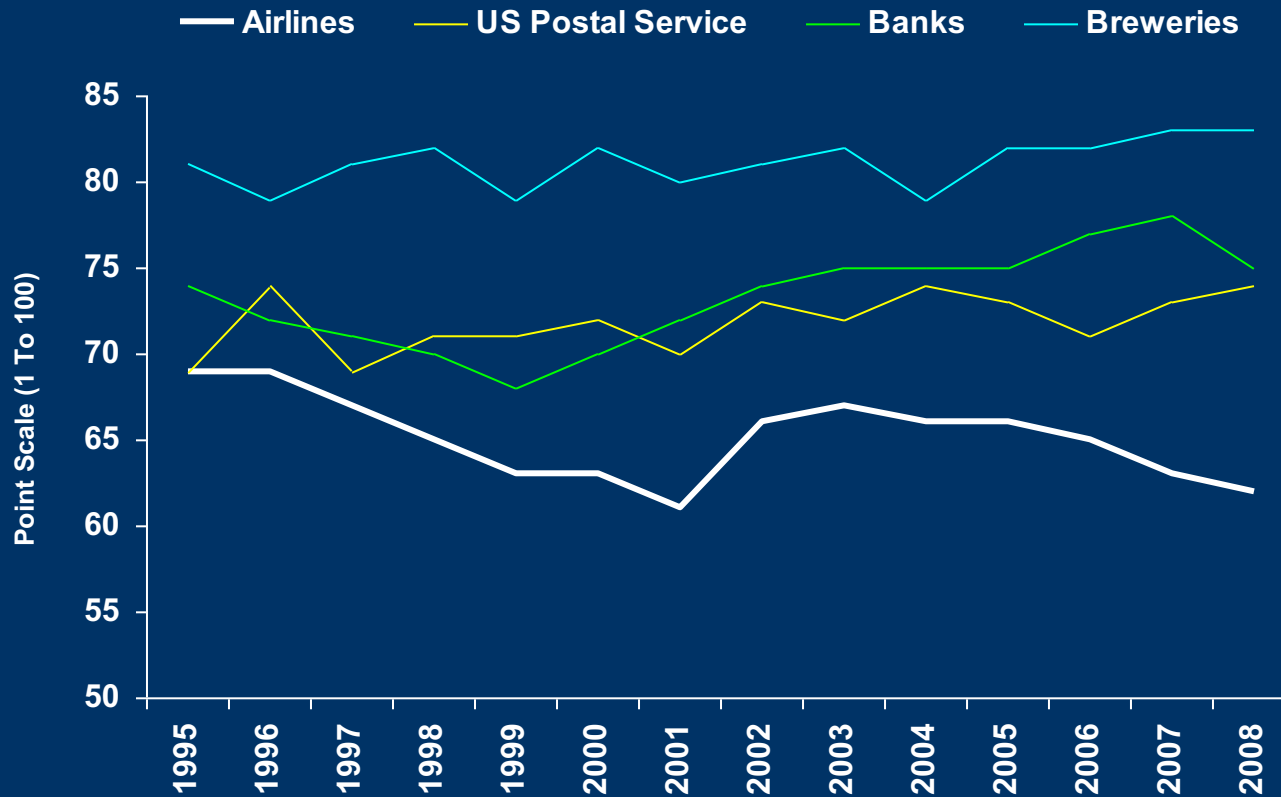


**“Every 1% Efficiency Gain In Air Traffic Management Saves Up To 500,000 Tons Of Fuel Per Year In Europe Alone.”**

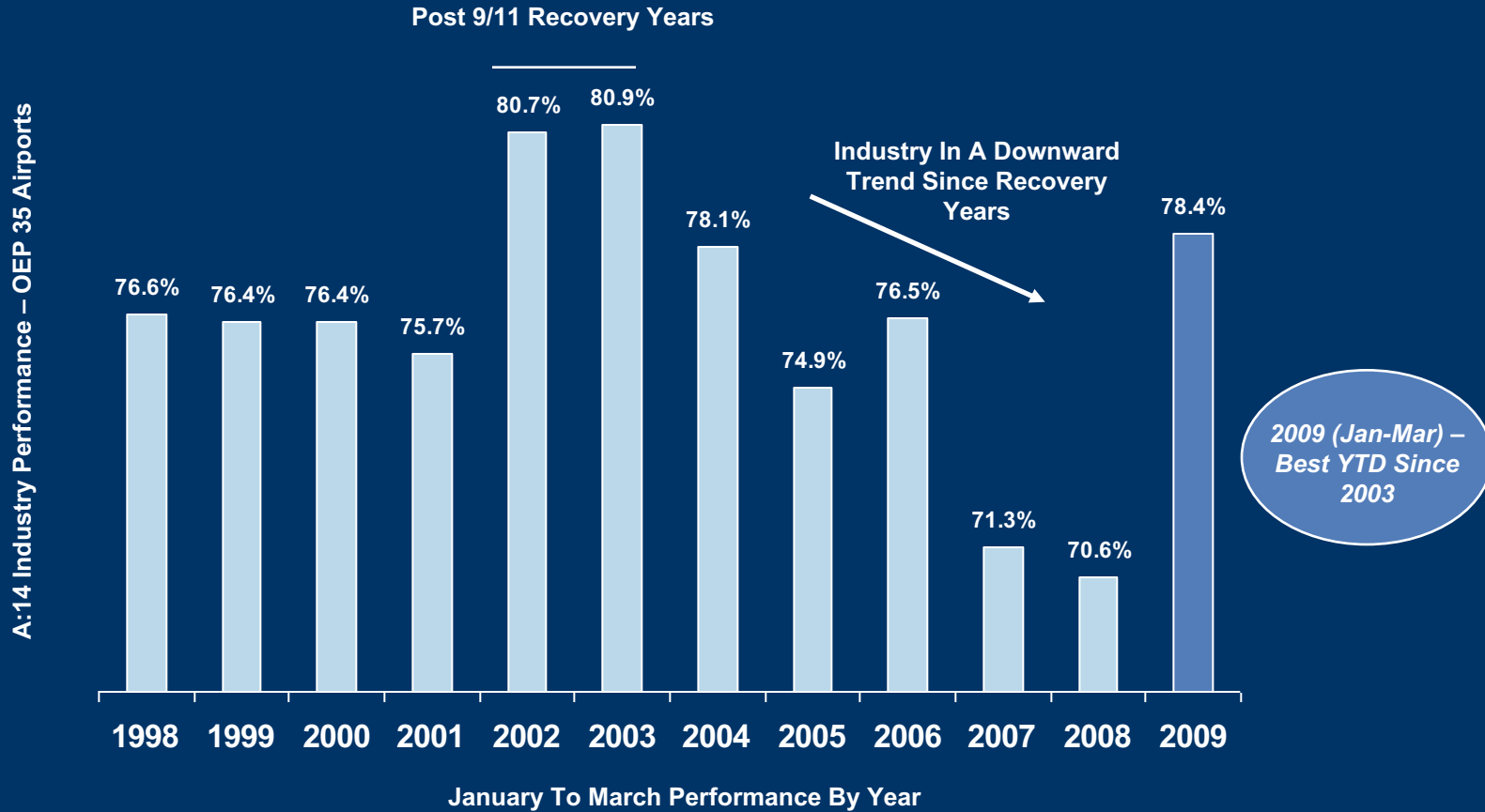
**Air Transport Action Group (ATAG)**

# **Current State Of Capacity And Delays – United's Perspective**

# According To The University of Michigan/American Consumer Satisfaction Index, The Airline Industry Is Consistently Rated Lower Than Other Industries ... And The Trend Is Growing



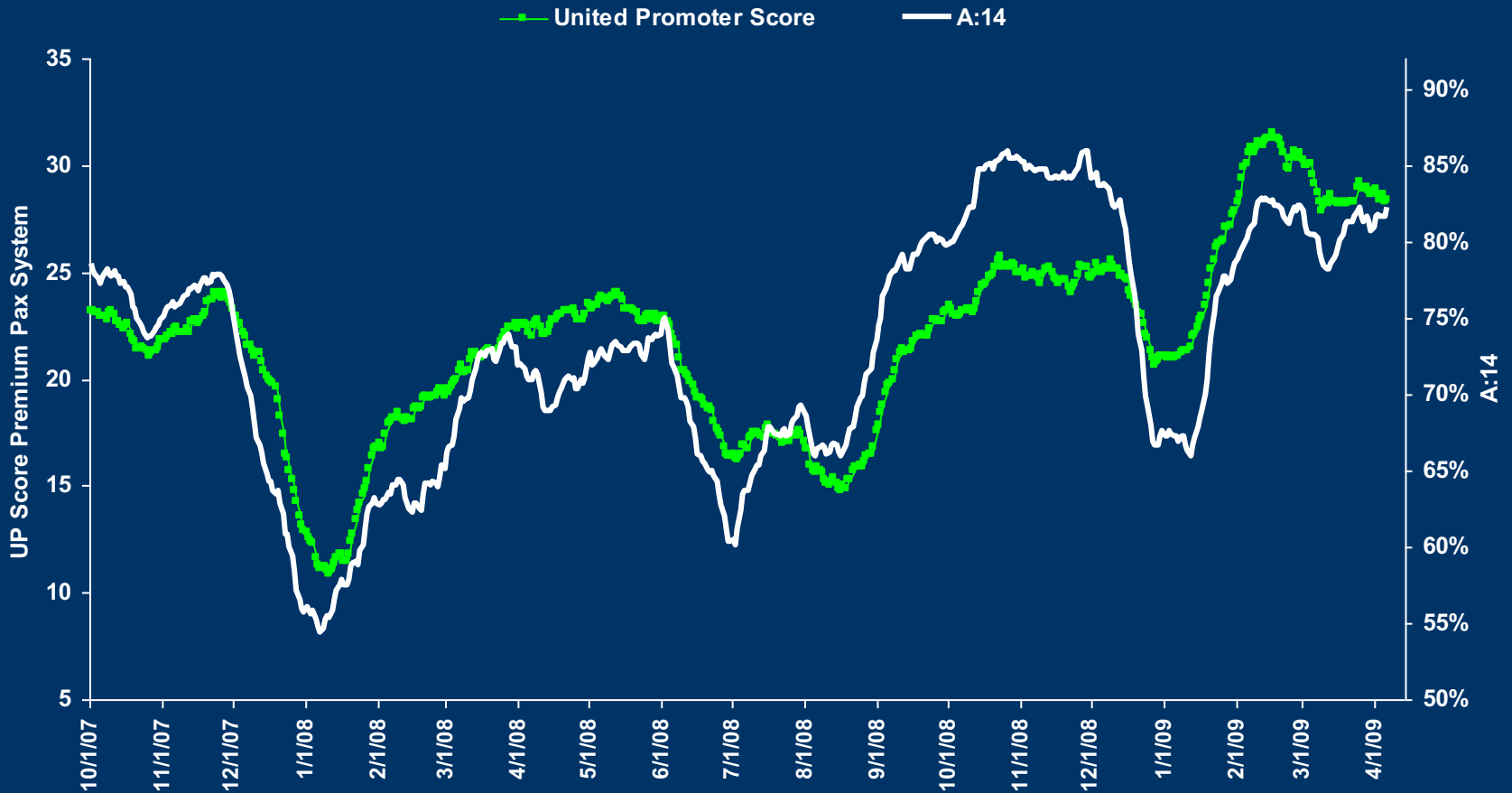
# A Reason For The Low Consumer Ratings Is On-Time Performance. The Airline Industry Has Seen Declining Performance Since 2003, But Is Recently Showing Improvement



SOURCE: ASPM

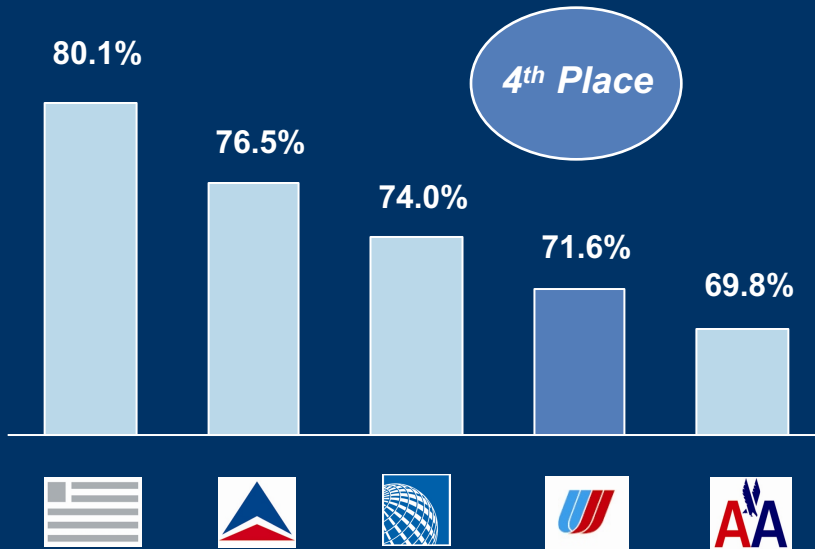
# As Measured By United's Internal Customer Satisfaction Numbers, Satisfied Customers Are Strongly Correlated With On-Time Performance

United System UP Score (Dom/Int) and Arrival :14 Trends  
(30 Day Moving Average; Oct 2007 – Apr 6, 2009)

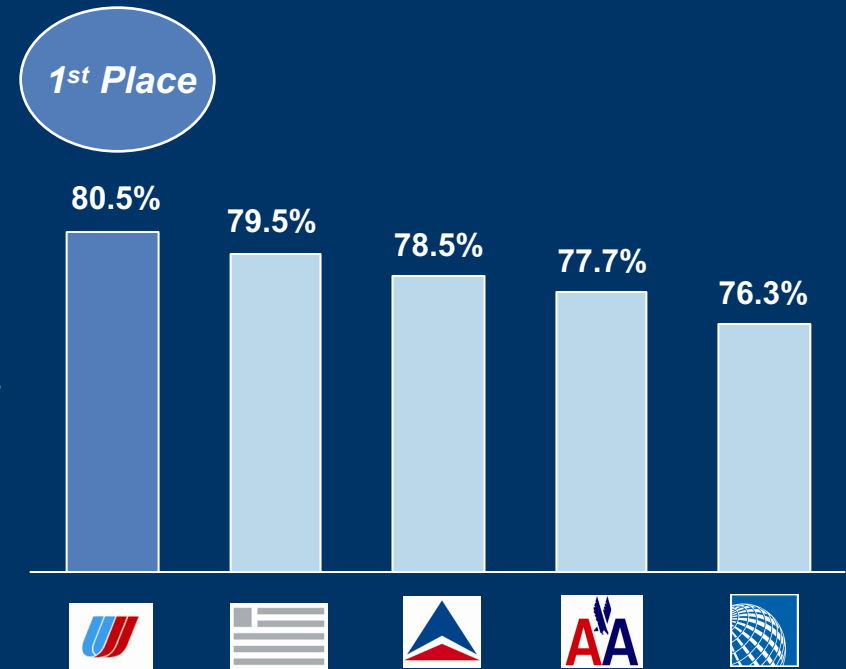


# United's A:14 Performance Last Year Was Near The Bottom Of The Major Carriers, But 2009 YTD Has Shown A Year Over Year Improvement

**Full Year 2008  
On-Time Arrival Performance  
DOT: Arrival 14**



**First Three Months 2009  
On-Time Arrival Performance  
DOT: Arrival 14 (DOT/Flightstats)**





# Since Last Year, Several Investments Have Been Made Both Internally And Externally To Improve Reliability While Maintaining Revenue

## Structural



- Increased Scheduled Ground Time
- Increased Scheduled Block Time
- Additional Gate Rest
- Increased Spare Aircraft

## Execution



- Improve Fleet Reliability
- Reduce Aircraft Ground Damages
- Reduce Short Delays (1 – 15 Minutes)
- Improve STAR on-time 00
- Reduce Crew Delays/Cancel
- Better Schedule Management with Expanded Operations Control Center

## Air Traffic/Airport Congestion



- Reduction In Flights
- O'Hare New Runway

# During The Past Eight Years, U.S. Airlines Have Been Impacted By Terrorist Attacks, SARS, Record Fuel Prices, Bankruptcies And Recessions ... All Impacting The Appropriate Level Of Airline Capacity

## U.S. Airline's Industry Daily Departures – Annual Averages

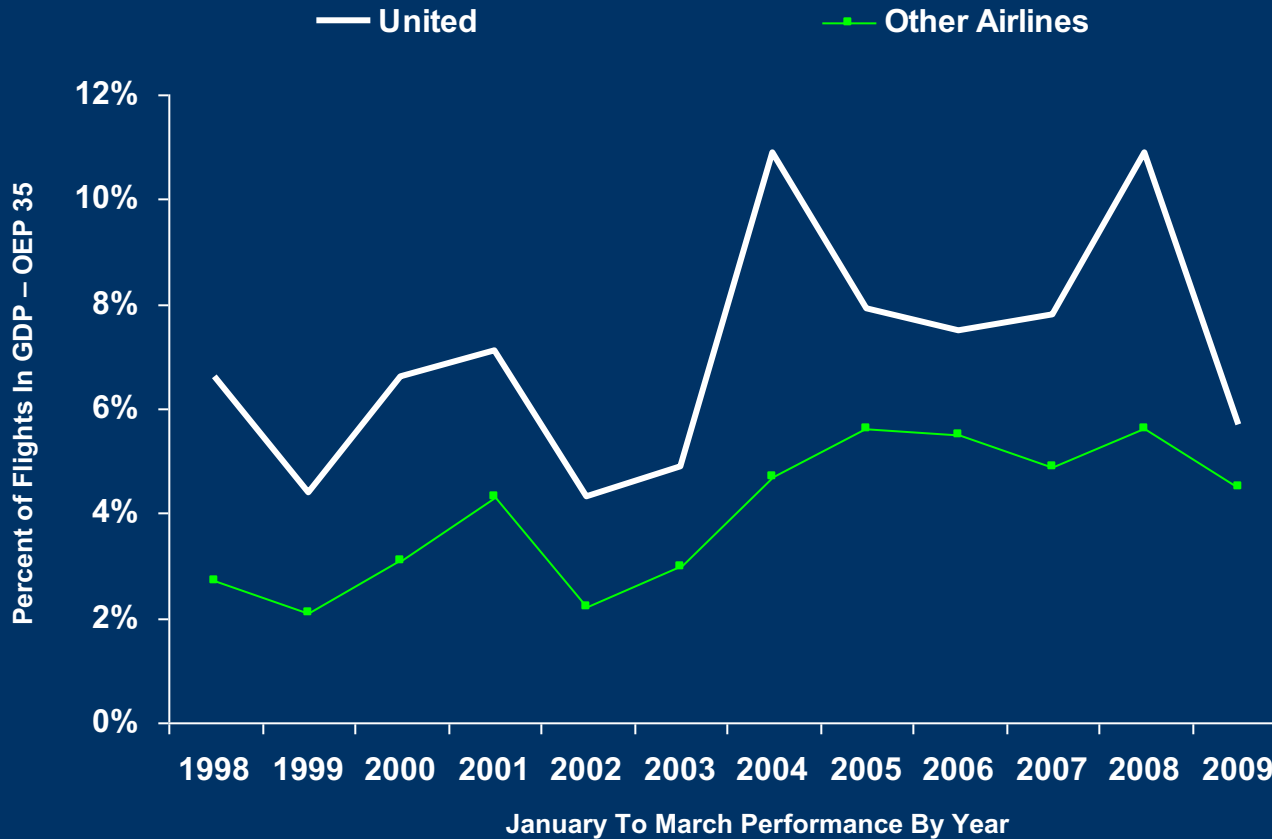


*Over The Past 8 Years, U.S. Airline Daily Departures Have Decreased To Early 1990's Levels*

SOURCE: OAG

NOTE: Industry departures are based on carriers with at least 100 scheduled domestic departures per day during January, 2003. Also includes Virgin America.

# The Reduction In Departures Has Resulted In A Decreased Need For Ground Delay Programs (GDP). United And The Overall Industry Have Seen A Decline In 2009 Of Flights Impacted By GDP's.



## 2009 Factors To Consider:

- Fewer Departures, But Peaked Arrival And Departure Banks Remain
- New O'Hare Runway
- Weather Has Been A Positive For UA In 2009. At UA Hubs, Moderate To Severe Weather Has Been The 2<sup>nd</sup> Lowest Jan-Mar Period In Recent History
- United – More Flights In A GDP Than During 2002 & 2003
- Other Airlines – More Flights In A GDP Than All Years Prior To 2004

SOURCE: ASPM

# **How Scheduled Block Time Is Currently Used At United**

# Scheduled Block Time Is Critical For The Reliable Operation Of An On-Time Airline, But Can Be Costly If Set Too High Or Too Low

- Block time is the time from gate departure (brake release) to gate arrival (brake set). It is composed of:
  - Taxi-out time
  - Flight time
  - Taxi-in time



## Scheduled block time is too low

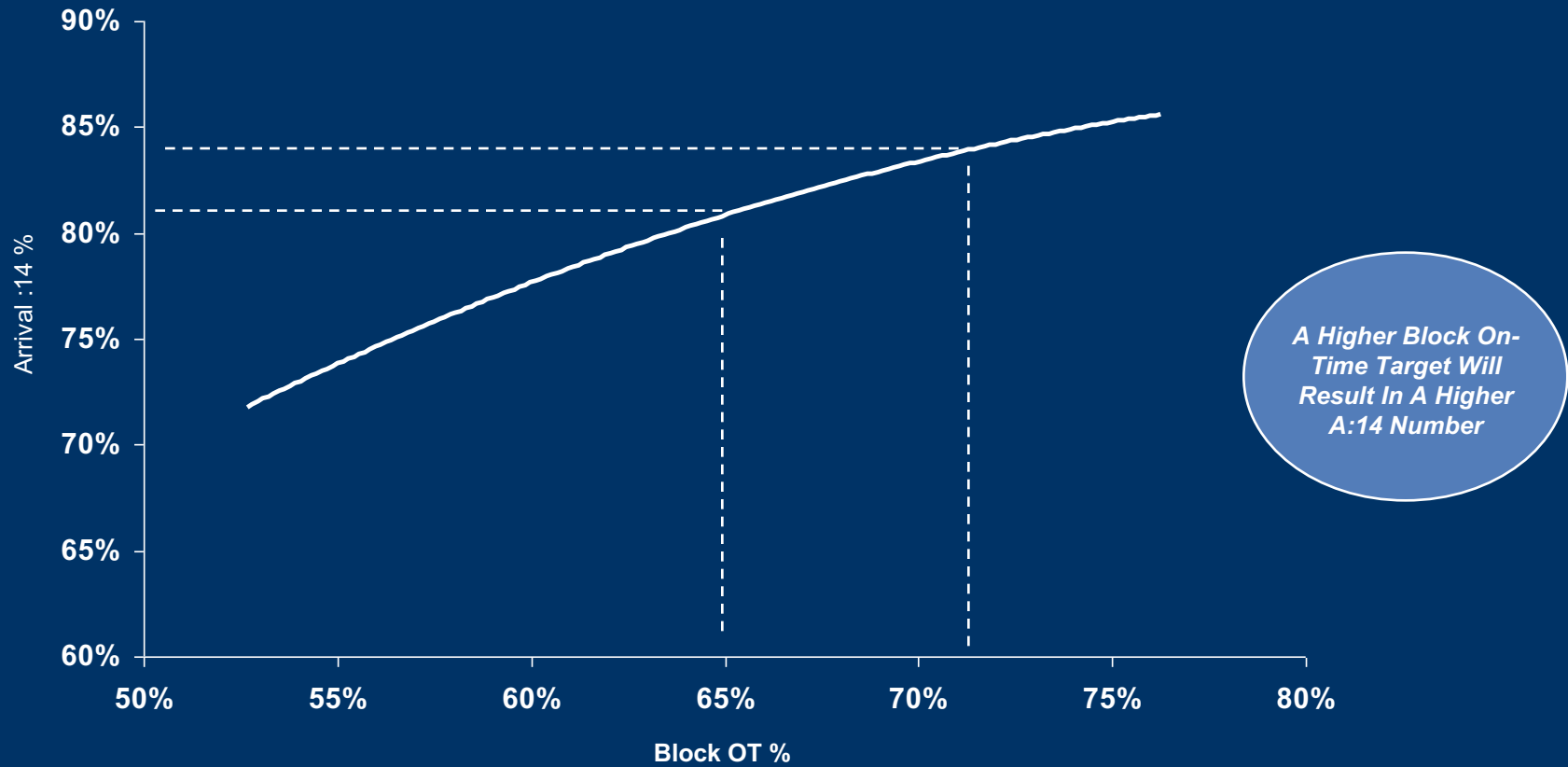
- Too few flight crews
- Poor utilization of ground crews
- Poor performance
- Disruption of schedule
- Use of extra fuel



## Scheduled block time is too high

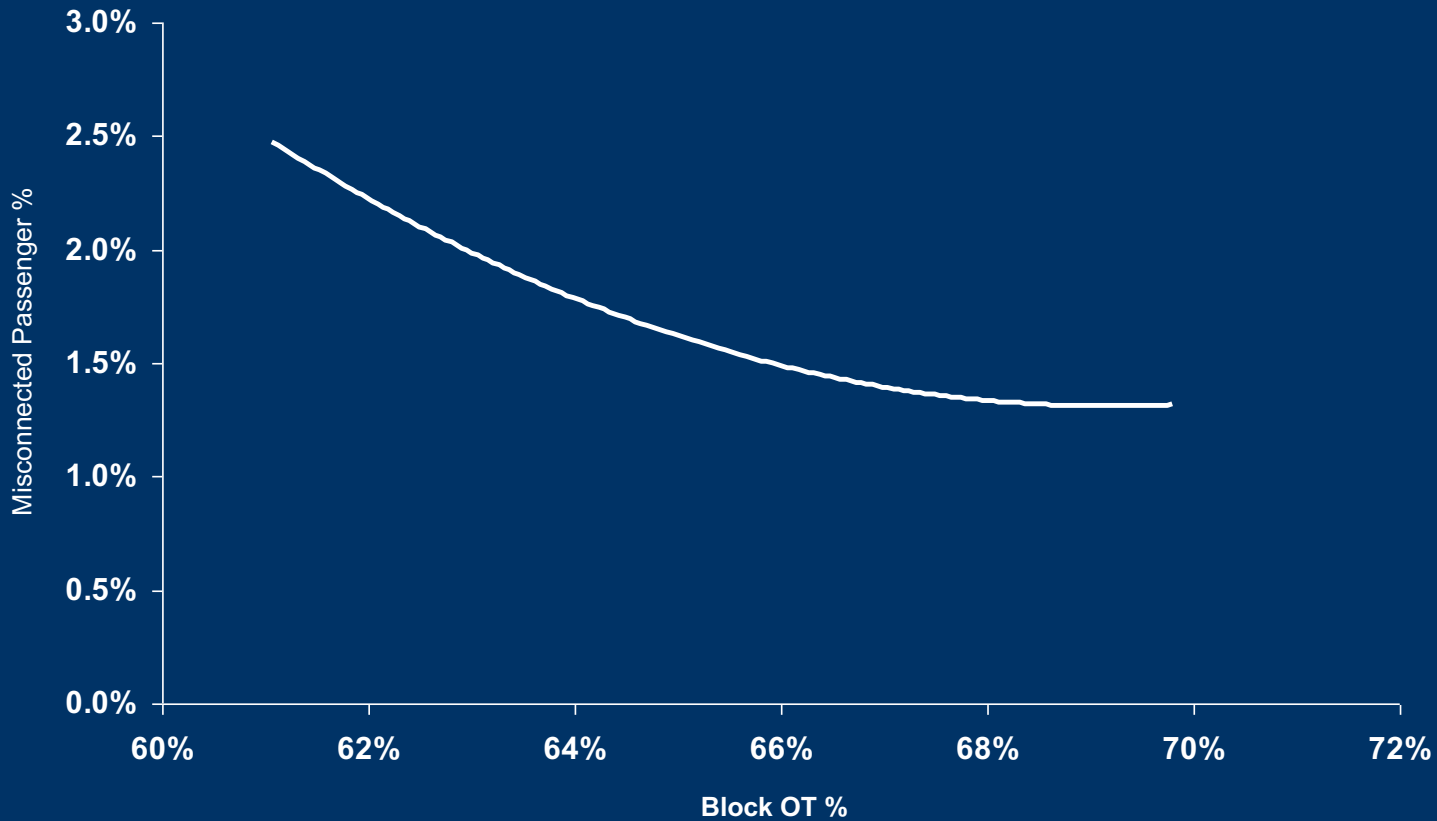
- Poor utilization of crews
- Poor utilization of ground crews
- Improved Performance Poor utilization of aircraft
- Holding for gates

# Historically, United Has Targeted 65% Of Flights To Achieve The Scheduled Block To Block Time, But Has Recently Increased The Target To 72% To Improve A:14



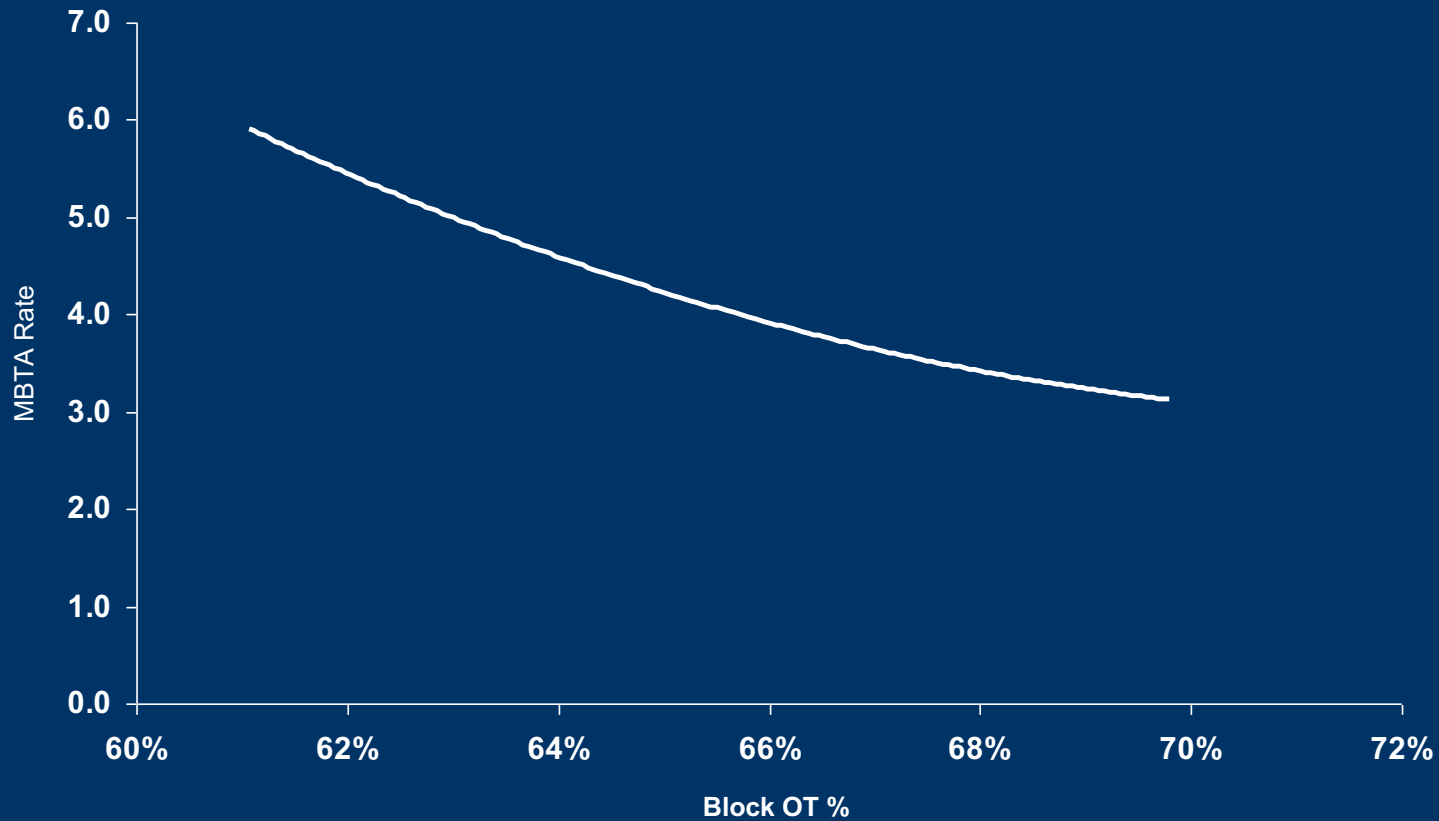
SOURCE: Internal United

# As A Result Of Increased Block Performance & Arrival 14, The Percent Of Misconnected Passengers Will Decrease ...



SOURCE: Internal United

## ... And The Bag Handling Numbers Will Also Improve



SOURCE: Internal United



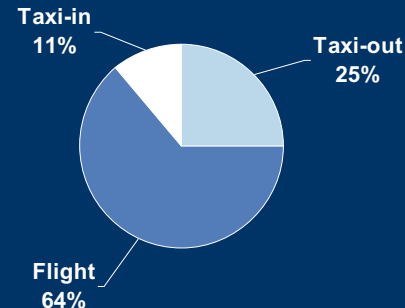
# **Changes In Actual Block Performance (2002/03 To 2009)**

# Comparing The Current Period With The Previous Period When Air Traffic Demand Decreased ...

- |   | 2002/2003<br>(Jan-Mar) |   | 2009<br>(Jan-Mar)  |
|---|------------------------|---|--|
| • The Block On-Time % Has Increased .....   | 67%                    | ➔ | 74%  |
| • <u>Scheduled Block Time</u> On Same City Pair,<br>Equipment Type And Time of Day .....  |                        |   | Increased By :08 Mins/Flt<br>(:02 To :03 For Increased Block Target %) |
| • <u>Actual 65% Block Time</u> On Same City Pair,<br>Equipment Type And Time of Day ..... |                        |   | Increased By :05 Mins/Flt  |

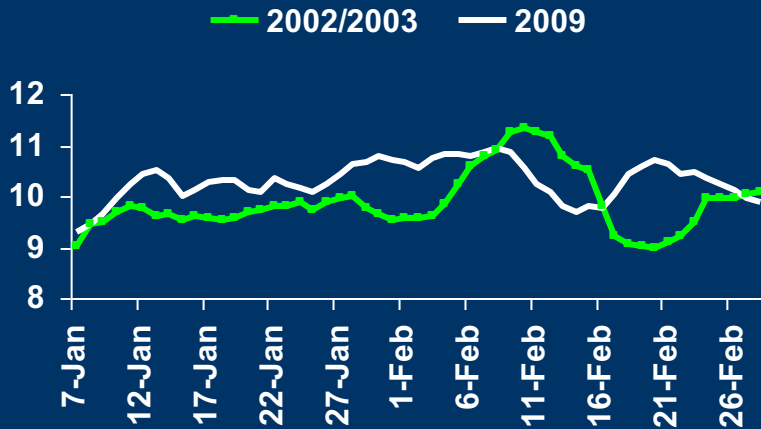


Flight Times Have Shown A Majority Of The Increase – Both East Bound And West Bound Are Impacted

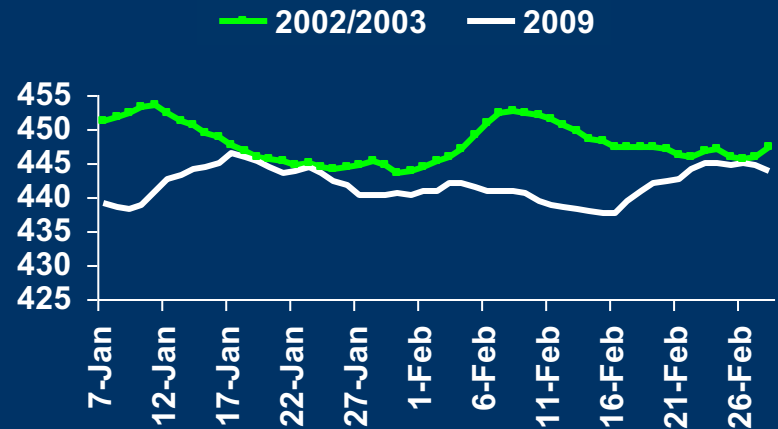


# Comparing Flight Time Statistics Between 2002/2003 & 2009, A Few Factors Effecting The Increase Are Additional Miles Flown And Reduced Speeds

**Average Excess Miles Flown  
Based On OEP 35 Airports**



**Average Speed  
Based On OEP 35 Airports**



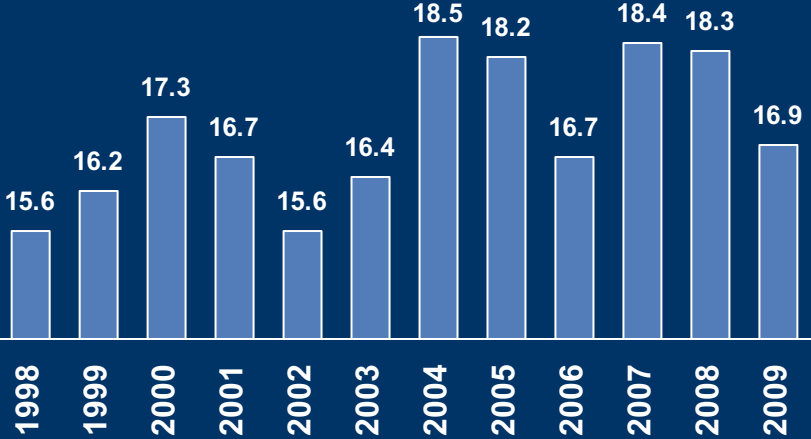
**Congestion Problem? Of The Flights With The Largest En-route Increases, Several Were Into LGA, ORD & IAD/DCA**

SOURCE: ASPM

NOTE: Average Excess Miles Flown is the average difference between the actual miles flown enroute minus the GCR distance enroute; Average Speed is the average of the nautical miles flown enroute divided by the flight time enroute.

# Taxi-out Times Have Improved In 2009, With United Averaging 1.4 Minutes Per Flight Improvement Compared To The Industry Average Of 0.8 Minutes Per Flight

**United's Average Taxi-out Times  
Based On OEP 35 Airports**



January To March Performance By Year

**Other Airline's Average Taxi-out Times  
Based On OEP 35 Airports**



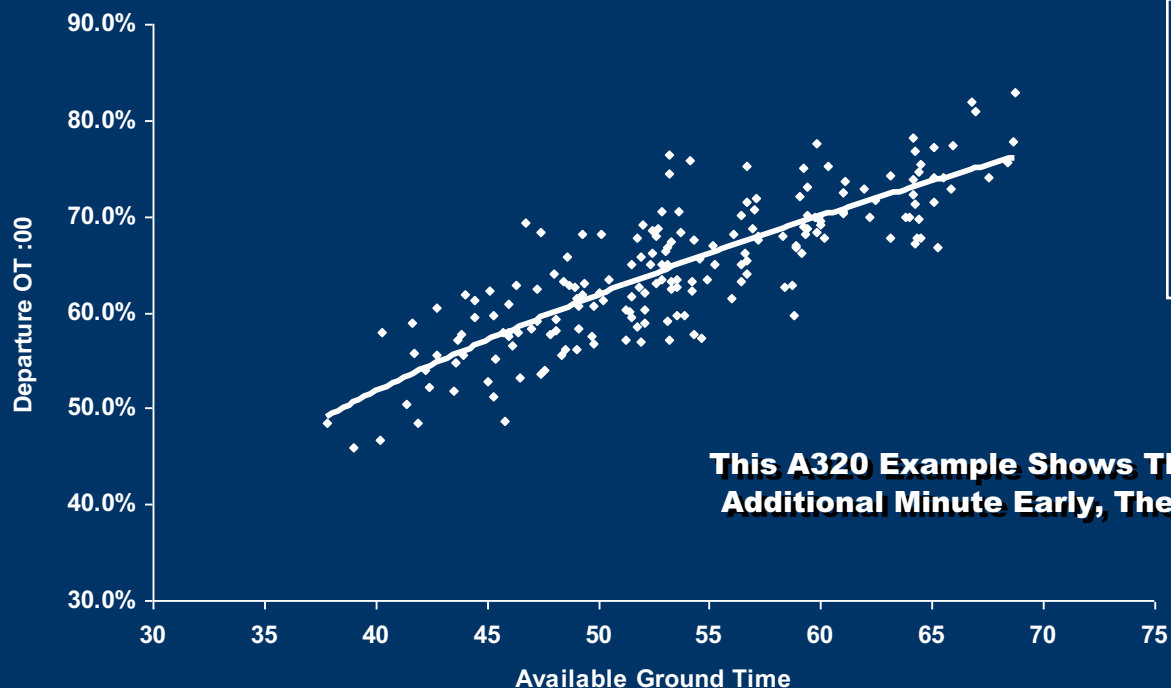
January To March Performance By Year

SOURCE: ASPM

# **Why Every Minute Is Critical In On-Time Performance**

# With The Addition Of Just 2 Or 3 Scheduled Block Time Minutes, It Is Possible To Visualize How Important These Minutes Are To The Reliability Of A Given Station By Increasing Available Ground Time

**When The Available Ground Time At A Station Increases, The Departure :00 Performance Will Also Increase**



**A Small Scheduled Block Time Add Will Help Offset Variability Associated With Winds, Taxi Congestion, Runway Configuration, Vectoring, Speed Restrictions, etc.**

**This A320 Example Shows That For Each Flight Which Arrives 1 Additional Minute Early, The D:00 Will Increase Almost 1 Point**

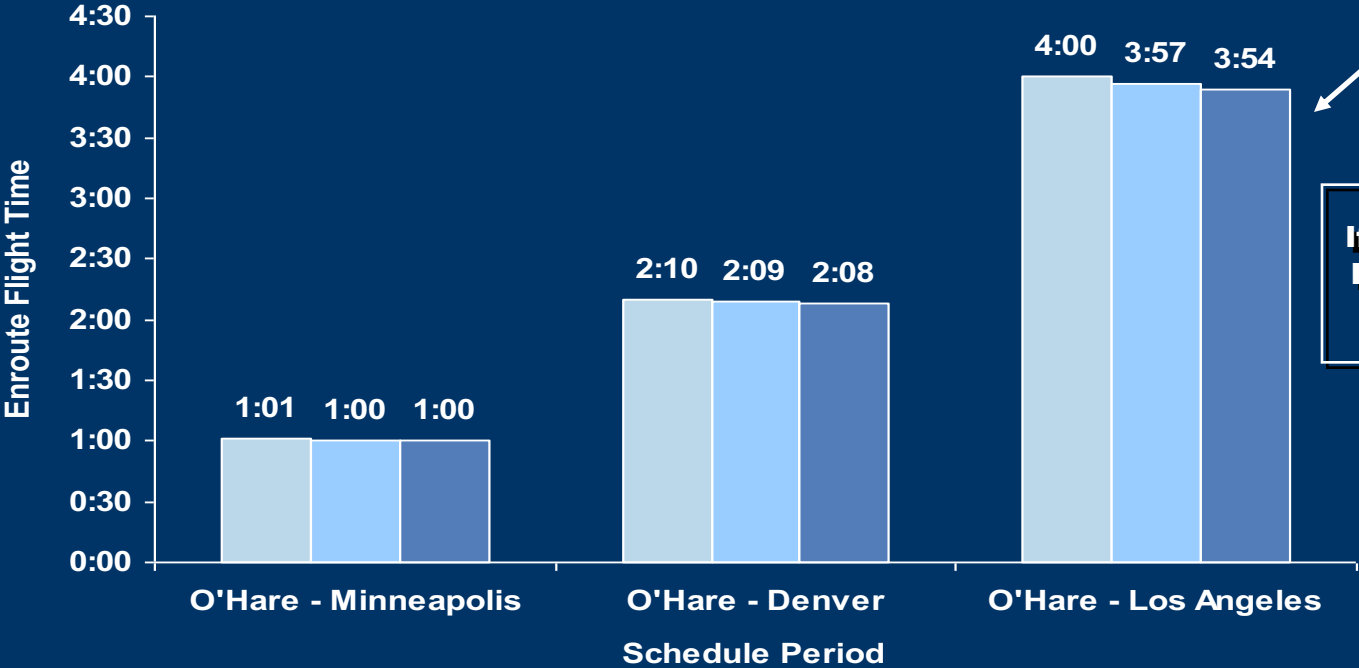
SOURCE: Internal United

NOTE: Based On A320 Flights Over The Past Two Years When STAR D:00 Between 80.0% - 84.9%

# Scheduled Block Time Is An Economical Method Compared To Flying Faster. Departing On-Time Is Critical Due To The Cost And Limited Potential Time Savings In Increased Speed

Impact On Flight Time By Changing The Cruise Mach Speed Based On A320 Fleet Type (Standard Altitude And Wind Component Used)

■ Cruise Mach 0.78   ■ Cruise Mach 0.79   ■ Cruise Mach 0.80



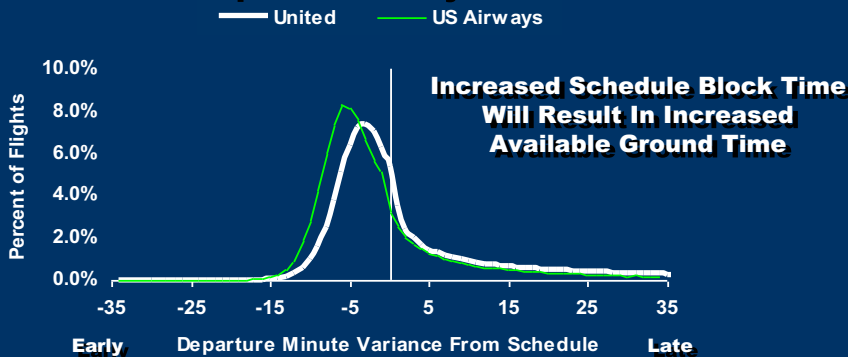
If The 9:00 AM ORD-LAX Flew At Mach 0.80 Each Day For A Year, \$87,000 In Fuel Would Be Burned

If Every Flight Flew Faster, Fuel Burn Would Increase By \$100M

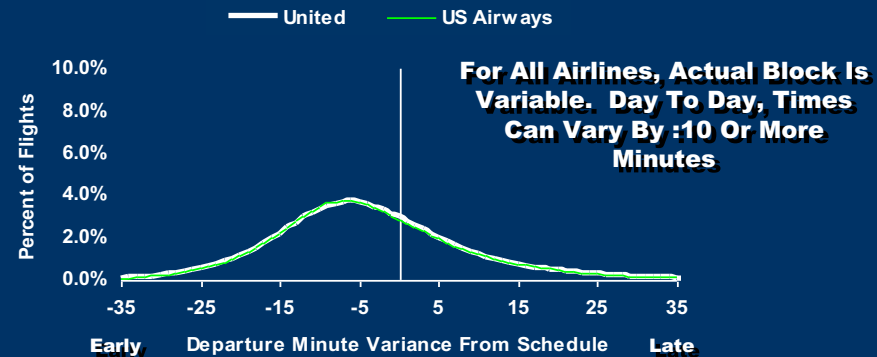
SOURCE: Internal United

# Comparing United To US Airways (#1 In A:14 During 2008), Actual Block Variability Is Similar, But The Largest Variation Is In Departure Performance

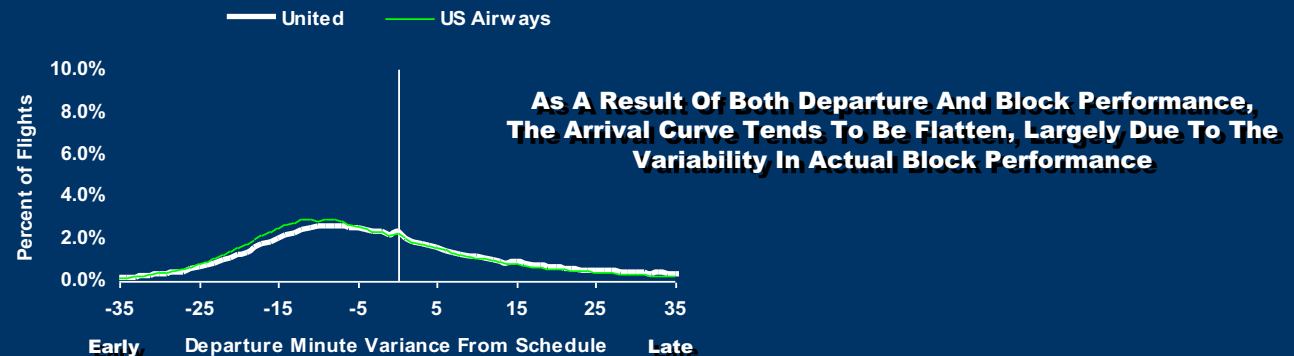
## US Airways Outperformed United In Departures Early & On-Time



## Actual Block Time Distribution Between The Two Carriers Is Similar



## The Advantage That US Airways Has In Departure Performance Is Reflected In The Arrival Distribution Curves

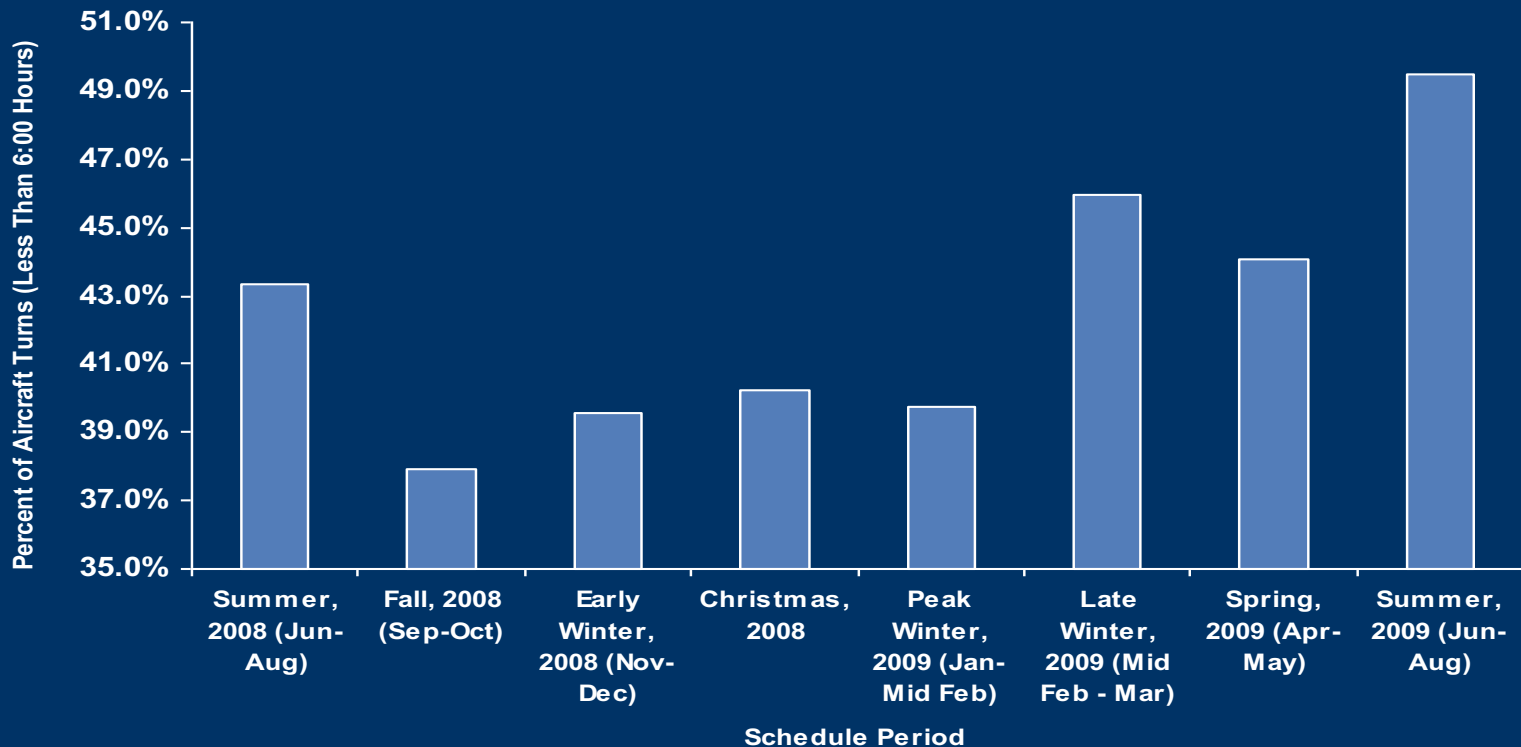


SOURCE: Department of Transportation



# The Additional Scheduled Block Time Is Further Helping To Ensure An On-Time Departure Despite The Fact That More Flights Are Scheduled Closer To A Minimum Turn Time

**Percent Of United's Narrow Body Fleet Types That Are Scheduled Within :10 Minutes Of Minimum Turn Time**



# As An Example Of The Importance Of Every Minute, An A320 Aircraft Flow From This Summer Shows The Importance Of Departing On-Time Or Early

**A320 Scheduled Aircraft Flow – Weekday, June, 2009**

**Typical Arrival  
Early/Late Minutes On  
A “Good” Weather Day**

<u>Origin</u>	<u>Dptr Time</u>	<u>Dest</u>	<u>Arvl Time</u>	<u>Scheduled Ground Time</u>	
<b>PHL</b>	<b>6:00</b>	<b>ORD</b>	<b>7:11</b>	<b>0:49</b>	<b>0:05 Minutes Early</b>
<b>ORD</b>	<b>8:00</b>	<b>CMH</b>	<b>10:13</b>	<b>0:42</b>	<b>0:04 Minutes Early</b>
<b>CMH</b>	<b>10:55</b>	<b>ORD</b>	<b>11:13</b>	<b>0:42</b>	<b>0:06 Minutes Late</b>
<b>ORD</b>	<b>11:55</b>	<b>LAX</b>	<b>14:17</b>	<b>0:44</b>	<b>0:16 Minutes Late</b>
<b>LAX</b>	<b>15:01</b>	<b>SFO</b>	<b>16:15</b>	<b>0:43</b>	<b>0:25 Minutes Late</b>
<b>SFO</b>	<b>16:58</b>	<b>DEN</b>	<b>20:32</b>	<b>0:48</b>	<b>0:22 Minutes Late</b>
<b>DEN</b>	<b>21:20</b>	<b>SAN</b>	<b>22:39</b>	<b>Overnight</b>	<b>0:33 Minutes Late</b>

# Moving Towards NextGen

# Moving Forward, United Is Taking A Proactive Approach In Working With The FAA, Airport Authorities And Various Vendors To Reduce Actual Block Minutes



**Initiatives Focused On To Reduce Time, Fuel And Emissions:**

## Airlines

- **Replace/Retire Older Fleets**
- **Optimizing Flight Planning**
- **Flying Optimum Speeds**
- **Managing GDP's At Gate**
- **Managing Peak Operations**

## Air Traffic Management

- **Surface Management Systems**
- **Route Optimization (RNP)**
- **Continuous Descent Approach**
- **Re-Designed/Optimize Airspace**
- **SOIA Wake Turbulence Waiver**

# Q&A