



Crystal Ball Parking Done Here!

7th National Aviation System Planning Symposium

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Agenda

- **The art and science of forecasting and planning**
- **A look back**
- **Current Market Outlook**
- **A look forward**



Forecasting – art or science?



or



Looking backwards through the crystal ball



US Commercial Aviation in 1972

- Airline regulation is the normal
- Air travel is for business or luxury
- Load factors are in the 50's
- Oil is less than \$10/bbl
- Twin-aisle aircraft (quads and tri-jets) represent the future
- Security is focused on preventing hijackings to Cuba
- Enhanced safety is pre-eminent research topic
- “Low cost carriers” is a gleam in Herb Kelleher’s eyes
- US airlines dominate the world
- NYC airports, ORD, DCA are congested



US Commercial Aviation in 1992

- Airline de-regulation is the normal
- Air travel in US is mass market
- Load factors are in the 70's
- Oil is \$20/bbl
- Twin engine aircraft (both single-aisle and twin-aisle) represent the future
- Security is un-focused
- Enhanced safety is pre-eminent research topic
- “Low cost carriers” are reality in the US and fantasy in rest of world
- US airline domination of the world is decaying rapidly
- NYC airports, ORD, DCA are congested



Where are we now?



US Commercial Aviation in 2012

- **Airline de-regulation is the normal**
- **Air travel in US is mass market**
 - **Growth has been meager over last decade**
- **Load factors are in the 80's**
- **Oil is \$100/bbl with lots of volatility**
- **Twin engine aircraft (both single-aisle and twin-aisle) dominate the future**
- **Security is challenging and highly focused**
- **Safety Improvements become more challenging**



US Commercial Aviation in 2012

- **“Low cost carriers” are reality throughout the world**
- **Alliances dominate the international marketplace**
- **NextGen is finally happening, albeit slowly**
- **Air Travel is a global industry**
- **NYC airports, LAX, ATL, DCA are congested**
- **Climate Change is major issue**
 - **Industry is aligned in aspirational goals**



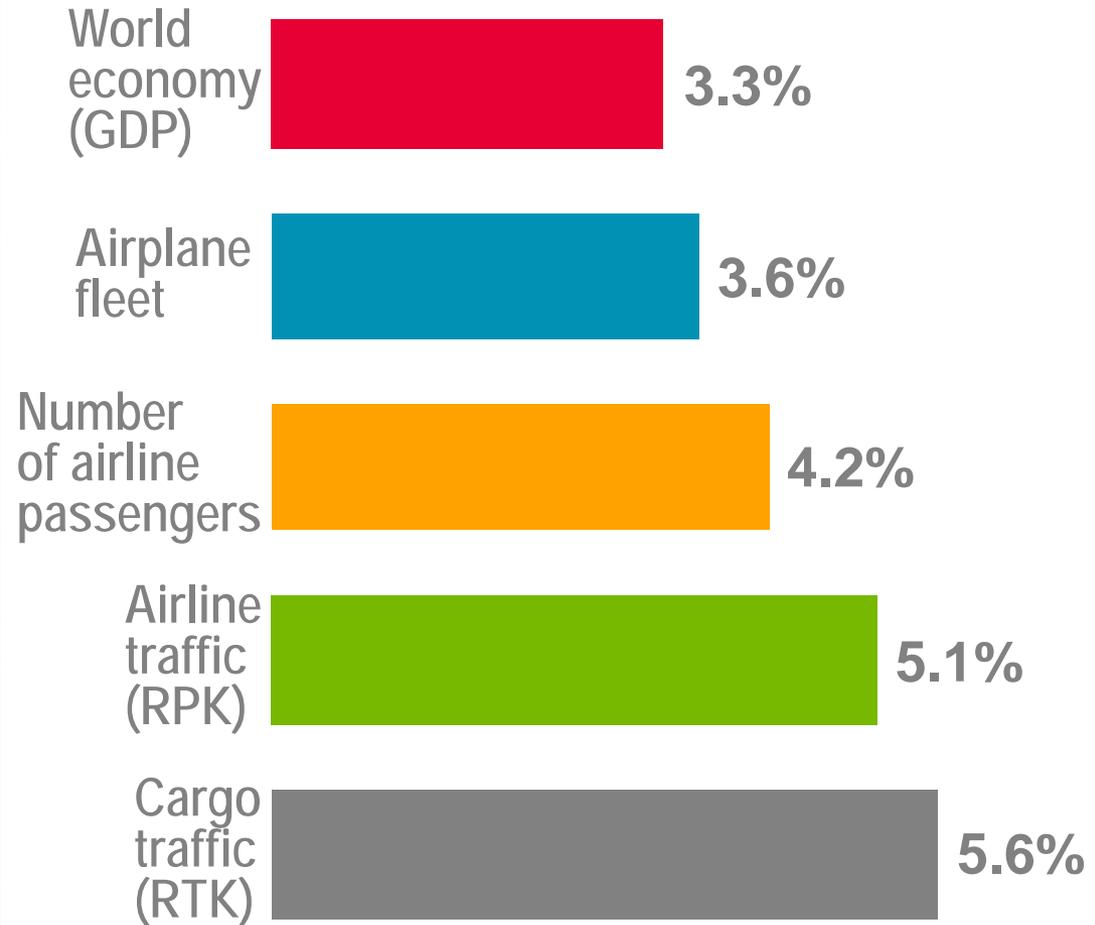
Looking to the future



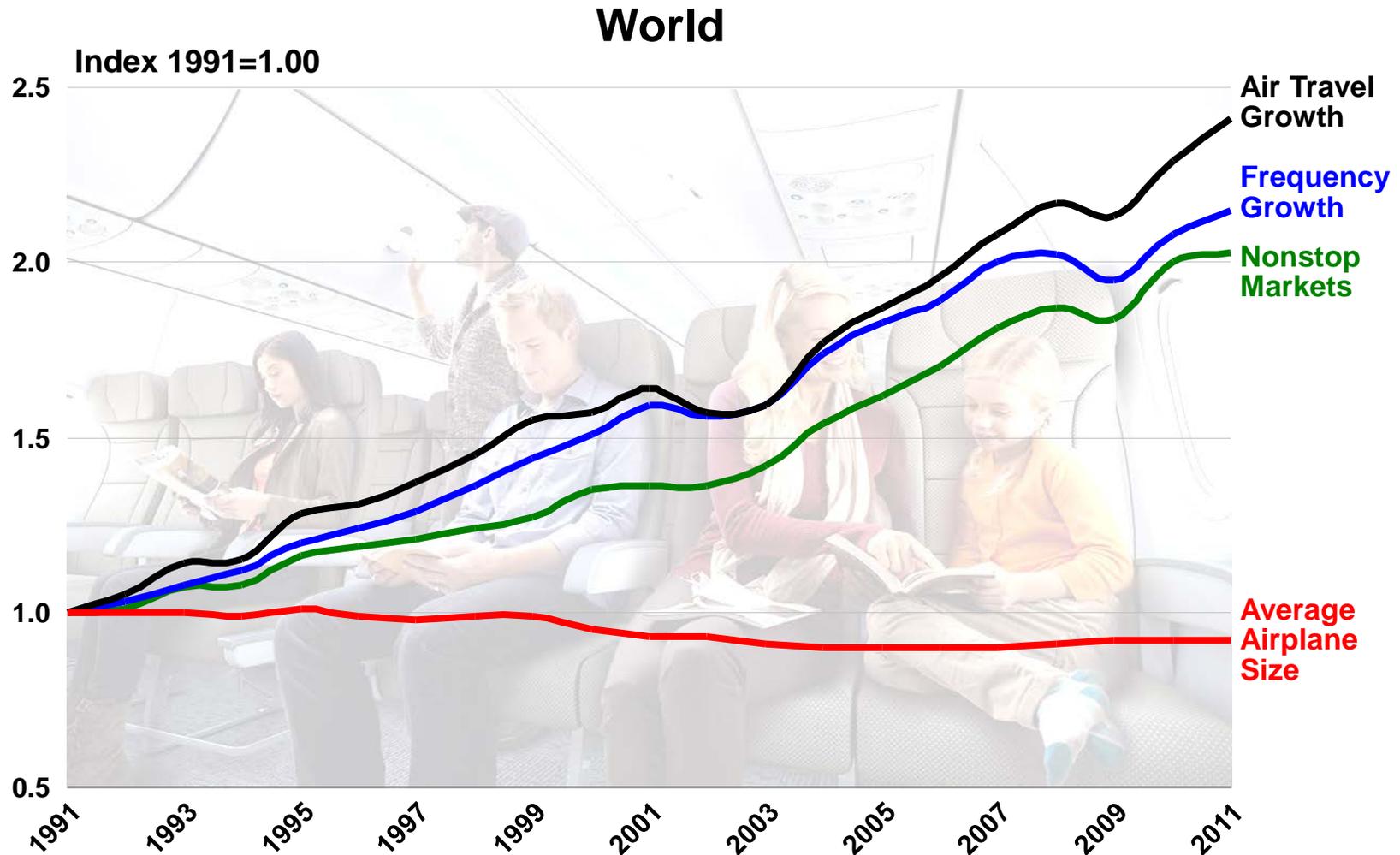
20-year forecast: strong long-term growth



2010 to 2030



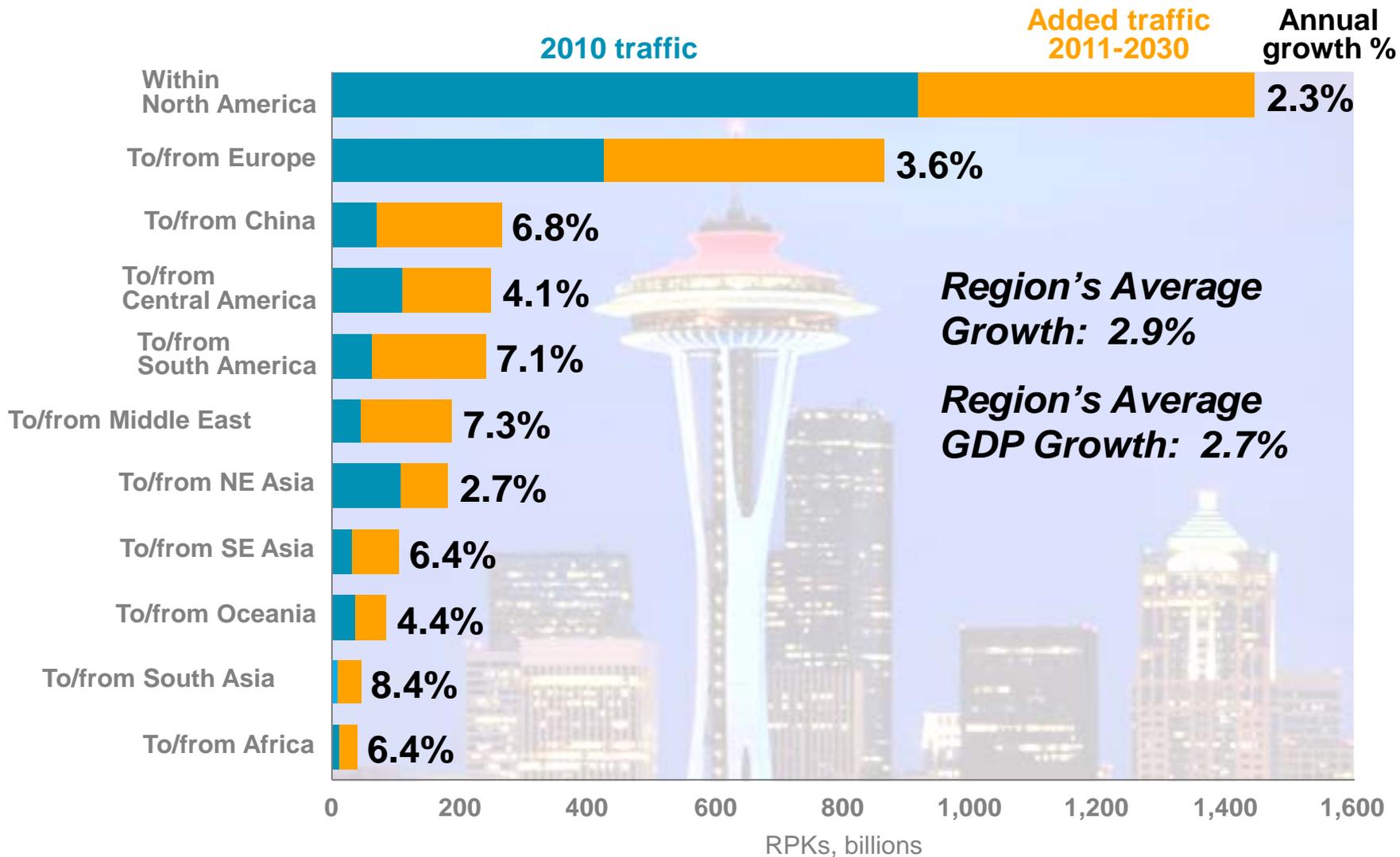
Air travel growth has been met by increased frequencies and nonstops



August OAG

All routes

North American air travel growth varies by market

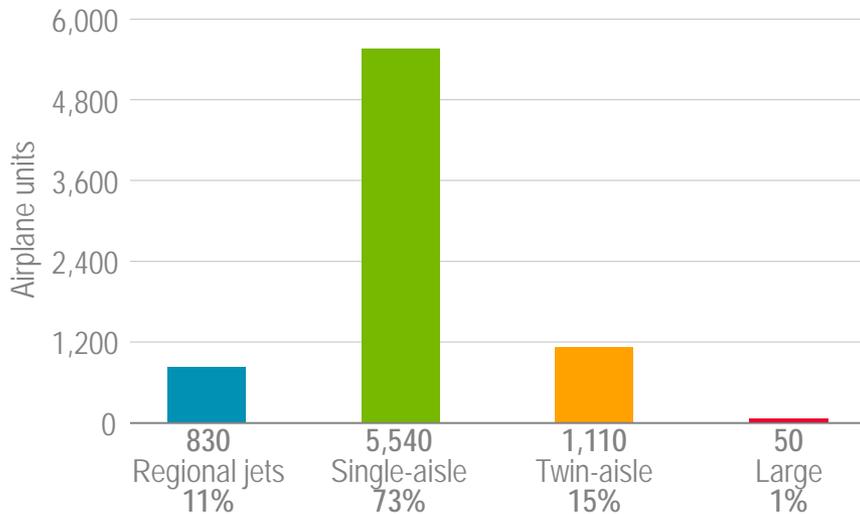


North America airlines will need 7,530 new airplanes valued at \$760 billion



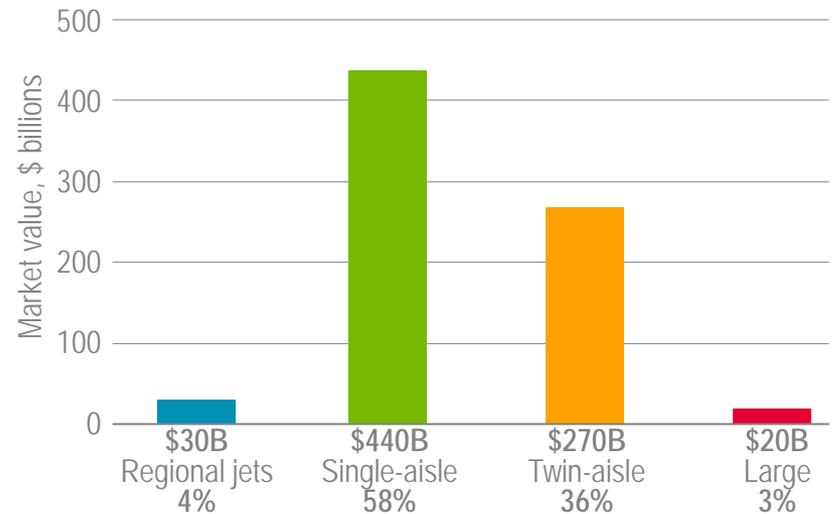
Airplane deliveries: 7,530

2011 to 2030

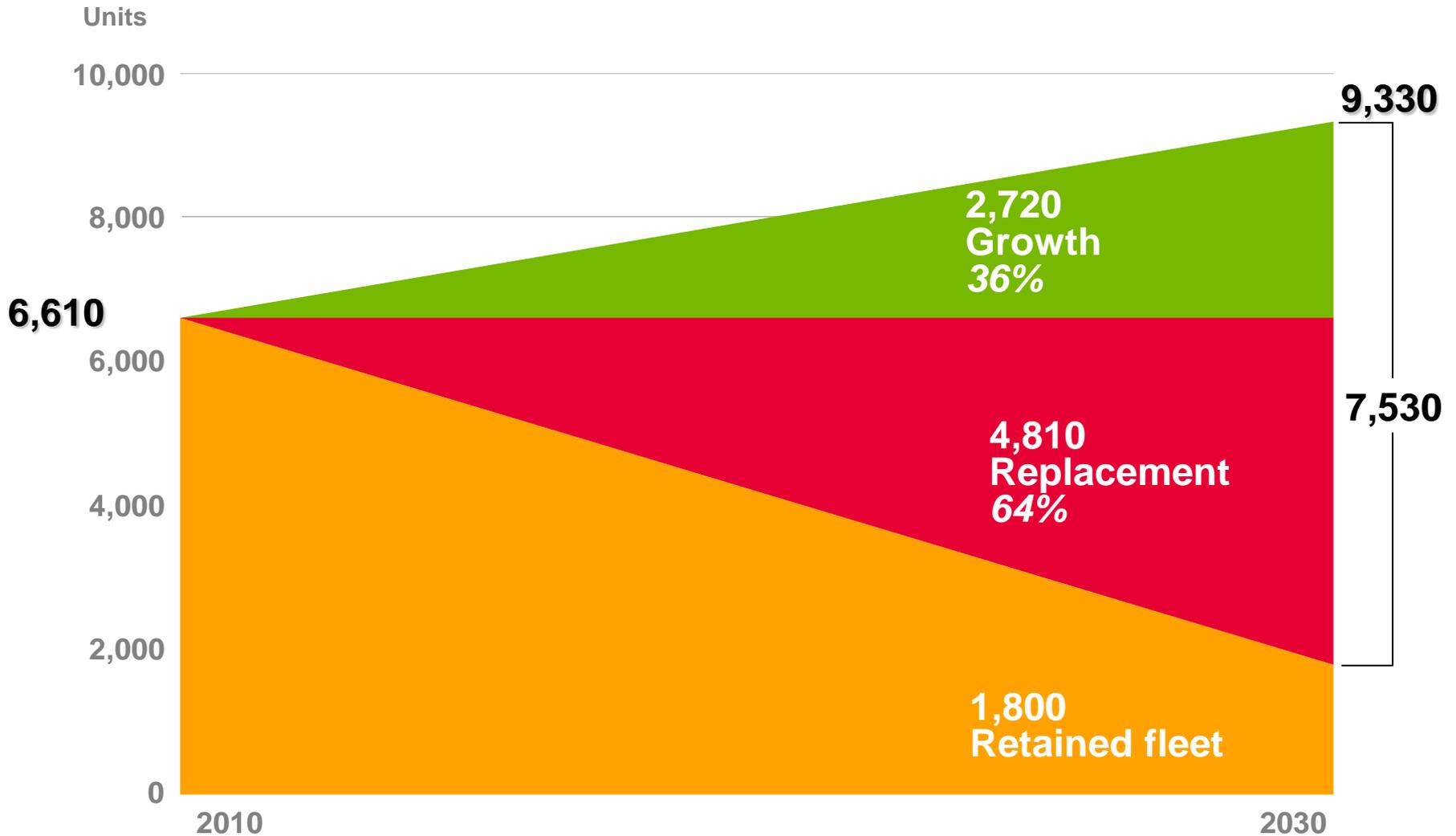


Market value: \$760 billion

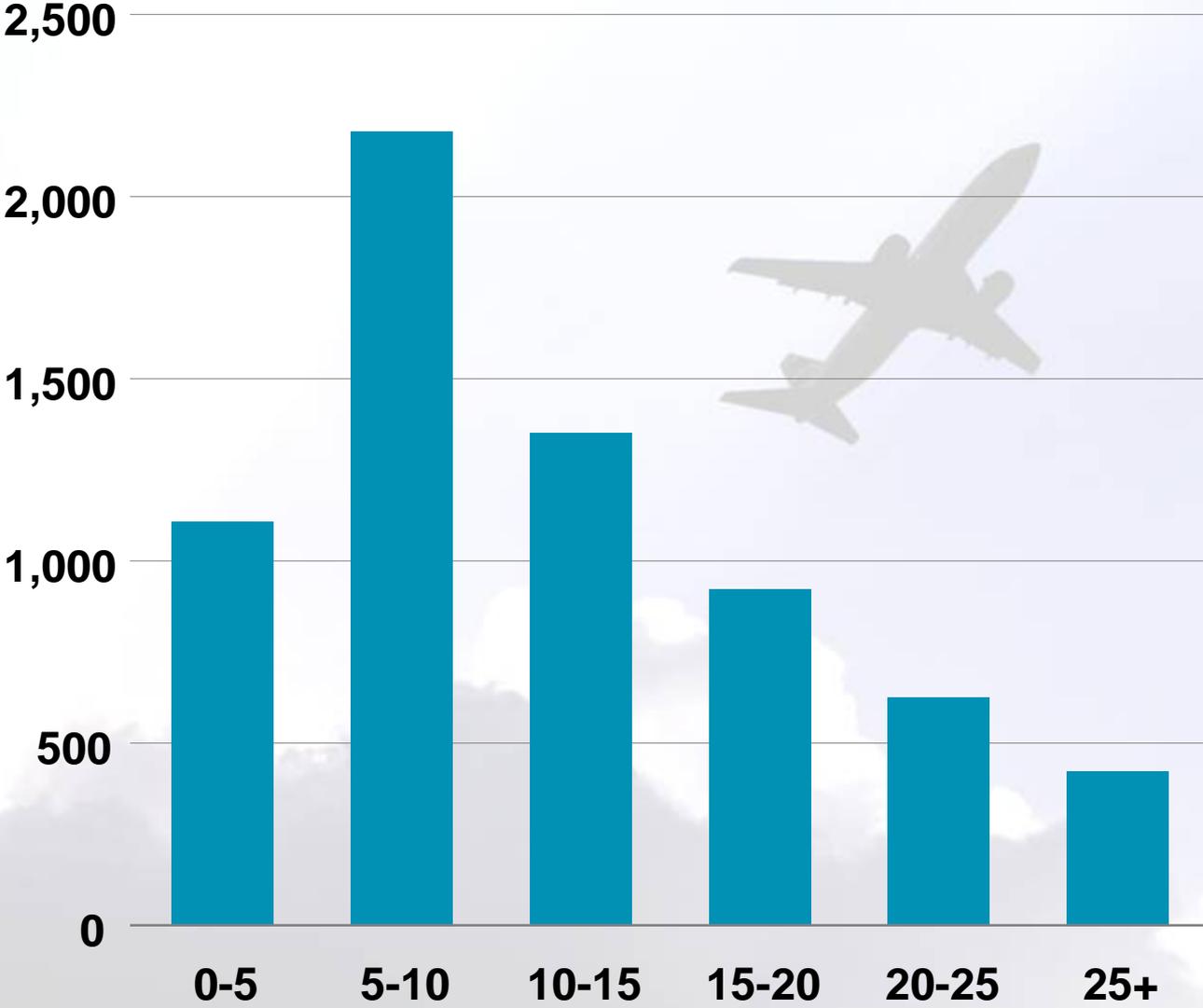
2011 to 2030



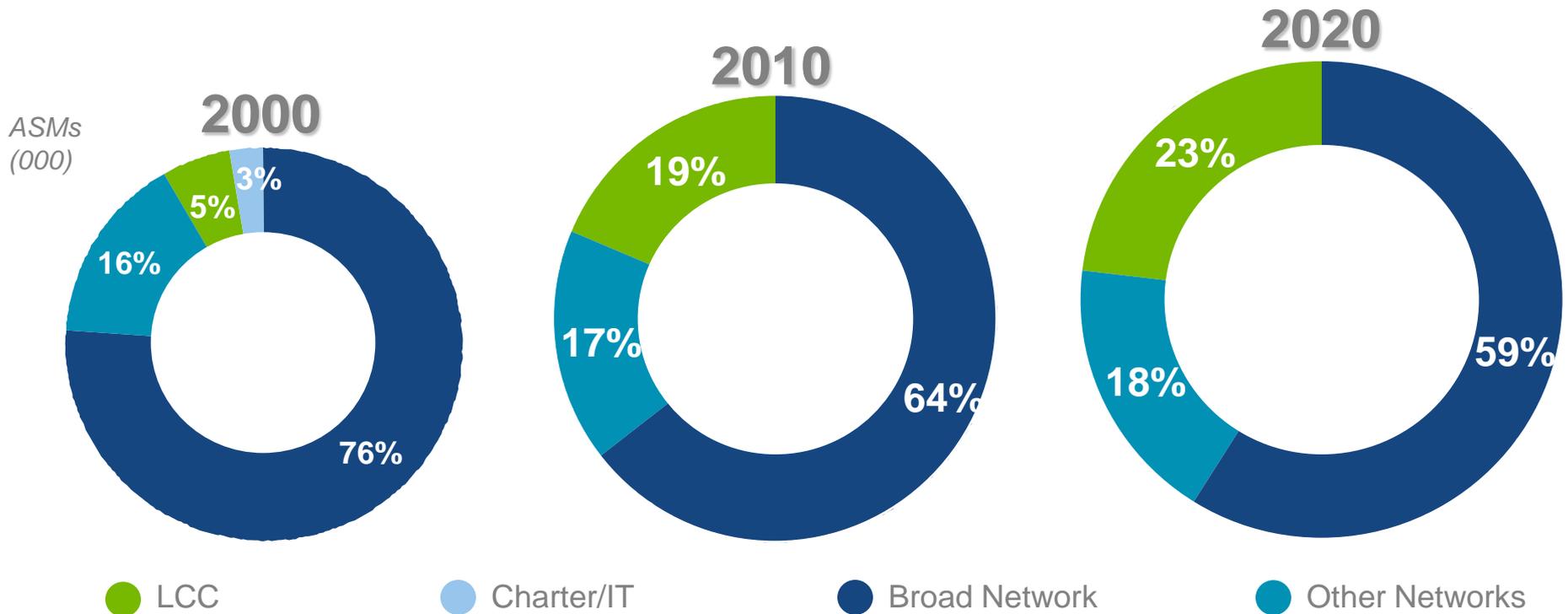
Two-thirds of North America deliveries will be replacements



North America fleet age distribution



North American airlines business model shifts

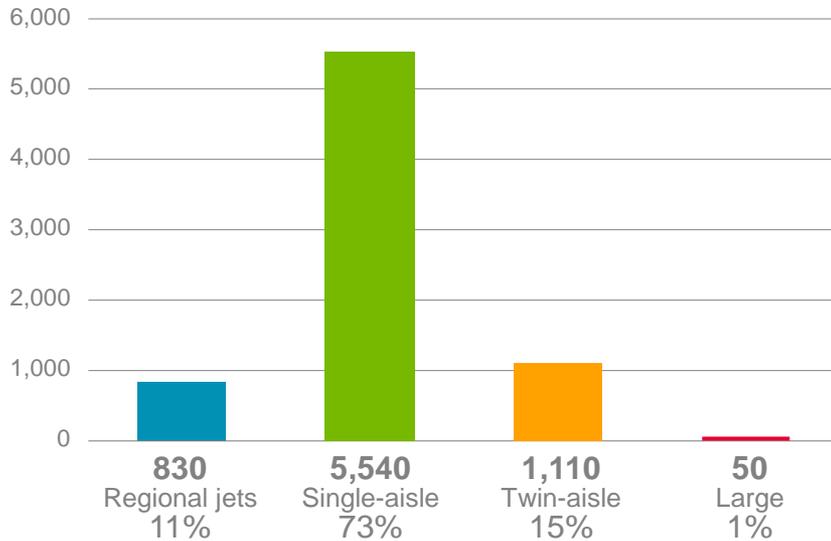


Source: Boeing CMOs

North America forecast vs. backlog

7,530 New Airplane Deliveries

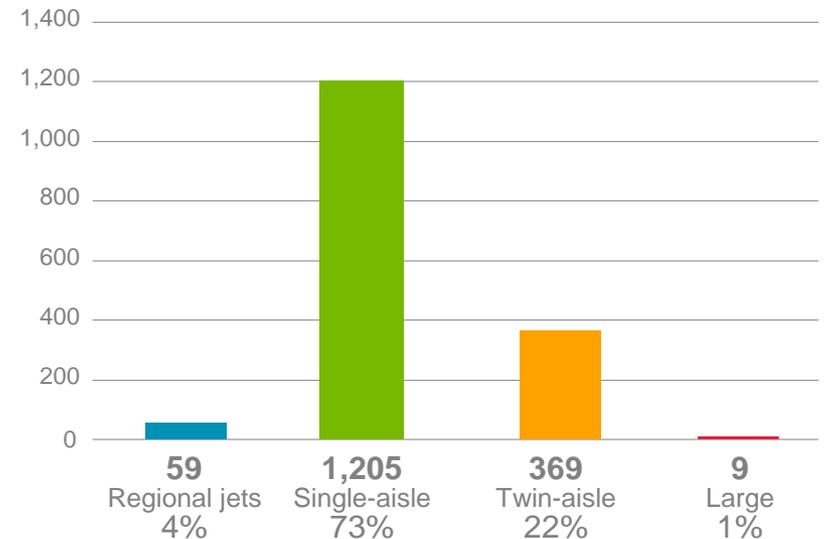
2011 to 2030



1,633 Airplane Backlog

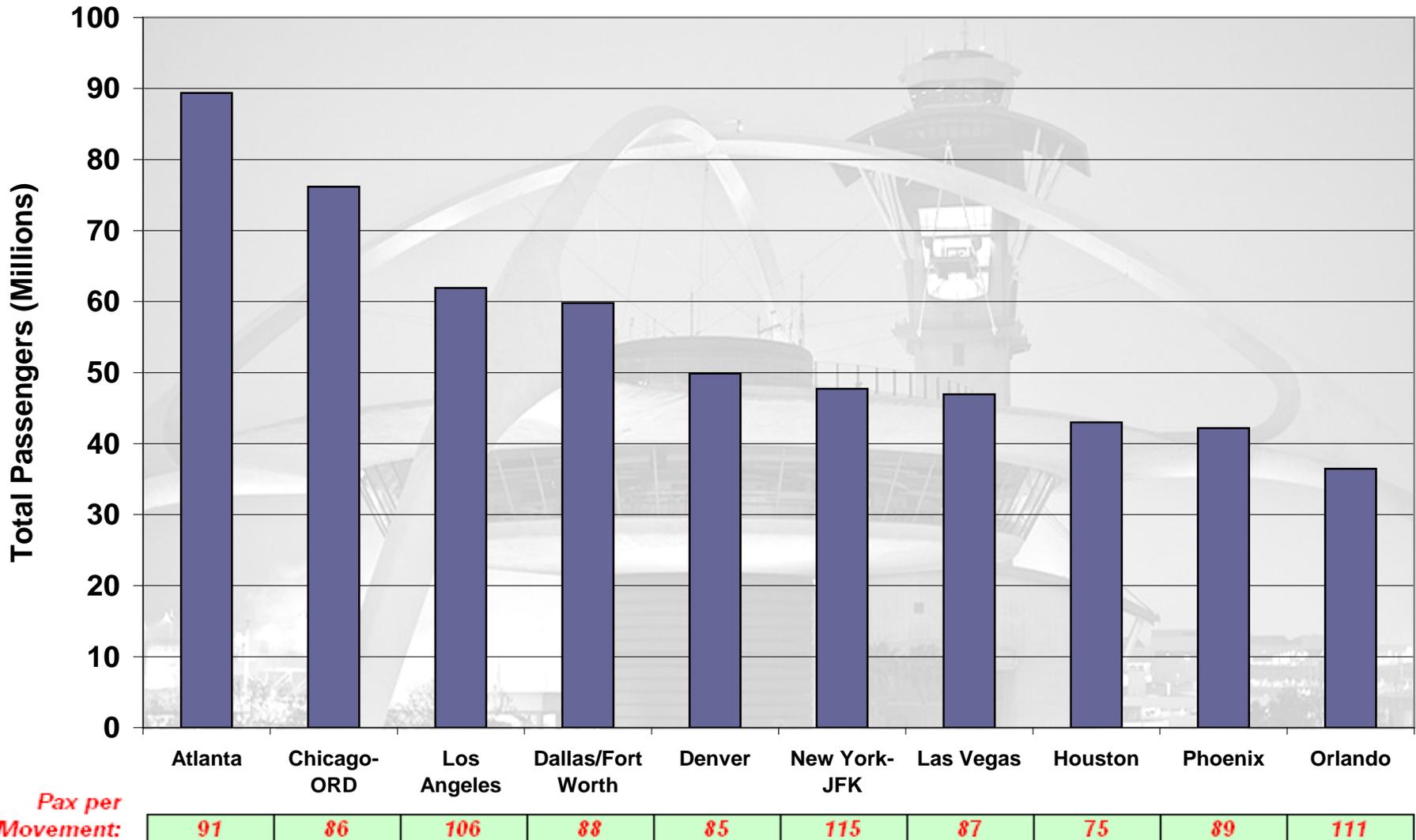
2011

Including assigned leasing airplanes



Source: Forecast – CMO 2011
Backlog – Ascend 6/11

North America – top 10 airports in 2007



Source: ACI

Clouds in our crystal ball



Constraints on growth – airport landside

- **Local transportation**
- **Land use**



Constraints on growth – airport airside

- **Geography**

- **Technology**

- **Noise**

- **Economics**



Constraints on growth – ATC/ATM

- **Technology**

- **Money**

- **Politics**



Constraints on growth – security

- **The next attack vector**
- **Risk management**



Constraints on growth – economics

- **Slow recovery**
- **Fuel price volatility**
- **Budget deficits**



Constraints on growth – environment

- **What are the rules going to be?**

CARBON FOOTPRINT



- **How does aviation participate cost effectively?**

What do I see in my crystal ball?



US Commercial Aviation in 2032

- **NextGen is still being implemented**
 - **Satellite Based Navigation is standard**
- **Oil is \$200/bbl with lots of volatility**
 - **Aviation biofuels make up a significant fraction of the supply**
- **“Open Skies” are the worldwide normal**
- **NYC Airports, DCA, LAX still congested**



US Commercial Aviation in 2032 - continued

- **Environmental Issues are “front and center”**
 - **Aviation leads in global standards**
- **Financiers will be excited by a new and different airline business model**
 - **But, LCCs and Network carriers will still be prevalent**



US Commercial Aviation in 2032 - continued

- **Airplanes will still look the same**
 - **But will be more efficient than today**
- **Non-stop to anywhere capability**
 - **Hubs will still represent foundation of air travel**
- **High Speed Rail is not a replacement for air travel**



US Commercial Aviation in 2032 - continued

- **There will be a “surprise” for all of us**
- **Yet, many of the issues-du-jour will be similar to today**
- **Uncertainty and volatility will still be challenges to forecasters and planners**
 - **Those of us still working will have plenty to do!**
- **Cracks and blemishes in my crystal ball**



Final comments



- **Is Commercial Aviation in the U.S. a mature industry?**
- **Or is the industry undergoing another metamorphosis?**
- **What are the surprises in the next two decades?**

“A forecaster is like a cross-eyed javelin thrower: they don’t win many accuracy contests, but they keep the crowd’s attention.”

~Anonymous



The next Current Market Outlook

- **The 2012 version of the CMO will be published on our website on or about July 5, 2012**

Long-Term Market



- **<http://www.boeing.com/commercial/cmo/index.html>**