Air Traffic Management

Neil Planzer

Vice President

Airspace and Air Traffic Management

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Global ATM Market Drivers


Growth Capacity

Cost of Congestion and Delay

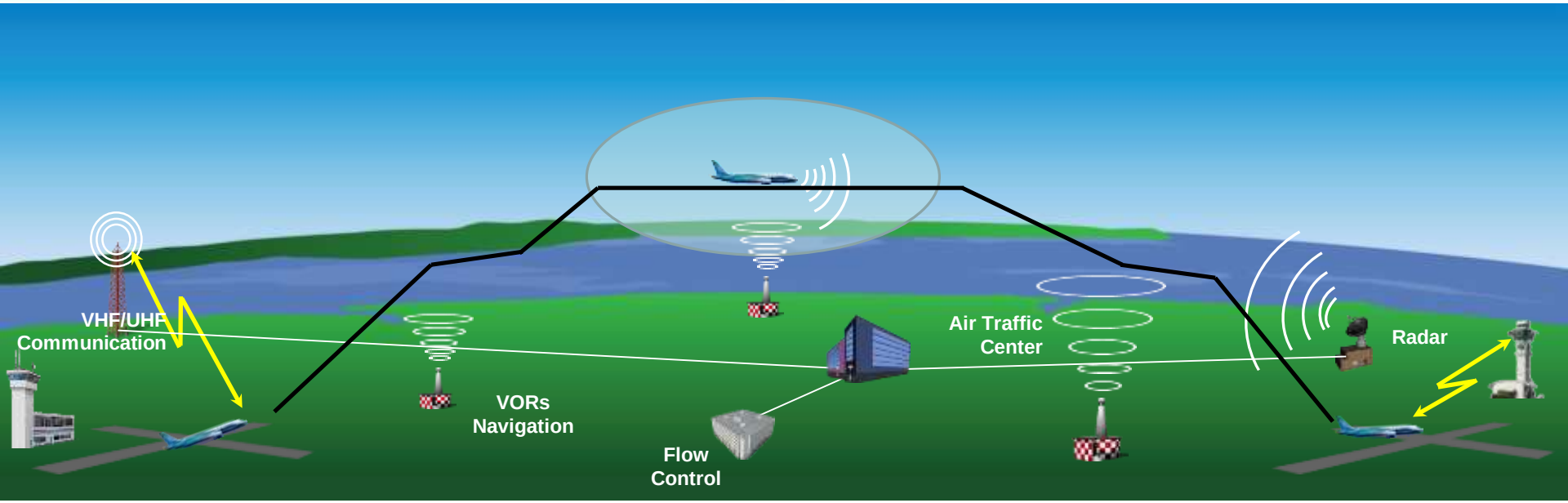
Systems Interoperability


Air-Ground Integration


Equipage


Environmental Improvements

Air Traffic System – Current State



Current

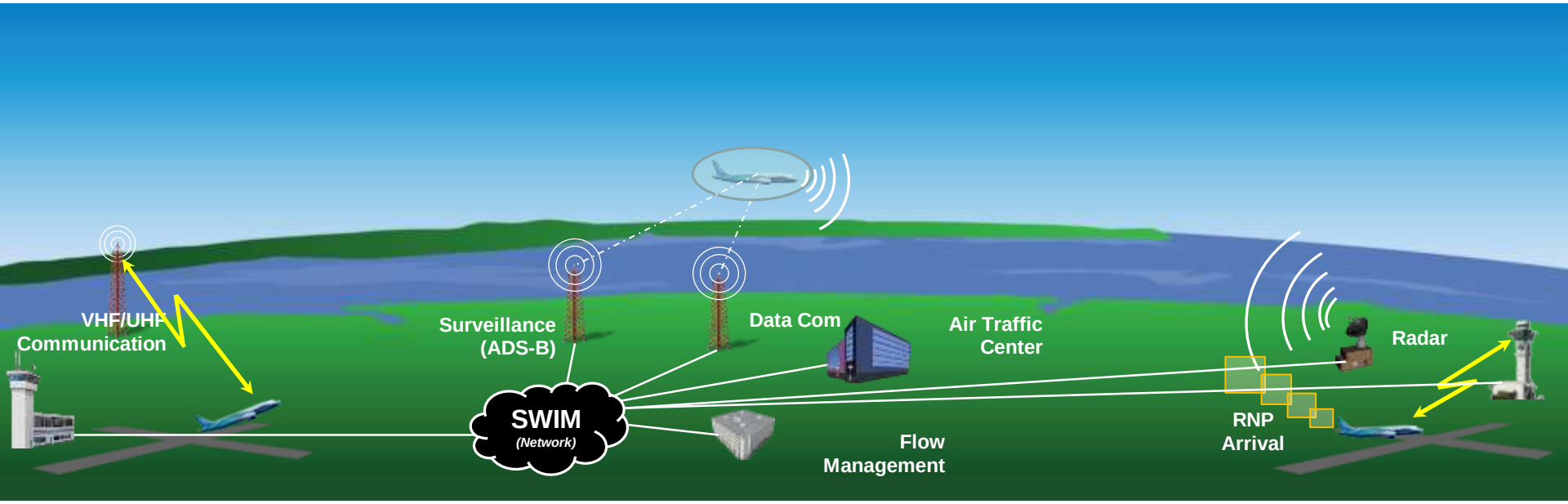
Communications:
- Voice-based communication
- Primarily one-way information flow from ATC

Navigation:
- Filed flight plan over points on the ground
- Changes by voice command

Surveillance:
- Based on radar technology
- Large separation criteria

Command & Control:
- Air Traffic Controller-centric
- Non-integrated command decisions

Air Traffic System – Future State



	Current	Future
Communications:	• Voice-based communication • Primarily one-way information flow from ATC	• Digital information for command and control • Two-way information flow between the air and ground
Navigation:	• Filed flight plan over points on the ground • Changes by voice command	• Trajectory-based operations; time addition • Primarily satellite navigation
Surveillance:	• Based on radar technology • Large separation criteria	• Based on satellite-enabled technology • Optimized spacing and separation criteria
Command & Control:	• Air Traffic Controller-centric • Non-integrated command decisions	• Distributed ATC/airplane command and control • Integrated decision making
Information Management:	• Limited information distribution	• Enabled, secure network-centric operations • High degree of automated distribution

Why is Boeing in the ATM Business?

- **Current air traffic management systems are constrained and limited in capacity growth**
- **Robust, flexible, and globally harmonized ATM systems are critical for success and continued long-term growth**

2012 Current Market Outlook

- 20 years – 34,000 airplanes
- $3.8T market

Growth versus Replacement

- Growth – 67%
- Replacement – 33%

Safe and efficient ATM systems are key enablers of future airplane sales

An Holistic Approach to ATM

- **Looks at Air Traffic Management as a completely integrated, aircraft connected, shared command & control system**
- **Fully integrates the current and future capabilities of the aircraft**
- **Utilizes the best communications, navigation, and surveillance capabilities**
- **Considers the full breadth of the ATM system**
  - Enterprise Architecture, Concept of Operations, Procedural Development, Training, and Maintenance
- **Balance all stakeholder requirements to ensure each mission and objective can be accomplished – while reducing operating cost**
- **Creates a more robust, flexible, and seamless ATM system that allows dynamic airspace allocation for more effective & efficient use of airspace**

Metrics for Success

- **Improved safety and security**
- **Meet future requirements for civil air traffic systems**
- **Reduced operating costs**
- **Transition through mixed fleet operations**
- **Improved shared situational awareness between stakeholders**
- **Capacity and efficiency improvements**
- **Environmental improvements**